



west virginia department of environmental protection

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

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

Thursday, July 13, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for TAUNUS UNIT 3H
47-017-06842-00-00

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: TAUNUS UNIT 3H
Farm Name: JOHN PAUL STRICKLING, ET AL
U.S. WELL NUMBER: 47-017-06842-00-00
Horizontal 6A / New Drill
Date Issued: 7/13/2017

Promoting a healthy environment.

07/14/2017

PERMIT CONDITIONS 4701700000

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

CONDITIONS

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

API Number: _____

PERMIT CONDITIONS

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

07/14/2017

4/14

WW-6B
(04/15)

API NO. 47-017 - 06842
OPERATOR WELL NO. Taunus Unit 3H
Well Pad Name: Strickling Pad

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

1) Well Operator: Antero Resources Corporation 494507062 017-Doddridge West Union West Union 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Taunus Unit 3H Well Pad Name: Strickling Pad

3) Farm Name/Surface Owner: John Paul Strickling, et al Public Road Access: CR 28 (Nutter Fork)

4) Elevation, current ground: ~1076' Elevation, proposed post-construction: 1065'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7100' TVD, Anticipated Thickness- 60 feet, Associated Pressure- 3100#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17700' MD

11) Proposed Horizontal Leg Length: 9635'

12) Approximate Fresh Water Strata Depths: 60', 110', 258'

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

14) Approximate Saltwater Depths: 1479', 1780'

15) Approximate Coal Seam Depths: 327', 341'

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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5/17/17

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(04/15)

API NO. 47- 017 -
OPERATOR WELL NO. Tecurus Unit 3H
Well Pad Name: Strickling 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#	310' *see #19	310' *see #19	CTS, 431 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#	17700'	17700'	4460 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

4701708042

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

PACKERS

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

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WV Department of
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API NO. 47-017 -
OPERATOR WELL NO. Taurus Unit 3H
Well Pad Name: Strickling 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): 19.64 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.41 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.

DAF
5/17/17



4701706842

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47017036230000



47017029190001



47017029210000



47017037830000



47017038230000



Taunus Unit 3H

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Taunus Unit 3H - AOR



- WELL SYMBOLS
- Dry Hole
 - Gas Well

April 11, 2017

07/14/2017

TAUNUS UNIT 3H (STRICKLING PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	ELEV_GR	TD (SSTVD)	Approx distance to well	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Productible Formation(s) not perf'd
47017029210000	ASH FRED	J-427	BRAXTON OIL & GAS CORP	J & J ENTERPRISES	5381	1030	-4351	47	2303-5031	Weir, Benson	Big Injun, Gordon, Balltown, Bradford, Riley
47017029190001	HITTEL CHARLES C III	J-425	ENERGY CORP OF AMER	J & J ENTERPRISES	5290	1210	-4080	30	2479-5187	Weir, Gordon, Riley, Benson	Big Injun, Balltown, Bradford
47017036780000	PRUNTY G	1	CONSOL GAS COMPANY	STONEWALL GAS	5200	1029	-4171	500	4560-5000	Riley, Benson	Big Injun, Weir, Gordon, Balltown, Bradford
47017038230000	SMITH S	1	CONSOL GAS COMPANY	DAC CORP	5105	982	-4123	151	4920-4923	Benson	Big Injun, Weir, Gordon, Balltown, Bradford, Riley
47017037830000	SMITH W F	8	ANTERO RESOURCES CORPORATION	QUAKER STATE INC	5072	1022	-4050	224	4948-4952	Benson	Big Injun, Weir, Gordon, Balltown, Bradford, Riley
47017036230000	BUCK JAMES S	1	CONSOL GAS COMPANY	STONEWALL GAS	5023	892	-4131	29	4384-4820	Riley, Benson	Big Injun, Weir, Gordon, Balltown, Bradford

47017029210000

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MAY 19 2017

WW-9
(4/16)

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API Number 47 - 017 - _____
Operator's Well No. Taurus Unit 3H

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 West Union 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, fluids stored in tanks, cuttings removed offsite and taken to landfill.

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

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

Additives to be used in drilling medium? Please See Attachment

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

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

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

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

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

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

Company Official Signature [Signature]

Company Official (Typed Name) Cole Kilstrom

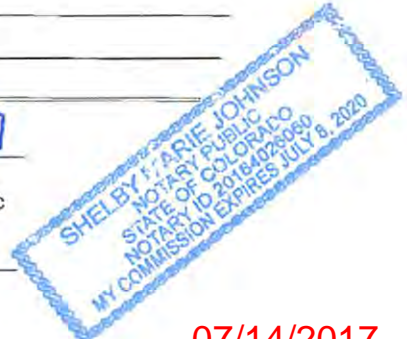
Company Official Title Environmental & Regulatory Manager

Subscribed and sworn before me this 13 day of April, 20 17

[Signature] Notary Public

My commission expires 7/8/2020

DAF
5/17/17



07/14/2017

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 19.64 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

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Access Road "A" (6.36 Acres) + Access Road "B" (0.30 Acres) + Access Road "C" (1.73 Acres) + Staging Area (0.24 Acres) + Well Pad (4.41 Acres) + Water Containment Pad (3.37 Acres) + Excess/Topsoil Material Stockpiles (3.23 Acres) = 19.64 Acres

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Annual Ryegrass	40
Field Bromegrass	40

Seed Type	lbs/acre
Crownvetch	10-15
Tall Fescue	30

*See Table 3 for additional seed type (Strickling Pad Design Page 29)

*See Table 4A for additional seed type (Strickling Pad Design Page 29)

*or type of grass seed requested by surface owner

*or type of grass seed requested by surface owner

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____

Comments: _____

Title: D: I + Gas Inspector

Date: 5/17/17

Field Reviewed? (L) 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

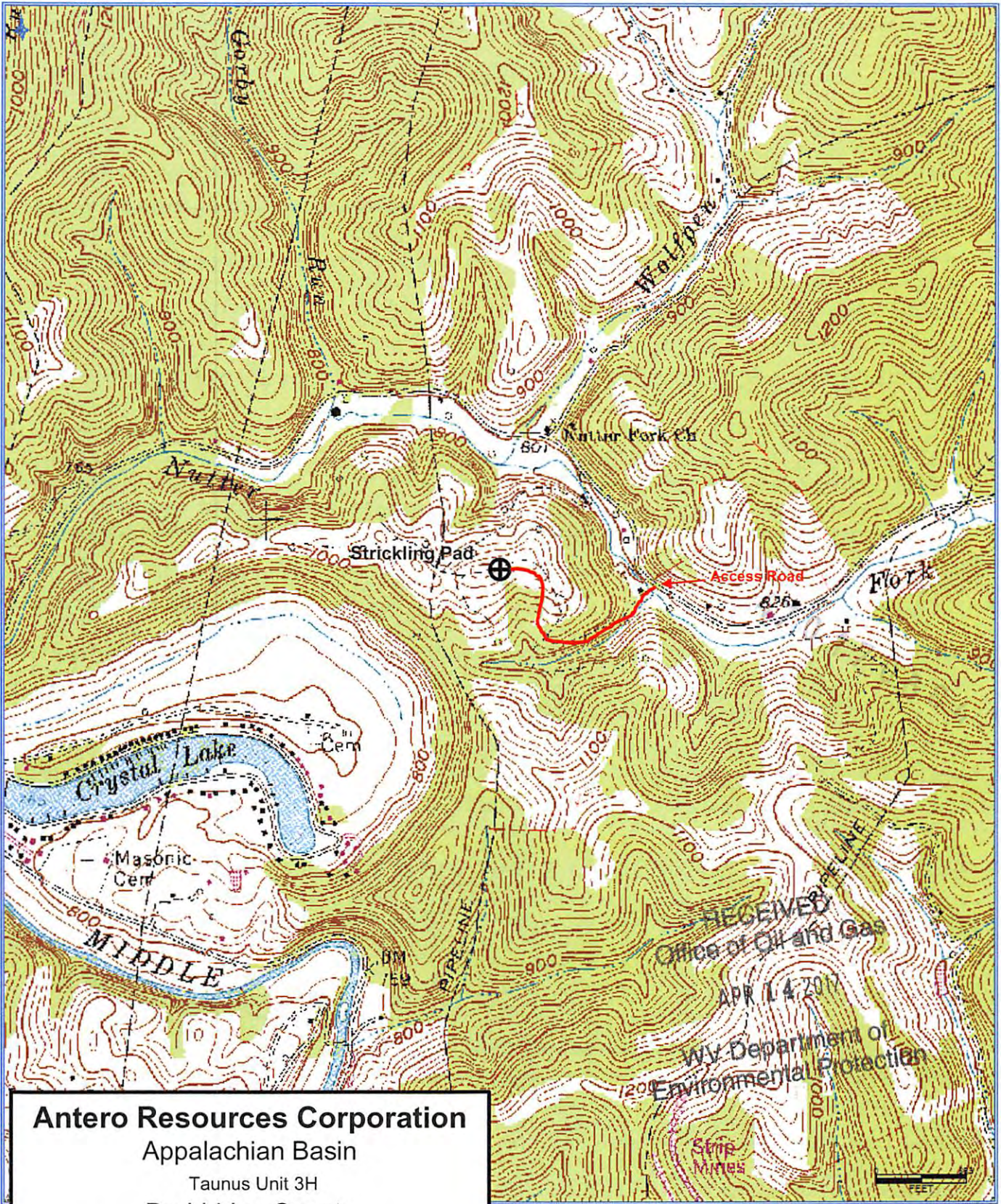
PRODUCTION INTERVAL

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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Antero Resources Corporation
 Appalachian Basin
 Taunus Unit 3H
 Doddridge County
 Quadrangle: West Union
 Watershed: Headwaters Middle Island Creek
 District: West Union
 Date: 9-09-2014



911 Address
2110 Nutter Fork
West Union, WV 26456

Well Site Safety Plan

Antero Resources

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Well Name: Buffett Unit 1H-2H; Jimmy Unit 1H-3H; Smithers Unit 1H-2H; Taunus Unit 1H-3H

Pad Location: STRICKLING PAD
Doddridge County/ West Union District

GPS Coordinates:

Entrance - Lat 39°19'54.0948"/Long -80°46'41.3724" (NAD83)

Pad Center - Lat 39°19'56.085"/Long -80°47'1.0068" (NAD83)

Driving Directions:

From the intersection of I-79 and Hwy 50 near Clarksburg: Head west on Hwy 50 for ~ 29.9 miles, then turn RIGHT at WV-18N (Town of West Union Ahead). In ~0.6 miles, turn left onto Davis St/Old U.S. 50 W and follow for ~0.4 miles. Take the second right onto WV-18N/Sistersville Pike and follow for ~5.1 miles. Turn right onto Nutter Fork and follow for ~2.1 miles. Look for rig signs and lease road on the RIGHT. Follow lease road to location.

Alternate Route:

From the town of Pennsboro: Head north on WV-74 N/Mountain Dr for 10.8 miles. Turn right onto WV-18 S for 7.1 miles. Turn left onto Nutter Fork and continue for 2.1 miles. Look for rig signs and lease road on the RIGHT. Follow lease road to location.

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

John C. [Signature]
5/17/17

683' to Bottom Hole

9,533' to Top Hole

BTM HOLE LATITUDE 39 - 22 - 30
TOP HOLE LATITUDE 39 - 20 - 00

TOP HOLE LONGITUDE 80 - 45 - 00
BTM HOLE LONGITUDE 80 - 47 - 30

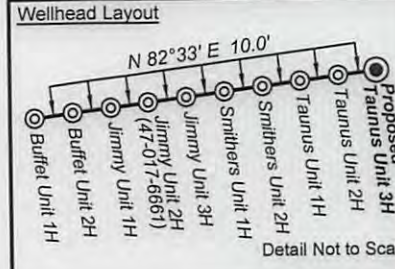
281' to Top Hole
6,129' to Bottom Hole

Antero Resources
Well No. Taurus Unit 3H
Antero Resources Corporation

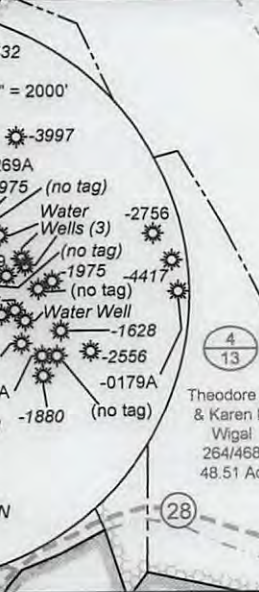
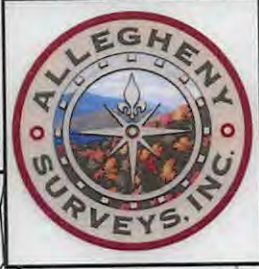
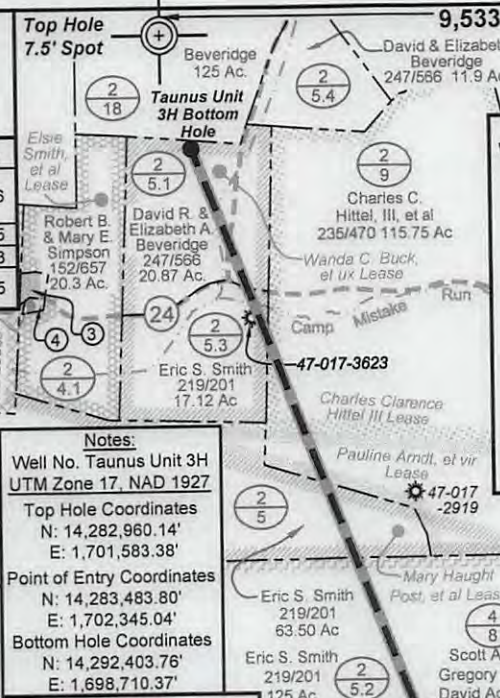
ID	TM/Par	Owner	Bk/Pg	Ac.
1	4/29	Phillip S. Underwood, Patricia Cooper & Katherine S. Sisler	WB 51/709	0.46
2	4/23	Christian Church	49/71 & 72	0.85
3	2/8	Lawrence R. Weekley	WB 40/120	1.03
4	2/4.3	Robert B. Mary E. Simpson	152/657	0.25

- Legend**
- ⊙ Proposed gas well
 - ⊕ Found corner, as noted
 - - - Creek or Drain
 - - - Existing Road
 - - - Surface boundary (approx.)
 - - - Interior surface tracts (approx.)
 - ⊙ Existing well, as noted

(- ⊙ -) Denotes Location of Well on United States Topographical Maps

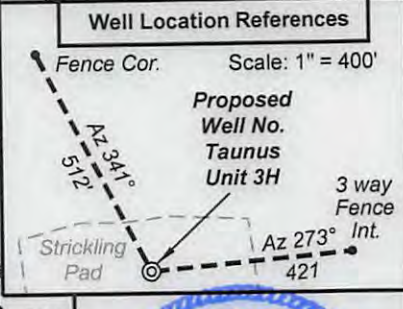


Note: 6 water wells and 4 springs were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.



Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Taurus Unit 3H Top Hole coordinates are
N: 305,695.27' Latitude: 39°19'55.89"
E: 1,636,899.73' Longitude: 80°47'01.27"
Bottom Hole coordinates are
N: 315,188.81' Latitude: 39°21'29.33"
E: 1,634,183.71' Longitude: 80°47'37.57"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,353,672.840m N: 4,356,551.243m
E: 518,658.072m E: 517,782.381m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

	Bearing	Dist.	Bottom Hole 7.5' Spot
L1	N 56°27' E	924.6'	+
L2	N 88°23' E	796.5'	
L3	N 52°24' E	1031.9'	
L4	S 66°10' E	2012.7'	
L5	N 68°43' W	1168.6'	



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.

Kenneth J. Plum, P.S. 2216

FILE NO: 43-30-WU-14
DRAWING NO: Taurus 3H Well Plat 07-16
SCALE: 1" = 1200'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

DATE: March 22 2017
OPERATOR'S WELL NO. Taurus Unit 3H
API WELL NO
47 - 017 - 06842
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: Existing Grade - 1076' Proposed Grade - 1065' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge
SURFACE OWNER: John Paul Strickling, et al ACREAGE: 357.75
ROYALTY OWNER: Carl W. Ash, et ux; W.F. Smith, et al; Freeman P. Smith, et al LEASE NO: ACREAGE: 125, 368, 63.75; 31
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,100' TVD 17,700 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

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

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

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

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

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Joseph Freeman, et ux Lease</u>			
Joseph Freeman, et ux	G.H. & J. E. Trainer	1/8	27/233
G.H. & J. E. Trainer	W. W. Hepburn	Assignment	34/244
W. W. Hepburn	Eastern Petroleum Company	Assignment	34/256
Eastern Petroleum Company	Clifton Oil & Gas Company	Assignment	81/114
Clifton Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	56/165
Quaker State Oil Refining Corporation	Williston Oil Development	Assignment	165/502
Williston Oil Development	Gerald W. Lauderman DBA Lauderman Oil & Gas Drilling Company	Assignment	100/3
Gerald W. Lauderman DBA Lauderman Oil & Gas Drilling Company	Michale E. Heitz	Assignment	140/677
Michale E. Heitz	HND Oil & Gas Company	Assignment	141/379
HND Oil & Gas Company	Quaker State Oil Refining Corporation	Assignment	145/492
Quaker State Oil Refining Corporation	QSE&P, Inc.	Assignment	159/474
QSE&P, Inc.	Belden & Blake Corporation	Assignment	175/466
Belden & Blake Corporation	Peake Energy, Inc.	Assignment	181/114
Peake Energy, Inc.	North Coast Energy Eastern, Inc.	Name Change	249/343
North Coast Energy Eastern, Inc.	Exco-North Coast Energy Eastern, Inc.	Name Change	277/68
Exco-North Coast Energy Eastern, Inc.	EXCO Resources (WV), Inc.	Name Change	Exhibit 2
EXCO Resources (WV), Inc.	EXCO Resources (WV), LLC	Name Change	285/83
EXCO Resources (WV), LLC	EXCO Production Company (WV), LLC	Name Change	Exhibit 3
EXCO Production Company (WV), LLC	Antero Resources Appalachian Corporation	Assignment	285/84
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Freeman P. Smith, et ux Lease</u>			
Freeman P. Smith, et ux	Clarence W. Mutschelknaus	1/8	LB0167/0687
Clarence W. Mutschelknaus	Drilling Appalachian Corporation	Assignment	LB0168/0050
Drilling Appalachian Corporation	Antero Resources Appalachian Corporation	Assignment	LB0278/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>B.J. (Sally) Underwood Lease</u>			
B.J. (Sally) Underwood	Drilling Appalachian Corporation	1/8	LB0168/0053
Drilling Appalachian Corporation	Dominion Appalachian Development Properties, LLC	Assignment	LB0181/0667
Dominion Appalachian Development Properties, LLC	Consol Gas Appalachian Development Properties, LLC	Name Change	DB0181/0667
Consol Gas Appalachian Development Properties, LLC	CNX Gas Company, LLC	Name Change	Exhibit 4
CNX Gas Company, LLC	Antero Resources Corporation	Assignment	LB0317/0379
<u>Elwood T. Fox Lease</u>			
Elwood T. Fox	Antero Resources Corporation	1/8+	LB0347/0560
<u>Bertha Corathers Lease</u>			
Bertha Corathers	Antero Resources Corporation	1/8+	LB0347/0580
<u>Freeman P. Smith, et al Lease</u>			
Freeman P. Smith, et al	Clarence W. Mutschelknaus	1/8	151/473
Clarence W. Mutschelknaus	Antero Appalachian Corporation	Assignment	321/615

*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.

07/14/2017

CONTINUED ON NEXT PAGE

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

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

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

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>W.F. Smith, et al Lease</u>			
W.F. Smith, et al	J. E. Trainer	1/8	0034/0108
J. E. Trainer	Hope Natural Gas Company	Assignment	0035/0234
Hope Natural Gas Company	Clifton Oil & Gas Company	Assignment	0051/0072
Clifton Oil & Gas Company	Quaker State Oil Refining Company	Assignment	0053/0247
Quaker State Oil Refining Company	The Quaker State 1989-1 Drilling Foundation, L.P.	Assignment	0160/0200
The Quaker State 1989-1 Drilling Foundation, L.P.	Bladen & Blake Corporation	Assignment	0175/0466
Bladen & Blake Corporation	Peak Energy, Inc	Assignment	0181/0114
Peak Energy, Inc	Peak Energy, Inc	Assignment	0181/0567
Peak Energy, Inc	North Coast Energy Eastern, Inc.	Name Change	DB 0249/0343
North Coast Energy Eastern, Inc.	Exco- North Coast Energy Eastern, Inc.	Name Change	DB 0277/0068
Exco- North Coast Energy Eastern, Inc.	Exco Resources (WV), Inc.	Name Change	Exhibit 2
Exco Resources (WV), Inc.	Exco Resources (WV), LLC.	Name Change	285/83
Exco Resources (WV), LLC.	Exco Production Company (WV),LLC.	Merger	Exhibit 3
Exco Production Company (WV),LLC.	Antero Resources Appalachian Corporation	Assignment	0285/0084
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Carl W. Ash, et ux Lease</u>			
Carl W. Ash, et ux	Key Oil Company	1/8	0108/0433
Key Oil Company	J & J Enterprises, Inc.	Assignment	0141/0090
J & J Enterprises, Inc.	Sam Jack Partnership Number Ten	Assignment	0159/0205
Sam Jack Partnership Number Ten	Eastern American Energy Corporation	Assignment	0193/0310
Eastern American Energy Corporation	Energy Corporation Of America	Assignment	0240/0498
Energy Corporation Of America	Antero Resources Appalachian Corporation	Assignment	0272/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Mary Haught Post, et al Lease</u>			
Mary Haught Post, et al	Antero Resources Corporation	1/8+	434/90
<u>Pauline Arndt, et vir Lease</u>			
Pauline Arndt, et vir	Key Oil Company	Assignment	LB0109/0562
Key Oil Company	J&J Enterprises	Assignment	LB0111/0326
J&J Enterprises	Eastern American Energy Co.	Assignment	LB0159/0139
Eastern American Energy Co.	Energy Corporation of America	Merger	DB0283/0431
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	LB0272/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Charles Clarence Hittel III Lease</u>			
Charles Clarence Hittel III	Antero Resources Corporation	1/8	320/0551

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

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

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Wanda C. Buck, et ux Lease</u>	Wanda C. Buck, et ux	Stonewall Gas Co.	1/8	150/566
	Stonewall Gas Co.	Dominion Reserves, Inc.	Assignment	166/53
	Dominion Reserves, Inc.	CNX Gas Company	Merger	292/469
	CNX Gas Company	Antero Resources Corporation	Assignment	317/379

*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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 WV Department of Environmental Protection

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
Office of Oil and Gas

APR 14 2017

Natalie E. Tennant
Secretary of State

07/14/2017

State of West Virginia



Certificate

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

by the provisions of the West Virginia Code, Articles of Merger were received and filed
MERGING EXCO RSOURCES (PA), LLC, A QUALIFIED TX ORGANIZATION WITH EXCO RESOURCES (WV), LLC, A QUALIFIED TX ORGANIZATION, AS SURVIVORS AND CREATING THE FOLLOWING NON-QUALIFIED TX ORGANIZATIONS: BG NATURAL GAS PRODUCTION COMPANY (PA), LLC, APPALACHIA MIDSTREAM, LLC, EXCO RSOURCES (XA), LLC, BG NATURAL GAS PRODUCTION COMPANY (WV), LLC AND EXCO PRODUCTION COMPANY (PA), LLC. IN THE MERGER EXCO RESOURCES (WV), LLC CHANGED ITS NAME TO EXCO PRODUCTION COMPANY (WV), LLC.

Therefore, I hereby issue this

CERTIFICATE OF MERGER

470 1700842



Given under my hand and the Great Seal of the State of

West Virginia on

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West Virginia Oil and Gas
APR 14 2017 July 1, 2010

WV Department of Environmental Protection
Natalie E. Tennant

Secretary of State

07/14/2017

FORM WW-6A1
EXHIBIT 4

State of West Virginia



Certificate

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

by the provisions of the West Virginia Code, Articles of Merger were received and filed,

MERGING CONSOL GAS COMPANY, A QUALIFIED DE ORGANIZATION, WITH AND INTO CNX GAS COMPANY LLC, A QUALIFIED VA ORGANIZATION.

Therefore, I hereby issue this

CERTIFICATE OF MERGER



Given under my hand and the Great Seal of the State of West Virginia on this day of January 5, 2011
Office of Oil and Gas

APR 14 2017

Natalie E. Tennant
Secretary of State
Department of Environmental Protection

07/14/2017



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

April 13, 2017

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

RE: Taunus Unit 3H
Quadrangle: West Union 7.5⁺
Doddridge County/West Union District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Taunus Unit 3H 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 Taunus Unit 3H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in blue ink that reads "Haley West". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Haley West
Landman

4205200022

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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: Antero Resources Corporation
By: Kevin Kilstrom
Its: Senior Vice President of Production
Telephone: 303-357-7310

Address: 1615 Wynkoop Street
Denver, CO 80202
Facsimile: 303-357-7315
Email: sklaas@anteroresources.com



Subscribed and sworn before me this 12 day of April 2017.
[Signature] Notary Public
My Commission Expires 7/8/2020

Oil and Gas Privacy Notice:

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

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**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: 4/13/2017 **Date Permit Application Filed:** 4/13/2017

Notice of:

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

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

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

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

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

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

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

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

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

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

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL,
-SPRING OR OTHER WATER SUPPLY SOURCE
Name: PLEASE SEE ATTACHMENT
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**

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

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Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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


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WW-6A
(8-13)

API NO. 47- 017 -
OPERATOR WELL NO. Taurus Unit 3H
Well Pad Name: Strickling Pad

Notice is hereby given by:

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



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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 13 day of April 2017.

SGJ Notary Public

My Commission Expires 7/8/2020

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WW-6A Notice of Application Attachment (Taurus Unit 3H):

List of Surface Owner(s) with Proposed Disturbance associated with Taurus Unit 3H (Strickling Pad):

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

TM 4 PCL 28

Owner: John Paul Strickling & Linda L. Strickling
Address: 130 Englands Run Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (2nd Address)
Address: 1855 Smithton Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (3rd Address)
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: Rebecca R. Strickling
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: James E. Strickling
Address: 412 Stealey Ave
Clarksburg, WV 26301

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WW-6A Notice of Application Attachment (Taunus Unit 3H):

ROAD AND/OR OTHER DISTURBANCE – These owners were only notified if their tract is overlying the oil and gas leasehold being developed by the proposed well work as outlined in WV Code 22-6A-10(b)(2).

TM 4 PCL 28 (On-Lease)

Owner: John Paul Strickling & Linda L. Strickling
Address: 130 Englands Run Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (2nd Address)
Address: 1855 Smithton Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (3rd Address)
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: Rebecca R. Strickling
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: James E. Strickling
Address: 412 Stealey Ave
Clarksburg, WV 26301

TM 4 PCL 36 (Off-Lease)

Owner: John Paul Strickling & Linda L. Strickling
Address: 130 Englands Run Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (2nd Address)
Address: 1855 Smithton Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (3rd Address)
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: Rebecca R. Strickling
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: James E. Strickling
Address: 412 Stealey Ave
Clarksburg, WV 26301



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WW-6A Notice of Application Attachment (Taurus Unit 3H):

WATER SOURCE OWNERS: Within 1500'

These owners of water sources, within 1500' of the well pad, were notified of all well work permit applications.

***NOTE: On attached water well map 2 other water sources are identified, but are located greater than 1500' from the subject well pad location.**

TM 4 PCL 14.1

1 Water Well: 1129'

Owner: John M. & Andrea Fitzgerald
Address: RR 2 Box 316
West Union, WV 26456

TM 4 PCL 23

1 Water Well: 1344'

Owner: Church Christian (Nutters Fork)
c/o Karen A. Smith
Address: 151 Chipps Run
West Union, WV 26415

TM 4 PCL 28

4 springs: 513', 1110', 1210', 1224'

Owner: John Paul Strickling, et al
(2nd Address)
Address: 1855 Smithton Rd
West Union, WV 26456

TM 4 PCL 29

1 Water Well: 1323'

Owner: Philip S. Underwood, Patricia Cooper
& Katherine S. Sisler
(c/o Bonnie J. Underwood)
Address: 2018 Nutter Fork
West Union, WV 26456

TM 4 PCL 30

3 Water Wells: 1198', 1306', 1315'

Owner: Kathryn J. Sisler
Address: 256 Shawnee Ct.
O'Fallon, IL 62269

53 0 1 26 10 12

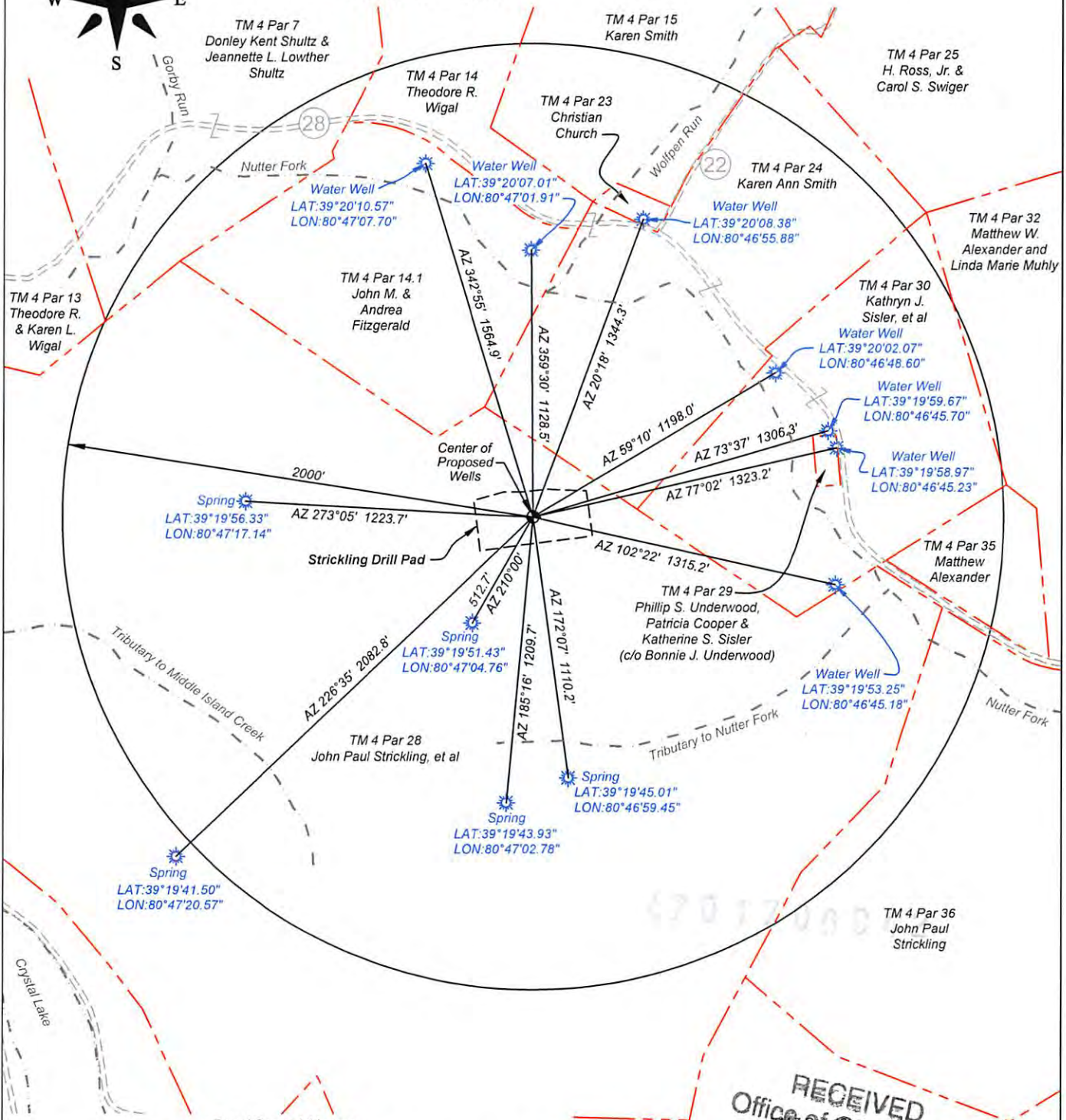
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Scale 1" = 600'



Strickling Drill Pad Water Well & Spring Map



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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: 05/20/2016 **Date Permit Application Filed:** 04/13/2017

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

HAND DELIVERY CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

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

Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

Notice is hereby given:

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

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>518649.38m (Approximate Pad Center)</u>
County: <u>Doddridge</u>	Northing: <u>4353669.67m (Approximate Pad Center)</u>
District: <u>West Union</u>	Public Road Access: <u>CR 28 (Nutter Fork)</u>
Quadrangle: <u>West Union 7.5'</u>	Generally used farm name: <u>John Paul Strickling, et al</u>
Watershed: <u>Headwaters Middle Island Creek</u>	

This Notice Shall Include:

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

Notice is hereby given by:

Well Operator: Antero Resources Appalachian Corporation
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-6759
Email: sklaas@anteroresources.com
Facsimile: 303-357-7315

Authorized Representative: Samantha Klaas
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-6759
Email: sklaas@anteroresources.com
Facsimile: 303-357-7315

Oil and Gas Privacy Notice:

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

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WW-6A4 Notice of Intent to Drill Attachment:

Surface Owners:

Owner: John Paul Strickling & Linda L. Strickling
Address: 130 Englands Run Rd
West Union, WV 26456

Owner: Rebecca R. Strickling
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: James E. Strickling
Address: 412 Stealey Ave
Clarksburg, WV 26301

Owner: John Paul Strickling
Address: HC 69 Box 34
West Union, WV 26456

*Please note this address has been updated since WW-6A4s were sent on 5/20/2016.

Owner: Rebecca Ruth Strickling
Address: HC 69 Box 34
West Union, WV 26456

*Please note this address has been updated since WW-6A4s were sent on 5/20/2016.

Owner: James Earl Strickling
Address: HC 69 Box 34
West Union, WV 26456

*Please note this address has been updated since WW-6A4s were sent on 5/20/2016.

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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: 04/13/2017 **Date Permit Application Filed:** 04/13/2017

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

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

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

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>518658.072m</u>
County:	<u>Doddridge</u>		Northing:	<u>4353672.840m</u>
District:	<u>West Union</u>	Public Road Access:	<u>CR 28 (Nutter Fork)</u>	
Quadrangle:	<u>West Union 7.5'</u>	Generally used farm name:	<u>John Paul Strickling, et al</u>	
Watershed:	<u>Headwaters Middle Island Creek</u>			

This Notice Shall Include:

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

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

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our files 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.

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

List of Surface Owner(s):

TM 4 PCL 28

Owner: John Paul Strickling & Linda L. Strickling
Address: 130 Englands Run Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (2nd Address)
Address: 1855 Smithton Rd
West Union, WV 26456

Owner: John Paul Strickling, et al (3rd Address)
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: Rebecca R. Strickling
Address: 756 Strickling Farm Ln
West Union, WV 26456

Owner: James E. Strickling
Address: 412 Stealey Ave
Clarksburg, WV 26301

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice
Governor

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

March 15, 2017

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

Subject: DOH Permit for the Strickling Pad, Doddridge County
Taunus Unit 3H Well site 47-017-06842

Dear Mr. Martin,

This well site will be accessed from a DOH permit #04-2014-0846 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Doddridge County Route 28 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

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List of Anticipated Additives Used for Fracturing or Stimulating Well

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier Base	Proprietary
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
Guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	Proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7
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)	23605-75-5
Diethylene Glycol	107-19-7
Methenamine	100-97-0
Polyethylene polyamine	68608-67-8
Coco amine	61791-14-8
2-Propyn-1-olcompound with methyloxirane	3993-91-7

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 WV Department of Environmental Protection
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STRICKLING WELL PAD & WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION EROSION & SEDIMENT CONTROL

WEST UNION DISTRICT, DODDRIDGE COUNTY
NUTTER FORK - MIDDLE ISLAND CREEK

USGS 7.5 WEST UNION & SMITHBURG

LOCATION COORDINATES:

ACCESS ROAD ENTRANCE
LATITUDE: 39.331693 LONGITUDE: -80.778159 (NAD 83)
N 4353609.43 E 519119.64 (UTM NAD83, ZONE 17 METERS)

CENTROID OF WELL PAD
LATITUDE: 39.332246 LONGITUDE: -80.783613 (NAD 83)
N 4353669.67 E 518649.38 (UTM NAD83, ZONE 17 METERS)

CENTER OF TANK
LATITUDE: 39.331046 LONGITUDE: -80.781259 (NAD 83)
N 4353536.91 E 518852.60 (UTM NAD83, ZONE 17 METERS)

GENERAL DESCRIPTION:

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

FLOODPLAIN NOTES:

THE PROPOSED SITE IS LOCATED IN FLOODZONE "X" PER FEMA FLOOD MAP #54017C0110C.

MISS UTILITY STATEMENT:

ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT DESIGN; TICKET #1309921790. IN ADDITION, MISS UTILITY WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:

ANTERO RESOURCES CORPORATION WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

ENVIRONMENTAL NOTES:

WETLAND DELINEATIONS WERE PERFORMED BETWEEN APRIL, 2013 & JULY, 2016 BY ALLSTAR ECOLOGY AND THE THRASHER GROUP, INC. TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY PURVIEW OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE JULY 27, 2016 JURISDICTIONAL STREAMS AND WETLANDS MAP WAS PREPARED BY ALLSTAR ECOLOGY AND SUMMARIZES THE RESULTS OF THE FIELD DELINEATION. THE EXHIBIT DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP. IT IS STRONGLY RECOMMENDED THAT THE AFOREMENTIONED AGENCIES BE CONSULTED IN AN EFFORT TO GAIN WRITTEN CONFIRMATION OF THE DELINEATION SHOWN ON THIS EXHIBIT PRIOR TO ENGAGING CONSTRUCTION ON THE PROPERTY DESCRIBED HEREIN. THE DEVELOPER SHALL OBTAIN THE APPROPRIATE PERMITS FROM THE FEDERAL AND/OR STATE REGULATORY AGENCIES PRIOR TO ANY PROPOSED IMPACTS TO WATERS OF THE U.S., INCLUDING WETLAND FILLS AND STREAM CROSSINGS.

GEOTECHNICAL NOTES:

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

A SUBSURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY KLEINFELDER SEPTEMBER 23 THROUGH OCTOBER 04, 2013 AND MAY 02 THROUGH MAY 12, 2014. THE REPORT PREPARED BY KLEINFELDER DATED MAY 30, 2014 (INCLUDING AN ADDENDUM DATED JUNE 13, 2014), REFLECTS THE RESULTS OF THE SUBSURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SUBSURFACE INVESTIGATION REPORT BY KLEINFELDER FOR ADDITIONAL INFORMATION, AS NEEDED.

PROJECT CONTACTS:

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

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

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

ENGINEER/SURVEYOR:

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

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

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

ENVIRONMENTAL:

ALLSTAR ECOLOGY, LLC
RYAN L. WARD - ENVIRONMENTAL SCIENTIST
OFFICE: (866) 213-2668 CELL: (304) 692-7477

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

GEOTECHNICAL:

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

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OFFICE: (304) 842-4100 CELL: (304) 627-7405

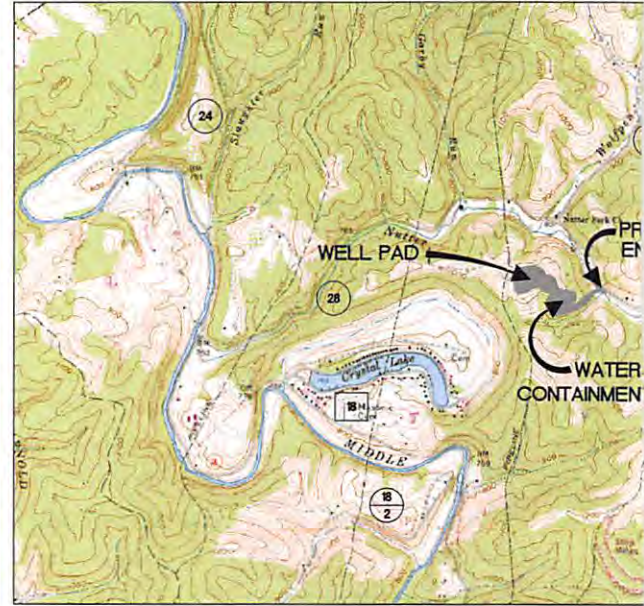
RESTRICTIONS NOTES:

1. THERE ARE NO LAKES, WETLANDS, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE WELL PAD AND LOD. THERE IS A PERENNIAL STREAM IMPACT THAT WILL NEED TO BE PERMITTED BY THE APPROPRIATE AGENCIES.
2. THERE ARE NO NATURALLY PRODUCING TROUT STREAMS WITHIN 300 FEET OF THE WELL PAD AND LOD.
3. THERE ARE NO GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY FACILITIES WITHIN 1000 FEET OF THE WELL PAD AND LOD.
4. THERE ARE NO 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 PROPOSED WELL PAD.
6. THERE ARE NO AGRICULTURAL BUILDINGS LARGER THAN 2,500 SQUARE FEET WITHIN 625 FEET OF THE CENTER OF THE WELL PAD.

REPRODUCTION NOTE

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

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



2000 0 2000
SCALE: 1" = 2000'

WEST VIRGINIA COUNTY MAP



(NOT TO SCALE)

DESIGN CERTIFICATION:

THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS CRS 35-8.

07/14/2017

MAY 19 2017

WATER CONTAINMENT PAD CONSTRUCTION PLAN, CONTROL PLANS

WVDOH COUNTY, WEST VIRGINIA
CREEK WATERSHED
GRID QUAD MAPS

APPROVED
WVDEP OOG
UPDATED
1-5-2017

SHEET INDEX:

- 01 - COVER SHEET
- 02 - CONSTRUCTION AND E&S CONTROL NOTES
- 03 - LEGEND
- 04 - MATERIAL QUANTITIES
- 05 - STORM DRAINAGE COMPUTATIONS
- 06 - EXISTING CONDITIONS
- 07 - EXISTING STRUCTURES & FEATURES
- 08 - OVERALL PLAN SHEET INDEX & VOLUMES
- 09 - ACCESS ROAD & WATER CONTAINMENT PAD PLAN
- 10 - ACCESS ROAD & WELL PAD PLAN
- 11 - WATER CONTAINMENT PAD GRADING PLAN
- 12 - WELL PAD GRADING PLAN
- 13 - ACCESS ROAD PROFILES
- 14-15 - ACCESS ROAD SECTIONS
- 16 - WELL PAD SECTIONS
- 17 - WATER CONTAINMENT PAD SECTIONS
- 18 - STREAM CROSSING "A" DETAILS
- 19 - STREAM CROSSING "B" DETAILS
- 20 - STREAM CROSSING "C" DETAILS
- 21 - STREAM CROSSING "D" DETAILS
- 22-29 - CONSTRUCTIONS DETAILS
- 30 - ACCESS ROAD & WATER CONTAINMENT PAD RECLAMATION PLAN
- 31 - ACCESS ROAD & WELL PAD RECLAMATION PLAN
- 32 - FIRM EXHIBIT
- GE501-GE517 - GEOTECHNICAL DETAILS
- *APPENDIX - CONSPAN BRIDGE DESIGN BY CONTECH

WV Department of
Environmental Protection

NAVITUS
ENERGY ENGINEERING

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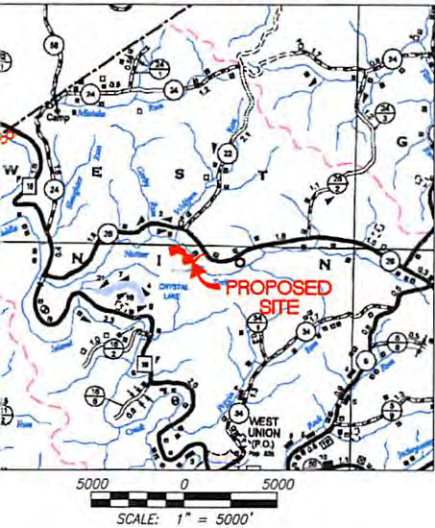


WEST VIRGINIA STATE PLANE COORDINATE SYSTEM
NORTH ZONE, NAD83
ELEVATION BASED ON NAVD88
ESTABLISHED BY SURVEY GRADE GPS & OPUS
POST-PROCESSING

- API# 1706623
- API# 1706624
- API# 1706625
- API# 1706661
- API# 1706662
- API# 1706663
- API# 1706790

STRICKLING LIMITS OF DISTURBANCE AREA (AC)	
Total Site	
Access Road "A" (2,157)	6.36
Access Road "B" (162)	0.30
Access Road "C" (807)	1.73
Staging Area	0.24
Well Pad	4.41
Water Containment Pad	3.37
Excess/Topsoil Material Stockpiles	3.23
Total Affected Area	19.64
Total Wooded Acres Disturbed	
	13.39
Impacts to John P. Strickling, Et Al TM 4-36	
Access Road "A" (31')	0.04
Staging Area	0.10
Total Affected Area	0.14
Total Wooded Acres Disturbed	
	0.02
Impacts to John P. Strickling, Et Al TM 4-28	
Access Road "A" (2,126')	6.32
Access Road "B" (162')	0.30
Access Road "C" (807')	1.73
Staging Area	0.14
Well Pad	4.41
Water Containment Pad	3.37
Excess/Topsoil Material Stockpiles	3.23
Total Affected Area	19.50
Total Wooded Acres Disturbed	
	13.37

WVDOH COUNTY ROAD MAP



Proposed Well Name	WV North NAD 83	WV North NAD 83	UTM (METERS) Zone 17	NAD 83 Lat & Long
Taurus Unit 3H	N 305895.27 E 1638896.73	N 305730.61 E 1605458.52	N 4353672.84 E 518658 07	LAT 39-19-56.1860 LONG -80-47-00.6440
Taurus Unit 2H	N 305893.98 E 1638889.82	N 305729.32 E 1605448.80	N 4353672.40 E 518655 06	LAT 39-19-56.1740 LONG -80-47-00.7700
Taurus Unit 1H	N 305692.68 E 1638879.90	N 305728.02 E 1605438.69	N 4353671.95 E 518652 04	LAT 39-19-56.1600 LONG -80-47-00.8960
Smithers Unit 2H	N 305691.38 E 1638869.99	N 305726.72 E 1605428.77	N 4353671.50 E 518649 03	LAT 39-19-56.1460 LONG -80-47-01.0220
Smithers Unit 1H	N 305690.08 E 1638860.07	N 305725.42 E 1605418.86	N 4353671.06 E 518646 02	LAT 39-19-56.1310 LONG -80-47-01.1480
Jimmy Unit 3H	N 305688.79 E 1638850.15	N 305724.13 E 1605408.94	N 4353670.61 E 518643 00	LAT 39-19-56.1170 LONG -80-47-01.2740
Jimmy Unit 2H	N 305687.49 E 1638840.24	N 305722.83 E 1605399.03	N 4353670.17 E 518639 99	LAT 39-19-56.1030 LONG -80-47-01.4000
Jimmy Unit 1H	N 305686.19 E 1638830.32	N 305721.53 E 1605389.11	N 4353669.72 E 518636 97	LAT 39-19-56.0890 LONG -80-47-01.5260
Buffett Unit 2H	N 305684.90 E 1638820.41	N 305720.23 E 1605379.20	N 4353669.28 E 518633 96	LAT 39-19-56.0750 LONG -80-47-01.6520
Buffett Unit 1H	N 305683.60 E 1638810.49	N 305718.93 E 1605369.28	N 4353668.83 E 518630 95	LAT 39-19-56.0600 LONG -80-47-01.7770
Well Pad Elevation	1,065.0			

Stream and Impact Cause	STRICKLING EPHEMERAL STREAM IMPACT (LINEAR FEET)				Total Disturbance (LF)
	Permanent Impacts Culvert / Fill (LF)	Inlets/Outlets Structures (LF)	Temp. Impacts Cofferdam/ E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	
Thrasher Stream 148 (Access Road "A")	30	13	9	23	75
Thrasher Stream 149 (Access Road "A")	53	103	6	37	199
Thrasher Stream 150 (Access Road "A")	34	46	10	14	104
Thrasher Stream 153 (Access Road "A")	21	0	23	22	66

Stream and Impact Cause	STRICKLING PERENNIAL STREAM IMPACT (LINEAR FEET)				Total Disturbance (LF)
	Permanent Impacts Culvert / Fill (LF)	Inlets/Outlets Structures (LF)	Temp. Impacts Cofferdam/ E&S Controls (LF)	Temp. Disturb. Distance to L.O.D. (LF)	
Stream 1 (Access Road "A")	34	0	0	59	92.5

DATE	REVISION	REVISOR
07/07/2014	REVISED PER ALLSTAR COMMENTS	
11/21/2014	REVISED PER WVDEP COMMENTS	
02/25/2015	REVISED PER DRAINAGE FEATURES	
07/13/2015	REVISED STREAM & WETLAND DELINEATION	
05/27/2016	REVISED PER SURFACE CONFIG	
06/04/2016	REVISED STREAM & WETLAND DELINEATION	



THIS DOCUMENT WAS PREPARED FOR:
ANTERO RESOURCES CORPORATION

COVER SHEET
STRICKLING
WELL PAD & WATER CONTAINMENT PAD
WEST UNION DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA



DATE: 06/23/2014

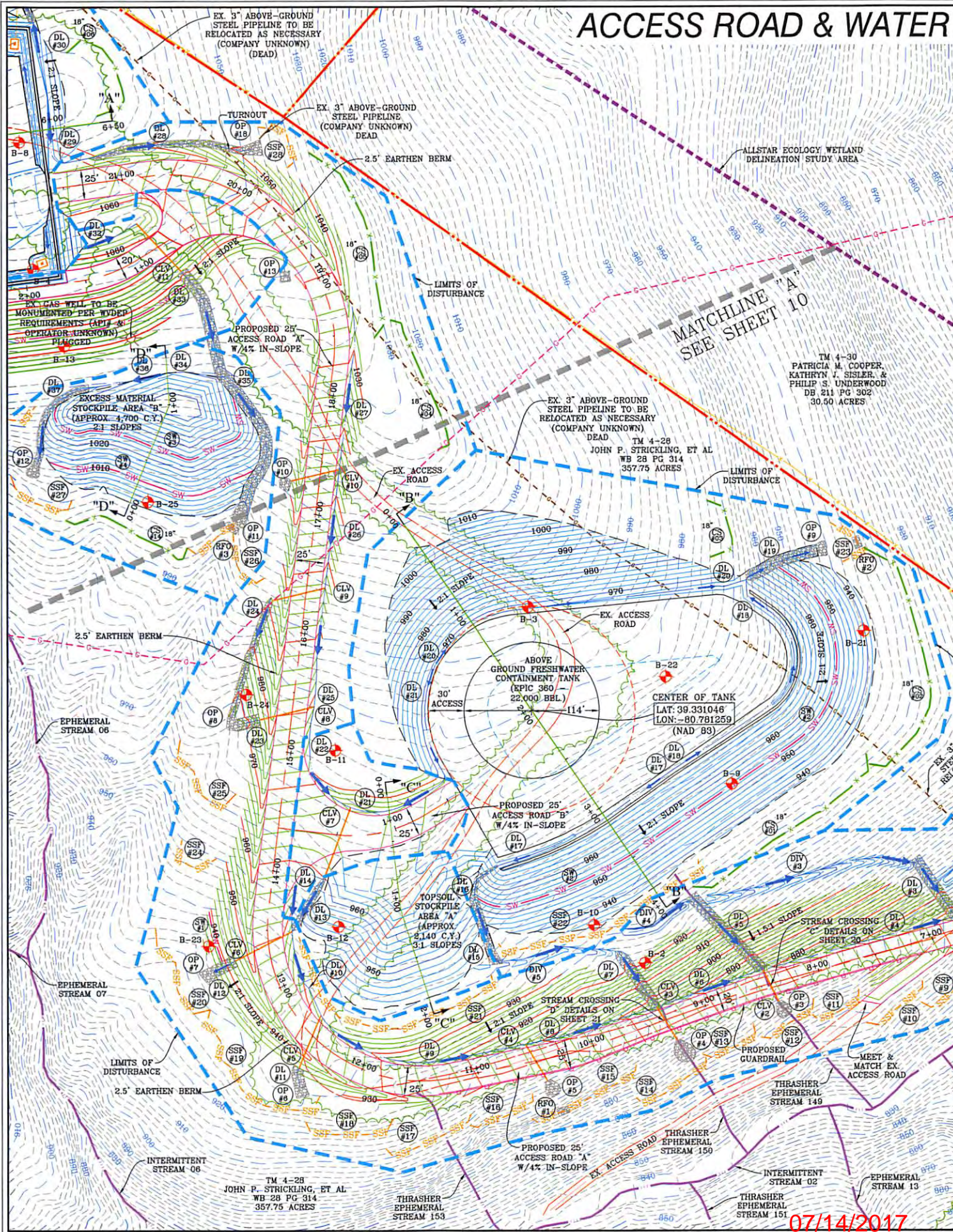
SCALE: AS SHOWN

SHEET # 21

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!!

07/14/2017

ACCESS ROAD & WATER



MATCHLINE "A"
SEE SHEET 10

TM 4-30
PATRICIA M. COOPER,
KATHRYN J. SIELER, &
PHILIP S. UNDERWOOD
DB 211 PG 302
30.50 ACRES

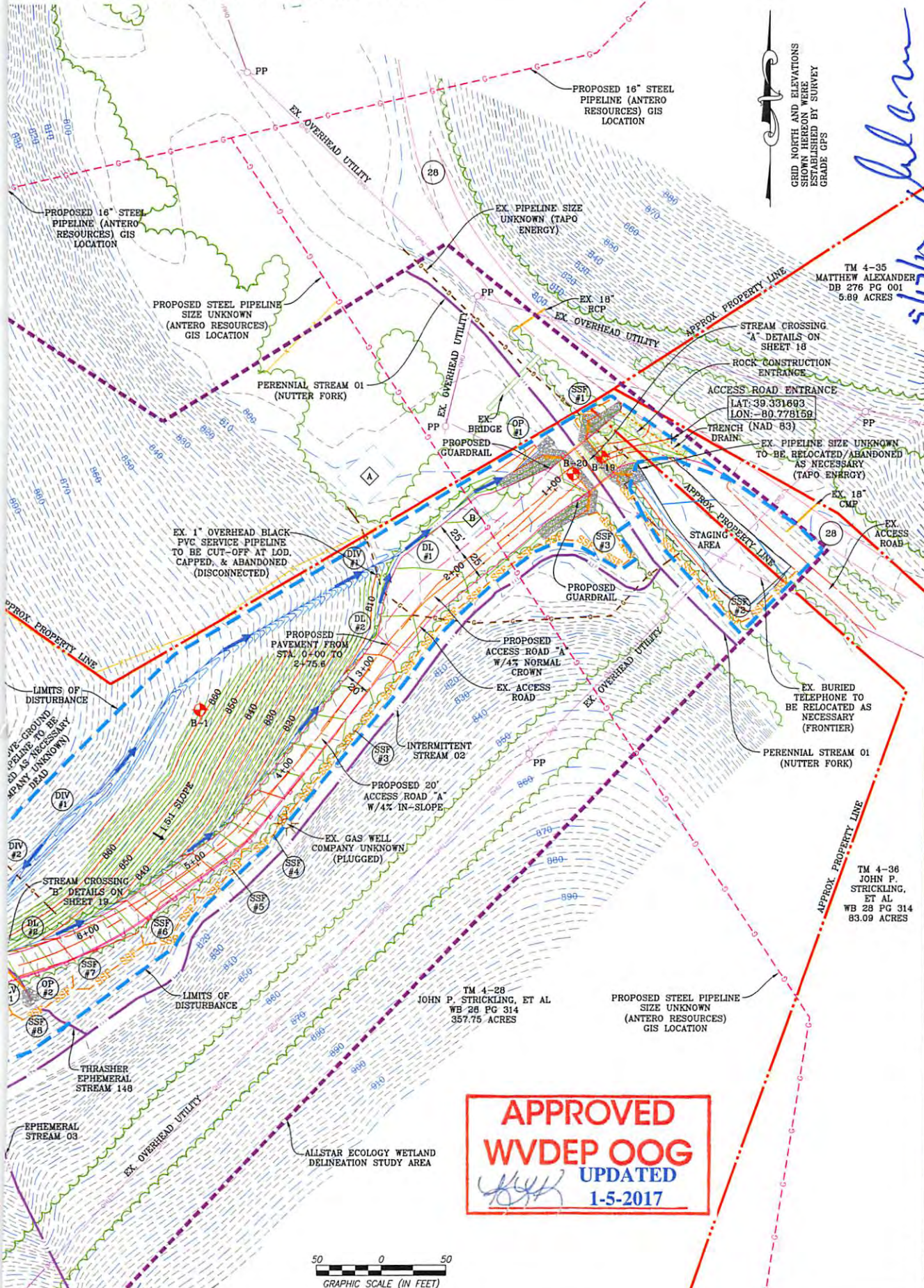
EX. 3" ABOVE-GROUND
STEEL PIPELINE TO BE
RELOCATED AS NECESSARY
(COMPANY UNKNOWN)
DEAD
TM 4-28
JOHN P. STRICKLING, ET AL
WB 28 PG 314
357.75 ACRES

TM 4-28
JOHN P. STRICKLING, ET AL
WB 28 PG 314
357.75 ACRES

THRASHER
EPHEMERAL
STREAM 153

07/14/2017

CONTAINMENT PAD PLAN



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DATE	REVISION
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05/27/2016	REVISED PER SURFACE CONFIG
09/04/2016	REVISED STREAM & WETLAND DELINEATION

Antero Resources

THIS DOCUMENT WAS PREPARED FOR:
ANTERO RESOURCES CORPORATION

ACCESS ROAD & WATER CONTAINMENT PAD PLAN

STRICKLING
WELL PAD & WATER CONTAINMENT PAD

WEST UNION DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER

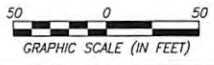
STRICKLING JOHN P.

STATE OF WEST VIRGINIA

08/04/2016

DATE: 06/23/2014
SCALE: 1" = 50'
SHEET 9 OF 17

APPROVED
WVDEP OOG
UPDATED
1-5-2017



ACCESS ROAD & WELL PAD

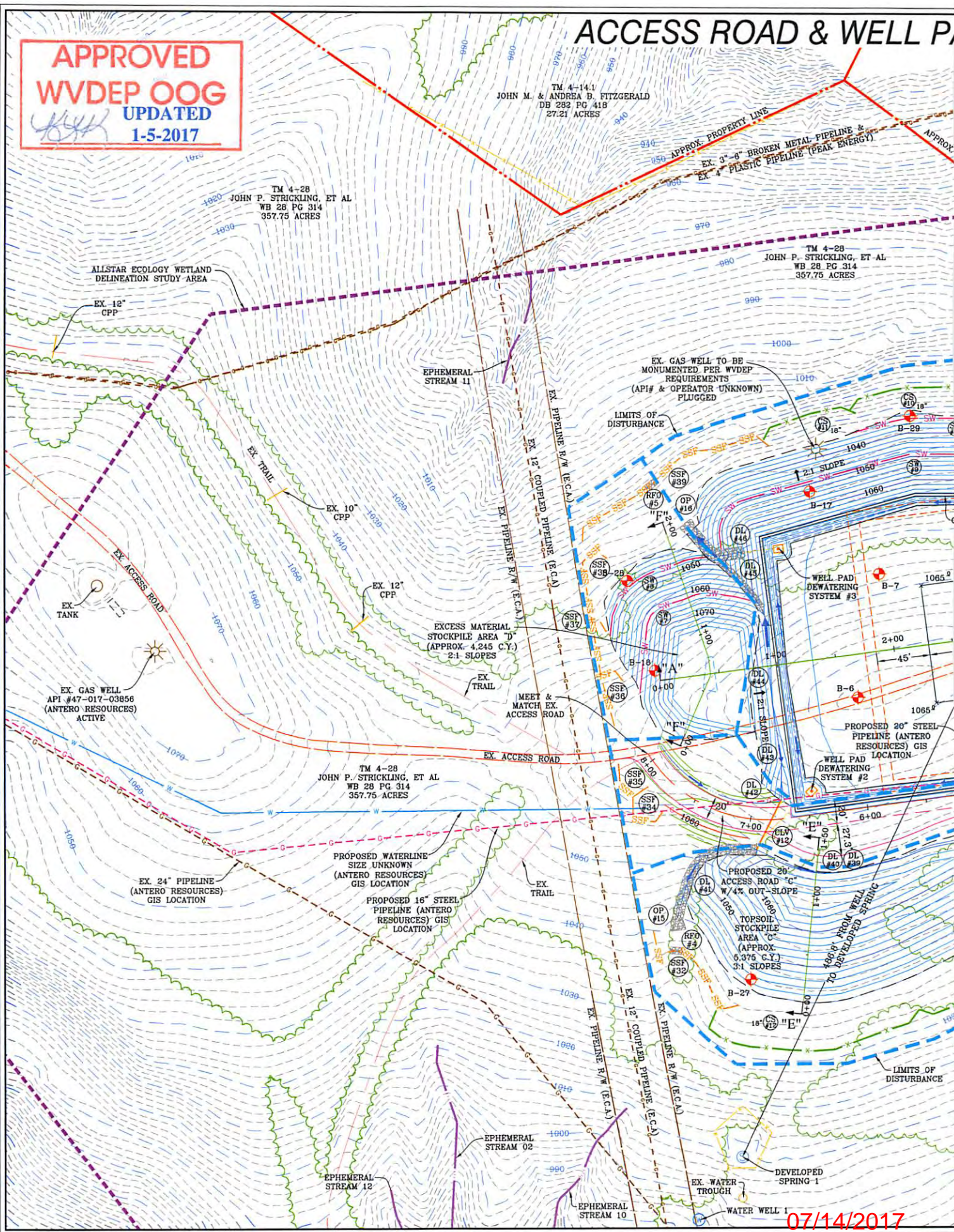
APPROVED
WVDEP OOG
UPDATED
1-5-2017

TM 4-14.1
JOHN M. & ANDREA B. FITZGERALD
DB 282 PG 418
27.21 ACRES

TM 4-28
JOHN P. STRICKLING, ET AL
WB 28 PG 314
357.75 ACRES

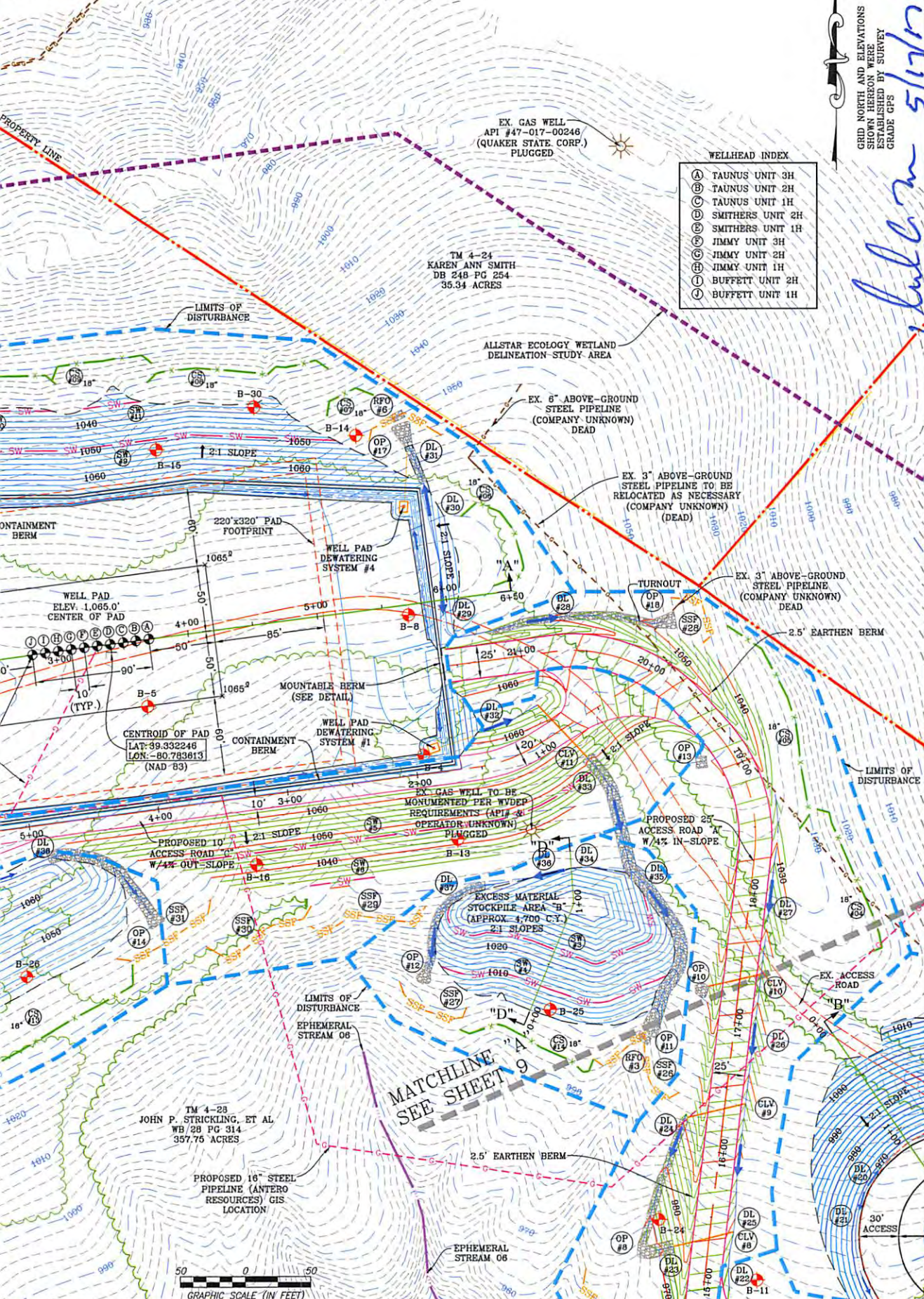
TM 4-28
JOHN P. STRICKLING, ET AL
WB 28 PG 314
357.75 ACRES

TM 4-28
JOHN P. STRICKLING, ET AL
WB 28 PG 314
357.75 ACRES



07/14/2017

PAD PLAN



GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS
Jul 16 2017

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ENERGY ENGINEERING

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WELLHEAD INDEX

A	TAUNUS UNIT 3H
B	TAUNUS UNIT 2H
C	TAUNUS UNIT 1H
D	SMITHERS UNIT 2H
E	SMITHERS UNIT 1H
F	JIMMY UNIT 3H
G	JIMMY UNIT 2H
H	JIMMY UNIT 1H
I	BUFFETT UNIT 2H
J	BUFFETT UNIT 1H

DATE	REVISION
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Antero
RESOURCES CORPORATION

THIS DOCUMENT WAS PREPARED FOR:
ANTERO RESOURCES CORPORATION

ACCESS ROAD & WELL PAD PLAN

STRICKLING

WELL PAD & WATER CONTAINMENT PAD

WEST UNION DISTRICT
DODDRIDGE COUNTY, WEST VIRGINIA

REGISTERED PROFESSIONAL ENGINEER
STATE OF WEST VIRGINIA
19578
08/04/2016

DATE: 06/23/2014
SCALE: 1" = 50'
SHEET 10 OF 28

07/14/2017