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west virginia department of environmental protection

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

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

Tuesday, March 14, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION (A)  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for SWANSON UNIT 1H  
47-017-06801-00-00

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: SWANSON UNIT 1H  
Farm Name: ROSS, ALVIN D., ET AL  
U.S. WELL NUMBER: 47-017-06801-00-00  
Horizontal 6A / New Drill  
Date Issued: 3/14/2017

Promoting a healthy environment.

03/17/2017

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

1) Well Operator: Antero Resources Corporation 494507062 017 - Dodd New Miltr Big Isaac 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Swanson Unit 1H Well Pad Name: Existing Wolf Pen Pad

3) Farm Name/Surface Owner: Ross, Alvin D., et al Public Road Access: CR 25/1

4) Elevation, current ground: 1188' Elevation, proposed post-construction: 1188' *AS 3/16/17*

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 7400' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 7400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 19300' MD

11) Proposed Horizontal Leg Length: 11300'

12) Approximate Fresh Water Strata Depths: 77', 201', 271'

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

14) Approximate Saltwater Depths: 1734'

15) Approximate Coal Seam Depths: 511', 872'

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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MAR 01 2017

WV Department of  
Environmental Protection

WW-6B  
(04/15)

API NO. 47-017 - 06801  
OPERATOR WELL NO. Swanson Unit 1H  
Well Pad Name: Existing Wolf Pen Pad

12/21

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

1) Well Operator: Antero Resources Corpora 494507062 017 - Doddri New Millr Big Isaac 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Swanson Unit 1H Well Pad Name: Existing Wolf Pen Pad

3) Farm Name/Surface Owner: Ross, Alvin D., et al Public Road Access: CR 25/1

4) Elevation, current ground: 1201' Elevation, proposed post-construction: 1201'

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

Other \_\_\_\_\_

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

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
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15) Approximate Coal Seam Depths: 511', 872'

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: \_\_\_\_\_

PRF  
12/28/16

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WW-6B  
(04/15)

API NO. 47-017  
OPERATOR WELL NO. Swanson Unit 1H  
Well Pad Name: Exdaling Wolf Pen Pad

18)

**CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	330' *see #19	330' *see #19	CTS, 458 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#	19300'	19300'	4899 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

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

PAG  
12/28/16

WW-6B  
(10/14)

API NO. 47-017 -  
OPERATOR WELL NO. Swanson Unit 1H  
Well Pad Name: Existing Wolf Pen Pad

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

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

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

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

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

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

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 19.81 Existing Acres

22) Area to be disturbed for well pad only, less access road (acres): 4.02 Existing Acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

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

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

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

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

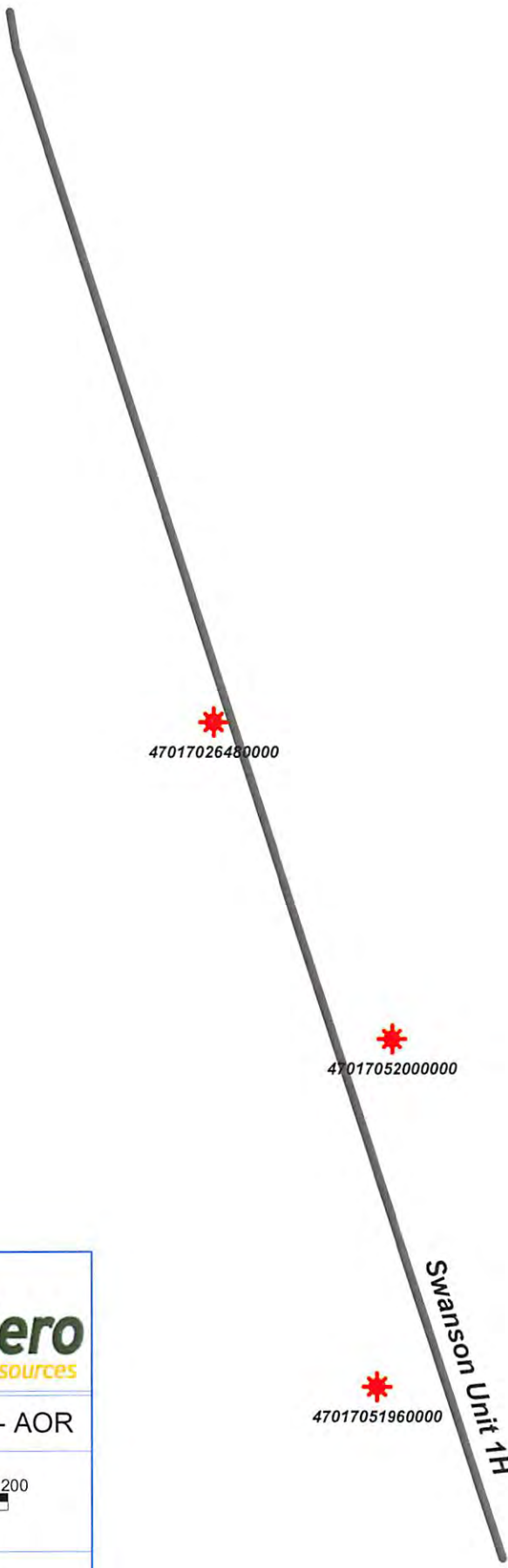
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

\*Note: Attach additional sheets as needed.

DAE  
12/28/16



4701706801




47017026480000


47017052000000

47017051960000

Swanson Unit 1H



Swanson Unit 1H - AOR



WELL SYMBOLS  
Gas Well

December 20, 2016

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Environmental Protection

03/17/2017

SWANSON UNIT 1H (WOLF PEN PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

UWI (API Num)	Well Name	Well Num	Operator	Historical Operator	TD	ELEV	GR TD (SSIVD)	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Productive Formation(s) not perf'd
47017026480000	DOUGLASS HEIRS	1-A	ANTERO RESOURCES CORPORATION	UNITED OPERATING CO	5872	884	-4988	4888-4900	Alexander	Big Injun, Riley, Benson, Elk
47017051960000	COTTRILL WAVELENE	B 14-4	JAY-BEE OIL & GAS	JAY BEE PRODUCTION	5684	1161	-4523	5129-5485	Benson, Elk	Big Injun, Riley, Alexander
47017053000000	CURRINGHAM DONALD C ET AL	B26-1	JAY-BEE OIL & GAS	JAY-BEE OIL & GAS	5508	983	-4525	4908-5355	Riley, Benson, Alexander, Elk	Big Injun

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03/17/2017

4701706801

WW-9  
(4/16)

API Number 47 - 017  
Operator's Well No. Swanson Unit 1H

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) Headwaters Middle Island Creek Quadrangle New Milton 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)

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/Slit 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 *Cole Kilstrom*

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager



Subscribed and sworn before me this 19th day of December, 20 16

*Kara Quackenbush*

Notary Public

My commission expires July 21, 2018

*DAF*  
*12/28/16*

03/17/2017



**Antero Resources Corporation**

Proposed Revegetation Treatment: Acres Disturbed 19.81 Existing Acres \_\_\_\_\_ Prevegetation pH \_\_\_\_\_

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

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

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Access Road "A" (6.44 acres) + Staging Area "A" (0.69 acres) + Staging Area "B" (0.47 acres) + Well Pad (4.02 acres) + Water Containment Pad (2.15 acres) + Production Equipment Pad (1.48) + Excess/Topsoil Material Stockpiles (4.56 acres) = 19.81 Acres

**Seed Mixtures**

**Temporary**

**Permanent**

Seed Type	lbs/acre
<u>Annual Ryegrass</u>	<u>10</u>

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

See attached Table 3 for additional seed type (Wolf Pen Pad Design Page 18)

See attached Table 4A for additional seed type (Wolf Pen Pad Design Page 18)

\*or type of grass seed requested by surface owner

\*or type of grass seed requested by surface owner

**NOTE: No Fescue or Timothy Grass shall be used**

**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: \_\_\_\_\_

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

Title: 0:1 & Gas Inspector

Date: 12/28/16

Field Reviewed?  Yes  No

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

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

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

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

**PRODUCTION INTERVAL**

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

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

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Environmental Protection  
03/17/2017



**911 Address**  
**515 Wolf Pen Rd.**  
**New Milton, WV 26411**

## Well Site Safety Plan

### Antero Resources

**Well Name:** Lager Unit 1H, Lager Unit 2H, Lager Unit 3H,  
 Sling Unit 1H, Sling Unit 2H, Swanson Unit 1H,  
 Swanson Unit 2H, Swanson Unit 2H, Swanson  
 Unit 3H, Swanson Unit 4H, Blade Unit 1H, Blade  
 Unit 2H

**Pad Location:** WOLF PEN PAD  
 Doddridge County/New Milton District

#### GPS Coordinates:

**Entrance** - Lat 39°14'21.37"/Long -80°40'37.98" (NAD83)

**Pad Center** - Lat 39°14'30.62"/Long -80°40'19.83" (NAD83)

#### Driving Directions:

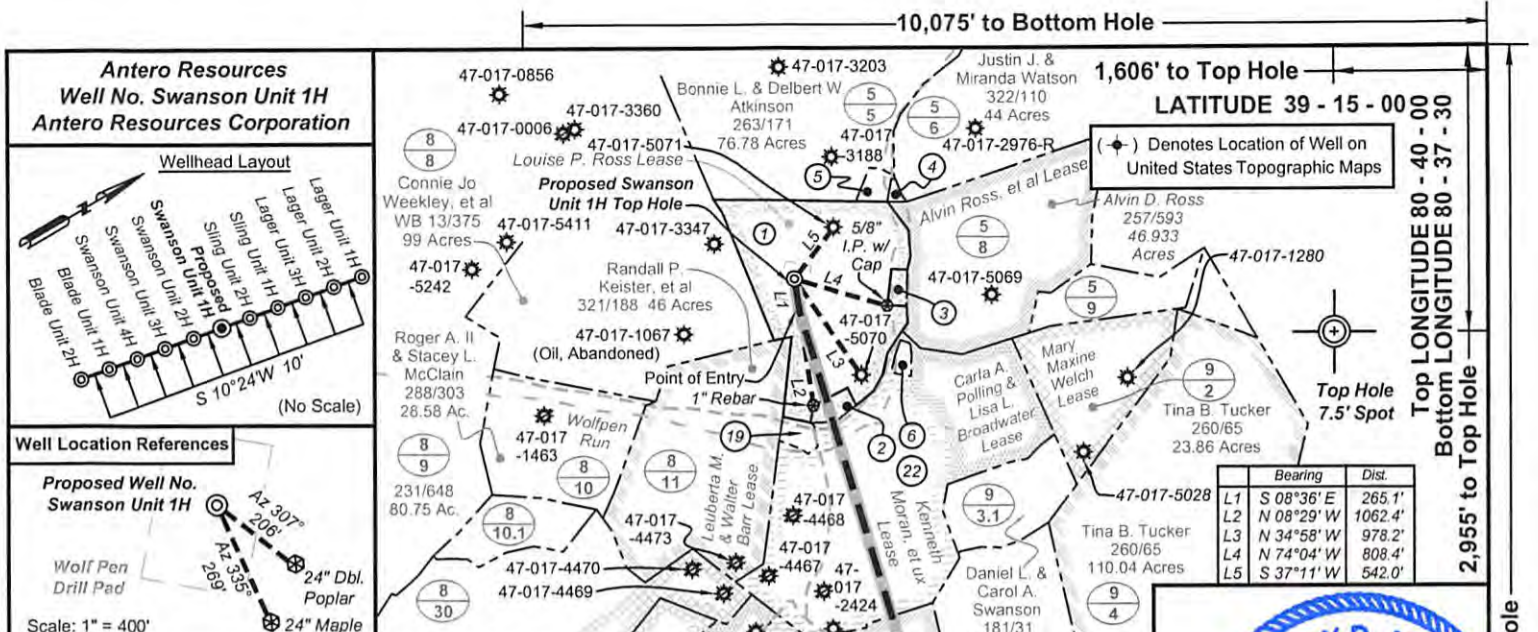
**FROM US 50 NEAR CLARKSBURG, WV:** Head west on US 50 for 23 miles. Turn left onto County Route 50/16 and continue for 0.2 miles. Turn left to stay on Co RTE 50/16 and continue for 1.6 miles. Turn left onto WV 18 S and continue for 3.1 miles. Turn left onto Co RTE 25/Meathouse Fork and continue for 0.4 miles. Turn left onto Co RTE 25/1 or Wolf Pen Rd and continue for 0.6 miles. Access Road will be on the left.

#### Alternate Route:

**FROM BANCS VOLUNTEER FIRE DEPARTMENT IN NEW MILTON, WV:** Head northwest on Meathouse Fork toward Co Rte 25/2 for 0.9 miles. Turn right onto Wolf Pen Rd and continue for 0.6 miles. The access road will be on the Left.

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

*John L. M.*  
 12/28/16



**Antero Resources**  
**Well No. Swanson Unit 1H**  
**Antero Resources Corporation**

**Wellhead Layout**

**Well Location References**

Scale: 1" = 400'

No.	TM-Par	Owner	Bk/Pg	Acres
1	5-7	Alvin D. Ross	315 / 358	44.1
2	9-26	Cliffton A. & Samme R. Hart	212 / 304	1.0
3	5-7.1	Thomas G. Hart	280 / 438	1.0
4	5-6.1	Alvin D. Ross, et al	WB 40/294	1.0
5	5-5.1	Bonnie L. & Delbert W. Atkinson	263 / 171	1.42
6	9-1.1	Sammy Todd & Brenda L. Moran	260 / 554	0.84
7	9-8	Charles E. Summers Living Trust & Hirsal Maxwell	282 / 430	52.5
8	9-9	William Rodney Willis, et al	248 / 78	4.0
9	9-16.6	Rodney R. Rush	252 / 671	22.39
10	9-16	Ramona Jean Boyce	WB26/621	70.0
11	9-10	Marvin L. Nuce, et al	AP 37/238	11.5
12	9-17.1	Christine M. Bartlett, et al	263 / 479	45.74
13	9-16.8	Forrest D. & Christopher D. DeWeese	243 / 677	8.0
14	9-16.7	Zenith D. Boyce, et ux	190 / 624	6.0
15	13-3	Denzil R. & Linda M. Rutherford	235 / 619	56.94
16	9-11	Rachel Runner	87 / 353	11.0
17	13-4	Denzil R. & Linda M. Rutherford	235 / 619	23.73
18	13-10	Denzil R. & Linda M. Rutherford	235 / 619	33.0
19	9-1.2	Jennifer R. Kelly	WB 48/53	1.51
20	13-11	Felisha E. Perrodin, et al	310 / 653	32.3
21	9-16.3	Terry E. & April D. McKinney	184 / 441	3.0
22	9-1	Kenneth P. & Ronda J. Moran	265 / 466	83.14

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

*Bradley D. Miller*  
Bradley D. Miller, P.S. 2167

**Notes:**  
**West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.**  
Well No. Swanson Unit 1H Top Hole coordinates are  
N: 272,355.98'    Latitude: 39°14'30.59"  
E: 1,668,002.35'    Longitude: 80°40'19.93"  
Bottom Hole coordinates are  
N: 261,284.21'    Latitude: 39°12'41.59"  
E: 1,671,333.08'    Longitude: 80°39'35.78"  
**UTM Zone 17, NAD 1983**  
Top Hole Coordinates    Bottom Hole Coordinates  
N: 4,343,674.232m    N: 4,340,318.166m  
E: 528,302.964m    E: 529,373.945m  
Plat orientation and corner and well references are based upon the grid north meridian.  
Well location references are based upon the magnetic meridian.

Note: It appears 14 water wells and 1 spring were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

FILE NO: 88-30-NM-13  
DRAWING NO: Swanson 1H Well Plat 12-16  
SCALE: 1" = 1600'  
MINIMUM DEGREE OF ACCURACY: Submeter  
PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

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

DATE: December 16 2016  
OPERATOR'S WELL NO. Swanson Unit 1H  
API WELL NO 47 - 017 - 06801  
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: Existing 1201'    WATERSHED: Headwaters Middle Island Creek    QUADRANGLE: New Milton  
DISTRICT: New Milton    COUNTY: Doddridge

SURFACE OWNER: Alvin D. Ross, et al    Richard Wolfe; Stephanie S. Hecht; H.A.J.F. Douglas, et ux; Peter McDonald;    ACREAGE: 44.1 29.586; 77.32; 122; 57;  
ROYALTY OWNER: Louise P. Ross; Kenneth Moran, et ux, E.L. Davis; W.H.H. Douglas, et ux    LEASE NO:    ACREAGE: 46; 83.14; 52.5; 218

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ 7,400' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG    TARGET FORMATION: Marcellus Shale    ESTIMATED DEPTH: 19,300' MD

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



10,075' to Bottom Hole

1,606' to Top Hole

LATITUDE 39 - 15 - 00

Top LONGITUDE 80 - 40 - 00  
Bottom LONGITUDE 80 - 37 - 30  
2,955' to Top Hole

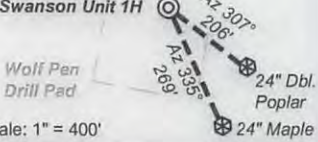
Antero Resources  
Well No. Swanson Unit 1H  
Antero Resources Corporation

Wellhead Layout



Well Location References

Proposed Well No. Swanson Unit 1H



Scale: 1" = 400'

No.	TM-Par	Owner	Bk/Pg	Acres
1	5-7	Alvin D. Ross	315 / 358	44.1
2	9-26	Cliffon A. & Samme R. Hart	212 / 304	1.0
3	5-7.1	Thomas G. Hart	280 / 438	1.0
4	5-6.1	Alvin D. Ross, et al	WB 40/294	1.0
5	5-5.1	Bonnie L. & Delbert W. Atkinson	263 / 171	1.42
6	9-1.1	Sammy Todd & Brenda L. Moran	260 / 554	0.84
7	9-8	Charles E. Summers Living Trust & Hirsal Maxwell	282 / 430	52.5
8	9-9	William Rodney Willis, et al	248 / 78	4.0
9	9-16.6	Rodney R. Rush	252 / 671	22.39
10	9-16	Ramona Jean Boyce	WB26/621	70.0
11	9-10	Marvin L. Nuce, et al	AP 37/238	11.5
12	9-17.1	Christine M. Bartlett, et al	263 / 479	45.74
13	9-16.8	Forrest D. & Christopher D. DeWeese	243 / 677	8.0
14	9-16.7	Zenith D. Boyce, et ux	190 / 624	6.0
15	13-3	Denzil R. & Linda M. Rutherford	235 / 619	56.94
16	9-11	Rachel Runner	87 / 353	11.0
17	13-4	Denzil R. & Linda M. Rutherford	235 / 619	23.73
18	13-10	Denzil R. & Linda M. Rutherford	235 / 619	33.0
19	9-1.2	Jennifer R. Kelly	WB 48/53	1.51
20	13-11	Felisha E. Perrodin, et al	310 / 653	32.3
21	9-16.3	Terry E. & April D. McKinney	184 / 441	3.0
22	9-1	Kenneth P. & Ronda J. Moran	265 / 466	83.14

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

Bradley D. Miller, P.S. 2167

Notes:  
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
Well No. Swanson Unit 1H Top Hole coordinates are  
N: 272,355.98' Latitude: 39°14'30.59"  
E: 1,668,002.35' Longitude: 80°40'19.93"  
Bottom Hole coordinates are  
N: 261,284.21' Latitude: 39°12'41.59"  
E: 1,671,333.08' Longitude: 80°39'35.78"  
UTM Zone 17, NAD 1983  
Top Hole Coordinates Bottom Hole Coordinates  
N: 4,343,674.232m N: 4,340,318.166m  
E: 528,302.964m E: 529,373.945m  
Plat orientation and corner and well references are based upon the grid north meridian.  
Well location references are based upon the magnetic meridian.

Note: It appears 14 water wells and 1 spring were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

FILE NO: 88-30-NM-13  
DRAWING NO: Swanson 1H Well Plat 12-16  
SCALE: 1" = 1600'  
MINIMUM DEGREE OF ACCURACY: Submeter  
PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV



Notes:  
Well No. Swanson Unit 1H  
UTM Zone 17, NAD 1927  
Top Hole Coordinates  
N: 14,250,155.629'  
E: 1,733,226.462'  
Point of Entry Coordinates  
N: 14,249,894.328'  
E: 1,733,270.439'  
Bottom Hole Coordinates  
N: 14,239,144.809'  
E: 1,736,739.991'

Bottom Hole 7.5' Spot

Scale: 1" = 2000'



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

DATE: December 16 2016  
OPERATOR'S WELL NO. Swanson Unit 1H  
API WELL NO  
47 - 017 - 06801  
STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
(IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
LOCATION: ELEVATION: Existing 1201' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: New Milton  
DISTRICT: New Milton COUNTY: Doddridge  
SURFACE OWNER: Alvin D. Ross, et al Richard Wolfe; Stephanie S. Hecht; H.A.J.F. Douglas, et ux; Peter McDonald; ACREAGE: 44.1 29.586; 77.32; 122; 57;  
ROYALTY OWNER: Louise P. Ross; Kenneth Moran, et ux, E.L. Davis; W.H.H. Douglas, et ux LEASE NO: ACREAGE: 46; 83.14; 52.5; 218  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) 7,400' TVD  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 19,300' MD

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

WW-6A1

Operator's Well Number Swanson Unit 1H

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

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

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<b><u>Louise P. Ross Lease</u></b>			
Louise P. Ross	Jay-Bee Production Company	1/8	LB 0204/0024
Jay-Bee Production Company	Antero Resources Appalachian Corporation	Assignment	0301/0373
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Leuberta M. &amp; Walter Barr Lease</u></b>			
Leuberta M. Barr & Walter Barr	North Coast Energy Eastern, Inc.	1/8	0206/0580
EXCO-North Coast Eastern, Inc.	EXCO Resources (WV), Inc.	Merger	Exhibit 2
EXCO Resources (WV), Inc.	EXCO Resources (WV), LLC	Name Change	Exhibit 3
EXCO Resources (WV), LLC, et al	EXCO Resources (WV), LLC	Assignment	DB 0285/0083
EXCO Resources	Antero Resources Appalachian Corporation	Assignment	0283/0624
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Kenneth Moran, et ux Lease</u></b>			
Kenneth Moran, et ux	Clarence W. Mutschelknaus	1/8	0218/0644
Clarence W. Mutschelknaus	Bluestone Energy Partners	Assignment	0240/0325
Bluestone Energy Partners	Antero Resources Appalachian Corporation	Assignment	0288/0001
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>E. L. Davis Lease</u></b>			
E. L. Davis	Hope Natural Gas Co.	1/8	0031/0218
Hope Natural Gas Co.	Consolidated Gas Corp.	Confirmatory Deed	0143/0345
Consolidated Gas Corp.	Consolidated Gas Transmission Corp.	Assignment of Oil & Gas Leases	0135/0383
Consolidated Gas Transmission Corp.	CNG Transmission Corp.	Name Change	0051/0795
CNG Transmission Corp.	Dominion Transmission, Inc.	Name Change	0058/0362
Dominion Transmission, Inc.	Antero Resources Appalachian Corporation	Assignment	1423/1068
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>H.A.J.F. Douglas et ux Lease</u></b>			
H.A.J.F. Douglas, et ux	G.B. Travis	1/8	LB 0031/0216
G.B. Travis	J.E. Trainer	Assignment	LB 0035/0035
J.E. Trainer Estate, by special commissioner	Luther G. Pigott & Frank E. Michael	Assignment	LB 0054/0269
Franklin E. Michaels, et ux	Luther G. Pigott	Deed	DB 0158/0226
Luther G. Pigott, et ux	Carolyn P. Erambert	Assignment	LB 0100/0726
Carolyn P. Erambert	United Operating Company	Assignment	LB 0101/0305
United Operating Company	Peake Energy, Inc.	Assignment	LB 0183/0207
Peake Energy, Inc.	North Coast Energy Eastern, Inc.	Name Change	DB 0249/0343
North Coast Energy Eastern, Inc, by J. Douglas	EXCO-North Coast Energy Eastern, Inc	Name Change	DB 0277/0068
Ramsey Ph.D.			
EXCO-North Coast Eastern, Inc.	EXCO Resources (WV), Inc.	Merger	Exhibit 2
EXCO Resources (WV), Inc.	EXCO Production Company (WV), LLC	Name Change	Exhibit 3
EXCO Production Company (WV), LLC, et al	Antero Resources Appalachian Corporation	Assignment	0285/0084
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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

Operator's Well Number Swanson Unit 1H

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

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

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<b><u>W. H. H. Douglas, et ux Lease</u></b>			
W. H. H. Douglas & wife	Hope Natural Gas Co.	1/8	0033/0411
Hope Natural Gas Co.	Consolidated Gas Supply Corp.	Confirmatory Deed	DB 0143/0345
Consolidated Gas Supply Corp.	Consolidated Gas Transmission Corp.	Assignment of Oil & Gas Leases	0135/0383
Consolidated Gas Transmission Corp.	CNG Transmission Corp.	Name Change	0051/0795
CNG Transmission Corp.	Dominion Transmission Inc.	Name Change	0058/0362
Dominion Transmission, Inc.	Antero Resources Appalachian Corporation	Assignment	0143/1068
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Peter McDonald Lease</u></b>			
Peter McDonald	Bluestone Energy Partners	1/8	0251/0302
Bluestone Energy Partners	Antero Resources Appalachian Corporation	Merger	DB 0288/0001
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Richard Wolfe Lease</u></b>			
Richard Wolfe	Tenmile Land, LLC.	1/8	0216/0266
Tenmile Land, LLC.	Antero Resources Appalachian Corporation	Assignment	0277/0380
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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



WW-6A1  
(5/13)

Operator's Well No. Swanson Unit 1H

**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
<b>Stephanie S. Hecht Lease</b>				
	Stephanie Hecht	Antero Resources Appalshian Corporation	1/8+	0300/0195
	<b>Antero Resources Appalshian Corporation</b>	<b>Antero Resources Corporation</b>	<b>Name Change</b>	<b>Exhibit 1</b>

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

**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation

By: Kevin Kilstrom

Its: Senior Vice President of Production

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Office of Oil and Gas  
Page 1 of \_\_\_\_\_  
DEC 21 2016  
WV Department of  
Mental Protection

03/17/2017

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](http://www.wvsos.com)  
E-mail: [business@wvsos.com](mailto: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)

6. Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

<u>Alvyn A. Schopp</u>	<u>(303) 367-7310</u>
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: *Alvyn A. Schopp* Date: June 10, 2013

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

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of Oil and Gas  
DEC 2 1 2015  
WV Department of  
Environmental Protection  
Revised 4/13

# State of West Virginia



## Certificate

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

an Amended Certificate of Authority of

**EXCO - NORTH COAST ENERGY EASTERN, INC.**

was filed in my office as required by the provisions of the West Virginia Code and was found to conform to law.

Therefore I issue this

### CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the corporation to

**EXCO RESOURCES (WV), INC.**



*Given under my hand and the  
Great Seal of the State of  
West Virginia on this day of  
December 2, 2009*

REC-1000-0000  
Office of the Secretary of State  
DEC 21 2016  
*Natalie E. Tennant*  
Secretary of State

# State of West Virginia



## Certificate

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

**EXCO RESOURCES (WV), INC.**  
*(A Delaware Corporation)*

*filed Articles of Conversion in my office as required by the provisions of the West Virginia Code and was found to conform to law.*

*Therefore, I issue this*

### CERTIFICATE OF CONVERSION

*Converting the corporation to:*

**EXCO RESOURCES (WV), LLC**  
*(A Delaware Limited Liability Company)*



*Given under my hand and the Great Seal of the State of West Virginia on*

July 7, 2010

*Natalie E. Tennant*

*Secretary of State*

RECEIVED  
Office of Oil and Gas  
JUL 21 2016  
WV Department of Environmental Protection  
03/17/2017

4701706801



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

December 20, 2016

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

RE: Swanson Unit 1H  
Quadrangle: New Milton 7.5'  
Doddridge County/New Milton District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Swanson Unit 1H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Swanson Unit 1H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

Brett Kuhn  
Landman

A handwritten signature in blue ink, appearing to read "Brett Kuhn", is written over the typed name and title.

RECEIVED  
Office of Oil and Gas  
DEC 21 2016  
WV Department of  
Environmental Protection

03/17/2017

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

**Date of Notice Certification:** 12/19/2016

**API No.** 47- 017 - \_\_\_\_\_  
**Operator's Well No.** Swanson Unit 1H  
**Well Pad Name:** Existing Wolf Pen 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>528302.964m</u>
County:	<u>Doddridge</u>		Northing:	<u>4343674.232m</u>
District:	<u>New Milton</u>	Public Road Access:	<u>CR 25/1</u>	
Quadrangle:	<u>New Milton 7.5'</u>	Generally used farm name:	<u>Ross, Alvin D., et al</u>	
Watershed:	<u>Headwaters Middle Island Creek</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.

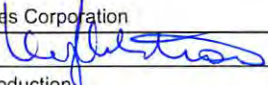
<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" 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 style="padding-left: 100px;"><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><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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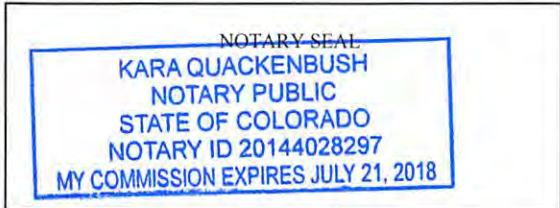
**Required Attachments:**

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

**Certification of Notice is hereby given:**

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

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



Subscribed and sworn before me this 19<sup>th</sup> day of December 2016  
Kara Quackenbush Notary Public  
 My Commission Expires July 21, 2018

**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](mailto:deprivacyofficer@wv.gov).

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Office of Oil and Gas  
DEC 21 2016  
WV Department of  
Environmental **03/17/2017**

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:** 12/20/2016 **Date Permit Application Filed:** 12/20/2016

**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: PLEASE SEE ATTACHMENT  
Address: \_\_\_\_\_

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

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE  
Name: PLEASE SEE ATTACHED  
Address: \_\_\_\_\_

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

\*Please attach additional forms if necessary

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WV Department of Environmental Protection  
October 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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

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

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

**Water Well Testing:**

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

**Water Testing Laboratories:**

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

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

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

**Written Comment:**

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

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

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

WV Department of  
Environmental Protection

**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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03/17/2017

WW-6A  
(8-13)

4701706801

API NO. 47-017  
OPERATOR WELL NO. Swanson Unit 1H  
Well Pad Name: Existing Wolf Pen Pad

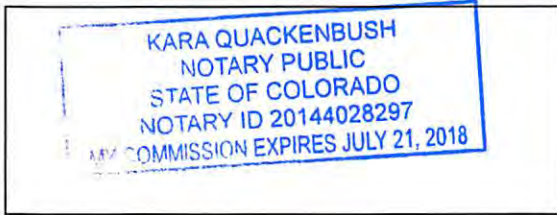
**Notice is hereby given by:**

Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7310  
Email: kquackenbush@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](mailto:deprivacyofficer@wv.gov).



Subscribed and sworn before me this 20<sup>th</sup> day of December 2016

*Kara Quackenbush*  
Notary Public

My Commission Expires July 21, 2018

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**WW-6A Notice of Application Attachment (WOLF PEN PAD):****List of Surface Owner(s) with Proposed Disturbance associated with Wolf Pen Well Pad:**

**WELL PAD – This owner was notified of all well work permit applications, and has executed signed Surface Use Agreements with Antero Resources Corporation.**

**TM 5 PCL 7**

**Owner:** Alvin D. Ross & Samme M. Hart /

**Address:** RR 1 Box 7  
New Milton, WV 26411

**Owner:** Alvin D. Ross & Samme M. Hart (2<sup>nd</sup> Address) /

**Address:** 927 Wolf Pen Rd.  
New Milton, WV 26411

**ROAD AND/OR OTHER DISTURBANCE – Please note the additional surface tracts with disturbance shown on the pad design are NOT overlying the Oil & Gas leasehold being developed by the proposed well; therefore, are not required to be notified per WV Code 22-6A-10.**

**COAL OWNER OR LESSEE**

**Owner:** Consolidation Coal Company – CONSOL Energy, Inc. /

CNX Center - Engineering & Ops. Support – Coal  
Attn: Analyst

**Address:** 1000 CONSOL Energy Dr.  
Canonsburg, PA 15317

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**WW-6A Notice of Application Attachment (WOLF PEN PAD):****List of Water Source Owners associated with Wolf Pen Well Pad:****WATER SOURCE OWNERS – Within 1500'**

**\*NOTE: On attached water well map 5 other water sources are identified, but are located greater than 1500' from the subject well pad location.**

**TM 8 PCL 11**

1 Water Well: 1439'

**Owner:** Randall P. Keister, et al ✓**Address:** 210 Pleasant View Dr.  
Weirton, WV 26062**TM 9 PCL 26**

1 Water Well: 1118'

**Owner:** Clifton Aldine & Samme Ross Hart**Address:** 927 Wolf Pen Rd.  
New Milton, WV 26411**TM 9 PCL 1.1**

1 Water Well: 1075'

**Owner:** Sammy Todd & Brenda L. Moran**Address:** 1074 Wolf Pen Rd.  
New Milton, WV 26411**TM 5 PCL 7.1**

2 Water Wells: 823', 850'

**Owner:** Thomas G. Hart**Address:** RR 1 Box 8  
New Milton, WV 26411**TM 5 PCL 7, 8**

2 Water Wells: 898', 1210'

**Owner:** Alvin D. Ross**Address:** 1294 Wolf Pen Rd.  
New Milton, WV 26411**TM 5 PCL 5, 5.1**

3 Water Wells: 1079', 1398', 1458'

**Owner:** Bonnie L. & Delbert W. Atkinson**Address:** 1481 Wolf Pen Rd.  
New Milton, WV 26411RECEIVED  
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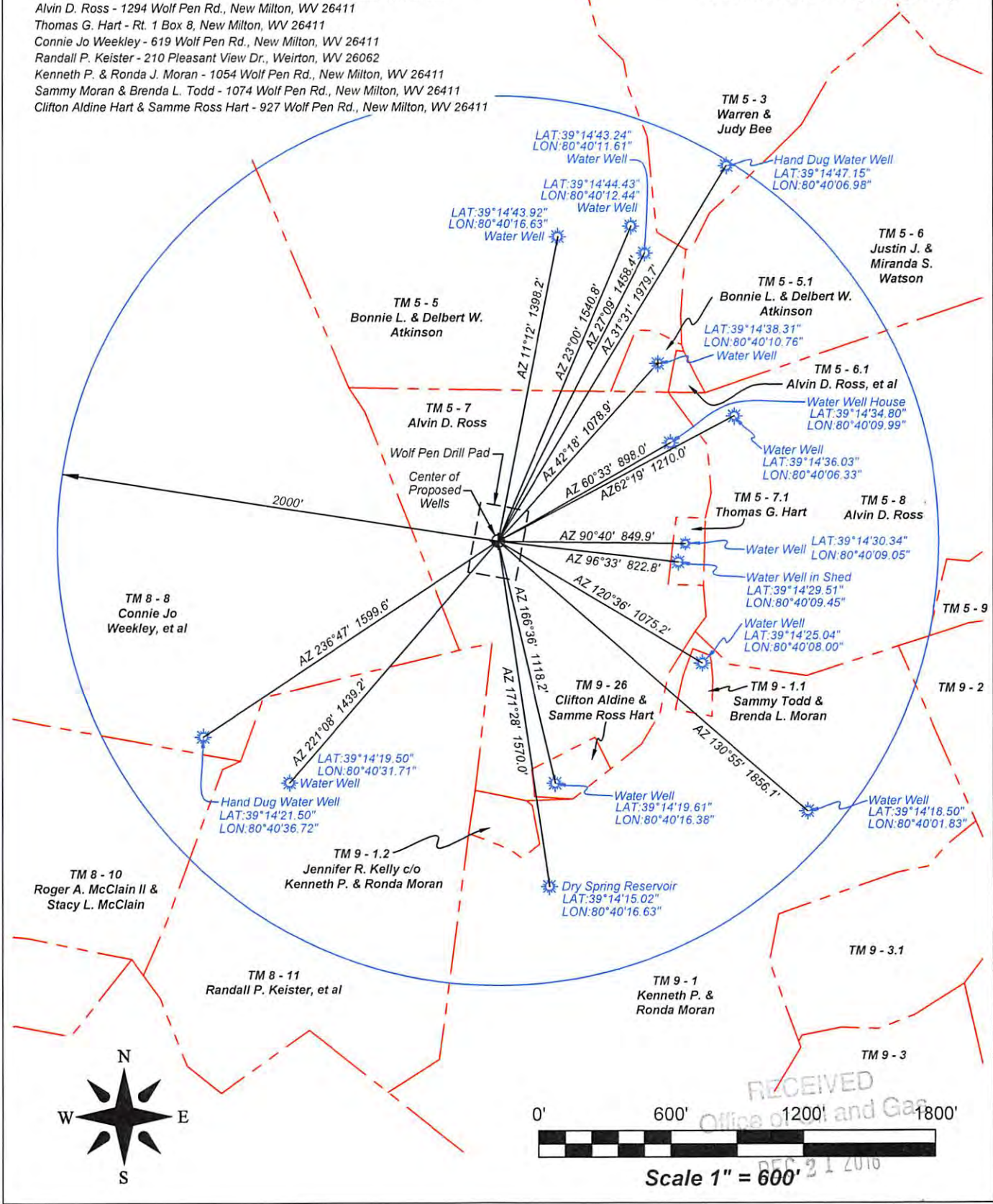
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Parcel Owner Addresses

Warren & Judy Bee - 3076 Big Isaac Rd., Salem, WV 26426  
 Delbert W. & Bonnie L. Atkinson - 1481 Wolf Pen Rd., New Milton, WV 26411  
 Alvin D. Ross - 1294 Wolf Pen Rd., New Milton, WV 26411  
 Thomas G. Hart - Rt. 1 Box 8, New Milton, WV 26411  
 Connie Jo Weekley - 619 Wolf Pen Rd., New Milton, WV 26411  
 Randall P. Keister - 210 Pleasant View Dr., Weirton, WV 26062  
 Kenneth P. & Ronda J. Moran - 1054 Wolf Pen Rd., New Milton, WV 26411  
 Sammy Moran & Brenda L. Todd - 1074 Wolf Pen Rd., New Milton, WV 26411  
 Clifton Aldine Hart & Samme Ross Hart - 927 Wolf Pen Rd., New Milton, WV 26411

**Wolf Pen Drill Pad  
 Water Well & Spring Map**



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:** 11/28/2016 **Date Permit Application Filed:** 12/20/2016

**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: Alvin D. Ross, et al / Name: \_\_\_\_\_  
Address: RR 1 Box 7 / Address: \_\_\_\_\_  
New Milton, WV 26411

**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: West Virginia UTM NAD 83 Easting: 528290.14m (Approximate Pad Center)  
County: Doddridge Northing: 4343665.37m (Approximate Pad Center)  
District: New Milton Public Road Access: CR 25/1 (Wolf Pen Rd.)  
Quadrangle: New Milton 7.5' Generally used farm name: Ross, Alvin D., et al  
Watershed: Headwaters Middle Island Creek

**This Notice Shall Include:**

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

**Notice is hereby given by:**

Well Operator: Antero Resources Appalachian Corporation Authorized Representative: Kara Quackenbush  
Address: 1615 Wynkoop St. Address: 1615 Wynkoop St.  
Denver, CO 80202 Telephone: 303-357-7323  
Telephone: 303-357-7323 Email: kquackenbush@anteroresources.com  
Email: kquackenbush@anteroresources.com Facsimile: 303-357-7315  
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 of your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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TM5 PCL 7



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

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

**Date of Notice:** 12/20/2016      **Date Permit Application Filed:** 12/20/2016

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

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

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

**Notice is hereby provided to the SURFACE OWNER(s)**  
(at the address listed in the records of the sheriff at the time of notice):

**Name:** Alvin D. Ross & Samme M. Hart                      **Name:** Alvin D. Ross & Samme M. Hart (2nd Address)  
**Address:** RR 1 Box 7    **Address:** 927 Wolf Pen Rd.  
New Milton, WV 26411    New Milton, WV 26411

**Notice is hereby given:**

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

**State:** West Virginia    **Easting:** 528302.964m  
**County:** Doddridge    **UTM NAD 83      Northing:** 4343674.232m  
**District:** New Milton    **Public Road Access:** CR 25/1  
**Quadrangle:** New Milton 7.5'    **Generally used farm name:** Ross, Alvin D., et al  
**Watershed:** Headwaters Middle Island Creek

**This Notice Shall Include:**

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

**Well Operator:** Antero Resources Corporation                      **Address:** 1615 Wynkoop Street  
**Telephone:** (303) 357-7310    Denver, CO 80202  
**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 [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).

RECEIVED  
Office of Oil and Gas  
DEC 21 2016  
WV Department of  
Environmental Protection



## 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 2, 2016

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

Subject: DOH Permit for the Wolf Penn Pad, Doddridge County  
Swanson Unit 1H Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #04-2014-0256 which has been applied for by Antero Resources Corporation for access to the State Road for a well site located off of Doddridge County Route 25/1 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

Cc: Kara Quackenbush  
 Antero Resources Corporation  
 CH, OM, D-4  
 File

RECEIVED  
 Office of Oil and Gas

DEC 21 2016  
 WV Department of  
 Environmental Protection

# List of Anticipated Additives Used for Fracturing or Stimulating Well

4701706801

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

RECEIVED  
 OFFICE OF OIL AND GAS  
 DEC 21 2016  
 Department of  
 Energy Production

03/17/2017

47-017-06801  
Swanson Unit 1H

12/21/16

# WOLF PEN WELL PAD & WATER CONTAINMENT PAD AS-BUILT AND EROSION & SEDIMENT CONTROL IMPROVEMENT PLAN

NEW MILTON DISTRICT, DODDRIDGE COUNTY, WEST VIRGINIA  
MEATHOUSE FORK WATERSHED

USGS 7.5 NEW MILTON & SMITHBURG QUAD MAPS

**WVDEP OOG  
ACCEPTED AS-BUILT**

1/31/2017

**LOCATION COORDINATES:**  
ACCESS ROAD ENTRANCE  
LATITUDE: 39.229269 LONGITUDE: -80.872747 (NAD 83)  
N 434567.71 E 526785.96 (UTM ZONE 17 METERS)

CENTER OF TANK 1  
LATITUDE: 39.241224 LONGITUDE: -80.872316 (NAD 83)  
N 434597.23 E 526827.16 (UTM ZONE 17 METERS)

CENTER OF TANK 2  
LATITUDE: 39.240917 LONGITUDE: -80.872481 (NAD 83)  
N 434566.01 E 526864.11 (UTM ZONE 17 METERS)

CENTROID OF WELL PAD  
LATITUDE: 39.241638 LONGITUDE: -80.872174 (NAD 83)  
N 434566.57 E 526829.14 (UTM ZONE 17 METERS)

**GENERAL DESCRIPTION:**  
THE ACCESS ROAD(S), WATER CONTAINMENT PAD, & WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS

**FLOODPLAIN NOTE:**  
THE PROPOSED SITE IS LOCATED IN FLOODZONE "X" PER FEMA FLOOD MAP #54017C0235C.

**ENVIRONMENTAL NOTES:**  
WETLAND DELINEATIONS WERE PERFORMED MARCH & SEPTEMBER, 2013 & FEBRUARY, 2014 BY CAI 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 FEBRUARY 20, 2014 RESOURCE LOCATION MAP WAS PREPARED BY CAI 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.

**GEOTECHNICAL NOTE:**  
A SUBSURFACE INVESTIGATION OF THE SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. ON MARCH 12-16, 2014. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED APRIL 2, 2014, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WAS USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

**PROJECT CONTACTS**

**OPERATOR:**  
ANTERO RESOURCES CORPORATION  
530 WHITE OAKS BLVD  
BRIDGEPORT, WV 26030  
PHONE: (304) 842-4100  
FAX: (304) 842-4102

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

JACK BELL - LAND AGENT  
CELL: (304) 376-9662

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

ENGINEER/SURVEYOR:  
NAVITUS ENGINEERING, INC.  
CYRUS S. KUMAR, PE - PROJECT MANAGER/ENGINEER  
OFFICE: (866) 682-4185 CELL: (540) 686-6747

JON MCKEVER - OPERATIONS SUPERINTENDENT  
OFFICE: (303) 357-0799 CELL: (303) 608-2423

**ENVIRONMENTAL:**  
ALLSTAR ECOLOGY, LLC  
RYAN L. WARD - ENVIRONMENTAL SCIENTIST  
OFFICE: (866) 213-2066 CELL: (304) 692-7477

ROBERT B. WIRKS - FIELD ENGINEER  
OFFICE: (304) 842-4100 CELL: (304) 627-7495

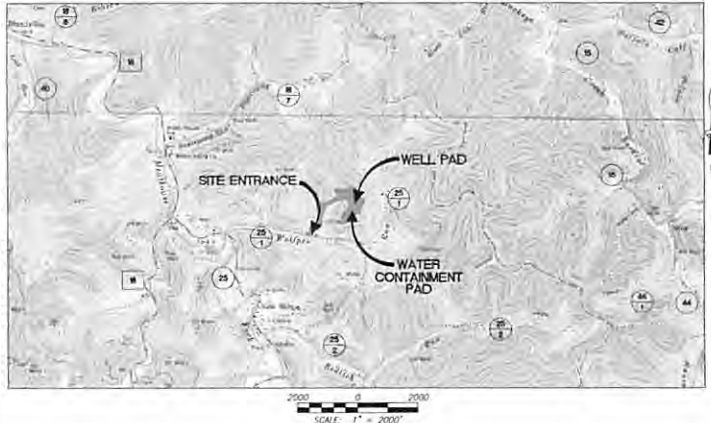
**GEOTECHNICAL:**  
PENNSYLVANIA SOIL AND ROCK, INC.  
CHRISTOPHER W. SAMIOS - PROJECT ENGINEER  
OFFICE: (412) 372-4000 CELL: (412) 369-0682

**RESTRICTIONS NOTES:**

1. THERE ARE NO PERENNIAL STREAMS, LAKES, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LDD. THERE ARE WETLAND AND STREAM IMPACTS THAT HAVE BEEN PERMITTED BY THE APPROPRIATE AGENCIES.
2. THERE ARE NO NATURALLY PRODUCE TRIBUTARY STREAMS WITHIN 300 FEET OF THE WELL PAD AND LDD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LDD.
4. THERE ARE NO APPARENT 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.

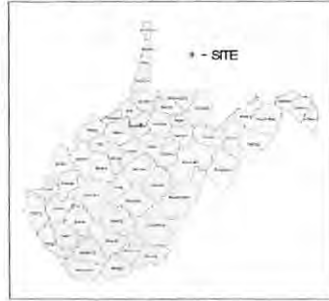
**NOTES:**

1. ALL BMP'S MUST REMAIN IN PLACE AND FUNCTIONAL UNTIL ALL AREAS WITHIN THE LIMIT OF DISTURBANCE ARE COMPLETELY AND PERMANENTLY STABILIZED. MAINTAIN A WEST INCLINE INSPECTION OF ALL EROSION AND SEDIMENT CONTROLS AFTER EACH RUNOFF EVENT IN EXCESS OF 0.5" AND ON A WEEKLY BASIS.
2. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL STABILIZATION MUST BE INITIATED NO LATER THAN 90 DAYS AFTER REACHING FINAL GRADE. FINAL STABILIZATION MEANS THAT ALL SOIL-RESTORING 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.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY NEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF DECEMBER 19, 2014. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE SLIDE AREAS AS OF DECEMBER 19, 2014. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATE.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.
7. THE EXISTING EGRESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.



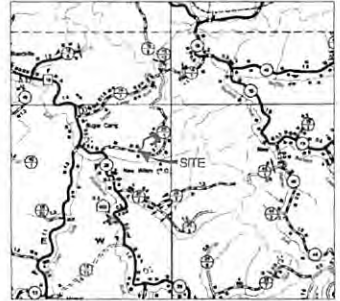
WEST VIRGINIA STATE PLANE COORDINATE SYSTEM  
NORTH ZONE, NAD83  
ELEVATION BASED ON NAVD83  
ELEVATION BASED ON NAVD83  
GAGE & OPUS  
POST-PROCESSING

WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

WVDOH COUNTY ROAD MAP



SCALE: 1" = 5000'

**AS-BUILT CERTIFICATION**  
THE DRAWINGS, 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 CAS 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!!

**SHEET INDEX:**

- 1 - COVER SHEET
- 2 - LEGEND
- 3 - OVERALL PLAN SHEET INDEX
- 4 - ACCESS ROAD AS-BUILT PLAN
- 5 - WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN
- 6 - ACCESS ROAD AS-BUILT PROFILES
- 7 - WELL PAD & WATER CONTAINMENT PAD AS-BUILT SECTION

Proposed Well Name	WV North NAD 83	WV North Zone 17	UTM (METERS)	NAD 83 Lat. & Long.
Lager	N 27249.16	E 527244.26	N 4343093.25	LAT 39-14-31 1923
Unit 1H	E 196931.38	E 163652.38	E 528302.48	LONG 80-40-19 1540
Lager	N 27238.41	E 163652.38	N 4343099.28	LAT 39-14-31 2028
Unit 2H	E 168802.87	E 163652.38	E 528304.96	LONG 80-40-19 2062
Lager	N 27238.49	E 163652.38	N 4343093.25	LAT 39-14-31 1994
Unit 2H	E 168807.77	E 163652.38	E 528304.96	LONG 80-40-19 2075
Sling	N 27235.66	E 163652.38	N 4343093.24	LAT 39-14-31 2079
Unit 1H	E 196935.96	E 163654.97	E 528303.96	LONG 80-40-19 2488
Sling	N 27235.62	E 163654.97	N 4343097.24	LAT 39-14-31 2006
Unit 2H	E 196934.95	E 163652.38	E 528303.96	LONG 80-40-19 2751
Swanson Unit 1H	N 27236.98	E 163652.38	N 4343093.25	LAT 39-14-30 8971
API 47-617-063000	E 196930.33	E 163652.38	E 528302.96	LONG 80-40-19 2014
Swanson Unit 2H	N 27249.16	E 163652.38	N 4343093.25	LAT 39-14-30 8966
API 47-617-063300	E 196930.33	E 163652.38	E 528302.96	LONG 80-40-19 3128
Swanson Unit 2H	N 27238.41	E 163652.38	N 4343099.28	LAT 39-14-31 1992
API 47-617-064900	E 196798.74	E 163652.38	E 528302.96	LONG 80-40-19 2311
Swanson	N 27236.48	E 163652.38	N 4343093.25	LAT 39-14-30 6107
Unit 4H	E 196795.83	E 163652.38	E 528301.48	LONG 80-40-19 3504
Black	N 27238.64	E 163652.38	N 4343093.25	LAT 39-14-30 5135
Unit 1H	E 196795.83	E 163652.38	E 528302.96	LONG 80-40-19 3787
Black	N 27236.48	E 163652.38	N 4343093.25	LAT 39-14-30 4159
Unit 2H	E 196796.32	E 163652.38	E 528302.96	LONG 80-40-19 3865
Well Pad Elevation	1,186.0			

WOLF PEN LIMITS OF DISTURBANCE AREA (AC)	
Total Site	Total
Access Road "A" (1,965.5)	6.44
Staging Area "A"	0.69
Staging Area "B"	0.47
Well Pad	4.02
Water Containment Pad	2.15
Production Equipment Pad	1.48
Excess/Topsoil Material Stockpiles	4.58
<b>Total Affected Area</b>	<b>19.81</b>
Total Wooded Acres Disturbed	16.02
Impacts to Joyce E. Nicholson, Joseph E. Schulte, & Connie Jo Weekley TM 8-7	
Access Road "A" (1,965.5)	5.64
Staging Area "A"	0.69
Staging Area "B"	0.02
Water Containment Pad	0.23
Excess/Topsoil Material Stockpiles	1.64
<b>Total Affected Area</b>	<b>8.22</b>
Total Wooded Acres Disturbed	6.57
Impacts to Alvin D. Ross, Et Al TM 6-7	
Access Road "A" (256)	0.80
Well Pad	4.02
Water Containment Pad	1.92
Production Equipment Pad	1.48
Excess/Topsoil Material Stockpiles	2.62
<b>Total Affected Area</b>	<b>10.84</b>
Total Wooded Acres Disturbed	6.65
Impacts to Roger A. McClain, & John H. McClain TM 8-10	
Staging Area "B"	0.45
<b>Total Affected Area</b>	<b>0.45</b>
Total Wooded Acres Disturbed	0.00

**REPRODUCTION NOTE:**  
THESE PLANS WERE CREATED TO BE PLOTTED ON 22"X34" (ANG) D PAPER. SCALE DRAWINGS ARE ON 11"X17" (ANG) B1 PAPER.  
THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY INCUR IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

**NAVITUS  
ENERGY ENGINEERING**

14800001 (08/16/24-185) | www.navituseng.com

DATE	REVISION
06/01/2016	UPDATED DROWNS/STOCKPILE #
04/17/2016	REVISED FOR PERMIT WIDTHS
03/12/2016	REVISED FOR WELL SLOPE
01/16/2017	REVISED FOR AS-BUILT
01/31/2017	ADD IN 'S' & WATER CONTAINMENT TANK

**Antero**

THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

COVER SHEET  
**WOLF PEN  
WELL PAD & WATER CONTAINMENT PAD**  
NEW MILTON DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 07/01/2015  
SCALE: AS SHOWN  
SHEET 1 OF 7

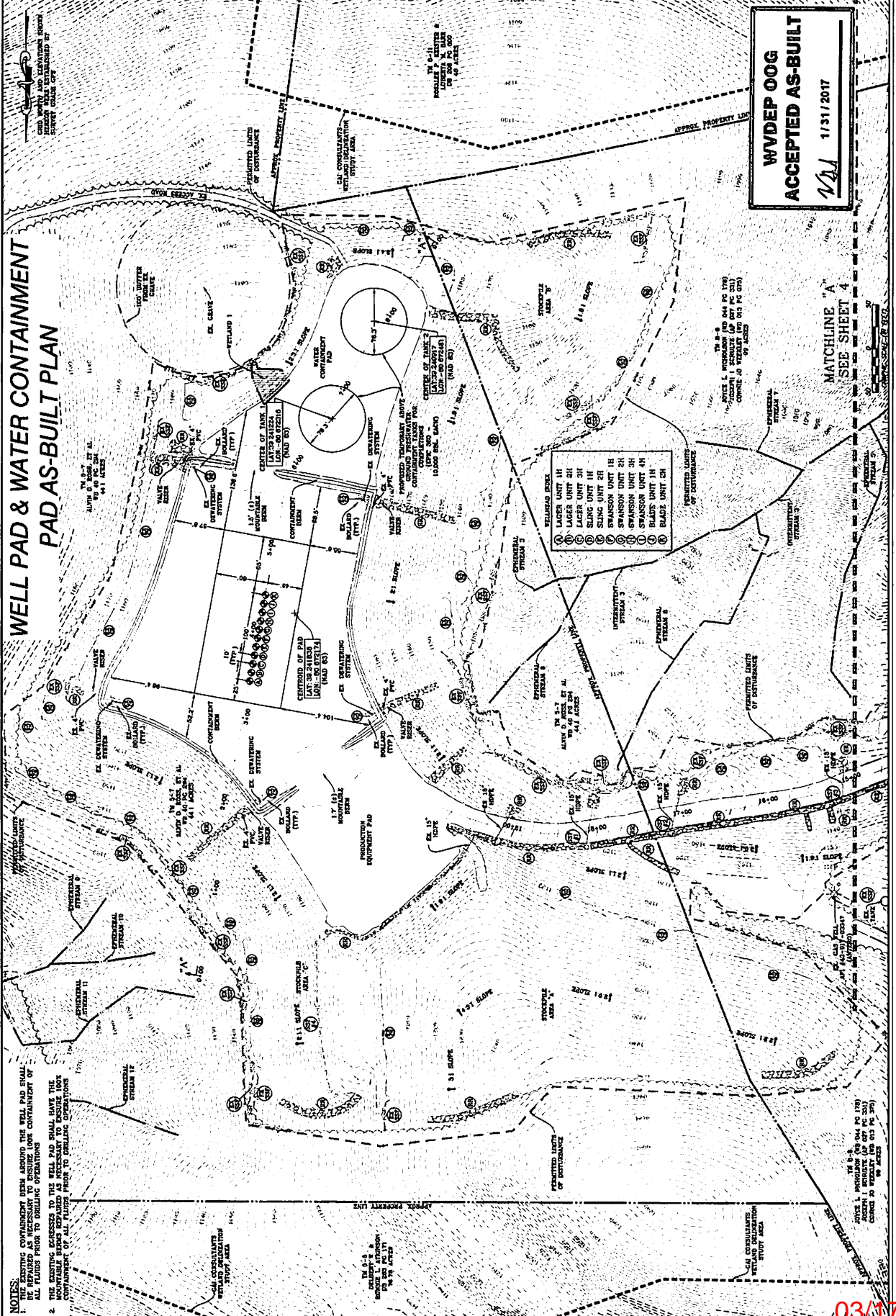
REVISION	DATE	DESCRIPTION
01/20/2017	ADD 1/3 & 2 WATER CONTAINMENT TANKS	
12/15/2016	REVISED FOR PERMITS	
09/21/2016	REVISED FOR BENCH MARKS	
08/25/2016	UPDATED DESIGN/STOCKPILE AREA	

**Antero**  
 THE COMPANY HAS PREPARED THIS PLAN FOR THE PROPOSED WELL PAD & WATER CONTAINMENT PAD  
 WOODRIDGE COUNTY, WEST VIRGINIA



DATE: 07/01/2015  
 SCALE: 1" = 50'  
 SHEET 5 OF 7

**WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN**



**WVDEP 008  
 ACCEPTED AS-BUILT**  
 1/31/2017

**NOTES:**  
 1. THE EXISTING EGRESS FROM AROUND THE WELL PAD SHALL BE MAINTAINED AS NECESSARY TO ENSURE WORK CONTINUES TO PROCEED PRIOR TO DRILLING OPERATIONS.  
 2. THE EXISTING EGRESS TO THE WELL PAD SHALL HAVE THE ACCOUNTABLE BENCH EXPANDED AS NECESSARY TO ENSURE THAT THE WELL PAD IS PROTECTED FROM COLLAPSE DURING OPERATIONS.

MATCHLINE "A"  
 SEE SHEET 4

**LOCATION COORDINATES:**

ACCESS ROAD ENTRANCE  
LATITUDE: 39.239269 LONGITUDE: -80.677217 (NAD 83)  
N 4343378.71 E 527855.96 (UTM ZONE 17 METERS)

CENTER OF TANK 1  
LATITUDE: 39.241224 LONGITUDE: -80.672316 (NAD 83)  
N 434597.23 E 528278.16 (UTM ZONE 17 METERS)

CENTER OF TANK 2  
LATITUDE: 39.240917 LONGITUDE: -80.672481 (NAD 83)  
N 434563.01 E 528264.11 (UTM ZONE 17 METERS)

CENTROID OF WELL PAD  
LATITUDE: 39.241836 LONGITUDE: -80.672174 (NAD 83)  
N 4343665.37 E 528290.14 (UTM ZONE 17 METERS)

**GENERAL DESCRIPTION:**

THE ACCESS ROAD(S), WATER CONTAINMENT PAD, & WELL PAD HAVE BEEN CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

**FLOODPLAIN NOTE:**

THE PROPOSED SITE IS LOCATED IN FLOODZONE "X" PER FEMA FLOOD MAP #54017C0235C.

**ENVIRONMENTAL NOTES:**

WETLAND DELINEATIONS WERE PERFORMED MARCH & SEPTEMBER, 2013 & FEBRUARY, 2014 BY GAI CONSULTANTS INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE FEBRUARY 28, 2014 RESOURCE LOCATION MAP WAS PREPARED BY GAI 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.

**GEOTECHNICAL NOTE:**

A SUBSURFACE INVESTIGATION OF THE SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. ON MARCH 12-18, 2014. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED APRIL 2, 2014, REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WAS USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

**PROJECT CONTACTS:**

**OPERATOR:**

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

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

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

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

ROBERT B. WIRKS - FIELD ENGINEER  
OFFICE: (304) 842-4100 CELL: (304) 627-7405

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

JACK BELL - LAND AGENT  
CELL: (304) 376-9682

**ENGINEER/SURVEYOR:**

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

**ENVIRONMENTAL:**

ALLSTAR ECOLOGY, LLC  
RYAN L. WARD - ENVIRONMENTAL SCIENTIST  
OFFICE: (866) 213-2666 CELL: (304) 692-7477

**GEOTECHNICAL:**

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

**RESTRICTIONS NOTES:**

1. THERE ARE NO PERENNIAL STREAMS, LAKES, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE ARE WETLAND AND STREAM IMPACTS THAT HAVE BEEN 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 APPARENT 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.

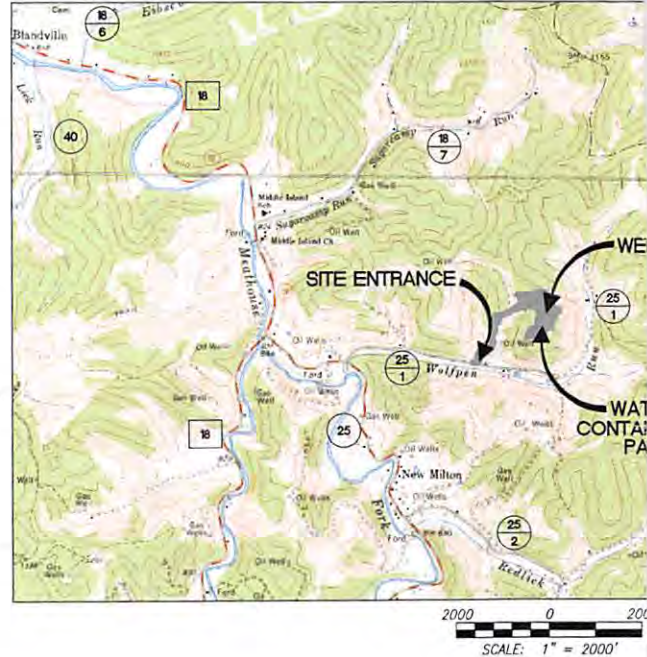
**NOTES:**

1. 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.
2. 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.
3. ALL PERMANENT SEDIMENT CONTROL MEASURES CAN BE REMOVED AFTER THE SITE IS PERMANENTLY STABILIZED AND APPROVAL IS RECEIVED FROM THE WVDEP.
4. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED, AND PERMANENTLY SEEDED.
5. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE DISTURBED AREA AS OF DECEMBER 05, 2014. THE AS-BUILT INFORMATION SHOWN HEREON REFLECTS FIELD DATA COLLECTED RELATING TO THE FINAL GRADING OF THE SLIDE AREAS AS OF DECEMBER 13, 2016. NAVITUS ENGINEERING IS NOT RESPONSIBLE FOR ANY CHANGES MADE TO THE SITE AFTER THE ABOVE MENTIONED DATE.
6. THE EXISTING CONTAINMENT BERM AROUND THE WELL PAD SHALL BE REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS
7. THE EXISTING EGRESSES TO THE WELL PAD SHALL HAVE THE MOUNTABLE BERMS REPAIRED AS NECESSARY TO ENSURE 100% CONTAINMENT OF ALL FLUIDS PRIOR TO DRILLING OPERATIONS.

# WOLF PEN WELL PAD & WATER CONTAINMENT PAD AS-BUILT AND EROSION CONTROL IMPROVEMENTS

NEW MILTON DISTRICT, DODDRIDGE COUNTY  
MEATHOUSE FORK WATER

USGS 7.5 NEW MILTON & SMITH



**WEST VIRGINIA COUNTY MAP**



(NOT TO SCALE)

**AS-BUILT 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.

03/17/2017

# WATER CONTAINMENT PAD DESIGN & SEDIMENT RETENTION PLAN

4701706801

WVDOH COUNTY, WEST VIRGINIA  
UNDEVELOPED  
QUAD MAPS



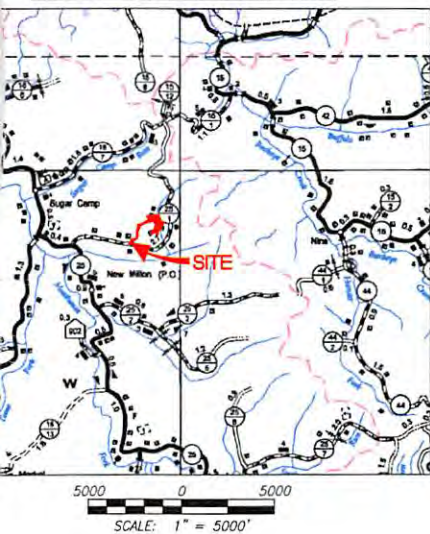
WEST VIRGINIA STATE PLANE COORDINATE SYSTEM  
NORTH ZONE, NAD83  
ELEVATION BASED ON NAVD88  
ESTABLISHED BY SURVEY GRADE GPS & OPUS  
POST-PROCESSING

### SHEET INDEX:

- 1 - COVER SHEET
- 2 - LEGEND
- 3 - OVERALL PLAN SHEET INDEX
- 4 - ACCESS ROAD AS-BUILT PLAN
- 5 - WELL PAD & WATER CONTAINMENT PAD AS-BUILT PLAN
- 6 - ACCESS ROAD AS-BUILT PROFILES
- 7 - WELL PAD & WATER CONTAINMENT PAD AS-BUILT SECTION

Proposed Well Name	WV North NAD 27	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Lager	N 272405.16	N 272441.25	E 528305.40	LAT 39-14-31 3903
Unit 1H	E 1668011.38	E 1636570.38	E 528305.40	LONG -80-40-19 1849
Lager	N 272395.33	N 272431.41	N 4343686.26	LAT 39-14-31 2928
Unit 2H	E 1668009.57	E 1636568.58	E 528304.96	LONG -80-40-19 2062
Lager	N 272385.49	N 272421.57	N 4343683.25	LAT 39-14-31 1954
Unit 3H	E 1668007.77	E 1636566.77	E 528304.46	LONG -80-40-19 2275
Sling	N 272375.65	N 272411.74	N 4343680.24	LAT 39-14-31 0979
Unit 1H	E 1668005.96	E 1636564.97	E 528303.96	LONG -80-40-19 2488
Sling	N 272365.82	N 272401.90	N 4343677.24	LAT 39-14-31 0005
Unit 2H	E 1668004.16	E 1636563.16	E 528303.46	LONG -80-40-19 2701
Swanson	N 272355.98	N 272392.07	N 4343674.23	LAT 39-14-30 9031
Unit 1H	E 1668002.35	E 1636561.35	E 528302.96	LONG -80-40-19 2914
Swanson	N 272346.15	N 272382.23	N 4343671.23	LAT 39-14-30 8056
Unit 2H	E 1668000.55	E 1636559.55	E 528302.46	LONG -80-40-19 3128
Swanson	N 272336.31	N 272372.40	N 4343668.22	LAT 39-14-30 7082
Unit 3H	E 1667998.74	E 1636557.74	E 528301.96	LONG -80-40-19 3341
Swanson	N 272326.48	N 272362.56	N 4343665.22	LAT 39-14-30 6107
Unit 4H	E 1667996.93	E 1636555.94	E 528301.46	LONG -80-40-19 3554
Blade	N 272316.64	N 272352.73	N 4343662.21	LAT 39-14-30 5133
Unit 1H	E 1667995.13	E 1636554.13	E 528300.96	LONG -80-40-19 3767
Blade	N 272306.80	N 272342.89	N 4343659.21	LAT 39-14-30 4159
Unit 2H	E 1667993.32	E 1636552.33	E 528300.46	LONG -80-40-19 3980
Well Pad Elevation	1,188.0			

WVDOH COUNTY ROAD MAP



WOLF PEN LIMITS OF DISTURBANCE AREA (AC)	
<b>Total Site</b>	<b>Total</b>
Access Road "A" (1,985')	6.44
Staging Area "A"	0.69
Staging Area "B"	0.47
Well Pad	4.02
Water Containment Pad	2.15
Production Equipment Pad	1.48
Excess/Topsoil Material Stockpiles	4.56
<b>Total Affected Area</b>	<b>19.81</b>
Total Wooded Acres Disturbed	16.02
<b>Impacts to Joyce L. Nicholson, Joseph I. Schulte, &amp; Connie Jo Weekley TM 8-8</b>	
Access Road "A" (1,729')	5.64
Staging Area "A"	0.69
Staging Area "B"	0.02
Water Containment Pad	0.23
Excess/Topsoil Material Stockpiles	1.64
<b>Total Affected Area</b>	<b>8.22</b>
Total Wooded Acres Disturbed	6.57
<b>Impacts to Alvin D. Ross, Et Al TM 5-7</b>	
Access Road "A" (256')	0.80
Well Pad	4.02
Water Containment Pad	1.92
Production Equipment Pad	1.48
Excess/Topsoil Material Stockpiles	2.92
<b>Total Affected Area</b>	<b>11.14</b>
Total Wooded Acres Disturbed	9.45
<b>Impacts to Roger A. McClain, II &amp; John H. McClain TM 8-10</b>	
Staging Area "B"	0.45
<b>Total Affected Area</b>	<b>0.45</b>
Total Wooded Acres Disturbed	0.00



DATE	REVISION
06/31/2015	UPDATED BORROW/STOCKPILE #1
04/11/2016	REVISED TOE BENCH WIDTHS
05/12/2016	REVISED PER SURFACE CONFIG./WELL SHIFT
12/13/2016	REVISED WELLS



COVER SHEET  
**WOLF PEN**  
WELL PAD & WATER CONTAINMENT PAD  
NEW MILTON DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 07/01/2015  
SCALE: AS SHOWN  
SHEET 1 OF 7

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

**REPRODUCTION NOTE**  
THESE PLANS WERE CREATED TO BE PLOTTED ON 22"X34" (ANSI D) PAPER. HALF SCALE DRAWINGS ARE ON 11"X17" (ANSI B) PAPER.  
THESE PLANS WERE CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

*Handwritten signature and date: 12/28/16*

03/17/2017