



west virginia department of environmental protection

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

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

December 11, 2015

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-8510269, issued to ANTERO RESOURCES CORPORATION, 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 all 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 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.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-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) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: DEEM UNIT 2H
Farm Name: JACKSON, STEPHEN C.

API Well Number: 47-8510269

Permit Type: Horizontal 6A Well

Date Issued: 12/11/2015

PERMIT CONDITIONS

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.

CONDITIONS

1. Operator shall take additional measures with this permitted activity to avoid communication with offset wells. Such additional measures are described in the attached addendum. This addendum is part of the terms of the well work permit, and includes a description of depth and completed formations of offset wells. Also included is a description of monitoring activities that will take place during fracturing operations of the permitted well work.
2. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.
3. 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.
4. 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.
5. 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.
6. 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.

PERMIT CONDITIONS

7. 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.
8. 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.
9. 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.
10. 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.



Addendum for Antero pads in Ritchie County, WV

Deem Unit 2H Buck Run Pad

The following outlines the process to be undertaken by Antero Resources prior to and during completion process of wells in Ritchie County.

- Investigate all wells within 1320' of new wells - for all identified Marcellus vertical wells and any existing well(s) with an interval that is less than 1500 feet from the deepest formation drilled (including, but not specific to the Alexander formation) to the top of Marcellus:
 - Contact operator of all wells
 - Confirm well status, producing horizon, well completion/stimulation information
 - Discuss plans to stimulate the horizontal Marcellus wells and the plans for monitoring potential impact on shallow wells
 - Make sure all vertical wells (with an interval that is less than 1500 feet from the deepest formation drilled to the top of Marcellus) have adequate wellhead equipment, including pressure gauges
 - Provide shallow well operator with frac dates and develop plan for monitoring during stimulation
 - If well waters out during frac, shut it in until after stimulation, and install adequate well control equipment prior to swabbing in the impacted shallow well
- Control fracturing parameters during job to limit fracture height growth
 - Limit rate and limit pressures for each segment of fracturing stages

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12/11/2015

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

1) Well Operator: Antero Resources Corporal 494488557 085 - Ritchie Clay Pennsboro 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Deem Unit 2H Well Pad Name: Buck Run Pad

3) Farm Name/Surface Owner: Stephen C. Jackson et al Public Road Access: CR 74/9

4) Elevation, current ground: 1162' Elevation, proposed post-construction: 1127'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

Michael Gaff
11/4/15

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- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6600' TVD

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 17,400' MD

11) Proposed Horizontal Leg Length: 9544'

12) Approximate Fresh Water Strata Depths: 115', 244', 462'

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

14) Approximate Saltwater Depths: 532', 1149', 1794'

15) Approximate Coal Seam Depths: 420', 557', 757'

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

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

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

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18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|-----------|-------------|-----------|------------------------|----------------------------|------------------------------|-------------------------------|
| Conductor | 20" | New | H-40 | 94# | 40' | 40' | CTS, 38 Cu. Ft. |
| Fresh Water | 13-3/8" | New | J-55/H-40 | 54.5#/48# | 515' | 515'*see #19 | CTS, 715 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# | 17,400' | 17,400' | CTS, 4377 Cu. Ft. |
| Tubing | 2-3/8" | New | N-80 | 4.7# | | 7100' | |
| Liners | | | | | | | |

*MAG
11/24/15*

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|-----------|------------------------|---------------------|----------------------|--|--------------------|--------------------------|
| Conductor | 30" | 24" | 0.438" | 1530 | 50 | Class A | 1.18 |
| Fresh Water | 13-3/8" | 17-1/2" | 0.38"/0.33" | 2730/1730 | 1000 | Class A | 1.18 |
| Coal | 9-5/8" | 12-1/4" | 0.352" | 3520 | 1500 | Class A | 1.18 |
| Intermediate | | | | | | | |
| Production | 5-1/2" | 8-3/4" & 8-1/2" | 0.361" | 12,630 | 2500 | Lead-HPOZ & Tail-H | H/POZ-1.44 & H-1.8 |
| Tubing | 2-3/8" | 4.778" | 0.19" | 11,200 | | | |
| Liners | | | | | | | |

PACKERS

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

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WW-6B
(10/14)

API NO. 47-085 - 10269
OPERATOR WELL NO. Deem Unit 2H
Well Pad Name: Buck Run Pad

MAG
11/11/15

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 freshwater 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): 28.50 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.26 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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25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

WW-9
(2/15)

API Number 47 - 085 - 10269

Operator's Well No. Deem 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 494488557

Watershed (HUC 10) North Fork Hughes River Quadrangle Pennsboro 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

MAC
10/14/15

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- 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 _____)

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Stiff Foam, Production - Water Based Mud

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

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. 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)

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.

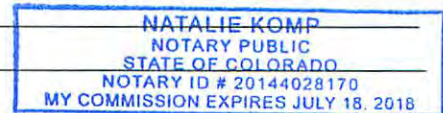
I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations 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 *Cole Kilstrom*

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental and Regulatory Manager



Subscribed and sworn before me this 29th day of October, 20 15

Natalie Komp Notary Public

My commission expires July 18, 2018

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85-10269

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 28.50 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" (4.02 acres) + Access Road "B" (2.71 acres) + Staging Area (0.85 acres) + Well Pad (8.26 acres) + Water Containment Pad (3.13 acres) + Excess/Topsoil Material Stockpiles (9.53 acres) = 28.50 acres

Seed Mixtures

Temporary

Permanent

| | |
|------------------------|-----------|
| Seed Type | lbs/acre |
| <u>Annual Ryegrass</u> | <u>40</u> |

| | |
|-------------------|--------------|
| Seed Type | lbs/acre |
| <u>Crownvetch</u> | <u>10-15</u> |

See attached Table IV-3 for additional seed type (Buck Run Pad Design Page 22)

Perennial Ryegrass 20
See attached Table IV-4a for additional seed type (Buck Run Pad Design Page 22)

*or type of grass seed requested by surface owner

*or type of grass seed requested by surface owner

NOTE: NO FESCUE OR TIMOTHY GRASS SHALL BE USED AT THIS SITE

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Michael Gaff

Comments: Preseed & Mulch any disturbed areas per WVD&P regulations. Maintain & upgrade E-r-s as necessary.

Title: Oil & Gas Inspector Date: 11/4/15

Field Reviewed? () Yes () No

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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

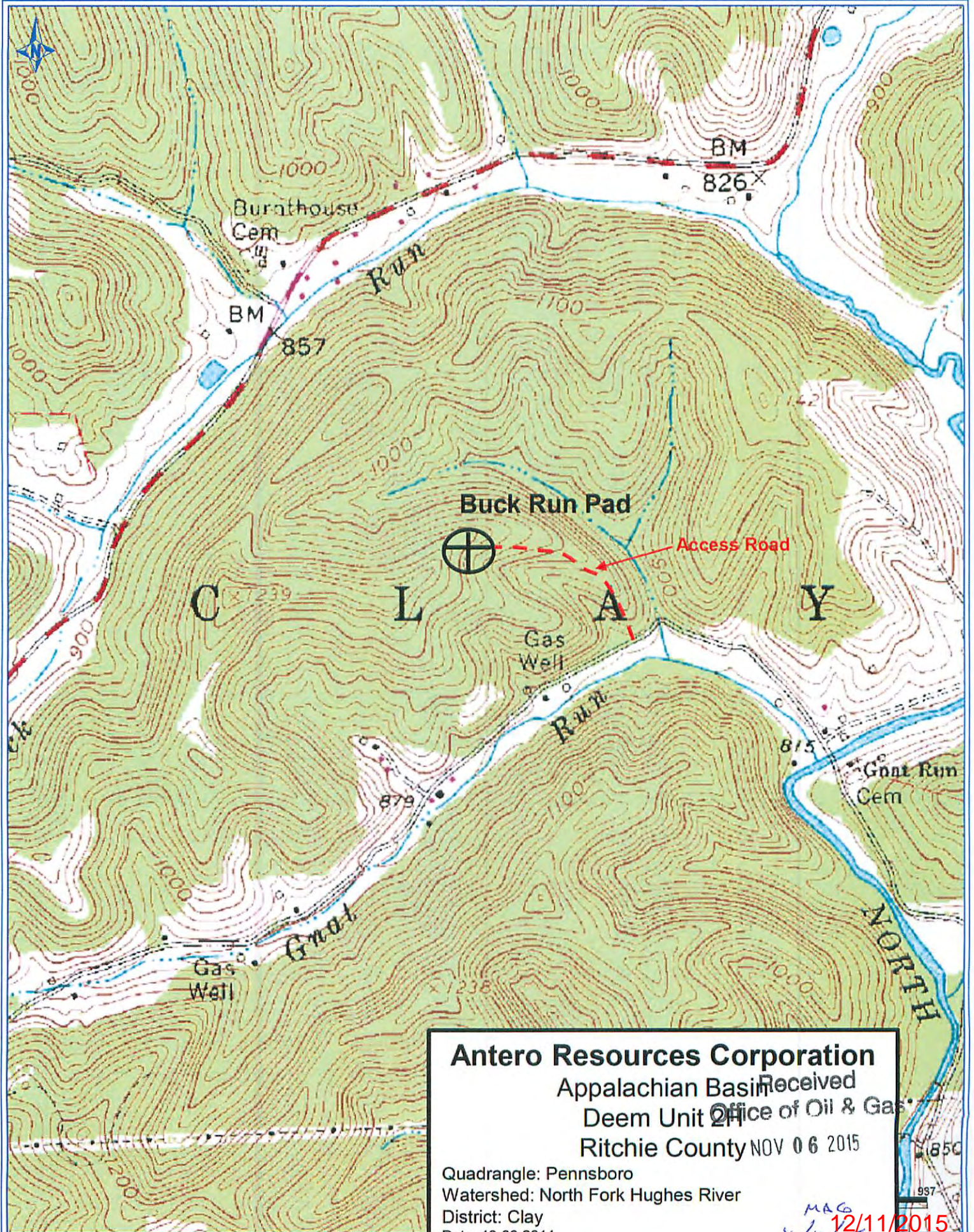
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13. Escaid 110
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligo
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. 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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85-10269



Antero Resources Corporation
 Appalachian Basin
 Deem Unit
 Ritchie County

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Quadrangle: Pennsboro
 Watershed: North Fork Hughes River
 District: Clay
 Date: 10-06-2014

MAG
 11/24/15
 12/11/2015

LATITUDE 39°20'00"

8,696'

LATITUDE 39°20'00"

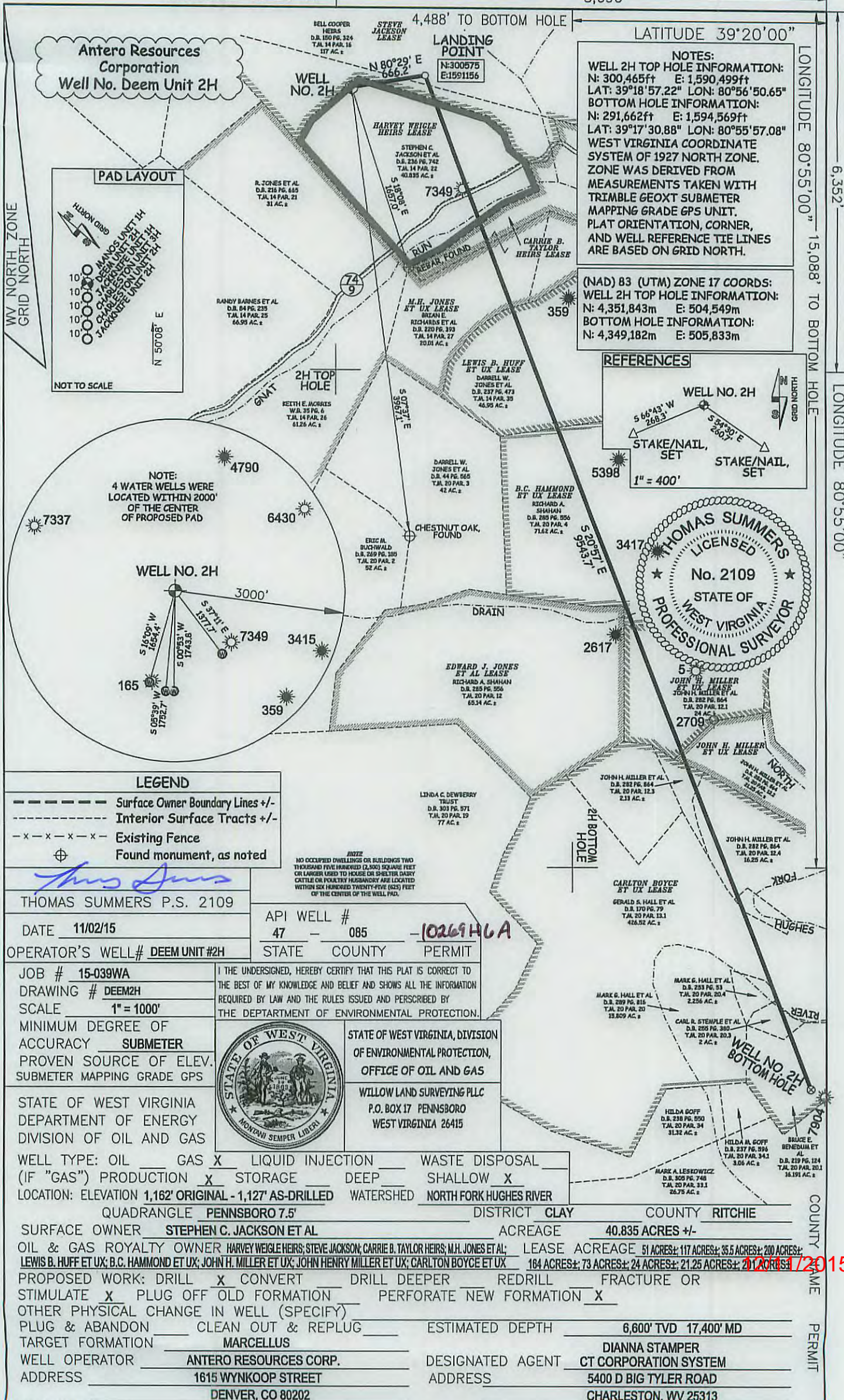
LONGITUDE 80°55'00"

6,352'

LONGITUDE 80°55'00"

COUNTY CLAY

PERMIT



COUNTY CLAY

PERMIT

10/11/2015

WW-6A1

Operator's Well Number Deem 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>Harvey Weigle Heirs Lease</u> | | | |
| Harley Weigle Heirs | J & J Enterprises, Inc. | 1/8 | 0178/0571 |
| J & J Enterprises | Eastern American Energy Company | Assignment | 0231/0732 |
| Eastern American Energy Corporation | Energy Corporation of America | Merger | DB 0306/0836 |
| Energy Corporation of America | Antero Resources Appalachian Corporation | Assignment | 0257/0377 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>Steve Jackson Lease</u> | | | |
| Steve Jackson | Antero Resources Appalachian Corporation | 1/8+ | 0257/0716 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>Carrie B. Taylor Heirs Lease</u> | | | |
| David W. Taylor, Heir of Faye P. Taylor | Antero Resources Corporation | 1/8+ | 0267/0305 |
| <u>M.H. Jones, et ux Lease</u> | | | |
| M.H. Jones, et ux | P.G. McKeon | 1/8 | 0032/0025 |
| P.G. McKeon | Carnegie Natural Gas | Assignment | 0041/0357 |
| Carnegie Natural Gas | Carnegie Production Company | Assignment | 0228/0859 |
| Carnegie Production Company | EQT Production Company | Certificate of Registration of Trade Name | Exhibit 2 |
| EQT Production Company | Antero Resources Corporation | *Partial Assignment | 0282/0175 |
| <u>Lewis B. Huff, et ux Lease</u> | | | |
| Lewis B. Huff, et ux | Robert P. Jackson | 1/8 | 0155/0442 |
| Robert P. Jackson | Kepeco, Inc. | Assignment | 0168/0595 |
| Kepeco, Inc. | Eastern Kentucky Production Company | Name Change | Exhibit 3 |
| Eastern Kentucky Production Company | Kepeco Resources, Inc. | Assignment | 0188/0061 |
| Kepeco Resources, Inc. | Union Drilling, Inc. | Merger | CRB 0004/0322 |
| Union Drilling, Inc. | Equitable Resources Exploration, Inc. | Merger | DB 0227/0201 |
| Equitable Resources Exploration, Inc. | Equitable Resources Energy Company | Merger | DB 0230/0047 |
| Equitable Resources Energy Company | Enervest East Limited Partnership | Assignment | 0222/0273 |
| Enervest East Limited Partnership | The Houston Exploration Company | Assignment | 0234/0890 |
| The Houston Exploration Company | Seneca-Upshur Petroleum, Inc. | Assignment | 0236/0650 |
| Seneca-Upshur Petroleum, Inc. | Seneca-Upshur Petroleum, LLC | Assignment | DB 0311/0863 |
| Seneca-Upshur Petroleum, LLC | Alliance Petroleum Corporation | Assignment | 0269/0062 |
| Alliance Petroleum Corporation | Antero Resources Appalachian Corporation | *Partial Assignment | 0256/0001 |
| 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.

CONTINUED ON NEXT PAGE

12/11/2015

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>B.C. Hammond, et ux Lease</u> | | | |
| B.C. Hammond, et ux | McCall Drilling Company, Inc. | 1/8 | 0057/0131 |
| McCall Drilling Company, Inc. | Burnt House Oil & Gas Company | Assignment | 0102/0565 |
| Burnt House Oil & Gas Company | Lewis B. Huff | Assignment | 0114/0620 |
| Lewis B. Huff | Penn Resources, Inc. | Assignment | 0114/0647 |
| Penn Resources, Inc. | Seco Oil & Gas, Inc. | Assignment | 0138/0378 |
| Seco Oil & Gas, Inc. | Metroplex Energy, Inc. | Assignment | 139/0788 |
| Metroplex Energy, Inc. | Seco Oil & Gas, Inc. | Assignment | 0140/0716 |
| Seco Oil & Gas, Inc. | Walter C. Crane and Carroll W. Thompson, d/b/a North Hills Investment Company | Assignment | 0208/0296 |
| Walter C. Crane and Carroll W. Thompson, d/b/a North Hills Investment Company | J.F. Deem Oil & Gas, LLC | Assignment | 0252/0232 |
| J.F. Deem Oil & Gas, LLC | Antero Resources Appalachian Corporation | Assignment | 0262/0646 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>Edward J. Jones, et al Lease</u> | | | |
| Edward J. Jones, et al | Herman Dotson | 1/8 | 0094/0288 |
| Herman Dotson | M.A. Murphy | Assignment | 0097/0243 |
| M.A. Murphy | Key Oil Company | Assignment | 0220/0069 |
| Key Oil Company | Antero Resources Appalachian Corporation | *Partial Assignment of Oil & Gas Lease | 0253/0747 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>John H. Miller, et ux Lease (TM 20-12.1)</u> | | | |
| John H. Miller, et ux | Antero Resources Appalachian Corporation | 1/8+ | 0259/0642 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>John H. Miller, et ux Lease (TM 20-12.2)</u> | | | |
| John H. Miller, et ux | Antero Resources Appalachian Corporation | 1/8+ | 0259/0637 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |

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NOV 06 2015

*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. Deem 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>Carlton Boyce, et ux Lease</u> | | | | |
| | Carlton Boyce, et ux | B & M Associates | 1/8 | 0217/0365 |
| | B & M Associates | Key Oil Company | Assignment | 0217/0585 |
| | Key Oil Company | Antero Resources Appalachian Corp. | Assignment | 0253/0747 |
| | Antero Resources Appalachian Corp. | 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: Kevin Kilstrom
 Its: VP of Production

**Received
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NOV 06 2015

85-10269

FORM WW-6A1
EXHIBIT 1

FILED

JUN 10 2013

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



Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvso.com
E-mail: business@wvso.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 Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of Incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: _____
(attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)
Alvyn A. Schopp (303) 357-7310
Contact Name Phone Number
- Signature Information (See below **Important Legal Notice Regarding Signature**):
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person
Signature: [Handwritten Signature] Date: June 10, 2013

Important Legal Notice Regarding Signature For West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

Form CF-4

Issued by the Office of the Secretary of State

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Office of Oil & Gas

NOV 06 2015

12/11/2015

State of West Virginia



Certificate

I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

EQT PRODUCTION COMPANY

has filed a "Certificate of Registration of Trade Name" in my office according to the provisions of Chapter 47 of the West Virginia Code and was found to conform to law.

Therefore, I hereby issue this

CERTIFICATE OF REGISTRATION OF TRADE NAME

authorizing it to transact business in West Virginia under the assumed name of

CARNEGIE PRODUCTION COMPANY

Received
Office of Oil & Gas
NOV 06 2015



Given under my hand and the Great Seal of the State of West Virginia on this day of April 9, 2009

Natalie E. Tennant
Secretary of State



FORM WW-6A1
EXHIBIT 3

85-10269 ✓

Commonwealth of Kentucky

OFFICE OF
SECRETARY OF STATE

DREXELL R. DAVIS
Secretary



FRANKFORT,
KENTUCKY

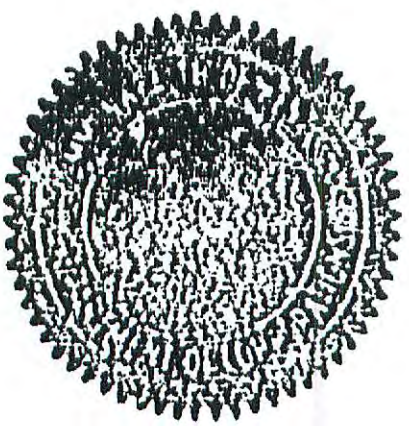
CERTIFICATE OF AMENDMENT TO ARTICLES OF INCORPORATION

I, DREXELL R. DAVIS, Secretary of State of the Commonwealth of Kentucky, do hereby certify that Amended Articles of Incorporation of

KEPCO, INC.

CHANGING NAME TO EASTERN KENTUCKY PRODUCTION COMPANY

amended pursuant to Kentucky Revised Statutes, 271A, ~~(271)~~ duly signed and verified or acknowledged according to law, have been filed in my office by said corporation, and that all taxes, fees and charges payable upon the filing of said Articles of Amendment have been paid.



SECRETARY OF STATE

Given under my hand and seal of Office as Secretary of State,
at Frankfort, Kentucky, this 15TH day of AUGUST, 1985. Received
Office of Oil & Gas

Drexell R. Davis
SECRETARY OF STATE

NOV 06 2015

ASSISTANT SECRETARY OF STATE

12/11/2015



October 28, 2015

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 57th Street SE
Charleston, WV 25304

RE: Deem Unit 2H
Quadrangle: Pennsboro 7.5'
Ritchie County/Clay District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Deem 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 Deem Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,


Spencer Booth
Senior Landman

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Office of Oil & Gas
NOV 06 2015

12/11/2015

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

Date of Notice Certification: 10/29/2015

API No. 47- 085 -10269

Operator's Well No. Deem Unit 2H

Well Pad Name: Buck Run Pad

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

| | |
|---|---|
| State: <u>West Virginia</u> | UTM NAD 83 Easting: <u>504,549m</u> |
| County: <u>Ritchie</u> | Northing: <u>4,351,843m</u> |
| District: <u>Clay</u> | Public Road Access: <u>CR 74/9</u> |
| Quadrangle: <u>Pennsboro 7.5'</u> | Generally used farm name: <u>Stephen C. Jackson et al</u> |
| Watershed: <u>North Fork Hughes River</u> | |

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

| | |
|---|---|
| <p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p> | <p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> |
|---|---|

Required Attachments:

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

Office of Oil & Gas

NOV 06 2015

12/11/2015

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> <i>[Signature]</i> | | <u>Denver, CO 80202</u> |
| Its: | <u>VP of Production</u> | Facsimile: | <u>303-357-7315</u> |
| Telephone: | <u>303-357-7310</u> | Email: | <u>asteale@anteroresources.com</u> |



Subscribed and sworn before me this 29th day of October 2015
Natalie Komp Notary Public
 My Commission Expires July 18, 2015

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.

Received
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NOV 06 2015

**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: 10/30/2015 **Date Permit Application Filed:** 10/30/2015

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: PLEASE SEE ATTACHMENT(S)
Address: _____
Name: _____
Address: _____

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

COAL OPERATOR
Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
*PLEASE NOTE THAT ANTERO RESOURCES OWNS THE ADDITIONAL SURFACE TRACT WITH DISTURBANCE SHOWN ON PAD DESIGN AS IT WAS PURCHASED FROM THE ALLENDERS.

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE
Name: Tasha L. Hall *PLEASE NOTE THERE ARE 3 ADDITIONAL WATER SOURCES SHOWN ON THE ATTACHED MAP, BUT THEY ARE LOCATED GREATER THAN 1500' FROM THE SUBJECT PAD LOCATION
Address: 1407 Gnats Run
Pennsboro, WV 26415

SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

OPERATOR OF ANY NATURAL GAS
Name: _____
Address: _____

*Please attach additional forms if necessary

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12/11/2015

WW-6A Notice of Application Attachment (BUCK RUN PAD):**List of Surface Owner(s) with Proposed Disturbance associated with Buck Run Well Pad:**

WELL PAD – All owners were notified of all well work permit applications, and have executed signed Surface Use Agreements with Antero Resources Corporation.

TM 14 PCL 22

Owner: Stephen D. Jackson ✓
Address: 3117 Mountain Drive
 Pennsboro, WV 26415

Owner: Stephen D. Jackson ✓ (2nd Address)
Address: Corelogic Tax Service
 Attn: Escrow Reporting
 1 Corelogic Drive DFW-4-3
 Westlake, TX 76262

TM 14 PCL 16

Owner: Bell Cooper Heirs, et al (Gracie Cooper ATTY) ✓
 c/o Stephen Jackson
Address: 3117 Mountain Drive
 Pennsboro, WV 26415

Owner: Elleen Williams ✓
Address: 5 Perity Lane
 Pittsburgh, PA 15220

Owner: Colleen Sciulli ✓
Address: 3429 Ward Street
 Pittsburgh, PA 15213

Owner: Cinda Louise & David M. Fleming ✓
Address: 4501 Hudson Street
 Parkersburg, WV 26104

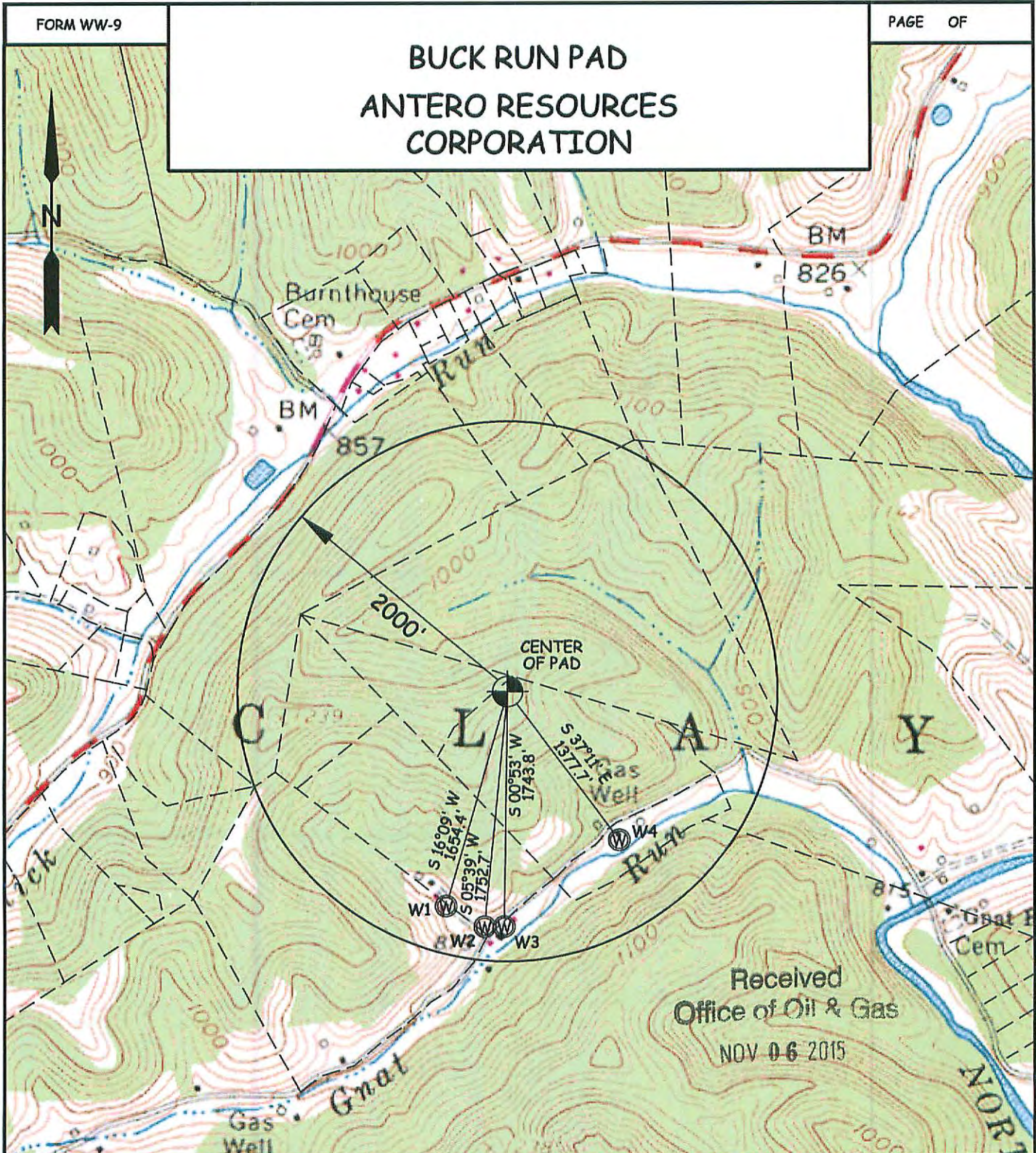
ROAD AND/OR OTHER DISTURBANCE – Antero Resources Corporation is the owner of this tract

TM 14 PCL 22.1

Owner: Antero Resources Corporation (purchased property from Eric S. & Melanie Allender)
Address: 1615 Wynkoop Street
 Denver, CO 80212

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 Office of Oil & Gas
 NOV 06 2015

BUCK RUN PAD ANTERO RESOURCES CORPORATION



| WELL | SURFACE OWNER | ADDRESS | WELL LATITUDE | WELL LONGITUDE |
|------|-------------------------|---------------------------------------|----------------|----------------|
| W1 | RANDY BARNES ET AL | 140 PINE DR. PENNSBORO, WV 26415 | 39° 18' 41.18" | 80° 56' 55.88" |
| W2 | RANDY M. JONES ET AL | 1379 GNATS RN PENNSBORO, WV 26415 | 39° 18' 39.76" | 80° 56' 52.19" |
| W3 | BRIAN E. RICHARDS ET AL | 1390 GNATS RUN RD PENNSBORO, WV 26415 | 39° 18' 39.79" | 80° 56' 50.34" |
| W4 | TASHA L. HALL | 1407 Gnats Run, Pennsboro, WV 26415 | 39° 18' 46.24" | 80° 56' 39.54" |

| | | | |
|--|------------------|--|---|
| WILLOW LAND SURVEYING, PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717 | | TOPO SECTION(S) OF: PENNSBORO 7.5' QUAD. JOB #: 14-008WA | SCALE : 1-INCH = 1000-FEET 0' 1000' 2000' 3000' |
| DATE: 09/23/14 | DRAWN BY: D.L.P. | FILE: BUCKRUNPADWATERMAP | |

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.

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Office of Oil & Gas

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.

NOV 06 2015

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting 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 57th St. SE
Charleston, WV 25304
(304) 926-0450

Received
Office of Oil & Gas
NOV 06 2015

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.**

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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Office of Oil & Gas
NOV 06 2015

12/11/2015

WW-6A
(8-13)

API NO. 47-085 - 10269
OPERATOR WELL NO. Deem Unit 2H
Well Pad Name: Buck Run Pad

Notice is hereby given by:

Well Operator: Antero Resources Corporation
Telephone: (303) 357-7310
Email: asteel@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.



Subscribed and sworn before me this 30th day of Oct, 2015.

Natalie Komp Notary Public

My Commission Expires July 18, 2018

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Office of Oil & Gas
NOV 06 2015

12/11/2015

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY**

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: 9/4/2014 **Date of Planned Entry:** 9/15/2014

Delivery method pursuant to West Virginia Code § 22-6A-10a

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

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)
 Name: PLEASE SEE ATTACHMENT
 Address: _____

 Name: _____
 Address: _____

 Name: _____
 Address: _____

COAL OWNER OR LESSEE
 Name: NO DECLARATIONS ON COUNTY RECORD
 Address: _____

MINERAL OWNER(s)
 Name: PLEASE SEE ATTACHMENT
 Address: _____

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

| | |
|-----------------------------------|---|
| State: <u>West Virginia</u> | Approx. Latitude & Longitude: <u>39.315920, -80.947150 (NAD 83)</u> |
| County: <u>Ritchie</u> | Public Road Access: <u>CR 74/B</u> |
| District: <u>Clay</u> | Watershed: <u>North Fork Hughes River</u> |
| Quadrangle: <u>Pennsboro 7.5'</u> | Generally used farm name: <u>Bell Cooper Heirs et al</u> |

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Antero Resources Corporation
 Telephone: (303) 357- 7310
 Email: astele@anteroresources.com

Address: 1615 Wynkoop Street
Denver, CO 80202
 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.

WW-6A3 Notice of Entry For Plat Survey Attachment:

85-10269

Surface Owners:

Located on TM 14/PCL 16

Owner: Cooper Bell Hrs (Gracie Cooper, ATTY) ✓
c/o Steve Jackson
Address: 3117 Mountain Dr.
Pennsboro, WV 26415

Owner: Elleen Williams ✓
Address: 1221 Oklahoma Ave.
Pittsburgh, PA 15216

Owner: Colleen Sciulli ✓
Address: 3429 Ward St.
Pittsburgh, PA 15213

Owner: Cinda L. Fleming & David M. Fleming ✓
Address: 4501 Hudson St.
Parkersburg, WV 26104

Owner: Steve Jackson ✓
Address: 3117 Mountain Dr.
Pennsboro, WV 26415

Located on TM 14/PCL 22

Owner: Stephen Jackson, c/o Corelogic Tax Service, ✓
Attn: Escrow Reporting
Address: 1 Corelogic Dr.
DFW 4-3
Westlake, TX 76262

Mineral Owners:

Located on TM 14/PCL 16

Owner: Cinda L. Fleming & David M. Fleming ✓
Address: 4501 Hudson St.
Parkersburg, WV 26104

Owner: Elleen Williams ✓
Address: 1221 Oklahoma Ave.
Pittsburgh, PA 15216

Owner: Colleen Sciulli ✓
Address: 3429 Ward St.
Pittsburgh, PA 15213

Owner: Belle Cooper, Hrs. (Gracie Cooper ATTY) ✓
Address: Eldridge Cary
216 Station Way
Adairsville, GA 30103

Owner: Steve Jackson ✓
Address: 3117 Mountain Dr.
Pennsboro, WV 26415

Owner: H3 LLC ✓
Address: 1483 Johns Creek Rd.
Milton, WV 25541

Owner: Donna Barker, deceased ✓
Charlene Crooks
Address: 4610 4th Ave.
Vienna, WV 26105

Owner: Cora Kincaid ✓
Address: 10571 Stauton Turnpike
Smithville, WV 26178

Owner: Rosalee Wilson, Deceased ✓
Cinda Fleming & David Fleming ✓
Address: 93 Wynham Knob
Parkersburg, WV 26149

Located on TM 14/PCL 22

Apparent Heirs of Harley M. Weigle ✓
Owner: William & James Weigle, Betty Latstetter,
Jean VanSickle, Janice Staniewicz, Cinda &
David Fleming
Address: 60 Lexington Park Drive
Vienna, WV 26105

Owner: William & James Weigle, Betty Latstetter,
Jean VanSickle, Janice Staniewicz, Cinda &
David Fleming
Address: 2807 Rosemar Road
Parkersburg, WV 26105

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NOV 06 2015

12/11/2015

85-10269

WW-6A5
(1/12)

Operator Well No. Deem Unit 2H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF PLANNED OPERATION

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

Date of Notice: 10/30/2015 **Date Permit Application Filed:** 10/30/2015

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

CERTIFIED MAIL **HAND**
RETURN RECEIPT REQUESTED **DELIVERY**

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)

(at the address listed in the records of the sheriff at the time of notice):

Name: PLEASE SEE ATTACHMENT Name: _____
Address: _____ Address: _____

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on 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>504,549m</u> |
| County: | <u>Ritchie</u> | | Northing: | <u>4,351,843m</u> |
| District: | <u>Clay</u> | Public Road Access: | | <u>CR 74/9</u> |
| Quadrangle: | <u>Pennsboro 7.5'</u> | Generally used farm name: | | <u>Stephen C. Jackson et al</u> |
| Watershed: | <u>North Fork Hughes River</u> | | | |

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by W. Va. Code § 22-6A-10(b) to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

| | | | |
|----------------|-------------------------------------|------------|----------------------------|
| Well Operator: | <u>Antero Resources Corporation</u> | Address: | <u>1615 Wynkoop Street</u> |
| Telephone: | <u>(303) 357-7310</u> | | <u>Denver, CO 80202</u> |
| Email: | <u>asteale@anteroresources.com</u> | Facsimile: | <u>303-357-7315</u> |

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.

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12/11/2015

WW-6A5 Notice of Planned Operations Attachment (BUCK RUN PAD):

List of Surface Owner(s) with Proposed Disturbance associated with Buck Run Well Pad:

WELL PAD – All owners were notified of all well work permit applications, and have executed signed Surface Use Agreements with Antero Resources Corporation.

TM 14 PCL 22

Owner: Stephen D. Jackson ✓
Address: 3117 Mountain Drive
Pennsboro, WV 26415

Owner: Stephen D. Jackson ✓ (2nd Address)
Address: Corelogic Tax Service
Attn: Escrow Reporting
1 Corelogic Drive DFW-4-3
Westlake, TX 76262

TM 14 PCL 16

Owner: Bell Cooper Heirs, et al (Gracie Cooper ATTY) ✓
c/o Stephen Jackson
Address: 3117 Mountain Drive
Pennsboro, WV 26415

Owner: Elleen Williams ✓
Address: 5 Perity Lane
Pittsburgh, PA 15220

Owner: Colleen Sciulli ✓
Address: 3429 Ward Street
Pittsburgh, PA 15213

Owner: Cinda Louise & David M. Fleming ✓
Address: 4501 Hudson Street
Parkersburg, WV 26104

ROAD AND/OR OTHER DISTURBANCE – Antero Resources Corporation is the owner of this tract

TM 14 PCL 22.1

Owner: Antero Resources Corporation (purchased property from Eric S. & Melanie Adelman)
Address: 1615 Wynkoop Street
Denver, CO 80212

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NOV 06 2015

85-10269



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

April 30, 2015

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

Subject: DOH Permit for the Buck Run Pad, Ritchie County
Deem Unit 2H Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #03-2014-0532 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Route 74/9 in Ritchie County.

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,

A handwritten signature in blue ink that reads "Gary K. Clayton".

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

Cc: Ashlie Steele
Antero Resources Corporation
CH, OM, D-3
File

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**List of Anticipated Additives Used for Fracturing or
Stimulating Well**

| 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 |

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NOV 06 2015

12/11/2015

BUCK RUN

WELL PAD & WATER CONTAINMENT PAD

SITE DESIGN & CONSTRUCTION EROSION & SEDIMENT CONTROL

CLAY DISTRICT, RITCHIE COUNTY
HEADWATERS BUCK RUN W

USGS 7.5 PENNSBORO Q

LOCATION COORDINATES

ACCESS ROAD ENTRANCE
LATITUDE: 39.314263 LONGITUDE: -80.941670 (NAD 83)
N 4351653.29 E 505028.52 (UTM ZONE 17 METERS)

CENTROID OF PAD
LATITUDE: 39.315820 LONGITUDE: -80.947150 (NAD 83)
N 4351836.80 E 504555.94 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.316517 LONGITUDE: -80.943769 (NAD 83)
N 4351903.33 E 504847.41 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION

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

FLOODPLAIN NOTE

THE PROPOSED SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA MAP NUMBER #54085C0125C.

MISS UTILITY STATEMENT

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1403400823. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT

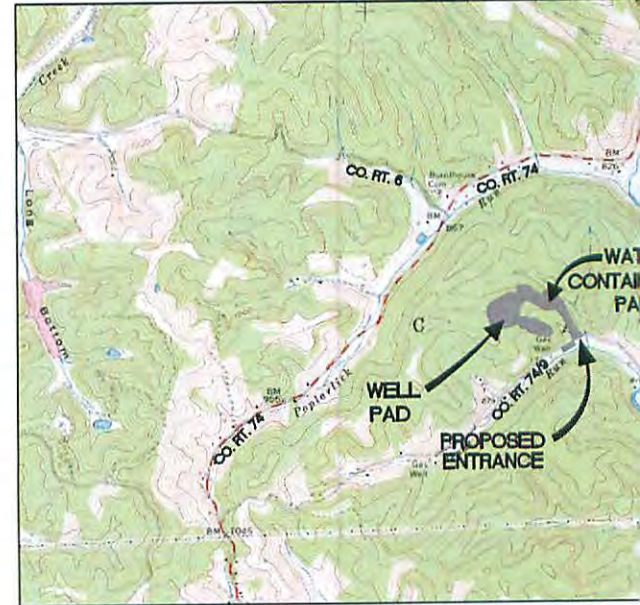
ANTERO RESOURCES CORPORATION WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-100) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

GEOTECHNICAL NOTE

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY PENNSYLVANIA SOIL AND ROCK INC. IN MARCH, 2014. THE REPORT PREPARED BY PENNSYLVANIA SOIL AND ROCK INC. DATED AUGUST 12, 2014, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WAS USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL AND ROCK INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

ENVIRONMENTAL NOTES

WETLAND DELINEATIONS WERE PERFORMED IN FEBRUARY-MARCH, 2014, & JULY, 2014 BY GAI CONSULTANTS, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE JULY 31, 2014 RESOURCE LOCATION MAP WAS PREPARED BY GAI CONSULTANTS, INC. AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE EXHIBIT DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES BE CONSULTED IN AN EFFORT TO GAIN 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.



| Buck Run INTERMITTENT STREAM IMPACT (LINEAR FEET) | | | | |
|---|-------------------|--------------------------------|-------------------------|-------------------|
| Stream and Impact Cause | Permanent Impacts | | Temp. Impacts | Total Impact (LF) |
| | Culvert/Fill (LF) | Inlets/Outlets Structures (LF) | Distance to L.O.D. (LF) | |
| Stream 4 (Access Road "A") | 0 | 0 | 30 | 30 |

PROJECT CONTACTS

OPERATOR:

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

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

JOHN KAWCAK - OPERATIONS SUPERINTENDENT
CELL: (817) 368-1553

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

ANTHONY SMITH - FIELD ENGINEER
OFFICE: (304) 842-4208 CELL: (304) 673-6196

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

DAVID PATSY - LAND AGENT
CELL: (304) 476-6090

ENGINEER/SURVEYOR:

NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT MANAGER/ENGINEER
OFFICE: (888) 682-4185 CELL: (540) 686-8747

ENVIRONMENTAL:

GAI CONSULTANTS, INC.
JASON A. COOK - SENIOR ENVIRONMENTAL SPECIALIST
OFFICE: (304) 926-8100 CELL: (303) 709-3306

GEOTECHNICAL:

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

API# 8510178
API# 8510179
API# 8510180

WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

RESTRICTIONS NOTES:

- THERE ARE NO PERENNIAL STREAMS, WETLANDS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE IS A STREAM IMPACT THAT WILL NEED TO BE PERMITTED BY THE APPROPRIATE AGENCIES.
- 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 625 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.

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!!

12/11/2015

CONTAINMENT PAD CONSTRUCTION PLAN, CONTROL PLANS WEST VIRGINIA WATERSHED



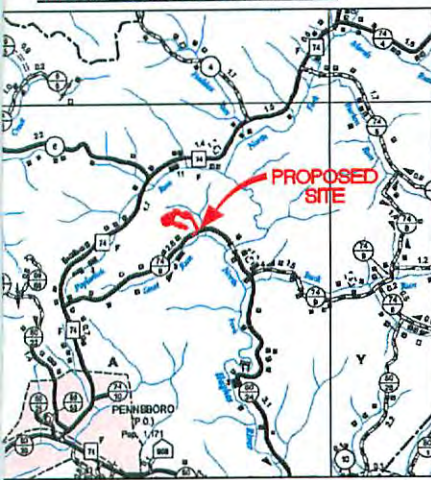
WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
NORTH ZONE NAD83
ELEVATION BASED ON NAVD83
ESTABLISHED BY SURVEY GRADE GPS & OPUS
POST-PROCESSING

SHEET INDEX

- 1 - COVER SHEET
- 2 - CONSTRUCTION AND E&S CONTROL NOTES
- 3 - MATERIAL QUANTITIES
- 4 - STORM DRAINAGE COMPUTATIONS
- 5 - EXISTING CONDITIONS
- 6 - OVERALL PLAN SHEET INDEX & VOLUMES
- 7 - ACCESS ROAD PLAN
- 8 - WATER CONTAINMENT PAD PLAN
- 9 - WELL PAD PLAN
- 10 - WELL PAD GRADING PLAN
- 11 - WATER CONTAINMENT PAD GRADING PLAN
- 12 - ACCESS ROAD PROFILES
- 13-14 - ACCESS ROAD SECTIONS
- 15 - WELL PAD & WATER CONTAINMENT PAD SECTIONS
- 16-19 - WELL PAD SECTIONS
- 20-24 - CONSTRUCTION DETAILS
- 25 - ACCESS ROAD RECLAMATION PLAN
- 26 - WATER CONTAINMENT PAD RECLAMATION PLAN
- 27 - WELL PAD RECLAMATION PLAN
- GE500-GE508 - GEOTECHNICAL DETAILS

| Buck Run LIMITS OF DISTURBANCE AREA (AC) | |
|--|--------------|
| Total Site | |
| Access Road "A" (872') | 4.02 |
| Access Road "B" (727') | 2.71 |
| Staging Area | 0.85 |
| Well Pad | 8.26 |
| Water Containment Pad | 3.13 |
| Excess/Topsoil Material Stockpiles | 9.53 |
| Total Affected Area | 28.50 |
| Total Wooded Acres Disturbed | |
| | 27.48 |
| Impacts to Bell Copper Heirs, et al TM 14-16 | |
| Access Road "A" (872') | 3.98 |
| Access Road "B" (727') | 2.71 |
| Well Pad | 4.66 |
| Water Containment Pad | 3.13 |
| Excess/Topsoil Material Stockpiles | 3.38 |
| Total Affected Area | 17.86 |
| Total Wooded Acres Disturbed | |
| | 17.73 |
| Impacts to Stephen D. Jackson TM 14-22 | |
| Access Road "A" (0') | 0.04 |
| Well Pad | 3.60 |
| Excess/Topsoil Material Stockpiles | 6.15 |
| Total Affected Area | 9.79 |
| Total Wooded Acres Disturbed | |
| | 9.75 |
| Impacts to Eric S. & Melanie Allender TM 14-22.1 | |
| Staging Area | 0.85 |
| Total Affected Area | 0.85 |
| Total Wooded Acres Disturbed | |
| | 0.00 |

WVDOH COUNTY ROAD MAP



DESIGN CERTIFICATION
THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 95-8.

| Proposed Well Name | WV North NAD 27 | WV North NAD 83 | UTM (METERS) Zone 17 | NAD 83 Lat & Long |
|--------------------|-----------------------------|-----------------------------|-----------------------------|--|
| Charleston Unit 1H | N 300438.93 E 1590469.42 | N 300473.02 E 1559027.38 | N 4351835.04 E 504539.53 | LAT 39-18-57.2537 LONG -80-56-50.4261 |
| Charleston Unit 2H | N 300445.34 E 1590476.09 | N 300479.43 E 1559035.06 | N 4351837.03 E 504541.83 | LAT 39-18-57.3183 LONG -80-56-50.3297 |
| Charleston Unit 3H | N 300451.74 E 1590483.77 | N 300485.84 E 1559042.73 | N 4351839.03 E 504544.14 | LAT 39-18-57.3828 LONG -80-56-50.2334 |
| Deem Unit 1H | N 300458.15 E 1590491.44 | N 300492.25 E 1559050.41 | N 4351841.02 E 504546.44 | LAT 39-18-57.4474 LONG -80-56-50.1370 |
| Deem Unit 2H | N 300464.56 E 1590499.12 | N 300498.66 E 1559058.09 | N 4351843.01 E 504548.75 | LAT 39-18-57.5119 LONG -80-56-50.0407 |
| Mancos Unit 1H | N 300470.97 E 1590506.80 | N 300505.06 E 1559065.76 | N 4351845.00 E 504551.06 | LAT 39-18-57.5765 LONG -80-56-49.9444 |
| Mancos Unit 2H | N 300477.38 E 1590514.47 | N 300511.47 E 1559073.44 | N 4351846.99 E 504553.36 | LAT 39-18-57.6411 LONG -80-56-49.8480 |
| Jackknife Unit 1H | N 300483.79 E 1590522.15 | N 300517.88 E 1559081.12 | N 4351848.96 E 504555.67 | LAT 39-18-57.7056 LONG -80-56-49.7517 |
| Jackknife Unit 2H | N 300490.20 E 1590529.83 | N 300524.29 E 1559088.79 | N 4351850.97 E 504557.97 | LAT 39-18-57.7702 LONG -80-56-49.6553 |
| Jackknife Unit 3H | N 300496.61 E 1590537.50 | N 300530.70 E 1559096.47 | N 4351852.97 E 504560.28 | LAT 39-18-57.8347 LONG -80-56-49.5590 |
| Well Pad Elevation | 1,127.0 | | | |



| DATE | REVISION | REVISED PER CLIENT REQUEST | REV. STREAM LABEL PER REPORT |
|------------|----------|----------------------------|------------------------------|
| 10/22/2014 | | | |
| 11/10/2014 | | | |



Received
Office of Oil & Gas
NOV 06 2015

BUCK RUN
 WELL PAD & WATER CONTAINMENT PAD
 CLAY DISTRICT
 RITCHIE COUNTY, WEST VIRGINIA



DATE: 08/12/2014
SCALE: AS SHOWN
SHEET 1 OF 27

MAG
11/2/15

LEGEND

| | | | |
|-----------------------------|-----|----------------------------|-----|
| EX INDEX CONTOUR | 700 | PR INDEX CONTOUR | 700 |
| EX INTERMEDIATE CONTOUR | | PR INTERMEDIATE CONTOUR | 700 |
| EX PROPERTY LINE | | PR INDEX CONTOUR (ROAD) | 700 |
| EX ROAD EDGE OF GRAVEL/DIRT | | PR INTERMEDIATE CTR (ROAD) | |
| EX ROAD EDGE OF PAVEMENT | | PR LIMITS OF DISTURBANCE | |
| EX ROAD CENTERLINE | | PR WELL HEAD | |
| EX DITCHLINE | | PR PERIMETER SAFETY FENCE | |
| EX CULVERT | | PR ROAD EDGE OF GRAVEL | |
| EX FENCELINE | | PR ROAD CENTERLINE | |
| EX OVERHEAD UTILITY | | PR RIP-RAP | |
| EX POWER POLE/GUY WIRE | | TRAPEZOIDAL DITCH | |
| EX PIPELINE & WELL | | PR DIVERSION | |
| EX TREELINE | | PR COMPOST FILTER SOCK | |
| EX DELINEATED STREAM | | PR SUPER SILT FENCE | |
| EX DELINEATED WETLAND/POND | | BORING LOCATION | |
| EX BUILDING | | | |
| 100' WETLAND/STREAM BUFFER | | | |
| DELINEATION STUDY AREA | | | |

NOTES:

1. ALL PROPOSED DITCH RELIEF AND DRAINAGE CULVERTS SHALL HAVE ADEQUATE OUTLET PROTECTION AS SHOWN IN THE STORM DRAINAGE COMPUTATIONS.

2. ALL FILL AREAS, INCLUDING ACCESS ROADS AND EXCESS MATERIAL STOCKPILES, SHALL BE "KEYED IN" AND COMPACTED IN 12" (MAXIMUM) LOOSE LIFT THICKNESS WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTOR. MOISTURE CONTENT WILL BE CONTROLLED IN ACCORDANCE WITH THE STANDARD PROCTOR TEST (ASTM-D698) RESULTS.

TM 14-21
RANDY M. &
CAROLYN MAE JONES
DB 216 PG 665
31 AC

APPROX. PROPERTY LINE

GAI CONSULTANTS
WETLAND DELINEATION
STUDY AREA

INTERMITTENT
STREAM 17

EPHEMERAL
STREAM 20

EPHEMERAL
STREAM 9

INTERMITTENT
STREAM 8

INTERMITTENT
STREAM 18

EPHEMERAL
STREAM 19

INTERMITTENT
STREAM 19

INTERMITTENT
STREAM 19

TM 14-21
RANDY M. &
CAROLYN MAE JONES
DB 216 PG 665
31 AC

GAI CONSULTANTS
WETLAND DELINEATION
STUDY AREA

TM 14-22
STEPHEN D. JACKSON
DB 286 PG 481
40.835 AC

LIMITS OF
DISTURBANCE

EXCESS MATERIAL
STOCKPILE AREA "D"
(APPROX. 3,700 C.Y.)
2.5:1 SLOPES

WELL PAD
DEWATERING
SYSTEM (TYP.)
(SEE DETAIL)

CENTROID OF PAD
LAT: 30 315920
LON: -80 947160
(NAD 83)

220'x320' PAD
FOOTPRINT

WELL PAD
DEWATERING
SYSTEM (TYP.)
(SEE DETAIL)

TM 14-22
STEPHEN D. JACKSON
DB 286 PG 481
40.835 AC

LIMITS OF
DISTURBANCE

EXCESS MATERIAL
STOCKPILE AREA "B"
(APPROX. 6,370 C.Y.)
2.5:1 SLOPES

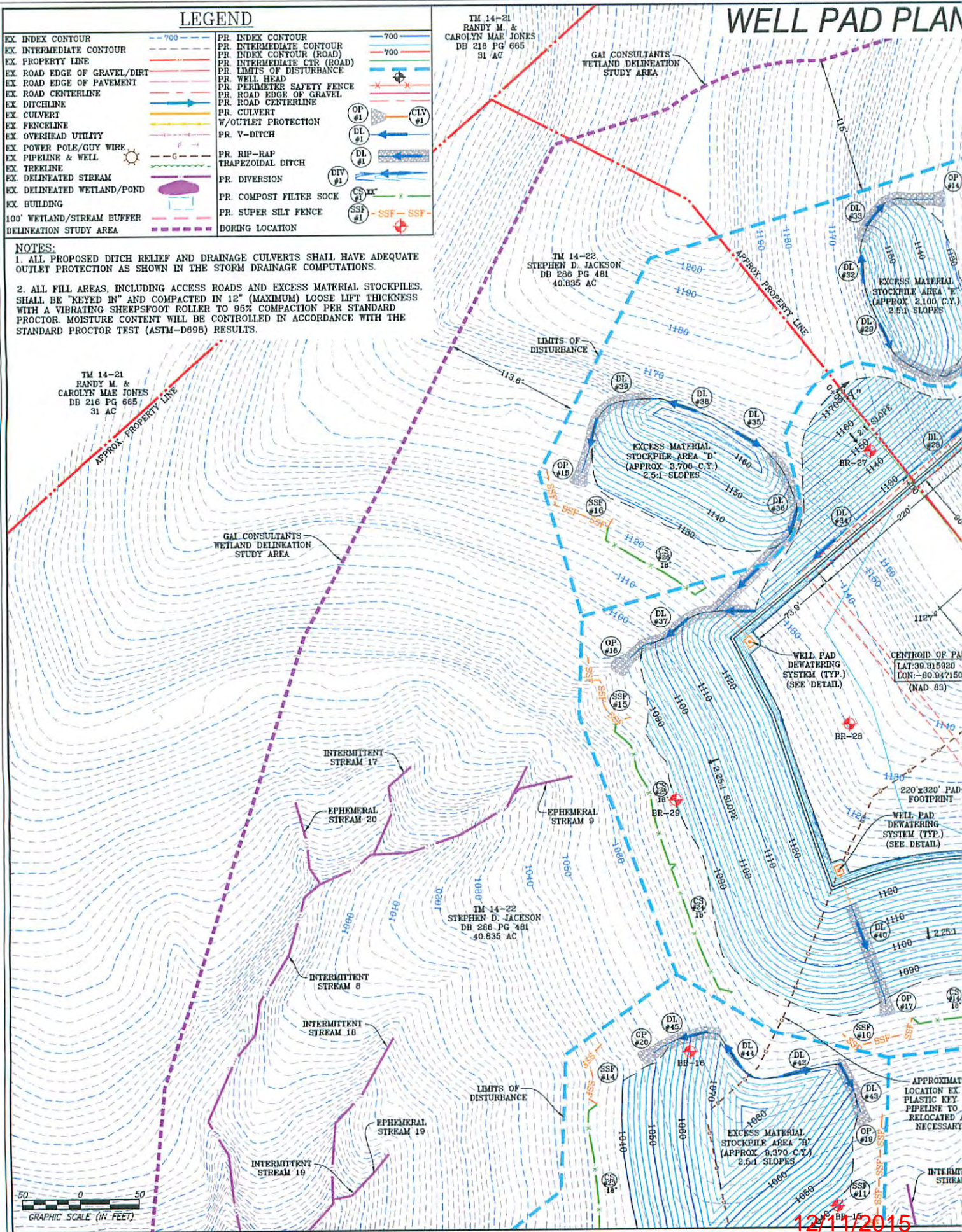
APPROXIMATE
LOCATION EX
PLASTIC KEY
PIPELINE TO
RELOCATED
NECESSARY

INTERMITTENT
STREAM



12/11/2015

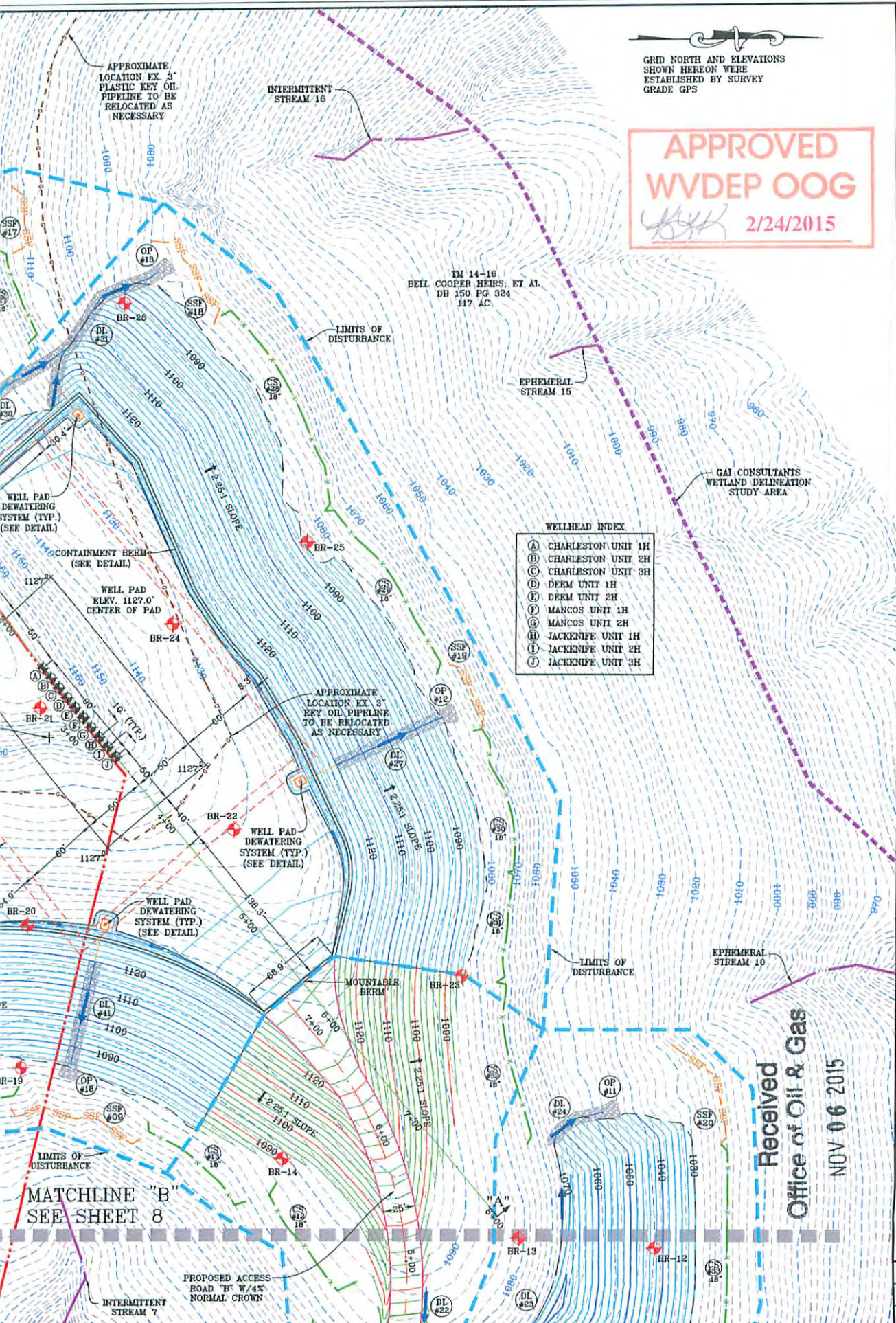
WELL PAD PLAN



GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS

APPROVED WVDEP OOG
 2/24/2015

NAVITUS
 ENERGY ENGINEERING
 Telephone: (888) 662-4185 | www.NavitusEng.com



| DATE | REVISION |
|------------|------------------------------|
| 10/22/2014 | REVISED PER CLIENT REQUEST |
| 11/10/2014 | REV. STREAM LABEL PER REPORT |
| | |
| | |
| | |

Antero
 THIS DOCUMENT WAS PREPARED FOR:
 ANTERO RESOURCES CORPORATION

WELL PAD PLAN
BUCK RUN
 WELL PAD & WATER CONTAINMENT PAD
 CLAY DISTRICT
 RITCHIE COUNTY, WEST VIRGINIA

Received
 Office of Oil & Gas
 NOV 06 2015



DATE: 08/12/2014
 SCALE: 1" = 50'
 SHEET 9 OF 27