



west virginia department of environmental protection

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

Jim Justice , Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Thursday, April 06, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION (A)
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for SUGAR RUN UNIT 4H
47-085-10318-00-00

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

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

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: SUGAR RUN UNIT 4H
Farm Name: RICHARDS, TERRY L.
U.S. WELL NUMBER: 47-085-10318-00-00
Horizontal 6A / New Drill
Date Issued: 4/6/2017

Promoting a healthy environment.

04/07/2017

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

04/07/2017

PERMIT CONDITIONS

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

PULLMAN

WW-6B
(04/15)

API NO. 47-085 - 10318
OPERATOR WELL NO. Sugar Run Unit 4H
Well Pad Name: Lynn Camp Pad

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

1) Well Operator: Antero Resources Corporation 494507062 085 - Ritchie Clay Pullman 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Sugar Run Unit 4H Well Pad Name: Lynn Camp Pad

3) Farm Name/Surface Owner: Terry L. Richards Public Road Access: Buzzard Run

4) Elevation, current ground: 1163' Elevation, proposed post-construction: 1149'

5) Well Type (a) Gas Oil Underground Storage
Other _____
(b) If Gas Shallow Deep
Horizontal

Michael Hoff
5/16/17

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 6650' TVD, Anticipated Thickness- 50 feet, Associated Pressure- 3000#

8) Proposed Total Vertical Depth: 6650' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 18350' MD

11) Proposed Horizontal Leg Length: 11144'

12) Approximate Fresh Water Strata Depths: 89', 216', 222', 459'

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

14) Approximate Saltwater Depths: 1221', 1247'

15) Approximate Coal Seam Depths: 210', 694', 784'

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#	80'	80'	CTS, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	510' *see #19	510' *see #19	CTS, 708 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#	18350'	18350'	4638 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

*MAG
2/16/17*

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-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 23.48 Acres

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

23) Describe centralizer placement for each casing string:

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

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

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

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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.

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*Note: Attach additional sheets as needed.



47085091410000



47085058230000



47085056710000



47085085280000



Sugar Run Unit 4H

47085085350000



47085085270000



47085085260000



47085085700000



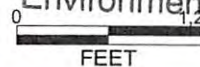
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SUGAR RUN UNIT 4H (LYNN CAMP PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

Well Name	Well Number	Operator	Well Oper	Env. GR	ID	TD (STVD)	Perforated Interval AND (shallowest, deepest)	Perforated formation(s) no information	Perforated formation(s) not perforated
420856212000	1	UNKNOWN	J.R. L. OR. CO. INC.	1184	1700	-4515			
420856213000	2	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1185	1495	-4192	1871-5110	Warren, Lefkoma, Riley, Benson, Alexander	Warren, Lefkoma, Riley, Benson, Alexander
4208562141000	3	GASSRANCH COMPANY	GASSRANCH COMPANY	1187	1431	-4124	1874-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	4-1840	SEV. OR. COMPANY	GARAGE MIT GAS LLP	1181	1353	-4171	1875-5101	Warren, Lefkoma, Riley, Benson, Alexander	Spenceville
420856217000	3	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1180	1321	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	4	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1181	1341	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	5	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1181	1341	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	6	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1181	1341	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	7	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1181	1341	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	8	SEV. OR. COMPANY	SEV. OR. INCORPORATED	1181	1341	-4144	1875-5118	Warren, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford
420856217000	9	SEV. OR. COMPANY	SEV. OR. COMPANY	1181	1341	-4144	1875-5118	Warren, Spenceville, Lefkoma, Riley, Benson, Alexander	New Spenceville Basin, Bradford

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WW-9
(4/16)

API Number 47 - 085 - 10318
Operator's Well No. Sugar Run Unit 4H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062
Watershed (HUC 10) North Fork Hughes River Quadrangle Pullman 7.5'

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

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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2/16/17*

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), Northwestern Landfill (Permit # SWF-1025/WV0109410)

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

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

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

Company Official Signature [Signature]
Company Official (Typed Name) Cole Kilstrom
Company Official Title Environmental & Regulatory Manager

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Subscribed and sworn before me this 24th day of January, 20 17
[Signature] Notary Public

My commission expires 7/8/2020

SHELBY MARIE JOHNSON
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20164025050
MY COMMISSION EXPIRES 04/07/2017

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 23.48 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

Road A (5.76 acres) + Road B (2.09 acres) + Road C (0.53 acres) + Well Pad (6.86 acres) + Water Containment Pad (3.20 acres) + Excess/Topsoil Material Stockpiles (5.04 acres) = 23.48
Total Affected Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
Field Bromegrass	40	Tall Fescue	30

*or type of grass seed requested by surface owner

*or type of grass seed requested by surface owner

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Michael Gaff

Comments: Presced & mulch any disturbed areas per WVDPA regulations. Maintain & upgrade E-n-s as necessary.

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Title: Oil & Gas Inspector Date: 2/16/17

Field Reviewed? Yes No

Form WW-9 Additives Attachment

SURFACE INTERVAL

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

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

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

PRODUCTION INTERVAL

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

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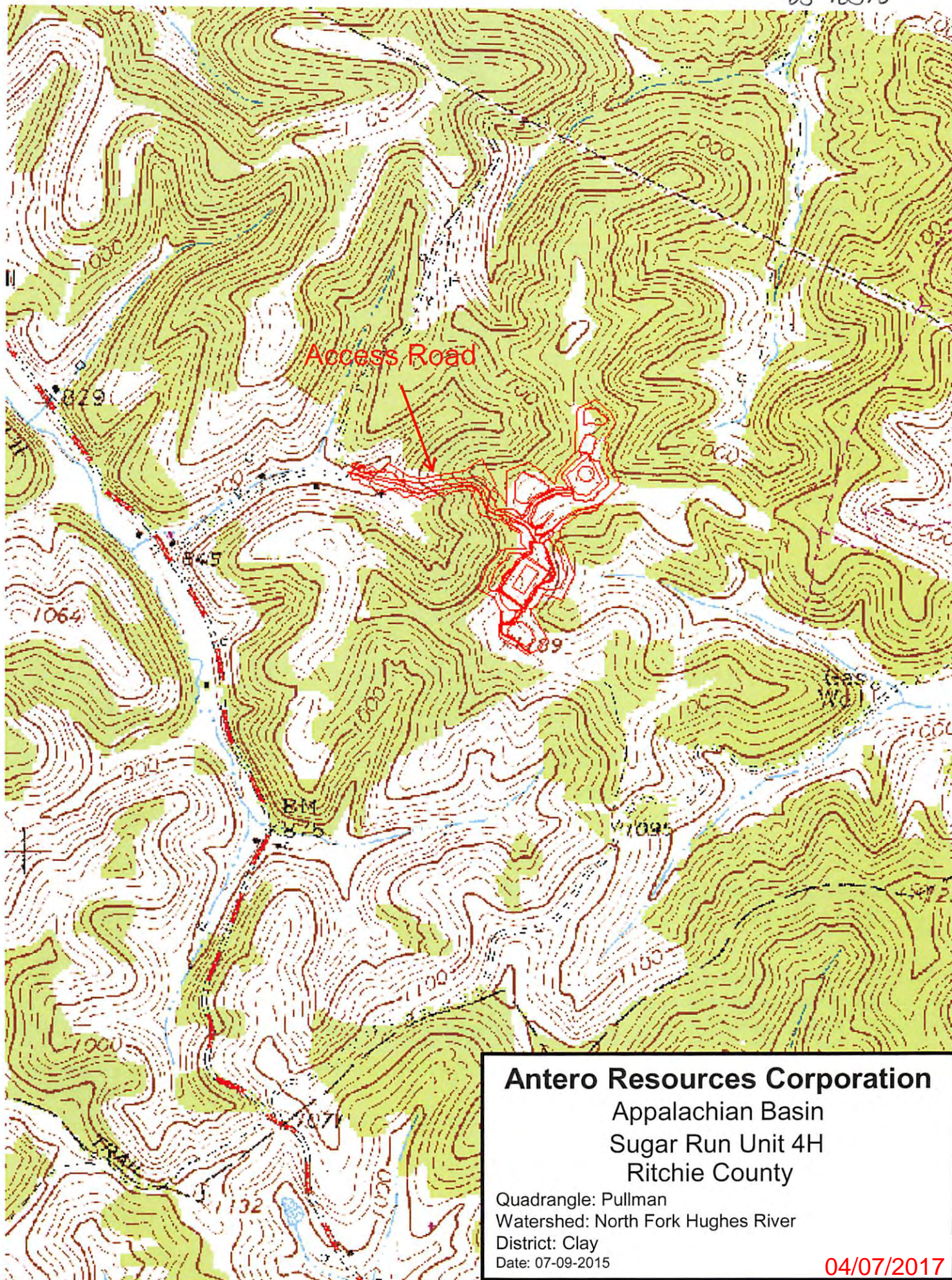
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13. Escaid 110
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
Drilling Fluid Additive – Sulfonated Asphalt Residuum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

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Antero Resources Corporation
Appalachian Basin
Sugar Run Unit 4H
Ritchie County

Quadrangle: Pullman
Watershed: North Fork Hughes River
District: Clay
Date: 07-09-2015

04/07/2017



911 Address
292 Buzzard Run Rd.
Pennsboro, WV 26415

Well Site Safety Plan

Antero Resources

Well Name: Buzzard Run Unit 1H-3H, Riggs Unit 1H-3H,
 Genny Unit 1H-2H, Sugar Run Unit 1H-5H

Pad Location: LYNN CAMP PAD
 Ritchie County/Clay District

GPS Coordinates:

Entrance - Lat 39°12'58.2438"/Long -80°56'58.5522" (NAD83)

Pad Center - Lat 39°12'50.3202"/Long -80°56'42.144" (NAD83)

Driving Directions:

From Clarksburg: Travel approximately 25 miles west on US-50 W. Turn right onto WV-18 N. go 0.6 miles. Turn left onto Davis St/Old US 50 W. go 0.4 miles. Take 2nd right onto WV-18 N/Sistersville Pike. Go 12.2 miles. Sharp left onto WV-74 S. Go 8.3 miles, access road will be on your right.

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Alternate Route:

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From Pennsboro: Head east on E. Myles Ave / Old US 50 W (.7 mi). Turn right onto WV-74 S/Pullman Rd (5.9 mi). Turn left onto Buzzard Run (.3 mi). Pad access road will be right.

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

Michael Daff
 2/10/17

LATITUDE 39°15'00"

8,111'

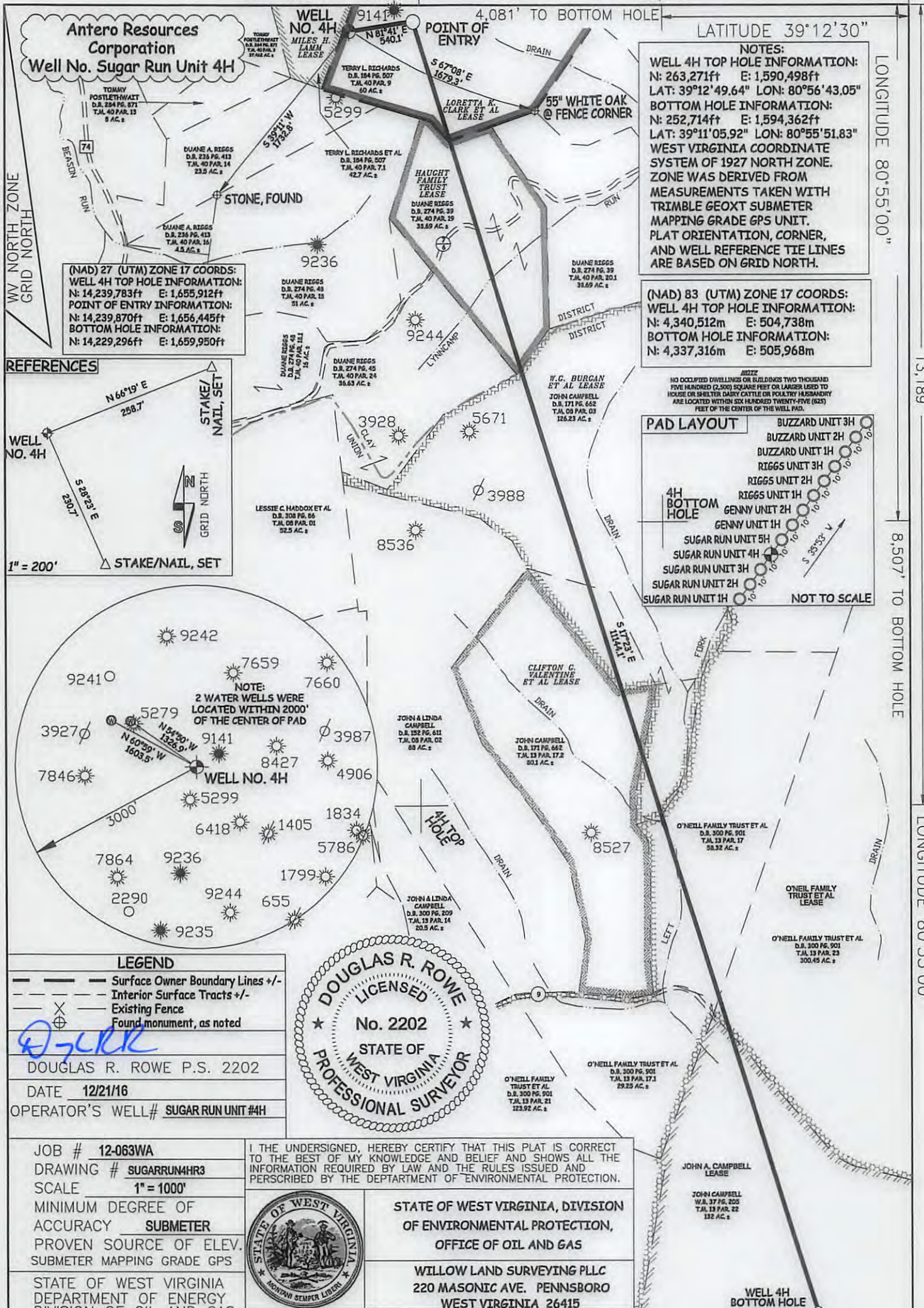
LATITUDE 39°12'30"

LONGITUDE 80°55'00"

13,189'

8,507' TO BOTTOM HOLE

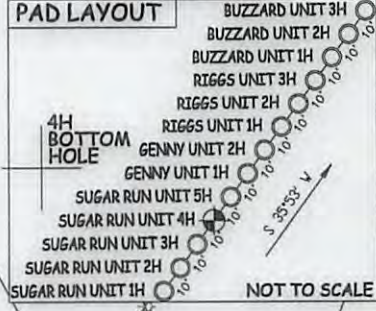
LONGITUDE 80°55'00"



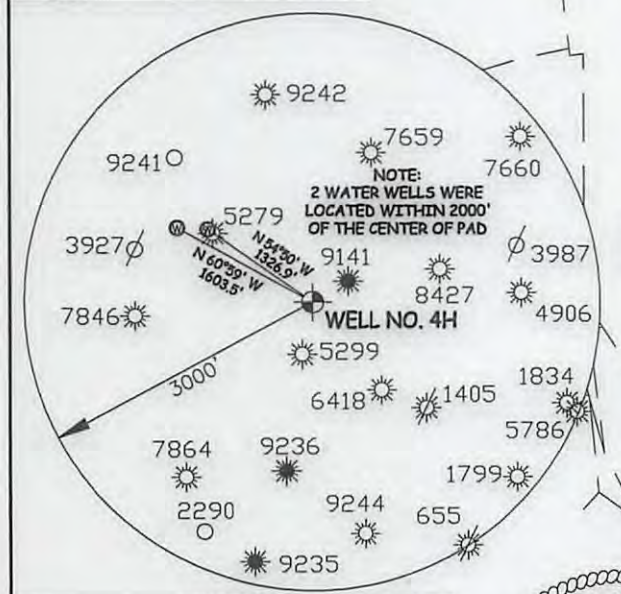
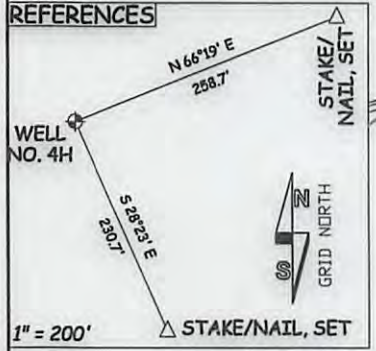
NOTES:
WELL 4H TOP HOLE INFORMATION:
 N: 263,271ft E: 1,590,498ft
 LAT: 39°12'49.64" LON: 80°56'43.05"
BOTTOM HOLE INFORMATION:
 N: 252,714ft E: 1,594,362ft
 LAT: 39°11'05.92" LON: 80°55'51.83"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 4H TOP HOLE INFORMATION:
 N: 4,340,512m E: 504,738m
BOTTOM HOLE INFORMATION:
 N: 4,337,316m E: 505,968m

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

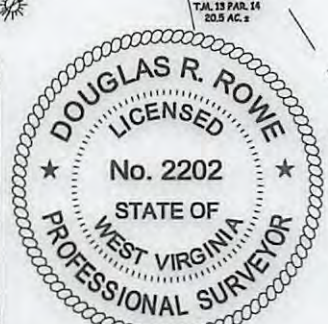


(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 4H TOP HOLE INFORMATION:
 N: 14,239,783ft E: 1,655,912ft
POINT OF ENTRY INFORMATION:
 N: 14,239,870ft E: 1,656,445ft
BOTTOM HOLE INFORMATION:
 N: 14,229,296ft E: 1,659,950ft



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

DOUGLAS R. ROWE P.S. 2202
 DATE 12/21/16
 OPERATOR'S WELL# SUGAR RUN UNIT #4H



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

JOB # 12-063WA
 DRAWING # SUGARRUN4HR3
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 1,163' ORIGINAL - 1,149' PROPOSED API WELL # STATE COUNTY PERMIT
 WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER TERRY L. RICHARDS ACREAGE 60 ACRES +/- 47 - 085 - 10318 H6A
 OIL & GAS ROYALTY OWNER LORETTA K. CLARK ET AL; HAUGHT FAMILY TRUST; LEASE ACREAGE 60 AC±; 38.7 AC±
 W.G. BURGAN ET AL; CLIFTON G. VALENTINE ET AL; O'NEIL FAMILY TRUST ET AL; JOHN A. CAMPBELL 154 AC±; 80.1 AC±; 571.83 AC±; 13.5 AC±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,650' TVD 18,350' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

04/07/2017

LATITUDE 39°15'00"

8,111'

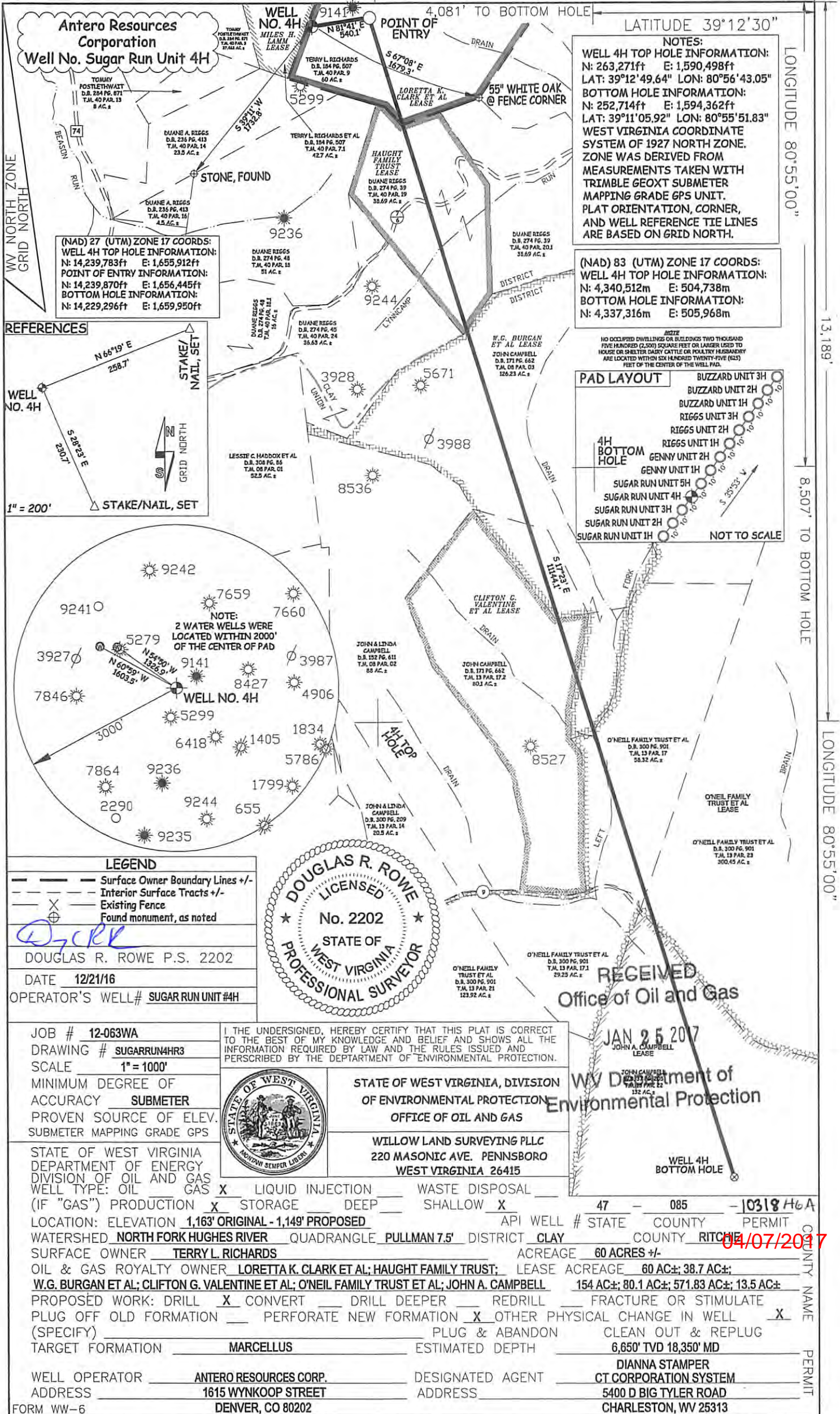
LATITUDE 39°12'30"

LONGITUDE 80°55'00"

13,189'

8,507' TO BOTTOM HOLE

LONGITUDE 80°55'00"



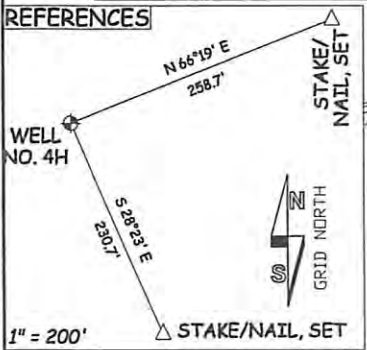
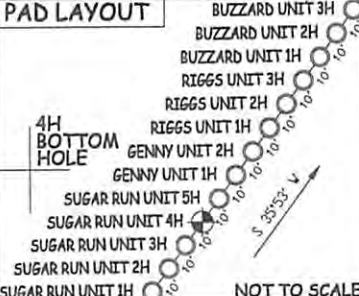
Antero Resources Corporation
Well No. Sugar Run Unit 4H

(NAD) 27 (UTM) ZONE 17 COORDS:
 WELL 4H TOP HOLE INFORMATION:
 N: 14,239,783ft E: 1,655,912ft
 POINT OF ENTRY INFORMATION:
 N: 14,239,870ft E: 1,656,445ft
 BOTTOM HOLE INFORMATION:
 N: 14,229,296ft E: 1,659,950ft

NOTES:
 WELL 4H TOP HOLE INFORMATION:
 N: 263,271ft E: 1,590,498ft
 LAT: 39°12'49.64" LON: 80°56'43.05"
 BOTTOM HOLE INFORMATION:
 N: 252,714ft E: 1,594,362ft
 LAT: 39°11'05.92" LON: 80°55'51.83"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

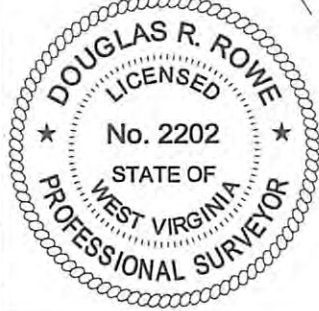
(NAD) 83 (UTM) ZONE 17 COORDS:
 WELL 4H TOP HOLE INFORMATION:
 N: 4,340,512m E: 504,738m
 BOTTOM HOLE INFORMATION:
 N: 4,337,316m E: 505,968m

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



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

DOUGLAS R. ROWE P.S. 2202
 DATE 12/21/16
 OPERATOR'S WELL# SUGAR RUN UNIT #4H



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

RECEIVED
 Office of Oil and Gas

JAN 25 2017
 JOHN A. CAMPBELL LEASE

WV Department of Environmental Protection

JOB # 12-063WA
 DRAWING # SUGARRUMHR3
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 1,163' ORIGINAL - 1,149' PROPOSED API WELL # STATE COUNTY PERMIT
 WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER TERRY L. RICHARDS ACREAGE 60 ACRES +/-
 OIL & GAS ROYALTY OWNER LORETTA K. CLARK ET AL; HAUGHT FAMILY TRUST; LEASE ACREAGE 60 AC±; 38.7 AC±
 W.G. BURGAN ET AL; CLIFTON G. VALENTINE ET AL; O'NEIL FAMILY TRUST ET AL; JOHN A. CAMPBELL 154 AC±; 80.1 AC±; 571.83 AC±; 13.5 AC±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) _____ PLUG & ABANDON _____ CLEAN OUT & REPLUG _____
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,650' TVD 18,350' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313

FORM WW-6

WW-6A1

Operator's Well Number Sugar Run Unit 4H

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>Miles H. Lamm Lease</u> ✓			
Miles H. Lamm	David J. Sheldon, D/B/A S&S, Inc.	1/8	0133/0366
David J. Sheldon, D/B/A S&S, Inc.	J & J Enterprises, Inc.	Assignment	0134/0316
J & J Enterprises, Inc.	Eastern American Energy Corporation	Assignment	0231/0732
Eastern American Energy Corporation	Energy Corporation of America	Certificate of Merger	COI 0006/0450
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0257/0397
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Loretta K. Clark, et al Lease</u> ✓			
Loretta K. Clark Bear, et al	Canbe Exploration Company	1/8	0146/0788
Canbe Exploration Company	Gold Energy Corporation	Assignment	0146/0794
Gold Energy Corporation	Oil Development Company	Assignment	0147/0178
Oil Development Company	Alan Gable Oil Development Energy Trust	Amended Plan of Reorganization	0207/0623
Alan Gable Oil Development Energy Trust	Gassearch Corporation	Assignment	0207/0628
Gassearch Corporation	Linn Energy Holdings, LLC	Assignment	0239/0118
Linn Energy Holdings, LLC	XTO Energy, Inc.	Assignment	0252/0614
XTO Energy, Inc.	Antero Resources Corporation	Notice of Agreement	0283/0474
<u>Haught Family Trust Lease</u> ✓			
Haught Family Trust (Dated August 17, 1989)	Whittle Corporation	1/8+	0257/0869
Whittle Corporation	Antero Resources Appalachian Corporation	Assignment	0261/0082
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>W.G. Burgan, et al Lease</u> ✓			
W.G. Burgan, et al	Key Oil Company	1/8	0224/0649
Key Oil Company	Antero Resources Appalachian Corporation	*Partial Assignment of Oil & Gas Leases	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Clifton G. Valentine, et al Lease</u> ✓			
Clifton G. Valentine, et al	Key Oil Company	1/8	0224/0663
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>O'Neill Family Trust, et al Lease</u> ✓			
Daniel J. O'Neill, trustee for the O'Neill Family Trust, et al	Key Oil Company	1/8	0252/1053
Key Oil Company	Antero Resources Appalachian Corporation	*Partial Assignment of Oil & Gas Leases	0253/0747
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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Office of Oil and Gas

JAN 25 2017

West Virginia Department of Environmental Protection

*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.

04/07/2017

WW-6A1
(5/13)

Operator's Well No. Sugar Run Unit 4H

**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>John A. Campbell Lease</u>	John A. Campbell, et ux Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	0254/0379 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

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JAN 25 2017

WV Department of
Environmental Protection

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: Robert S. Tucker 
Its: Vice President - Geology

**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.wvsos.com
E-mail: business@wvsos.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) 367-7310
Contact Name Phone Number

7. 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 of Oil and Gas

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

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JAN 25 2017
WV Department of
Environmental Protection



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

January 24, 2017

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

RE: Sugar Run Unit 4H
Quadrangle: Pullman 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 Sugar Run Unit 4H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas from all leases through which the Sugar Run Unit 4H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in black ink, appearing to read "H West", with a long, sweeping horizontal stroke extending to the right.

Haley West
Landman

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Office of Oil and Gas

JAN 25 2017

WV Department of
Environmental Protection

04/07/2017

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

Date of Notice Certification: 01/23/2017

API No. 47- 085 - 10318
Operator's Well No. Sugar Run Unit 4H
Well Pad Name: Lynn Camp 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>504738m</u>
County:	<u>Ritchie</u>		Northing:	<u>4340512m</u>
District:	<u>Clay</u>	Public Road Access:	<u>Buzzard Run</u>	
Quadrangle:	<u>Pullman 7.5'</u>	Generally used farm name:	<u>Terry L. Richards</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 type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p><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>
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RECEIVED
Office of Oil and Gas

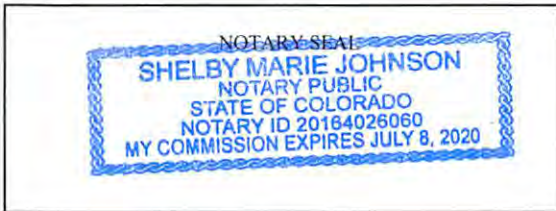
Required Attachments:

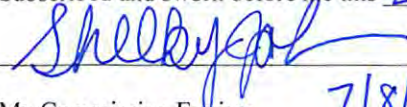
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice ^{of Jan 25 2017} have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with 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 notified 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 first class personal service, the return receipt card or other postal receipt for certified mailing.

Certification of Notice is hereby given:

THEREFORE, I Robert S. Tucker, 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>Robert S. Tucker</u> 		<u>Denver, CO 80202</u>
Its:	<u>Vice President - Geology</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>shjohnson@anteroresources.com</u>



Subscribed and sworn before me this 23 day of January 2017.

 _____ Notary Public
 My Commission Expires 7/8/2020

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
 Office of Oil and Gas
 JAN 25 2017
 WV Department of
 Environmental Protection

WW-6A
(9-13)

API NO. 47-085 - 10318
OPERATOR WELL NO. Sugar Run Unit 4H
Well Pad Name: Lynn Camp Pad

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

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

Date of Notice: 1/24/2017 **Date Permit Application Filed:** 1/24/2017

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
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

COAL OPERATOR

Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

WATER PURVEYOR(s)/OWNER(s) OF SPRING OR OTHER WATER SUPPLY SOURCE

Name: PLEASE SEE ATTACHMENT
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
Address: WV Department of Environmental Protection

*Please attach additional forms if necessary

RECEIVED
Office of Oil and Gas
JAN 25 2017

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 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

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.**

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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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04/07/2017

WW-6A
(8-13)

API NO. 47- 085 - 10318
OPERATOR WELL NO. Sugar Run Unit 4H
Well Pad Name: Lynn Camp Pad

Notice is hereby given by:

Well Operator: Antero Resources Corporation *W.S.V.*
Telephone: (303) 357-7310
Email: shjohnson@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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 24th day of Jan, 2017.
Shelby Marie Johnson Notary Public
My Commission Expires 7/8/2020

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WV Department of
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04/07/2017

WW-6A Notice of Application Attachment (LYNN CAMP PAD):**List of Surface Owner(s) with Proposed Disturbance associated with Lynn Camp Well Pad:**

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

TM 40 PCL 7.1

Owner: TL and Stella F Richards (Life)
Address: 1092 Little Beason Road
 Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
 Pennsboro, WV 26415

TM 40 PCL 9

Owner: Terry Lee Richards
Address: 1092 Little Beason Road
 Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
 Pennsboro, WV 26415

ROAD AND/OR OTHER DISTURBANCE – All owners have executed signed Surface Use and/or Road Agreements with Antero Resources Corporation. However, they were only notified if their tracts were overlying the oil and gas leasehold being developed by the proposed well work.

TM 40 PCL 7.1

Owner: TL and Stella F Richards (Life)
Address: 1092 Little Beason Road
 Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
 Pennsboro, WV 26415

TM 40 PCL 9

Owner: Terry Lee Richards
Address: 1092 Little Beason Road
 Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
 Pennsboro, WV 26415

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WATER SOURCE OWNERS**(W1) 1 Water Source – 1327'**

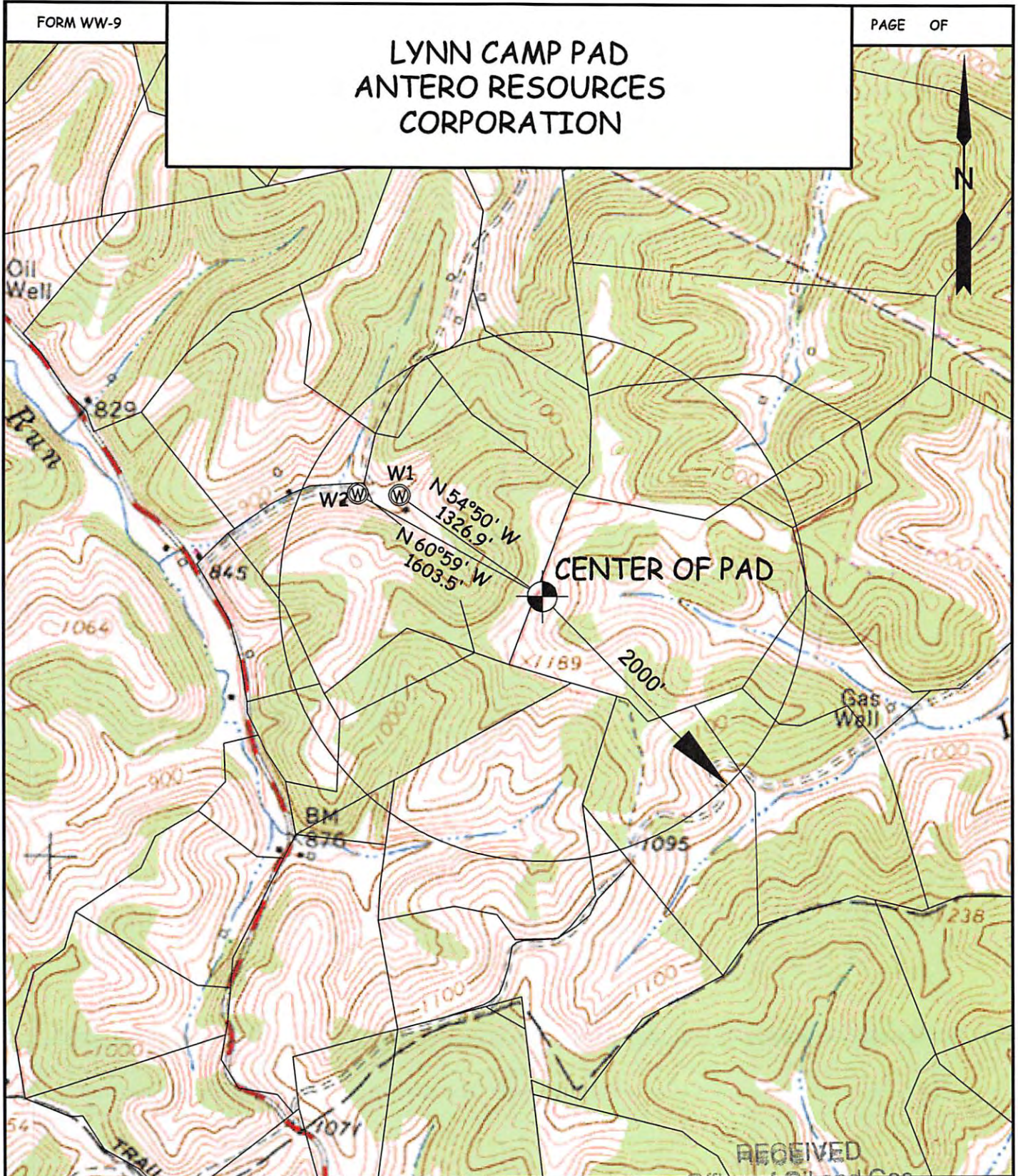
Owner: Terry Lee Richards
Address: 1092 Little Beason Road
Pennsboro, WV 26415

*Please note there is 1 additional water source shown on the attached map, but it is located greater than 1500' from the subject pad location.

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WELL SURFACE OWNER		ADDRESS	WELL LATITUDE	WELL LONGITUDE
W1	TERRY L. RICHARDS	1092 LITTLE BEASON RD, PENNSBORO WV, 26415	39°12'57.41"	80°56'56.59"
W2	TOMMY POSTLETHWAIT	106 SPRUCE ST, FOLLANSBEE WV, 26037	39°12'57.50"	80°57'00.63"

WILLOW LAND SURVEYING, PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717		TOPO SECTION(S) OF : PULLMAN 7.5' QUAD.	SCALE : 1-INCH = 1000-FEET 0' 1000' 2000' 3000' Environmental Protection
DATE: 07/09/15		JOB #: 12-063WA	
DRAWN BY: T.B.S.		FILE: LYNNCAMPADWATERMAP	

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

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

Notice Time Requirement: Notice shall be provided at least **TEN (10)** days prior to filing a permit application.
Date of Notice: 11/30/2016 **Date Permit Application Filed:** 01/24/2017

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

HAND DELIVERY CERTIFIED MAIL RETURN RECEIPT REQUESTED

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

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

Name: Terry Lee Richards & Stella F. Richards (Life)
Address: 1092 Little Beason Rd.
Pennsboro, WV 26415

Name: Terry Lee Richards & Stella F. Richards (Life) (2nd Address)
Address: 4426 Lamberton Rd. #6005
Pennsboro, WV 26415

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83 Easting:	<u>504744.74m (Approximate Pad Center)</u>
County:	<u>Ritchie</u>	Northing:	<u>504744.74m (Approximate Pad Center)</u>
District:	<u>Clay</u>	Public Road Access:	<u>Buzzard Run</u>
Quadrangle:	<u>Pullman 7.5'</u>	Generally used farm name:	<u>Richards, Terry L.</u>
Watershed:	<u>North Fork Hughes River</u>		

This Notice Shall Include:

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

Notice is hereby given by:

Well Operator: Antero Resources Appalachian Corporation
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7323
Email: kquackenbush@anteroresources.com
Facsimile: 303-357-7315

Authorized Representative: Kara Quackenbush
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7323
Email: kquackenbush@anteroresources.com
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.

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WW-6A5 Notice of Planned Operation Attachment (LYNN CAMP PAD):**List of Surface Owner(s) with Proposed Disturbance associated with Lynn Camp Well Pad:**

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

TM 40 PCL 7.1

Owner: TL and Stella F Richards (Life)
Address: 1092 Little Beason Road
Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
Pennsboro, WV 26415

TM 40 PCL 9

Owner: Terry Lee Richards
Address: 1092 Little Beason Road
Pennsboro, WV 26415

Owner: Stella F. Richards (2nd Address)
Address: 4426 Lamberton Road #6005
Pennsboro, WV 26415

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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

Reissued December 16, 2016

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 Lynn Camp Pad, Ritchie County
 Sugar Run Unit 4H Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #03-2014-0607 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Ritchie County route 7/5 SLS.

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

Very Truly Yours,

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

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Cc: Kara Quackenbush
 Antero Resources Corporation
 CH, OM, D-3
 File

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-nitropropionamide	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

Antero Resources Corporation Site Construction Plan for Lynn Camp Well Pad & Water Containment Pad

Antero Resources Corporation (Antero) is submitting the following Site Construction Plan in compliance with §35-8-5.5. This plan is submitted in conjunction with the Lynn Camp Well Pad & Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Navitus Engineering, Inc., a West Virginia registered professional engineer.

Requirement §5.5.a. *The plan should describe the nature and purpose of the construction project and identify the procedures for construction that will be used to achieve site stability. The plan shall be considered conditions of the permit and be enforceable as such.*

Antero Response

The nature and purpose of the subject project is to perforate, fracture, and complete one or more horizontal shallow wells. Procedures to achieve site stability include seeding and mulching of earth disturbed areas and implementation of erosion and sediment best management practices (BMPs). Details of seeding and mulching rates as well as procedures for installation and maintenance of erosion and sediment BMPs are outlined on page 2 of "Lynn Camp Well Pad & Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans" (Site Design) prepared and certified by Navitus Engineering, Inc. of West Virginia.

These procedures will be considered as conditions of the permit and shall be inspected and maintained for continual compliance measures outlined in §35-8-5.5.

Requirement §5.5.b.1. *A vicinity map location the site in relation to the surrounding area and roads;*

Antero Response

Please refer to the vicinity maps on page 1 for the location of the site in relation to the surrounding area and roads.

Requirement §5.5.b.2. *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater that shows appropriate detail of all site features and:*

Requirement §5.5.b.2.A. *Clearly identifies the limit of disturbance for the project;*

Antero Response

"Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," and "Well Pad Plan," maps are included on pages 8-11 of the Site Design.

Requirement §5.5.b.2.B. *Provides existing topographic information on a contour interval that affords sufficient detail to illustrate site terrain conditions*

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Antero Response

Please refer to the "Existing Conditions" and "Existing Structures & Features" map on pages 6-7 of the Site Design for the current topographic conditions for the constructed pad on a contour interval that affords sufficient detail to illustrate site terrain conditions.

Requirement §5.5.b.2.C. Identifies proposed cut and fill areas with grading contours at an interval that provides sufficient detail to accurately depict slope ratios, indicating top and bottom of slopes; and

Antero Response

Please refer to "Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," and "Well Pad Plan," maps on pages 8-11 as well as the "Water Containment Pad Grading Plan," "Well Pad Grading Plan," "Access Road Profiles," "Access Road Sections," "Well Pad & Water Containment Pad Sections," "Well Pad Sections," "Water Containment Pad Sections," and "Stockpile Sections" on pages 12-20 of the Site Design for proposed cut and fill areas with grading contours.

Requirement §5.5.b.2.D. Identifies any existing structures, roads, water bodies, and other critical areas within the area that would most likely be affected by the construction.

Antero Response

Please refer to "Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," and "Well Pad Plan," maps on pages 8-11 for the maps identifying any structures, roads, water bodies, and other critical areas within the area of interest that would be most likely affected by construction.

Requirement §5.5.b.3. A cross-section of the length and width of the location, providing cut and fill volumes; and

Antero Response

Please refer to "Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," and "Well Pad Plan," maps on pages 8-11 as well as the "Water Containment Pad Grading Plan," "Well Pad Grading Plan," "Access Road Profiles," "Access Road Sections," "Well Pad & Water Containment Pad Sections," "Well Pad Sections," "Water Containment Pad Sections," and "Stockpile Sections" on pages 12-20 for a cross-section of the location. The cut and fill volumes can be found in "Material Quantities" on page 4.

Requirement §5.5.b.4. Any other engineering designs or drawings necessary to construct the project.

Antero Response

All other engineering designs and drawings necessary to construct this project are included in the Site Design.

Requirement §5.5.c. At a minimum, site construction shall be conducted in accordance with the following criteria:

Antero Response

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c. of §35-8.

Requirement §5.5.c.1. All woody material, brush, and trees shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of necessary sediment controls. Trees six inches in diameter and larger shall be cut and logs stacked;

Antero Response

The Site Design outlines measures to maintain compliance with Section 201 of the WVDOH Specifications which outlines clearing and grubbing measures. Please refer to "Construction and E&S Control Notes" on page 2 of the Site Design.

Requirement §5.5.c.2. Topsoil shall be removed from construction areas and stockpiled for reuse during reclamation. In woodland areas, tree stumps, large roots, large rocks, tree and leaf debris, and ground vegetation shall be removed prior to actual site constructions;

Antero Response

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to "Construction and E&S Control Notes" on page 2 of the Site Design. In addition, soil for stockpiling and use as fill shall be further compliant with measures outlined in Section 5.5.c.2. of §35-8-5.5.

Requirement §5.5.c.3. No embankment fill shall be placed on frozen material;

Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.3. of §35-8-5.5.

Requirement §5.5.c.4. The fill material shall be clean mineral soil, free of roots, woody vegetation, stumps, sod, large rocks, frozen soil or other objectionable material;

Antero Response

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to "Construction and E&S Control Notes" on page 2 of the Site Design. In addition, soil shall be further defined to the measures outlined in Section 5.5.c.4. of §35-8-5.5.

Requirement §5.5.c.5. Embankment material shall exhibit adequate soil strength and contain the proper amount of moisture to ensure that compaction will be achieved;

Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.5. of §35-8-5.5.

Requirement §5.5.c.6 Earthen fill slopes should be constructed with slopes no steeper than a ratio of two to one (2:1);

Antero Response

The Site Design outlines all earthen fill slopes to be constructed with slopes no steeper than a ratio of two to one (2:1).

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Requirement §5.5.c.7. *Fill material will be placed in lifts or layers over the length of the fill. Lift thickness of soil shall be as thin as the suitable random excavated material will permit, typically from six to twelve (12) inches; and*

Antero Response

Please refer to the "Construction and E&S Control Notes" on page 2 of the Site Design. Fill shall be placed in horizontal lifts of maximum loose depth of 12 inches. Compaction will be performed with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

Requirement §5.5.c.8. *The size of rock lifts shall not exceed thirty-six (36) inches. The rock shall not be greater in any dimension than thirty-six (36) inches;*

Antero Response

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.8. of §35-8-5.5.

Requirement §5.5.c.9. *Compaction shall be obtained by compaction equipment or by routing the hauling equipment over the fill so that the entire surface of each fill lift is compacted by at least one wheel or tread track of equipment or by a compactor. Each lift shall be compacted before beginning the next lift;*

Antero Response

Compaction compliance measures are outlined in the "Construction and E&S Notes" on page 2. Compaction is required with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

Requirement §5.5.c.10. *Surface water diversion ditches shall be constructed above the disturbed area to intercept water and to divert surface water runoff around the site; and*

Antero Response

"Construction and E&S Control Notes" on page 2 of the Site Design identifies the surface diversions used to prevent surface water and subsurface water from flowing on to the well pad and coming into contact with the stormwater associated with the well pad. Additional Erosion & Sediment BMPs will be used to prevent sediment discharges from the project.

Requirement §5.5.c.11. *In areas of steep terrain, a terraced bench shall be constructed at the base of the slope where fill is to be placed, creating a toe foundation and aid in holding fill material. Additional terracing shall be constructed from each additional fifty (50) vertical feet of slope and shall be a minimum of ten (10) feet wide.*

Antero Response

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c.11.. of §35-8-5.5.

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Antero Resources Corporation Erosion and Sediment Control Plan for Lynn Camp Well Pad & Water Containment Pad

Antero Resources Corporation (Antero) is submitting the following narrative and set of drawings in compliance with §35-8-5.4. This plan is submitted in conjunction with the Lynn Camp Well Pad & Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Navitus Engineering, Inc., a West Virginia registered professional engineer.

Requirement §5.4.b.1. *A general sequence of events that describe in relative terms how and when each construction phase (i.e. clearing and grubbing, mass grading, stabilization) will occur and when each erosion and sediment control best management practice ("BMP") will be installed;*

Antero Response:

The following includes a general sequence of events that describe in relative terms how and when each construction phase is anticipated to occur and erosion and sediment control BMPs to be installed. Please refer to the Lynn Camp Well Pad & Water Containment Pad Site Design & Construction Plan, Erosion & Sediment Control Plans (Site Design) prepared and certified by Navitus Engineering, Inc. for specific construction measures. Compliance with the measures outlined in the Site Construction Plan (§35-8-5.4) submitted in conjunction with this plan will also be maintained.

1. A pre-construction conference with the contactor and the appropriate erosion and sediment control inspector 48 hours prior to beginning work to review the construction drawings and provide any requested guidance.
2. Stake the limits of construction and mark/flag all identified wetlands, streams, utilities, and other areas of concern for construction activities. Install signs to designate the areas and orange safety fence to identify important project attributes such as approved access roads, no refueling zones, wetlands/steam bounds, etc.
3. Construct the rock construction entrance. All vehicles entering and exiting the site shall do so via the rock construction entrance.
4. Construct all BMP's as soon as clearing and grubbing operations allow. Diversions and sediment trap(s)/basin(s) shall be seeded and mulched immediately.
5. If applicable, convey upslope drainage around the Access Road, Well Pad, and Water Containment Pad areas by constructing all diversion berm(s) and/or compost filter sock diversion(s) as shown on the plans.
6. Clear and grub the site. All woody material, brush, trees, stumps, large roots, boulders, and debris shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of necessary sediment controls. Trees six inches in diameter and larger shall be cut and logs stacked. Smaller trees, brush, & stumps shall be cut and/or grubbed and windrowed in appropriate areas for use as sediment barriers at water drainage outlets (as shown on the plans), windrowed below the well site, used for wildlife habitat, burned (as per WV forest fire laws), removed from site, or disposed of by other methods approved by WV DEP.

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7. If applicable, install all wetland or stream crossings as shown on the plans.
8. Strip the topsoil from the access road. Prior to placing any fill, the exposed subgrade shall be compacted and proof rolled to produce a stable and unyielding site. All stripped topsoil shall be stockpiled in areas shown in the plans, or re-spread at an approximate depth of 2-4 inches on all proposed 2:1 or flatter slopes, and immediately stabilized. Additional BMP measures shall be constructed around topsoil stockpiles, if necessary.
9. Construct the access road. All fill areas, including excess material stockpiles, shall be "Keyed In" and compacted in horizontal lifts with a maximum loose lift thickness of 12" and maximum particle size as outlined in the geotechnical report. All fill shall be compacted by a vibrating sheepsfoot roller to 95% per the standard proctor test (ASTM – D698). Moisture content will be controlled in accordance with the standard proctor test (ASTM – D698) results. It is also recommended that each lift be proof rolled with a loaded haul truck where applicable. Ditch relief culverts shall be installed at a grade of 1-8% to minimize outlet velocities to the extent possible. Install outlet protection once ditch relief culverts are installed, as shown on plans. Stabilize the road with geotextile fabric & stone and side slopes as specified with permanent seeding. Excess material shall be stockpiled (if necessary) in areas shown in the plans and immediately stabilized. Topsoil shall be stripped from all stockpile areas prior to construction of stockpiles. After stockpiles are constructed, topsoil is to be reapplied at a depth of 2"-4". Slopes shall be tracked by running tracked machinery up and down the slope, leaving tread marks parallel to the contour. All ditch lines shall be cleaned prior to installation of lined protection.
10. Strip the topsoil from the well pad and water containment pad. Prior to placing any fill, the exposed subgrade shall be compacted and proof rolled to produce a stable and unyielding site. All stripped topsoil shall be stockpiled in areas shown in the plans, or re-spread at an approximate depth of 2-4 inches on all proposed 2:1 or flatter slopes, and immediately stabilized. Additional BMP measures shall be constructed around topsoil stockpiles, if necessary.
11. Grade the well pad and water containment pad areas as shown on the plans. Install pad sumps (with 4" PVC drain pipe and outlet protection) and containment berm liner system. Immediately stabilize the outer areas of the well pad and water containment pad. The well pad and water containment pad areas shall be stabilized with geotextile fabric & stone and the side slopes with seed and mulch. Install all straw wattles as shown on plans. Apply seed and mulch to all disturbed areas. This shall include all areas that will not be subject to regular traffic activity (to be stabilized with stone), or any disturbed area that will not be re-disturbed before site reclamation begins.
12. Commence well drilling activity.
13. All BMP's must remain in place and functional until all areas within the limit of disturbance are complete and permanently stabilized. Maintenance must include inspection of all erosion and sediment controls after each runoff event in excess of 0.5" and on a biweekly basis.
14. The construction site should be stabilized as soon as possible after completion. Establishment of final stabilization must be initiated no later than 7 days after reaching final grade. Final stabilization means that all soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70% or greater has been established or that the surface has been stabilized by hard cover such as pavement or buildings. It should be noted that the 70% requirement refers to the total area vegetated and not just a percent of the site.
15. All permanent sediment control measures can be removed after the site is permanently stabilized and approval is received from the WVDEP.
16. Any areas disturbed by removal of controls shall be repaired, stabilized, and permanently seeded.

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Requirement §5.4.b.2. *A description of the stabilization methods to be used, including the application rates for temporary and permanent seeding and mulching, and provide the timeframes for establishing stabilization*

Antero Response:

Stabilization methods used include seeding and mulching of disturbed areas as well as the implementation of erosion and sediment control BMPs. Please refer to “Construction and E&S Control Notes” on page 2 and “Construction Details” on pages 23-30 for detailed descriptions of the different stabilization methods to be used. Seeding and mulching is to be in accordance with the WVDOT Standard Specifications unless specified otherwise in the plans or unless specified otherwise by the construction engineer or Antero representative. Please refer to “Erosion and Sediment Control Narrative” under “Construction and E&S Control Notes” on page 2 as well as “Revegetation” on page 30 of the Site Design for more specific information regarding application, liming, and mulching rates.

Erosion and sediment BMPs will be constructed, stabilized, and functional before site disturbance begins within the tributary areas of those BMPs. In a timely manner after earth disturbance activities cease, Antero shall stabilize any areas disturbed by the activities. During non-germination periods, mulch must be applied at the specified rates. Disturbed areas which are not at finish grade and which will be re-disturbed within 1 year will be stabilized in accordance with the temporary vegetative stabilization and specifications. Disturbed areas which are finished grade or which will not be re-disturbed within 1 year will be stabilized in accordance with the permanent vegetative stabilization specification. Please refer to “Construction and E&S Control Notes” on page 2 for more information regarding timeframes for establishing stabilization and erosion and sediment BMPs.

The site shall be considered to have achieved full stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics to resist sliding and other movements. Until the site achieves final stabilization, Antero will assure that the best management practices (BMPs) are implemented, inspected, operated, and maintained. As such, Antero will maintain written inspection logs. All maintenance work, including cleaning, repair, replacement, regarding, and re-stabilization shall be performed immediately upon discovery of deficiency. After final stabilization has been achieved, temporary erosion and sediment BMPs controls will be removed. Areas disturbed during removal of the BMPs will be stabilized immediately.

Requirement §5.4.b.3. *Details of specifications for the erosion and sediment control BMPs employed on the project.*

Antero Response:

Please refer to the “Construction and E&S Control Notes,” and “Construction Details” on pages 2 and 23-30 in the Site Design for specifications including instructions for installation, inspection, and maintenance for erosion and sediment control BMPs employed at this site.

Requirement §5.4.c.1. *A vicinity map locating the site in relation to the surrounding area and roads;*

Antero Response:

A vicinity map locating the site in relation to the surrounding area and roads is included on page 1 of the Site Design.

Requirement §5.4.c.2 *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater, showing appropriate detail of all site features, including the identification of site access that provides for a stabilized construction entrance and exit to reduce tracking of sediment onto public or private roads; and*

Antero Response:

"Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," "Well Pad Plan," "Water Containment Pad Grading Plan," and "Well Pad Grading Plan," maps are included on pages 8-13 of the Site Design. Specific design, layout and inspection and maintenance notes for a stabilized construction entrance are included in the "Construction and E&S Control Notes" verbiage on page 2.

Requirement §5.4.c.3. *The location of all proposed erosion and sediment control BMPs*

Antero Response:

"Overall Plan Sheet Index & Volumes," "Access Road Plan," "Water Containment Pad Plan," "Well Pad Plan," "Water Containment Pad Grading Plan," and "Well Pad Grading Plan," maps included on pages 8-13 of the Site Design locate all proposed erosion and sediment control BMPs.

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
 LATITUDE: 39.218179 LONGITUDE: -80.948596 (NAD 83)
 N 4340767.83 E 504561.13 (UTM ZONE 17 METERS)

CENTROID OF WELL PAD
 LATITUDE: 39.213978 LONGITUDE: -80.945040 (NAD 83)
 N 4340523.84 E 504744.74 (UTM ZONE 17 METERS)

CENTER OF WATER CONTAINMENT TANK
 LATITUDE: 39.218171 LONGITUDE: -80.943439 (NAD 83)
 N 4340761.29 E 504662.62 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

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

FLOODPLAIN NOTES:

THE PROPOSED SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA MAP NUMBER #54066C0200C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN. TICKET #1406607341. 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-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

GEOTECHNICAL NOTES:

THE PROPOSED ACCESS ROAD CUT SLOPE (1.6:1) SHALL BE FIELD VERIFIED BY A CERTIFIED GEOTECHNICAL ENGINEER TO ENSURE THE PROPOSED SLOPES ARE ADEQUATE PRIOR TO CONSTRUCTION. ACCESS ROAD CONSTRUCTION SHALL BE MONITORED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER OR PROJECT DESIGN ENGINEER DURING CONSTRUCTION.

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY KLEINFELDER BETWEEN MARCH 31, JUNE 4, 2014 & OCTOBER 21, 2015. THE REPORT PREPARED BY KLEINFELDER, DATED JUNE 13, 2014, REVISED OCTOBER 30, 2015, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY KLEINFELDER FOR ADDITIONAL INFORMATION, AS NEEDED.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN MARCH AND APRIL, 2014 AND MAY, 2015 BY SWCA ENVIRONMENTAL CONSULTANTS, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE MAY 19, 2015 DELINEATION MAP WAS PREPARED BY SWCA ENVIRONMENTAL CONSULTANTS, INC. AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFORESAID AGENCIES BE CONSULTED IN AN EFFORT TO OBTAIN WRITTEN CONFIRMATION OF THE DELINEATION SHOWN ON THIS EXHIBIT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

PROJECT CONTACTS:

MARK JOHNSON - SURVEYING COORDINATOR
 OFFICE: (304) 842-4162 CELL: (304) 719-6449

RICHARD LYLES - LAND AGENT
 CELL: (770) 378-6833

ENGINEER/SURVEYOR:
 NAVTUS ENGINEERING, INC.
 CHRIS S. KUMP, PE - PROJECT MANAGER/ENGINEER
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AARON KUNZLER - CONSTRUCTION SUPERVISOR
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ENVIRONMENTAL
 SWCA ENVIRONMENTAL CONSULTANTS, INC.
 IVAN J. MALDONADO - ENVIRONMENTAL SPECIALIST
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GEOTECHNICAL:
 KLEINFELDER
 JOSHUA D. PREGOSI-ENGINEER
 OFFICE: (724) 772-7072 CELL: (704) 400-1103

RESTRICTIONS NOTES:

- THERE ARE NO LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE IS A PERENNIAL STREAM & WETLAND 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 EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELLS) 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.

REPRODUCTION NOTE

THESE PLANS WERE CREATED TO BE PLOTTED ON 24"x36" (ANSI B) PAPER. HALF SCALE DRAWINGS ARE ON 11"x17" (ANSI B) PAPER.

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

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!!

LYNN CAMP WELL PAD & WATER CONTAINMENT PAD

SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

CLAY DISTRICT, RITCHIE COUNTY, WEST VIRGINIA
 BUNNELL RUN-NORTH FORK HUGHES RIVER WATERSHED
 USGS 7.5 PULLMAN QUAD MAP

**APPROVED
 WVDEP OOG**

11/16/2015



WEST VIRGINIA COUNTY MAP



WVDOH COUNTY ROAD MAP



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

SHEET INDEX:

- COVER SHEET
- CONSTRUCTION AND E&S CONTROL NOTES
- LEGEND
- MATERIAL QUANTITIES
- STORM DRAINAGE COMPUTATIONS
- EXISTING CONDITIONS
- EXISTING STRUCTURES & FEATURES
- OVERALL PLAN SHEET INDEX & VOLUMES
- ACCESS ROAD PLAN
- WATER CONTAINMENT PAD PLAN
- WELL PAD PLAN
- WATER CONTAINMENT PAD GRADING PLAN
- WELL PAD GRADING PLAN
- WELL PAD SECTIONS
- ACCESS ROAD SECTIONS
- STOCKPILE SECTIONS
- STREAM CROSSING "A" DETAILS
- STREAM CROSSING "B" DETAILS
- CONSTRUCTION DETAILS
- ACCESS ROAD RECLAMATION PLAN
- ACCESS ROAD RECLAMATION PLAN
- WELL PAD RECLAMATION PLAN
- GES01-GES19 - GEOTECHNICAL DETAILS

LYNN CAMP LIMITS OF DISTURBANCE AREA (AC)			
Total Area	Permitted	Modified	Total
Access Road "A" (1628)	5.28	0.48	5.76
Access Road "B" (854)	2.00	0.00	2.00
Access Road "C" (283)	1.54	-1.01	0.53
Well Pad	6.46	0.40	6.86
Water Containment Pad	3.20	0.00	3.20
Excavator/Topsoil Material Stockpiles	4.86	0.18	5.04
Total Affected Area	23.43	0.65	23.48
Total Wooded Acres Disturbed	7.83	0.85	8.58
Impacts to Tommy Post Wetland TM 40.3			
Access Road "A"	0.03	0.00	0.03
Total Affected Area	0.03	0.00	0.03
Total Wooded Acres Disturbed	0.00	0.00	0.00
Impacts to Terry Lee Richards & State F. Richards (304) TM 40.2			
Access Road "A" (1628)	5.28	0.48	5.73
Access Road "B" (158)	0.47	0.00	0.47
Access Road "C" (23)	2.10	-0.02	0.08
Well Pad	2.49	0.40	2.89
Excavator/Topsoil Material Stockpiles	2.47	0.18	2.63
Total Affected Area	10.78	1.02	11.80
Total Wooded Acres Disturbed	5.45	0.64	6.29
Impacts to Terry Lee Richards TM 40.0			
Access Road "B" (195)	1.62	0.00	1.62
Access Road "C" (240)	1.44	-0.99	0.45
Well Pad	3.97	0.00	3.97
Water Containment Pad	1.16	0.00	1.16
Excavator/Topsoil Material Stockpiles	0.34	0.01	0.35
Total Affected Area	8.53	-0.98	7.55
Total Wooded Acres Disturbed	1.17	0.00	1.17
Impacts to Terry Lee Richards TM 40.0			
Water Containment Pad	2.04	0.00	2.04
Excavator/Topsoil Material Stockpiles	2.05	0.01	2.06
Total Affected Area	4.09	0.01	4.10
Total Wooded Acres Disturbed	1.21	0.01	1.22

Proposed Well Name	WV North MAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Buzzard Run	N 28343.82	N 28377.92	N 434034.50	Lat 39-12-00 8988
Unit 1H (889) POD	E 158005.48	E 158109.53	E 504753.21	LONG 80-58-11 7899
Buzzard Run	N 28333.71	N 28359.80	N 434032.00	Lat 39-12-00 5897
Unit 3H	E 158044.83	E 158103.08	E 504751.47	LONG 80-58-41 8622
Buzzard Run	N 28332.59	N 28381.69	N 434032.83	Lat 39-12-00 5048
Unit 2H	E 158038.79	E 158097.84	E 504748.73	LONG 80-58-41 9348
Geney	N 28331.48	N 28353.57	N 434029.99	Lat 39-12-00 4235
Unit 2H	E 158032.95	E 158069.98	E 504747.97	LONG 80-58-42 3074
Geney	N 28331.38	N 28345.48	N 434024.48	Lat 39-12-00 3423
Unit 1H	E 158027.10	E 158008.15	E 504746.25	LONG 80-58-42 3630
Ridge	N 28330.25	N 28337.34	N 434027.98	Lat 39-12-00 2818
Unit 2H	E 158021.28	E 158000.31	E 504744.51	LONG 80-58-42 1535
Ridge	N 28329.14	N 28320.23	N 434018.49	Lat 39-12-00 1801
Unit 2H	E 158015.42	E 158007.48	E 504742.77	LONG 80-58-42 2291
Sugar Run	N 28327.02	N 28321.12	N 434016.89	Lat 39-12-00 0960
Unit 4H	E 158008.92	E 158008.82	E 504741.03	LONG 80-58-42 2977
Sugar Run	N 28327.91	N 28313.00	N 434014.48	Lat 39-12-00 0128
Unit 3H	E 158003.73	E 158002.78	E 504739.29	LONG 80-58-42 3703
Sugar Run	N 28327.03	N 28304.89	N 434011.08	Lat 39-12-00 8387
Unit 2H	E 158007.88	E 158006.93	E 504737.56	LONG 80-58-42 4429
Sugar Run	N 28326.88	N 28298.77	N 434008.49	Lat 39-12-00 8556
Unit 1H	E 158002.04	E 158001.09	E 504736.82	LONG 80-58-42 1154
Ridge	N 28324.56	N 28289.96	N 434006.68	Lat 39-12-00 7745
Unit 1H (889) POD	E 158000.20	E 158004.24	E 504734.08	LONG 80-58-42 5880
Well Pad Flattening	1.1483			

LYNN CAMP INTERMITTENT STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts Cofferdam/E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	Total Disturbance (LF)
	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)			
Stream 11 (Access Road "A")	36	38	10	40	124

LYNN CAMP PERENNIAL STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts Cofferdam/E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	Total Disturbance (LF)
	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)			
Stream 20 (Access Road "A")	55	5	46	45	151

LYNN CAMP EPHEMERAL STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts Cofferdam/E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	Total Disturbance (LF)
	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)			
Stream 8 (Access Road "B")	0	0	0	60	60
Stream 9 (Access Road "B")	0	0	0	17	17
Stream 12 (Access Road "A")	21	0	12	25	58
Stream 13 (Access Road "A")	15	12	0	14	37
Stream 14 (Access Road "A")	0	0	0	34	34
Stream 15 (Access Road "A")	0	2	5	17	24
Stream 16 (Access Road "A")	0	14	7	17	38
Stream 17 (Access Road "A")	110	0	18	13	141

LYNN CAMP WETLAND IMPACT (SQUARE FEET)			
Wetland and Impact Cause	Fill (SF)	Total Impact (SF)	Total Impact (AC)
WL1MM001 Wetland	1,141	1,141	0.03

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REVISION HISTORY

DATE	BY	REVISION
10/20/2015		REVISED PER DTP MODIFICATION

THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

Antero

LYNN CAMP
 WELL PAD & WATER CONTAINMENT PAD
 CLAY DISTRICT
 RITCHIE COUNTY, WEST VIRGINIA

COVER SHEET

DATE: 03/27/2015
 SCALE: AS SHOWN
 SHEET 1 OF 32

WELL PAD PLAN

MATCHLINE "A"
SEE SHEET 10

WELLHEAD INDEX

- ① BUZZARD RUN UNIT 1B (66' PCD)
- ② BUZZARD RUN UNIT 2H
- ③ BUZZARD RUN UNIT 2H
- ④ GONNY UNIT 2H
- ⑤ GONNY UNIT 1H
- ⑥ RIGGS UNIT 2H
- ⑦ RIGGS UNIT 2H
- ⑧ SUGAR RUN UNIT 4H
- ⑨ SUGAR RUN UNIT 3H
- ⑩ SUGAR RUN UNIT 2H
- ⑪ SUGAR RUN UNIT 1H
- ⑫ RIGGS UNIT 1E (66' PCD)

NOTES:

- ALL PIPELINE RE-ROUTES, CONNECTIONS, VALVES, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE OPERATOR (HAYDEN HARPER ENERGY KA, LLC & ENERGY CORPORATION OF AMERICA) STANDARDS AND GUIDELINES. IT IS REQUIRED THAT A REPRESENTATIVE FROM THE OPERATOR (HAYDEN HARPER ENERGY KA, LLC & ENERGY CORPORATION OF AMERICA) BE PRESENT WHEN THE LINES ARE CONNECTED AND THE INACTIVE WELL(S) ARE MADE ACTIVE.
- TOTAL PROPOSED PIPELINE RELOCATION FOR (HAYDEN HARPER ENERGY KA, LLC) IS 2,254.6 LF.

APPROVED WVDEP OOG
11/16/2015

NAVITUS
ENERGY ENGINEERING

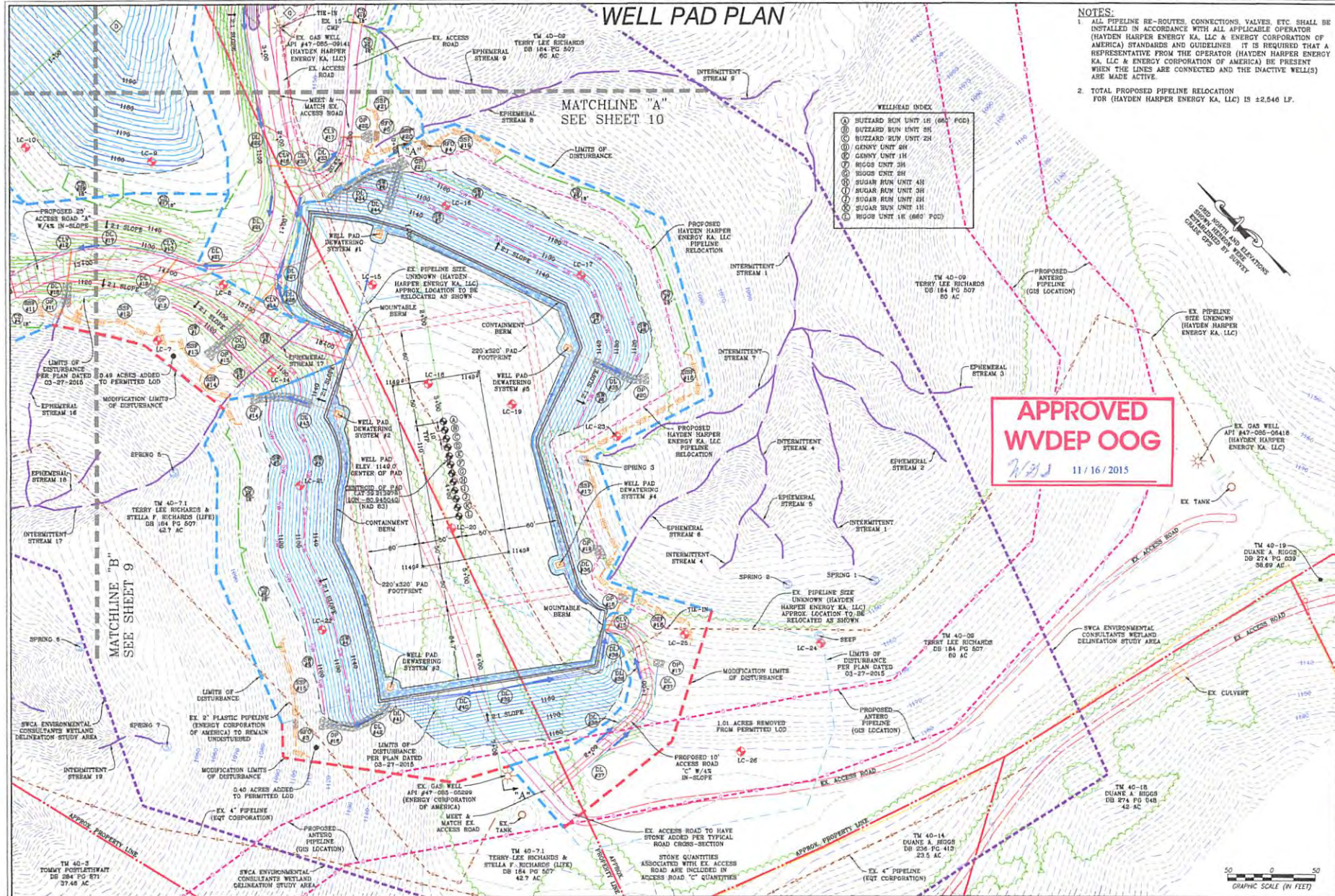
DATE	REVISION
10/20/2015	REVISED PER LOD MODIFICATION

Antero
THIS DOCUMENT WAS PREPARED FOR ANTERO ENERGY CORPORATION

WELL PAD PLAN
LYNN CAMP
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/27/2015
SCALE: 1" = 50'
SHEET 11 OF 32



LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
LATITUDE: 39.216179 LONGITUDE: -80.949598 (NAD 83)
N 4340767.83 E 504351.13 (UTM ZONE 17 METERS)

CENTROID OF WELL PAD
LATITUDE: 39.213978 LONGITUDE: -80.945040 (NAD 83)
N 4340523.84 E 504744.74 (UTM ZONE 17 METERS)

CENTER OF WATER CONTAINMENT TANK
LATITUDE: 39.216117 LONGITUDE: -80.943439 (NAD 83)
N 4340761.29 E 504882.82 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:

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

FLOODPLAIN NOTES:

THE PROPOSED SITE IS LOCATED IN FLOOD ZONE "X" PER FEMA MAP NUMBER #54085C0205C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1408607341. 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-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

GEOTECHNICAL NOTES:

THE PROPOSED ACCESS ROAD CUT SLOPE (1.5:1) SHALL BE FIELD VERIFIED BY A CERTIFIED GEOTECHNICAL ENGINEER TO ENSURE THE PROPOSED SLOPES ARE ADEQUATE PRIOR TO CONSTRUCTION. ACCESS ROAD CONSTRUCTION SHALL BE MONITORED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER OR PROJECT DESIGN ENGINEER DURING CONSTRUCTION.

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY KLEINFELDER BETWEEN MARCH 31, JUNE 8, 2014 & OCTOBER 21, 2015. THE REPORT PREPARED BY KLEINFELDER, DATED JUNE 13, 2014, REVISED OCTOBER 30, 2015, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY KLEINFELDER FOR ADDITIONAL INFORMATION, AS NEEDED.

ENVIRONMENTAL NOTES:

STREAM AND WETLAND DELINEATIONS WERE PERFORMED IN MARCH AND APRIL, 2014 AND MAY, 2015 BY SWCA ENVIRONMENTAL 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 MAY 19, 2015 DELINEATION MAP WAS PREPARED BY SWCA ENVIRONMENTAL CONSULTANTS, INC. AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. 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.

PROJECT CONTACTS:

MARK JOHNSON - SURVEYING COORDINATOR
OFFICE: (304) 842-4162 CELL: (304) 719-6449

RICHARD LYLES - LAND AGENT
CELL: (770) 378-6833

ENGINEER/SURVEYOR:
NAVITUS ENGINEERING, INC.
CYRUS S. KUMP, PE - PROJECT
MANAGER/ENGINEER
OFFICE: (888) 662-4185 CELL: (540) 686-6747

ENVIRONMENTAL:
SWCA ENVIRONMENTAL CONSULTANTS, INC.
IVAN J. MALDONADO - ENVIRONMENTAL SPECIALIST
OFFICE: (412) 839-1001 CELL: (570) 778-5768

GEOTECHNICAL:
KLEINFELDER
JOSHUA D. FREGOSI-ENGINEER
OFFICE: (724) 772-7072 CELL: (704) 400-1103

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) 842-4088 CELL: (304) 476-9770

JON MCEVERS - OPERATIONS SUPERINTENDENT
OFFICE: (303) 357-6799 CELL: (303) 808-2423

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

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

RESTRICTIONS NOTES:

1. THERE ARE NO LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE IS A PERENNIAL STREAM & WETLAND IMPACT THAT WILL NEED TO BE PERMITTED BY THE APPROPRIATE AGENCIES.
2. THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
4. THERE ARE NO EXISTING WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE WELL(S) BEING DRILLED.
5. THERE ARE NO OCCUPIED DWELLING STRUCTURES WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.
6. THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.

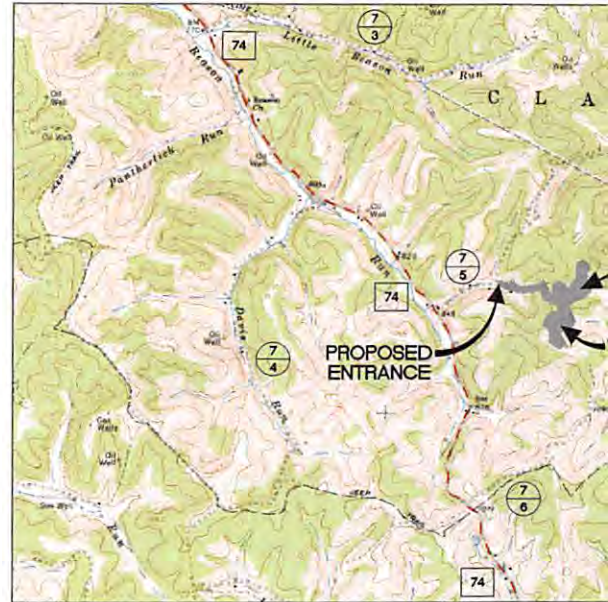
REPRODUCTION NOTE

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

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

LYNN CAMP WELL PAD & WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION EROSION & SEDIMENT CONTROL

CLAY DISTRICT, RITCHIE COUNTY
BUNNELL RUN-NORTH FORK HUGGINS CREEK
USGS 7.5 PULLMAN



WEST VIRGINIA COUNTY 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 35-8.

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!!

LYNN CAMP	
Stream and Impact Cause	Permit Type
Stream 8 (Access Road "B")	0
Stream 9 (Access Road "B")	0
Stream 12 (Access Road "A")	2
Stream 13 (Access Road "A")	1
Stream 14 (Access Road "A")	0
Stream 15 (Access Road "A")	0
Stream 16 (Access Road "A")	0
Stream 17 (Access Road "A")	11

LYNN CAMP	
Wetland and Impact	Permit Type
WL1MM001 Wetland	0

04/07/2017

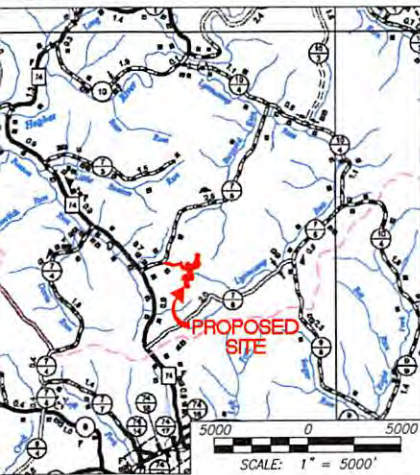
WATER CONTAINMENT PAD CONSTRUCTION PLAN, CONTROL PLANS

WEST VIRGINIA RIVER WATERSHED
MAP



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

WVDOH COUNTY ROAD MAP



*Michael Duff
2/16/17*

SHEET INDEX:

- 1 - COVER SHEET
- 2 - CONSTRUCTION AND E&S CONTROL NOTES
- 3 - LEGEND
- 4 - MATERIAL QUANTITIES
- 5 - STORM DRAINAGE COMPUTATIONS
- 6 - EXISTING CONDITIONS
- 7 - EXISTING STRUCTURES & FEATURES
- 8 - OVERALL PLAN SHEET INDEX & VOLUMES
- 9 - ACCESS ROAD PLAN
- 10 - WATER CONTAINMENT PAD PLAN
- 11 - WELL PAD PLAN
- 12 - WATER CONTAINMENT PAD GRADING PLAN
- 13 - WELL PAD GRADING PLAN
- 14-15 - ACCESS ROAD PROFILES
- 16 - ACCESS ROAD SECTIONS
- 17-18 - WELL PAD SECTIONS
- 19 - WATER CONTAINMENT PAD SECTIONS
- 20 - STOCKPILE SECTIONS
- 21 - STREAM CROSSING "A" DETAILS
- 22 - STREAM CROSSING "B" DETAILS
- 23-30 - CONSTRUCTION DETAILS
- 31 - ACCESS ROAD RECLAMATION PLAN
- 32 - WATER CONTAINMENT PAD RECLAMATION PLAN
- 33 - WELL PAD RECLAMATION PLAN
- GE501-GE519 - GEOTECHNICAL DETAILS

LYNN CAMP LIMITS OF DISTURBANCE AREA (AC)			
Total Site	Modified	Total	
Access Road "A" (1,826')	5.28	0.48	5.76
Access Road "B" (654')	2.09	0.00	2.09
Access Road "C" (263')	1.54	-1.01	0.53
Well Pad	6.46	0.40	6.86
Water Containment Pad	3.20	0.00	3.20
Excess/Topsoil Material Stockpiles	4.86	0.18	5.04
Total Affected Area	23.43	0.05	23.48
Total Wooded Acres Disturbed	7.83	0.85	8.68

Impacts to Tommy Postlethwait TM 40-3			
Access Road "A"	0.03	0.00	0.03
Total Affected Area	0.03	0.00	0.03
Total Wooded Acres Disturbed	0.00	0.00	0.00

Impacts to Terry Lee Richards & Stella F. Richards (Life) TM 40-7.1			
Access Road "A" (1,826')	5.25	0.48	5.73
Access Road "B" (159')	0.47	0.00	0.47
Access Road "C" (23')	0.10	-0.02	0.08
Well Pad	2.49	0.40	2.89
Excess/Topsoil Material Stockpiles	2.47	0.16	2.63
Total Affected Area	10.78	1.02	11.80
Total Wooded Acres Disturbed	5.45	0.84	6.29

Impacts to Terry Lee Richards TM 40-09			
Access Road "B" (495')	1.62	0.00	1.62
Access Road "C" (240')	1.44	-0.99	0.45
Well Pad	3.97	0.00	3.97
Water Containment Pad	1.16	0.00	1.16
Excess/Topsoil Material Stockpiles	0.34	0.01	0.35
Total Affected Area	8.53	-0.98	7.55
Total Wooded Acres Disturbed	1.17	0.00	1.17

Impacts to Terry Lee Richards TM 40-08			
Water Containment Pad	2.04	0.00	2.04
Excess/Topsoil Material Stockpiles	2.05	0.01	2.06
Total Affected Area	4.09	0.01	4.10
Total Wooded Acres Disturbed	1.21	0.01	1.22

Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Buzzard Run Unit 3H	N 263343.82 E 1590550.48	N 263377.92 E 159109.53	N 4340534.50 E 504753.21	LAT 39-12-50.6668 LONG -80-56-41.7896
Buzzard Run Unit 2H	N 263335.71 E 1590544.63	N 263399.80 E 159103.68	N 4340532.00 E 504751.47	LAT 39-12-50.5857 LONG -80-56-41.8822
Buzzard Run Unit 1H	N 263327.59 E 1590388.79	N 263361.69 E 159097.84	N 4340529.50 E 504749.73	LAT 39-12-50.5046 LONG -80-56-41.9348
Riggs Unit 3H	N 263319.48 E 1590532.95	N 263353.57 E 159091.99	N 4340526.99 E 504747.99	LAT 39-12-50.4235 LONG -80-56-42.0074
Riggs Unit 2H	N 263311.36 E 1590527.10	N 263345.46 E 159086.15	N 4340524.49 E 504746.25	LAT 39-12-50.3423 LONG -80-56-42.0800
Riggs Unit 1H	N 263303.25 E 1590521.28	N 263337.34 E 159080.31	N 4340521.99 E 504744.51	LAT 39-12-50.2612 LONG -80-56-42.1525
Genny Unit 2H	N 263295.14 E 1590515.42	N 263329.23 E 159074.46	N 4340519.49 E 504742.77	LAT 39-12-50.1801 LONG -80-56-42.2251
Genny Unit 1H	N 263287.02 E 1590509.57	N 263321.12 E 159058.62	N 4340515.99 E 504741.03	LAT 39-12-50.0990 LONG -80-56-42.2977
Sugar Run Unit 5H	N 263278.91 E 1590503.73	N 263313.00 E 159062.78	N 4340514.48 E 504739.30	LAT 39-12-50.0178 LONG -80-56-42.3703
Sugar Run Unit 4H	N 263270.79 E 1590497.86	N 263304.89 E 159056.93	N 4340511.98 E 504737.56	LAT 39-12-49.9367 LONG -80-56-42.4429
Sugar Run Unit 3H	N 263262.68 E 1590492.04	N 263296.77 E 159051.09	N 4340509.48 E 504735.82	LAT 39-12-49.8556 LONG -80-56-42.5154
Sugar Run Unit 2H	N 263254.56 E 1590486.20	N 263288.66 E 159045.24	N 4340505.98 E 504734.08	LAT 39-12-49.7745 LONG -80-56-42.5880
Sugar Run Unit 1H	N 263246.45 E 1590480.35	N 263280.54 E 159039.40	N 4340504.48 E 504732.34	LAT 39-12-49.6933 LONG -80-56-42.6606
Well Pad Elevation	1,149.0			

GENERAL STREAM IMPACT (LINEAR FEET)			
Permanent Impacts	Temp. Impacts	Temp. Disturb.	Total Disturbance
Inlets/Outlets Structures (LF)	Cofferdam/ E&S Controls (LF)	Distance to L.O.D. (LF)	(LF)
0	0	60	60
0	0	17	17
0	12	25	58
12	6	14	47
0	0	34	34
2	5	17	24
14	7	17	38
0	18	13	141

WETLAND IMPACT (SQUARE FEET)			
Fill (SF)	Total Impact (SF)	Total Impact (AC)	
1,141	1,141	0.03	

LYNN CAMP INTERMITTENT STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts	Temp. Disturb.	Total Disturbance (LF)
	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)			
Stream 11 (Access Road "A")	36	38	10	40	124

LYNN CAMP PERENNIAL STREAM IMPACT (LINEAR FEET)					
Stream and Impact Cause	Permanent Impacts		Temp. Impacts	Temp. Disturb.	Total Disturbance (LF)
	Culvert /Fill (LF)	Inlets/Outlets Structures (LF)			
Stream 20 (Access Road "A")	55	5	46	45	151

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DATE	REVISION	REVISED PER LOD MODIFICATION	REVISED PER SURFACE CONFIG	REVISED PER SURFACE CONFIG	REVISED SUMP DETAIL
10/30/2016					
06/16/2016					
12/15/2016					
01/20/2017					

Antero
THIS DOCUMENT WAS PREPARED FOR:
ANTERO RESOURCES CORPORATION

COVER SHEET
LYNN CAMP
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA

STATE OF WEST VIRGINIA
REGISTERED PROFESSIONAL ENGINEER
01/20/2017

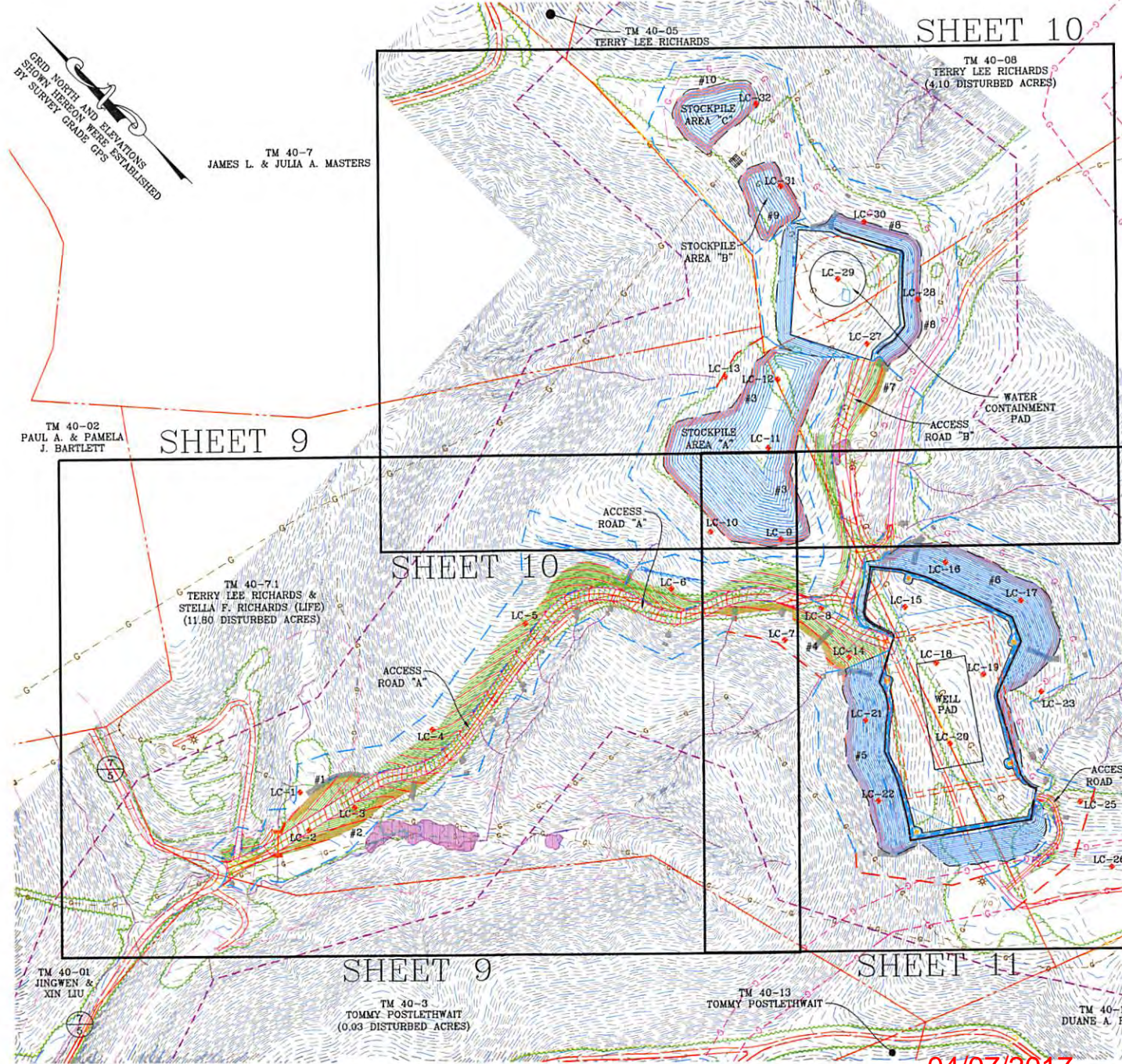
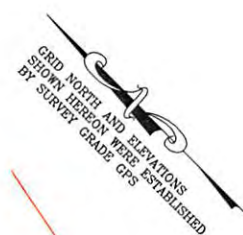
DATE: 03/27/2015
SCALE: AS SHOWN
SHEET 1 OF 33

04/07/2017

OVERALL PLAN SHEET

LYNN CAMP WELL PAD & WATER CONTAINMENT PAD						
Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope (%)	Length of Slope (FT)
Access Road "A"	6,213.1	15,889.3	0.0	9,676.2	20.0	950.0
Access Road "B"	1,163.6	2,727.7	0.0	1,564.1	15.0	130.0
Access Road "C"	72.0	158.0	0.0	86.0	20.0	164.0
Well Pad	40,869.8	37,179.5	3,690.3	0.0	n/a	n/a
Water Containment Pad	13,261.4	7,524.1	5,737.3	0.0	n/a	n/a
Stripped Topsoil (12")	17,055.5	0.0	17,055.5	0.0	n/a	n/a
Material Stockpiles	0.0	27,105.0	0.0	27,105.0	n/a	n/a
Totals	78,635.4	90,583.6	26,483.1	38,431.3	n/a	n/a
	Total Spoil (CY) =		-11,948.2			

MATERIAL STOCKPILES		
Name	Excess	Topsoil
3" Topsoil Respread	N/A	1,840
A	6,800	14,000
B	0	1,445
C	0	3,020
TOTAL	6,800	20,305



SHEET 10

SHEET 9

SHEET 10

SHEET 9

SHEET 11

04/07/2017

INDEX & VOLUMES

LYNN CAMP TOE BENCH QUANTITIES											
Description	Keyway #1	Keyway #2	Keyway #3	Keyway #4	Keyway #5	Keyway #6	Keyway #7	Keyway #8	Keyway #9	Keyway #10	Total
Drainage Method	D2	D2	D2	D2	D1	D1	D2	D1	D2	D2	N/A
Toe Bench											
Approximate Depth (LF)	4	6	4	5	5	6	6	4	8	4	N/A
Approximate Width (15' min.) (LF)	15	15	15	15	15	15	15	15	15	15	N/A
Length (LF)	178	312	1,098	326	438	760	110	454	392	444	4,512
Perimeter Drain (LF)	178	312	1,098	326	438	760	110	454	392	444	4,512
AASHTO #57 Gravel (TONS)	27	47	167	49	594	1,120	17	562	59	67	2,709
6 oz. Non-woven Geotextile (SF)	1,146	2,009	7,071	2,099	11,999	22,433	708	11,474	2,524	2,859	64,324
Overexcavation (CY)	1,302	3,114	8,029	2,805	3,769	7,584	1,098	3,320	5,088	3,247	39,354
Toe Bench Outlet Drain											
Average Length of Outlet Drain Pipe (LF)	15	50	40	35	35	40	45	45	45	45	N/A
Outlet Drain Pipe (LF)	30	200	440	140	175	320	90	225	180	225	2,025
6 oz. Non-woven Geotextile (SF)	210	1,400	3,080	980	1,225	2,240	630	1,575	1,260	1,575	14,175
AASHTO #57 Gravel (TONS)	3	22	49	16	19	36	10	25	20	25	225
Bonding Bench											
Approximate Depth (LF)	0	0	0	0	0	0	0	0	0	0	N/A
Approximate Width (LF)	10	10	10	10	10	10	10	10	10	10	N/A
Number of Benches (EA)	1	1	3	2	4	4	2	2	2	1	N/A
Length (LF)	178	312	1,098	326	438	760	110	454	392	444	4,512
Perimeter Drain (LF)	178	312	3,294	652	1,752	3,040	220	908	784	444	11,584
AASHTO #57 Gravel (TONS)	27	47	167	49	751	1,416	17	423	59	67	3,023
6 oz. Non-woven Geotextile (SF)	1,146	2,009	21,213	4,199	18,768	34,603	1,417	10,338	5,049	2,859	101,602
Overexcavation (CY)	455	988	5,026	1,395	2,759	5,362	554	1,619	2,526	1,135	21,819
Bonding Bench Outlet Drain											
Average Length of Outlet Drain Pipe (LF)	50	50	60	55	65	65	55	55	55	50	N/A
Outlet Drain Pipe (LF)	100	200	1,980	385	1,170	2,015	165	550	440	250	7,255
6 oz. Non-woven Geotextile (SF)	700	1,400	13,860	2,695	8,190	14,105	1,155	3,850	3,080	1,750	50,785
AASHTO #57 Gravel (TONS)	11	22	220	43	130	224	18	61	49	28	806
Additional Excavation											
Colluvium Material Rework (CY)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

TM 40-09
TERRY LEE RICHARDS
(7.55 DISTURBED ACRES)

SHEET 11



NOTES:

1. THE EARTHWORK QUANTITIES PROVIDED ARE AN ESTIMATE FOR CONSIDERATION. THE QUANTITIES SHOWN ARE CALCULATED USING A 1:1 CUT/SWELL & FILL SHRINK FACTOR. THE EXCESS MATERIAL & TOPSOIL STOCKPILES ARE SIZED TO ACCOMMODATE A CUT/SWELL FACTOR OF 1.1:1. THIS ADDITIONAL MATERIAL IS REFLECTED IN THE TOTAL SPOIL SHOWN ON THE MATERIAL QUANTITIES TABLE. IF THE CALCULATED SWELL IS LESS THAN 1.1:1, THE STOCKPILES SIZES CAN BE REDUCED DURING CONSTRUCTION. THE QUANTITIES SHOWN MAY BE GREATER OR LESSER THAN ACTUALLY EXCAVATED. THE ENGINEER IS NOT RESPONSIBLE FOR VARIANCES FROM THE ESTIMATED QUANTITIES AND DOES NOT CERTIFY THEIR ACCURACY.
2. THE TOE BENCH DEPTHS AND QUANTITIES PROVIDED IN THE TABLE ARE AN ESTIMATE, CALCULATED FROM THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT PREPARED BY KLEINFELDER. SEE GEOTECHNICAL INVESTIGATION REPORT PROVIDED BY KLEINFELDER FOR ADDITIONAL TOE BENCH DETAILS, VOLUMES, AND SPECIFICATIONS.



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DATE	REVISION
10/30/2015	REVISED PER LOD MODIFICATION
06/16/2016	REVISED PER SURFACE CONFIG
12/15/2016	REVISED PER SURFACE CONFIG
01/20/2017	REVISED SUMP DETAIL

Antero
THIS DOCUMENT
WAS PREPARED FOR:
ANTERO RESOURCES
CORPORATION

OVERALL PLAN SHEET INDEX & VOLUMES
LYNN CAMP
WELL PAD & WATER CONTAINMENT PAD
CLAY DISTRICT
RITCHIE COUNTY, WEST VIRGINIA



DATE: 03/27/2015
SCALE: 1" = 150'

SHEET 8 OF 33

04/07/2017