

west virginia department of environmental protection

Office of Oil and Gas 601 57th Street SE Charleston, WV 25304 (304) 926-0450 (304) 926-0452 fax Earl Ray Tomblin, Governor Randy C. Huffman, Cabinet Secretary www.dep.wv.gov

January 05, 2015

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706634, issued to ANTERO RESOURCES CORPORATION, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

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

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

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin

Chief

Operator's Well No: TRIPEL UNIT 3H

Farm Name: STEWART, RANDALL & CAROLY

API Well Number: 47-1706634

Permit Type: Horizontal 6A Well

Date Issued: 01/05/2015

PERMIT CONDITIONS

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

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 fifty (50) 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. 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.
- 8. 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.
- 9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW-6B (9/13)

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

1) Well Operator: Ar	ntero Resources Corporation	494488557	017 - Doddridge	New Milton	New Milton	1
,		Operator ID	County	District	Quadrangle	48
2) Operator's Well No	umber: Tripel Unit 3H	Well Pad	Name: Existir	g Stewart	Pad	_
3) Farm Name/Surfac	ce Owner: Randall & Carolyn S. S	Stewart Public Roa	d Access: CR	56		_
4) Elevation, current g	ground: 1,332' Ele	evation, proposed p	post-construction	on; 1,332'		
5) Well Type (a) Ga		Unde	erground Storag	е		-
Other	***************************************					_
(b)If (Deep	\$1000 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 -		12-14	1014
6) Existing Pad: Yes of					14	1
	ormation(s), Depth(s), Anticip	nated Thickness a	nd Associated I	Praccurate).	10	
	600' TVD, Anticipated Thickness-					
8) Proposed Total Ver	rtical Depth: 7,600'	,			- W	<u>Ir</u>
9) Formation at Total		hale		4		_
10) Proposed Total M	feasured Depth: 19,500'					æ.
11) Proposed Horizon	ntal Leg Length: 11,358'					
12) Approximate Fres	sh Water Strata Depths:	420'				#:
13) Method to Determ	nine Fresh Water Depths: De	orothy Unit 2H (API	# 47-017-06244)	on same pa	d.	P 23
14) Approximate Salts	water Depths: 2345'	- 11				
15) Approximate Coal	al Seam Depths: 825', 945', 11	167', 1776'				
16) Approximate Dep	oth to Possible Void (coal min	ne, karst, other): N	None anticipated.			-
17) Doog Branged wa	ell location contain coal seam		-14			
and the second of the control of the second	adjacent to an active mine?	Yes	No			
(a) If Yes, provide M	Jine Info: Name:	•				
(a) If Tes, provide iv	Depth:					•
	Seam:				· · · · · · · · · · · · · · · · · · ·	
	Owner:	***************************************				-
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18)

CASING AND TUBING PROGRAM

TYPE	Size	New	Grade	Weight per ft.	FOOTAGE: For	INTERVALS:	CEMENT:
		or Used		<u>(lb/ft)</u>	Drilling	Left in Well	Fill-up (Cu. Ft.)
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#	475'	475'	CTS, 660 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2,485'	2,485'	CTS, 1,012 Cu. Ft.
Intermediate						, , , , , , , , , , , , , , , , , , ,	
Production	5-1/2"	New	P-110	20#	19,500'	19,500'	4,959 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7,100	
Liners							

JO-14-2014

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						****

PACKERS

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

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:	
Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.	
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."	
21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres):	
22) Area to be disturbed for well pad only, less access road (acres): 5.14 Existing Acres	
23) Describe centralizer placement for each casing string:	
Conductor: no centralizers Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface. Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface. Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.	
24) Describe all cement additives associated with each cement type:	

25) Proposed borehole conditioning procedures:

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

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

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

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

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

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

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Office *Note: Attach additional sheets as needed.

Conductor: no additives, Class A cement.

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WW-9 (9/13)

API Number 47 -	017	-
Operator's	Well No.	Tripel 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 494488557
Watershed (HUC 10) Indian Fork Quadrang	le New Milton
Elevation 1332' County Doddridge	District New Milton
Do you anticipate using more than 5,000 bbls of water to complete the propose Will a pit be used? Yes No V	ed well work? Yes No No
If so, please describe anticipated pit waste: No pit will be used at this site (Drill	ing 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:	000
Land Application Underground Injection (UIC Permit Number Reuse (at API Number Future permitted well locations when Off Site Disposal (Supply form WW-9 for disposal Other (Explain	
Will closed loop system be used? If so, describe: Yes	
Drilling medium anticipated for this well (vertical and horizontal)? Air, freshv	Surface - Ale/Freshwater, Intermediate - Water, oil based, etc. Durt/Stiff Form, Production - Water Sared Mud
-If oil based, what type? Synthetic, petroleum, etc. N/A	and the first received on the state of
Additives to be used in drilling medium? Please See Attachment	
,	red in tanks removed effects and taken to lendfill
Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Stor	
-If left in pit and plan to solidify what medium will be used? (cement	
-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SW	F-1032-98)
I certify that I understand and agree to the terms and conditions of the on August I, 2005, by the Office of Oil and Gas of the West Virginia Departm provisions of the permit are enforceable by law. Violations of any term or claw or regulation can lead to enforcement action. I certify under penalty of law that I have personally examined and application form and all attachments thereto and that, based on my inqui obtaining the information, I believe that the information is true, accurate, appenalties for submitting false information, including the possibility of fine or in	tent of Environmental Protection. I understand that the condition of the general permit and/or other applicable and familiar with the information submitted on this try of those individuals immediately responsible for and complete. I am aware that there are significant imprisonment.
Company Official Signature	NOTARY PUBLIC
Company Official (Typed Name) Cole Kilstrom	NO- OF COLOBADO
Company Official Title Environmental Representative	MY COMMISSION EXPIRES JULY 2T 2018
Subscribed and sworn before me this 29th day of September	RECEIVED Office of Oil and Gas
~V/1 11 Z1 . 1 111 . 11 0 11 Z	
XWW Commission expires: July 21, 2018	Notary Public 007 1 7 2014
My commission expires	OCT 1 7 2014
My commission expires	Notary Public

Proposed Revegetation Trea	tment: Acres Disturbed 28.23	Existing Acres Prevegetation pH	
~ 4	Tons/acre or to correct to pl		
Fertilizer type Hay	or straw or Wood Fiber (will be used	where needed)	
Fertilizer amount_5	500	bs/acre	
Mulch 2-3 Mulch Area (0.56) + Existing Access Road (16.2)	Tons/ 6) + Existing Water Tank Pad Road (2.51) + Existing w	acre ell Pad (5.14) + Existing Water Tank Pad (1.72) + Existing Spoil I	Pad E (0.88)) + Existing Spoil Pad D (1.16) = 28.
		d Mixtures	
Te	mporary	Permane	nt
Seed Type Tall Fescue	lbs/acre 45	Seed Type Tall Fescue	lbs/acre 45
Perennial Rye Gra	ass 20	Perennial Rye Grass	20
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ttach: brawing(s) of road, location, rovided)		*or type of grass seed request	
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Form WW-9 Additives Attachment

SURFACE INTERVAL

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

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

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

PRODUCTION INTERVAL

1. Alpha 1655

Salt Inhibitor

2. Mil-Carb

Calcium Carbonate

3. Cottonseed Hulls

Cellulose-Cottonseed Pellets – LCM

4. Mil-Seal

Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM

5. Clay-Trol

Amine Acid Complex - Shale Stabilizer

6. Xan-Plex

Viscosifier For Water Based Muds

7. Mil-Pac (All Grades)

Sodium Carboxymethylcellulose – Filtration Control Agent

8. New Drill

Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer

9. Caustic Soda

Sodium Hydroxide – Alkalinity Control

10. Mil-Lime

Calcium Hydroxide – Lime

11. LD-9

Polyether Polyol – Drilling Fluid Defoamer

12. Mil Mica

Hydro-Biotite Mica – LCM

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Drilling Fluild Solvent - Aliphatic Hydrocarbon

14. Ligco

Highly Oxidized Leonardite - Filteration 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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WV Department of Environmental Protection 01/09/2015



Well Site Safety Plan Antero Resources

Well Name: Cross Unit 1H, Cross Unit 2H, Dorothy Unit 1H,

Dorothy Unit 2H, Randall Unit 1H, Randall Unit 2H, Swiger Unit 1H, Swiger Unit 2H, Tripel Unit

1H, Tripel Unit 2H, Tripel Unit 3H

Pad Location: STEWART PAD

Doddridge County/ New Milton District

GPS Coordinates: Lat 39°11′18.89″/Long 80°39′41.13″ (NAD83)

Driving Directions:

From the intersection of US-50 and W Virginia 18 S near the town of West Union head south on 18 S for 6.8 miles. Turn left onto CO Route 25/Meathouse Fork 3.3 miles. Turn right onto Co Route 56/ Brushy Fork 2.0 miles. Turn left onto lease road, pad about 1 mile up the lease road on right.

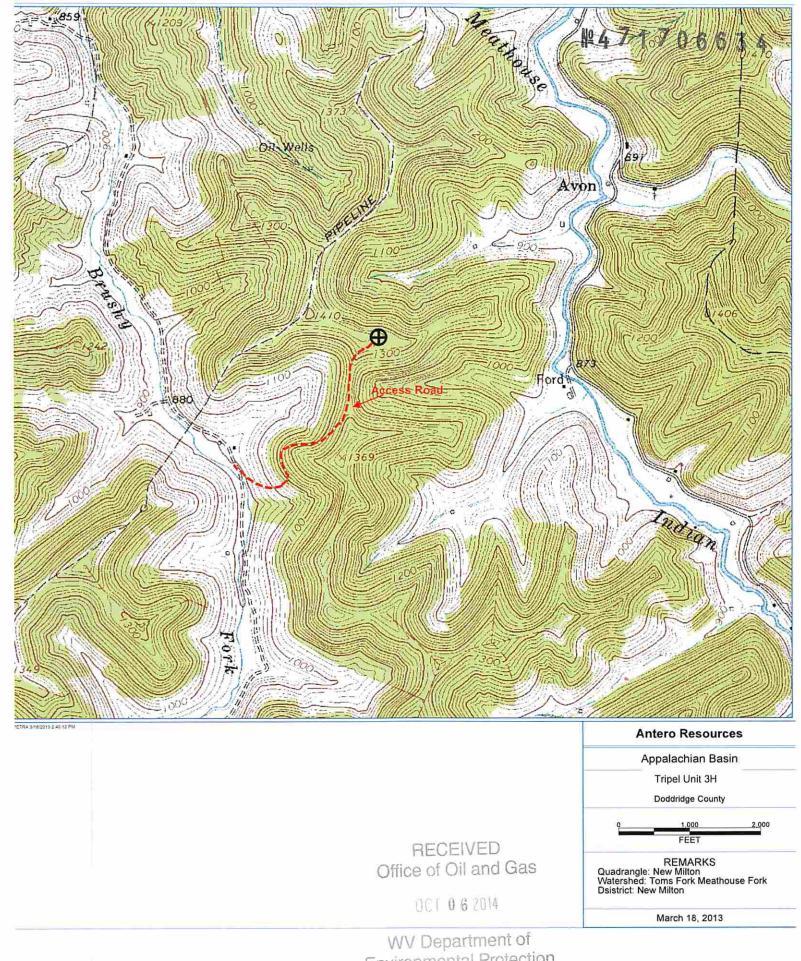
EMERGENCY (24 HOUR) CONTACT 1-800-878-1373

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