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State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 033 - 05619-RB County Harrison District Tenmile
Quad Wolf Summit Pad Name Southern Pad Field/Pool Name
Farm name Southern, Edgar Well Number Cottrill Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,346,399.932m Easting 544,928.576m
Landing Point of Curve Northing 4,346,154.95m Easting 544,798.46m
Bottom Hole Northing 4,344,913.600m Easting 545,195.232m

Elevation (ft) 1,175' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other ___

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL □ Oil □ Other ___
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole □ Air ■ Mud □ Fresh Water □ Brine

Mud Type(s) and Additive(s)
Air- Foam & 4% KCL
Mud- Polymer

Date permit issued 05/24/2012 Date drilling commenced 10/25/2012 Date drilling ceased 03/04/2013
Date completion activities began 03/12/2013 Date completion activities ceased 03/29/2013
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 202' Open mine(s) (Y/N) depths Y
Salt water depth(s) ft None Available Void(s) encountered (Y/N) depths Y, 229'-234'
Coal depth(s) ft 687' Cavern(s) encountered (Y/N) depths None
Is coal being mined in area (Y/N) Yes - Sycamore Creek Mine

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Reviewed by:
Sam Ward

APPROVED
NAME: Jacqualin Thornton
DATE: 4/11/2017

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05/26/2017
05/25/17

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API 47- 033 - 05619-RB Farm name Southern, Edgar Well number Cottrill Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30"	26"	71'	New	136#; J-55	N/A	Yes
Surface	24"	18 5/8"	192'	New	87.5#; J-55	N/A	Yes
Surface	17 1/2"	13 3/8"	295'	New	48#; J-55	N/A	Yes
Intermediate 1	12 1/4"	9 5/8"	2,593'	New	36#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	11,970'	New	20#; P-110	N/A	Yes
Tubing		2 3/8"	7,099'		4.7#; N-80	N/A	
Packer type and depth set		N/A					

Comment Details *Antero drilled a replacement borehole due to void encountered while drilling offset Cottrill Unit 3H well. 13-3/8" cement - 289 sx Class A - no returns to surface. Perf 8 holes @ 245', Cement Squeeze #1 - 835 sx Class A - no returns, Cement Squeeze #2 - 835 sx Class A - no returns. Notified Inspector Tristan Jenkins and ran Bond Log. 120 sx Grout from 180' to surface. Set Cement Retainer @ 200' and Cement Squeeze #3 - 66 sx Class A. Pressure test 1000#PSI held 30 min on 11/10/212.

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	145 sx	15.6	1.18	68	0'	8 Hrs.
Surface	Class A	404 sx	15.6	1.18	133	0'	8 Hrs.
Surface	Class A	*See Comments	15.6	1.18	205	*See Comments	8 Hrs. +
Intermediate 1	Class A	962 sx	15.6	1.18	812	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	949 sx (Lead); 830 sx (Tail)	14.2 (Lead); 15.2 (Tail)	1.44 (Lead); 1.8 (Tail)	2,263	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 11,970' MD, 6,918' TVD (BHL); 7,027' TVD (Deepest Point Drilled) Loggers TD (ft) 7080' (CBL)

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6,347'

Check all wireline logs run ** ☐ caliper ☐ density ☐ deviated/directional ☐ induction ☐ neutron ☐ resistivity ☐ gamma ray ☐ temperature ☐ sonic

**This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Cottrill Unit 3H, API #47-033-05602). Please reference the wireline logs submitted with Form WR-35 for the Cottrill Unit 3H. A Cement Bond Log has been included with this submittal.

Well cored ☐ Yes ■ No Conventional Sidewall Were cuttings collected ☐ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Conductor- 0
Surface- 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
Surface- 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
Intermediate- 1 above float joint, 1 above float collar, 1 every 4th joint to surface
Production- 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE ☐ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? ☐ Yes ■ No DETAILS

WERE TRACERS USED ■ Yes ☐ No TYPE OF TRACER(S) USED RA; Chemical

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API 47- 033 - 05619-RB Farm name Southern, Edgar Well number Cottrill Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

* PLEASE SEE ATTACHED EXHIBIT 1

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)

* PLEASE SEE ATTACHED EXHIBIT 2

Please insert additional pages as applicable.

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API 47- 033 - 05619-RB Farm name Southern, Edgar Well number Cottrill Unit 1H

PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6983' (TOP)	TVD	7,441' (TOP)	MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3,600 psi Bottom Hole 3,600 psi DURATION OF TEST ---------- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	4,331 mcfpd	------- bpd	---------- bpd	622 bpd	☐ Estimated ■ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		

*** PLEASE SEE ATTACHED EXHIBIT 3**

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Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling, LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Allied Oil & Gas Services, LLC
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301
Please insert additional pages as applicable.

Completed by Ashlie Steele Telephone 303-357-7310
Signature Ashlie Steele Title Permitting Supervisor Date 04/06/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

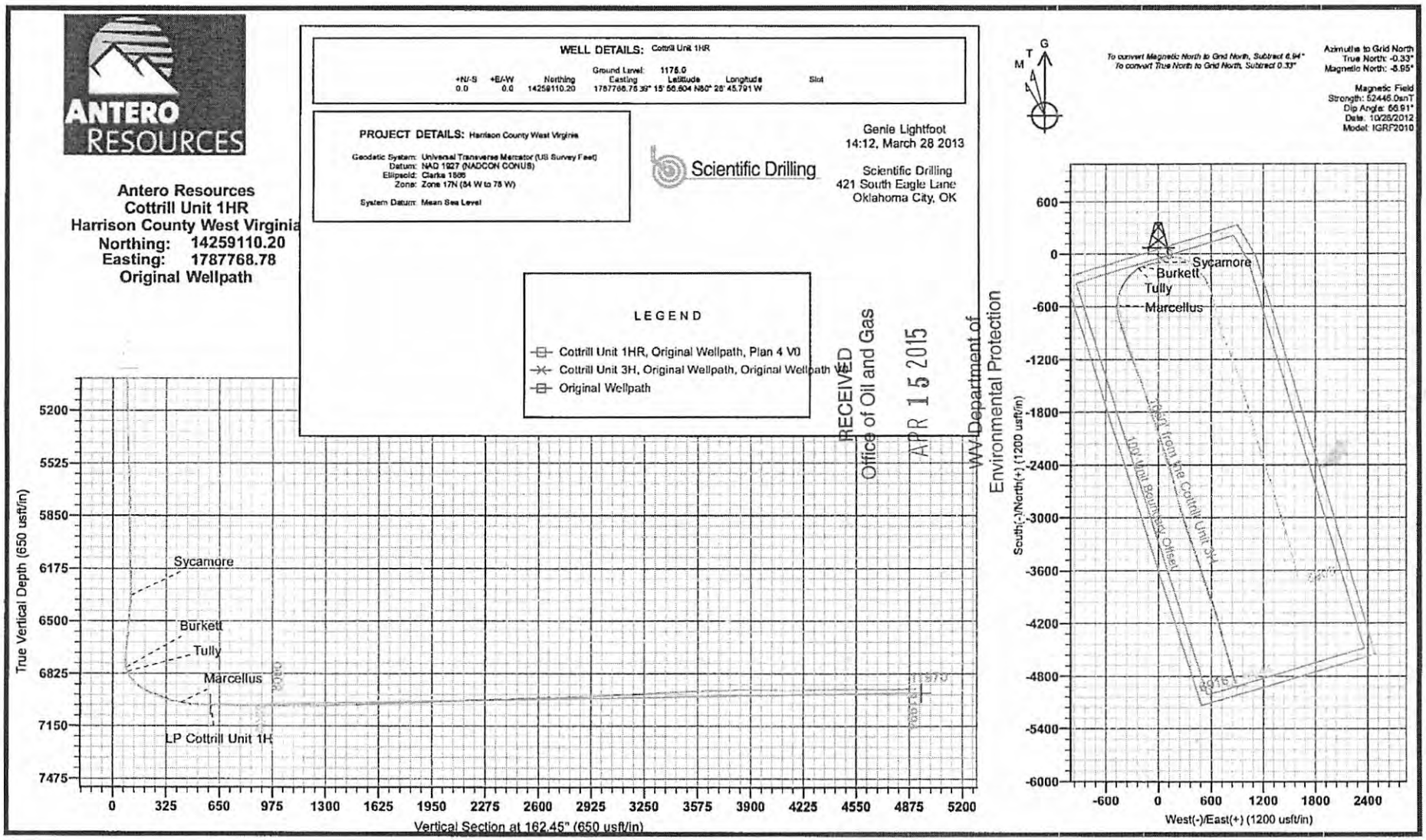
05/26/2017

API 47-033-05619-RB Farm Name Southern, Edgar Well Number Cottrill Unit 1H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12-Mar-13	11,616	11,915	60	Marcellus
2	17-Mar-13	11,203	11,502	60	Marcellus
3	18-Mar-13	10,790	11,089	60	Marcellus
4	18-Mar-13	10,377	10,675	60	Marcellus
5	19-Mar-13	9,963	10,262	60	Marcellus
6	19-Mar-13	9,550	9,849	60	Marcellus
7	19-Mar-13	9,137	9,436	60	Marcellus
8	20-Mar-13	8,724	9,022	60	Marcellus
9	20-Mar-13	8,310	8,609	60	Marcellus
10	20-Mar-13	7,897	8,196	60	Marcellus
11	20-Mar-13	7,484	7,783	60	Marcellus

API 47-033-05619-RB Farm Name Southern, Edgar Well Number Cottrill Unit 1H								
EXHIBIT 2								
Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	17-Mar-13	69.0	7,560	6,270	5,364	388,767	10,466	N/A
2	18-Mar-13	69.0	7,503	6,465	5,052	460,115	11,805	N/A
3	18-Mar-13	72.0	7,192	5,680	4,737	460,002	10,857	N/A
4	18-Mar-13	74.0	7,285	5,945	4,833	458,547	11,009	N/A
5	19-Mar-13	72.0	7,010	5,859	4,530	458,981	10,557	N/A
6	19-Mar-13	72.0	6,713	5,460	4,671	461,030	10,478	N/A
7	20-Mar-13	68.0	7,500	5,747	5,598	459,899	11,879	N/A
8	20-Mar-13	72.0	7,146	5,852	4,764	462,458	10,839	N/A
9	20-Mar-13	71.0	6,797	5,707	4,090	460,087	10,177	N/A
10	20-Mar-13	72.0	6,799	5,471	4,212	464,579	9,884	N/A
11	21-Mar-13	73.0	6,324	4,538	4,266	490,364	11,089	N/A
	AVG=	**71**	**7,075**	**5,727**	**4,738**	**5,024,829**	**119,040**	TOTAL

API 47-033-05619-RB Farm Name Southern, Edgar Well Number Cottrill Unit 1H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	**TOP DEPTH (TVD) From Surface**	**BOTTOM DEPTH (TVD) From Surface**	**TOP DEPTH (MD) From Surface**	**BOTTOM DEPTH (MD) From Surface**
Fresh Water	202	N/A	202	N/A
Siltstone	est 0	17	est 0	17
Siltstone w/Trace Coal	est 17	267	est 17	267
Sand/Siltstone	est 267	687	est 267	687
Coal	est 687	747	est 687	747
Siltstone w/Trace Coal	est 747	867	est 747	867
Sandstone	est 867	927	est 867	927
Shale	est 927	1,207	est 927	1,207
Shale/ Siltstone	est 1207	1,417	est 1207	1,417
Shale	est 1417	1,523	est 1417	1,523
Big Lime	est 1523	1,604	est 1523	1,604
Big Injun	est 1604	2,037	est 1604	2,037
Gantz Sand	est 2037	2,145	est 2037	2,145
Fifty Foot Sandstone	est 2145	2,253	est 2145	2,253
Gordon	est 2253	2,557	est 2253	2,557
Fifth Sandstone	est 2557	2,603	est 2557	2,603
Bayard	est 2603	2,979	est 2603	2,979
Warren	est 2979	3,248	est 2979	3,249
Speechley	est 3248	3,799	est 3248	3,799
Baltown	est 3799	4,131	est 3799	4,131
Bradford	est 4131	4,620	est 4131	4,621
Benson	4,620	4,916	4,621	4,917
Alexander	4,916	5,116	4,917	5,117
Elk	5,116	5,791	5,117	5,792
Rhinestreet	5,791	6,320	5,792	6,322
Sycamore	6,320	6,532	6,322	6,546
Middlesex	6,532	6,762	6,546	6,854
Burkett	6,762	6,788	6,854	6,898
Tully	6,788	6,983	6,898	7,441
Marcellus	6,983	NA	7,441	NA

*Please note Antero determines formation tops based on mud and wireline logs that are only run on one well on a multi-well pad (Please reference Cottrill Unit 3H API# 47-033-05602). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.


ANTERO RESOURCES
Antero Resources
Cottrill Unit 1HR
Harrison County West Virginia
Northing: 14259110.20
Easting: 1787768.78
Original Wellpath
WELL DETAILS: Cottrill Unit 1HR
Ground Level: 1176.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 14259110.20 1787768.78 39° 15' 56.604 N 80° 28' 45.791 W
PROJECT DETAILS: Harrison County West Virginia
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level
Scientific Drilling
Genie Lightfoot
14:12, March 28 2013
Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK
LEGEND
Cottrill Unit 1HR, Original Wellpath, Plan 4 V0
Cottrill Unit 3H, Original Wellpath, Original Wellpath V0
Original Wellpath
To convert Magnetic North to Grid North, Subtract 6.94°
To convert True North to Grid North, Subtract 0.33°
Azimuths to Grid North
True North: -0.33°
Magnetic North: -6.95°
Magnetic Field
Strength: 52446.0snT
Dip Angle: 66.91°
Date: 10/26/2012
Model: IGRF2010
True Vertical Depth (650 usft/in)
Vertical Section at 162.45° (650 usft/in)
Sycamore
Burkett
Tully
Marcellus
LP Cottrill Unit 1H
South(-)/North(+) (1200 usft/in)
West(-)/East(+) (1200 usft/in)
100' from the Cottrill Unit 3H
100' Unit Boundary Offset
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Antero Resources

Harrison County West Virginia
Cottrill Pad
Cottrill Unit 1HR
Original Wellpath

Design: Original Wellpath

EOW Completion Report

28 March, 2013

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Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Project	Harrison County West Virginia, Harrison County, USA		
Map System:	Universal Transverse Mercator (US Survey Fee	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site Cottrill Pad

Site Position:		**Northing:**	14,259,106.85 usft	**Latitude:**	39° 15' 56.572 N
From:	Map	**Easting:**	1,787,759.35 usft	**Longitude:**	80° 28' 45.912 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.33 °

Well Cottrill Unit 1HR

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,259,110.20 usft	**Latitude:**	39° 15' 56.604 N
	+E/-W	0.0 usft	**Easting:**	1,787,768.78 usft	**Longitude:**	80° 28' 45.791 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,188.0 usft	**Ground Level:**	1,175.0 usft

Wellbore Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/28/2012	-8.62	66.91	52,446

Design Original Wellpath

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	162.45

Survey Program **Date** 3/28/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
63.0	6,215.0	Survey #3 Def Gyro to KOP (Original Well	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
6,252.0	11,970.0	Survey #4 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard vec 1.0.1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
63.0	0.31	119.12	63.0	-0.1	0.1	0.1	0.49
113.0	0.73	144.86	113.0	-0.4	0.5	0.5	0.94
163.0	1.50	154.53	163.0	-1.3	0.9	1.5	1.58
213.0	1.78	157.90	213.0	-2.6	1.5	2.9	0.59
263.0	1.71	158.94	262.9	-4.0	2.0	4.4	0.15
313.0	1.43	163.24	312.9	-5.3	2.5	5.8	0.61
363.0	1.59	158.84	362.9	-6.5	2.9	7.1	0.39
413.0	1.42	161.91	412.9	-7.8	3.4	8.4	0.38
463.0	1.37	160.91	462.9	-8.9	3.8	9.6	0.11
513.0	1.34	161.25	512.9	-10.0	4.1	10.8	0.06

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
563.0	1.20	161.60	562.8	-11.1	4.5	11.9	0.28
613.0	1.21	161.89	612.8	-12.1	4.8	13.0	0.02
663.0	1.21	161.44	662.8	-13.1	5.2	14.0	0.02
713.0	1.21	160.39	712.8	-14.1	5.5	15.1	0.04
763.0	1.19	161.38	762.8	-15.1	5.8	16.1	0.06
813.0	1.22	160.04	812.8	-16.1	6.2	17.2	0.08
863.0	1.21	159.05	862.8	-17.1	6.6	18.2	0.05
913.0	1.30	159.68	912.8	-18.1	6.9	19.3	0.18
963.0	1.17	161.04	962.8	-19.1	7.3	20.4	0.27
1,013.0	1.18	156.23	1,012.7	-20.0	7.7	21.4	0.20
1,063.0	1.02	157.96	1,062.7	-20.9	8.1	22.4	0.33
1,113.0	1.02	155.04	1,112.7	-21.7	8.4	23.3	0.10
1,163.0	0.97	156.64	1,162.7	-22.5	8.8	24.1	0.11
1,213.0	1.00	152.65	1,212.7	-23.3	9.1	25.0	0.15
1,263.0	1.02	150.88	1,262.7	-24.1	9.6	25.9	0.07
1,313.0	1.06	153.47	1,312.7	-24.9	10.0	26.7	0.12
1,363.0	1.00	155.55	1,362.7	-25.7	10.4	27.6	0.14
1,413.0	1.05	148.77	1,412.7	-26.5	10.8	28.5	0.26
1,463.0	0.96	155.16	1,462.7	-27.3	11.2	29.4	0.29
1,513.0	0.93	154.54	1,512.7	-28.0	11.5	30.2	0.06
1,563.0	0.94	155.12	1,562.7	-28.8	11.9	31.0	0.03
1,613.0	0.90	150.76	1,612.7	-29.5	12.3	31.8	0.16
1,663.0	0.68	155.00	1,662.7	-30.1	12.6	32.5	0.45
1,713.0	0.73	148.67	1,712.6	-30.6	12.9	33.1	0.18
1,763.0	0.61	153.11	1,762.6	-31.1	13.2	33.6	0.26
1,813.0	0.63	150.30	1,812.6	-31.6	13.4	34.2	0.07
1,863.0	0.65	141.61	1,862.6	-32.1	13.7	34.7	0.20
1,913.0	0.67	141.21	1,912.6	-32.5	14.1	35.2	0.04
1,963.0	0.68	146.91	1,962.6	-33.0	14.4	35.8	0.14
2,013.0	0.73	141.73	2,012.6	-33.5	14.8	36.4	0.16
2,063.0	0.66	145.03	2,062.6	-34.0	15.1	37.0	0.16
2,113.0	0.72	143.55	2,112.6	-34.5	15.5	37.5	0.13
2,163.0	0.77	140.49	2,162.6	-35.0	15.9	38.1	0.13
2,213.0	0.71	139.31	2,212.6	-35.5	16.3	38.7	0.12
2,263.0	0.89	143.05	2,262.6	-36.0	16.8	39.4	0.37
2,313.0	0.84	140.66	2,312.6	-36.6	17.2	40.1	0.12
2,363.0	0.75	140.63	2,362.6	-37.1	17.7	40.7	0.18
2,413.0	0.86	141.74	2,412.6	-37.7	18.1	41.4	0.22
2,463.0	0.90	142.90	2,462.6	-38.3	18.6	42.1	0.09
2,513.0	0.89	140.99	2,512.6	-38.9	19.0	42.9	0.06
2,563.0	0.92	146.31	2,562.6	-39.6	19.5	43.6	0.18
2,592.0	1.02	136.67	2,591.6	-39.9	19.8	44.1	0.66
2,613.0	0.84	144.88	2,612.6	-40.2	20.0	44.4	1.06
2,663.0	0.89	140.61	2,662.6	-40.8	20.5	45.1	0.16

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,713.0	0.95	141.46	2,712.6	-41.4	21.0	45.8	0.12
2,763.0	0.92	138.53	2,762.5	-42.0	21.5	46.6	0.11
2,813.0	0.94	137.79	2,812.5	-42.7	22.1	47.3	0.05
2,863.0	0.94	138.32	2,862.5	-43.3	22.6	48.1	0.02
2,913.0	0.98	137.91	2,912.5	-43.9	23.2	48.8	0.08
2,963.0	1.02	134.90	2,962.5	-44.5	23.8	49.6	0.13
3,013.0	1.03	135.85	3,012.5	-45.2	24.4	50.4	0.04
3,063.0	1.07	133.09	3,062.5	-45.8	25.1	51.2	0.13
3,113.0	1.09	132.26	3,112.5	-46.4	25.7	52.0	0.05
3,163.0	1.02	134.04	3,162.5	-47.1	26.4	52.8	0.15
3,213.0	0.99	136.99	3,212.5	-47.7	27.0	53.6	0.12
3,263.0	0.99	135.22	3,262.5	-48.3	27.6	54.4	0.06
3,313.0	1.04	135.11	3,312.5	-48.9	28.3	55.2	0.10
3,363.0	0.99	133.91	3,362.5	-49.6	28.9	56.0	0.11
3,413.0	1.03	135.43	3,412.4	-50.2	29.5	56.7	0.10
3,463.0	0.91	134.69	3,462.4	-50.8	30.1	57.5	0.24
3,513.0	0.93	135.33	3,512.4	-51.3	30.7	58.2	0.04
3,563.0	0.95	137.22	3,562.4	-51.9	31.2	58.9	0.07
3,613.0	0.93	135.71	3,612.4	-52.5	31.8	59.7	0.06
3,663.0	0.94	137.28	3,662.4	-53.1	32.4	60.4	0.06
3,713.0	1.01	136.74	3,712.4	-53.7	33.0	61.2	0.14
3,763.0	0.96	135.25	3,762.4	-54.4	33.6	62.0	0.11
3,813.0	1.01	135.96	3,812.4	-55.0	34.2	62.7	0.10
3,863.0	1.03	135.90	3,862.4	-55.6	34.8	63.5	0.04
3,913.0	1.06	137.09	3,912.4	-56.3	35.4	64.3	0.07
3,963.0	1.02	140.73	3,962.4	-57.0	36.0	65.2	0.15
4,013.0	1.07	140.04	4,012.4	-57.7	36.6	66.0	0.10
4,063.0	1.05	137.23	4,062.4	-58.4	37.2	66.9	0.11
4,113.0	1.08	137.44	4,112.3	-59.0	37.8	67.7	0.06
4,163.0	1.10	135.17	4,162.3	-59.7	38.5	68.6	0.10
4,213.0	1.20	136.88	4,212.3	-60.5	39.2	69.5	0.21
4,263.0	1.25	137.08	4,262.3	-61.2	39.9	70.4	0.10
4,313.0	1.33	134.69	4,312.3	-62.0	40.7	71.4	0.19
4,363.0	1.32	133.49	4,362.3	-62.8	41.5	72.4	0.06
4,413.0	1.40	133.02	4,412.3	-63.7	42.4	73.5	0.16
4,463.0	1.41	132.27	4,462.3	-64.5	43.3	74.5	0.04
4,513.0	1.46	132.59	4,512.2	-65.3	44.2	75.6	0.10
4,563.0	1.55	132.67	4,562.2	-66.2	45.2	76.8	0.18
4,613.0	1.56	132.04	4,612.2	-67.1	46.2	77.9	0.04
4,663.0	1.61	131.61	4,662.2	-68.1	47.2	79.1	0.10
4,713.0	1.57	133.51	4,712.2	-69.0	48.2	80.3	0.13
4,763.0	1.60	134.99	4,762.1	-70.0	49.2	81.5	0.10
4,813.0	1.57	135.26	4,812.1	-70.9	50.2	82.8	0.06
4,863.0	1.56	133.14	4,862.1	-71.9	51.2	84.0	0.12
4,913.0	1.49	135.00	4,912.1	-72.8	52.1	85.2	0.17

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
4,963.0	1.51	134.44	4,962.1	-73.7	53.1	86.3	0.05
5,013.0	1.50	133.63	5,012.1	-74.7	54.0	87.5	0.05
5,063.0	1.49	133.08	5,062.0	-75.6	55.0	88.6	0.03
5,113.0	1.49	134.74	5,112.0	-76.5	55.9	89.7	0.09
5,163.0	1.54	133.77	5,162.0	-77.4	56.8	90.9	0.11
5,213.0	1.53	135.59	5,212.0	-78.3	57.8	92.1	0.10
5,263.0	1.63	137.15	5,262.0	-79.3	58.7	93.3	0.22
5,313.0	1.61	135.57	5,311.9	-80.3	59.7	94.6	0.10
5,363.0	1.54	137.02	5,361.9	-81.3	60.7	95.8	0.16
5,413.0	1.39	136.13	5,411.9	-82.3	61.5	97.0	0.30
5,463.0	1.35	133.08	5,461.9	-83.1	62.4	98.0	0.17
5,513.0	1.15	131.96	5,511.9	-83.8	63.2	99.0	0.40
5,563.0	1.11	129.06	5,561.9	-84.5	63.9	99.8	0.14
5,613.0	0.90	129.47	5,611.9	-85.0	64.6	100.6	0.42
5,663.0	0.85	123.61	5,661.9	-85.5	65.2	101.2	0.20
5,713.0	0.91	122.38	5,711.9	-85.9	65.9	101.8	0.13
5,763.0	1.00	122.51	5,761.9	-86.4	66.6	102.4	0.18
5,813.0	1.10	128.66	5,811.8	-86.9	67.3	103.1	0.30
5,863.0	0.91	136.86	5,861.8	-87.5	68.0	103.9	0.48
5,913.0	0.80	125.00	5,911.8	-88.0	68.5	104.5	0.42
5,963.0	0.78	140.91	5,961.8	-88.4	69.0	105.1	0.44
6,013.0	0.98	139.09	6,011.8	-89.0	69.5	105.8	0.40
6,063.0	0.83	132.82	6,061.8	-89.6	70.1	106.5	0.36
6,113.0	0.77	133.35	6,111.8	-90.1	70.6	107.2	0.12
6,163.0	0.94	139.03	6,161.8	-90.6	71.1	107.8	0.38
6,213.0	1.01	137.88	6,211.8	-91.2	71.7	108.6	0.15
6,215.0	1.01	137.83	6,213.8	-91.3	71.7	108.6	0.04
6,252.0	0.97	133.01	6,250.8	-91.7	72.1	109.2	0.25
6,315.0	1.41	239.13	6,313.8	-92.5	71.9	109.8	3.05
6,345.0	5.39	265.00	6,343.7	-92.8	70.1	109.6	13.91
Sycamore							
6,347.0	5.67	265.42	6,345.7	-92.8	69.9	109.6	13.91
6,379.0	9.78	267.86	6,377.4	-93.0	65.6	108.5	12.88
6,411.0	13.81	265.86	6,408.7	-93.4	59.1	106.9	12.66
6,442.0	17.73	265.41	6,438.6	-94.1	50.7	105.0	12.65
6,474.0	20.84	264.29	6,468.8	-95.0	40.2	102.7	9.79
6,506.0	23.48	263.15	6,498.4	-96.3	28.2	100.4	8.36
6,538.0	25.95	264.53	6,527.5	-97.8	14.9	97.7	7.93
6,570.0	27.97	265.10	6,556.0	-99.1	0.5	94.6	6.36
6,601.0	30.36	262.01	6,583.1	-100.8	-14.6	91.7	9.11
6,632.0	32.58	259.44	6,609.5	-103.4	-30.5	89.4	8.37
6,664.0	34.80	257.44	6,636.1	-107.0	-47.9	87.6	7.75
6,696.0	38.23	257.44	6,661.8	-111.1	-66.5	85.9	10.72
6,727.0	41.46	258.05	6,685.6	-115.3	-85.9	84.1	10.50

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
6,759.0	44.81	258.60	6,709.0	-119.8	-107.3	81.8	10.53
6,791.0	47.49	256.41	6,731.1	-124.8	-129.8	79.8	9.72
6,822.0	49.78	251.17	6,751.6	-131.3	-152.2	79.3	14.68
6,854.0	52.24	246.30	6,771.8	-140.3	-175.3	80.9	14.10
6,877.0	53.28	242.95	6,785.7	-148.1	-191.9	83.4	12.43
Burkett							
6,885.0	53.66	241.81	6,790.5	-151.1	-197.6	84.5	12.43
6,917.0	55.16	238.37	6,809.1	-164.1	-220.1	90.1	9.92
6,921.0	55.35	237.93	6,811.4	-165.8	-222.9	90.9	10.27
Tully							
6,949.0	56.71	234.87	6,827.0	-178.7	-242.2	97.3	10.27
6,980.0	58.82	230.89	6,843.6	-194.5	-263.1	106.1	12.81
7,012.0	61.25	226.66	6,859.5	-212.8	-284.0	117.3	13.74
7,044.0	63.72	224.39	6,874.3	-232.7	-304.2	130.1	9.96
7,076.0	64.77	222.29	6,888.2	-253.6	-324.0	144.1	6.76
7,108.0	66.79	219.44	6,901.4	-275.7	-343.1	159.4	10.29
7,139.0	68.41	216.57	6,913.2	-298.3	-360.7	175.6	10.03
7,171.0	70.50	213.58	6,924.4	-322.8	-377.9	193.8	10.92
7,203.0	72.11	211.11	6,934.7	-348.4	-394.1	213.4	8.88
7,234.0	72.90	208.63	6,944.0	-374.0	-408.8	233.4	8.04
7,265.0	72.89	205.87	6,953.1	-400.4	-422.4	254.4	8.51
7,296.0	72.71	202.59	6,962.3	-427.4	-434.6	276.5	10.12
7,328.0	72.79	198.85	6,971.8	-456.0	-445.4	300.4	11.16
7,359.0	73.98	195.56	6,980.6	-484.3	-454.2	324.8	10.87
7,391.0	75.63	191.56	6,989.0	-514.4	-461.4	351.3	13.12
7,423.0	76.80	187.13	6,996.7	-545.0	-466.4	379.0	13.93
7,455.0	77.52	182.68	7,003.8	-576.1	-469.1	407.8	13.74
7,464.0	78.12	181.52	7,005.7	-584.9	-469.4	416.1	14.26
Marcellus							
7,486.0	79.62	178.71	7,009.9	-606.5	-469.5	436.7	14.26
7,518.0	82.37	175.04	7,014.9	-638.0	-467.7	467.3	14.22
7,550.0	84.86	170.87	7,018.5	-669.6	-463.8	498.5	15.11
7,582.0	86.97	166.91	7,020.8	-700.9	-457.7	530.2	13.99
7,608.0	88.92	164.34	7,021.7	-726.0	-451.2	556.2	12.40
7,703.0	89.77	162.19	7,022.8	-817.0	-423.9	651.2	2.43
7,798.0	89.83	162.17	7,023.1	-907.4	-394.8	746.2	0.07
7,893.0	90.23	163.15	7,023.1	-998.1	-366.5	841.2	1.11
7,988.0	88.89	160.53	7,023.8	-1,088.4	-336.9	936.1	3.10
8,082.0	88.86	159.77	7,025.6	-1,176.8	-305.0	1,030.0	0.81
8,177.0	89.90	158.84	7,026.7	-1,265.6	-271.4	1,124.9	1.47
8,272.0	90.77	157.96	7,026.1	-1,354.0	-236.4	1,219.6	1.30
8,367.0	92.82	160.07	7,023.1	-1,442.6	-202.4	1,314.4	3.10
8,463.0	91.34	159.05	7,019.7	-1,532.5	-168.9	1,410.2	1.87
8,558.0	93.02	162.37	7,016.0	-1,622.1	-137.6	1,505.1	3.91
8,653.0	91.96	162.46	7,011.9	-1,712.6	-108.9	1,600.0	1.12

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
8,749.0	91.07	159.58	7,009.4	-1,803.3	-77.7	1,695.9	3.14
8,843.0	91.99	161.19	7,006.9	-1,891.8	-46.2	1,789.8	1.97
8,939.0	92.08	162.56	7,003.5	-1,983.0	-16.3	1,885.8	1.43
9,034.0	92.22	161.77	6,999.9	-2,073.4	12.8	1,980.7	0.84
9,130.0	91.91	162.63	6,996.4	-2,164.7	42.1	2,076.6	0.95
9,225.0	91.81	160.78	6,993.3	-2,254.8	71.9	2,171.6	1.95
9,320.0	92.69	160.63	6,989.6	-2,344.4	103.3	2,266.5	0.94
9,415.0	92.63	163.93	6,985.2	-2,434.8	132.1	2,361.3	3.47
9,510.0	91.99	164.77	6,981.4	-2,526.2	157.8	2,456.2	1.11
9,605.0	92.12	167.13	6,978.0	-2,618.3	180.8	2,551.0	2.49
9,700.0	91.95	167.35	6,974.6	-2,710.9	201.8	2,645.6	0.29
9,795.0	91.68	166.08	6,971.6	-2,803.3	223.6	2,740.3	1.37
9,890.0	90.87	164.13	6,969.5	-2,895.1	248.0	2,835.1	2.22
9,985.0	92.65	162.59	6,966.6	-2,986.1	275.2	2,930.1	2.48
10,080.0	92.93	161.90	6,961.9	-3,076.4	304.1	3,025.0	0.78
10,174.0	93.23	161.11	6,956.9	-3,165.5	333.9	3,118.8	0.90
10,270.0	93.12	160.39	6,951.6	-3,256.0	365.5	3,214.6	0.76
10,460.0	92.55	160.90	6,942.2	-3,435.0	428.4	3,404.3	0.40
10,555.0	93.10	160.38	6,937.5	-3,524.5	459.8	3,499.1	0.80
10,649.0	92.59	162.15	6,932.8	-3,613.4	490.0	3,593.0	1.96
10,744.0	91.48	161.91	6,929.4	-3,703.7	519.3	3,687.9	1.20
10,839.0	91.54	161.05	6,926.9	-3,793.8	549.5	3,782.9	0.91
10,933.0	90.88	159.65	6,925.0	-3,882.3	581.1	3,876.8	1.65
11,027.0	89.36	161.92	6,924.8	-3,971.0	612.0	3,970.7	2.91
11,121.0	89.40	161.27	6,925.8	-4,060.2	641.7	4,064.7	0.69
11,217.0	90.20	163.10	6,926.1	-4,151.6	671.0	4,160.7	2.08
11,312.0	91.28	164.31	6,924.9	-4,242.8	697.7	4,255.7	1.71
11,406.0	90.50	165.14	6,923.4	-4,333.5	722.4	4,349.6	1.21
11,502.0	91.71	165.04	6,921.6	-4,426.2	747.1	4,445.5	1.26
11,598.0	89.76	164.30	6,920.3	-4,518.8	772.5	4,541.4	2.17
11,693.0	89.97	163.92	6,920.6	-4,610.1	798.5	4,636.3	0.46
11,787.0	90.17	163.83	6,920.5	-4,700.4	824.6	4,730.3	0.23
11,883.0	91.17	164.49	6,919.3	-4,792.8	850.8	4,826.3	1.25
11,918.0	90.97	163.85	6,918.7	-4,826.5	860.4	4,861.2	1.92
11,970.0	90.97	163.85	6,917.8	-4,876.4	874.8	4,913.2	0.00

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Cottrill Unit 1HR
Project:	Harrison County West Virginia	**TVD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Site:	Cottrill Pad	**MD Reference:**	Cottril Unit 1H 1175' GL + 26' KB= @ 1201.0usft
Well:	Cottrill Unit 1HR	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	Original Wellpath	**Database:**	Oklahoma District Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,345.0	6,343.7	-92.8	70.1	Sycamore
6,877.0	6,785.7	-148.1	-191.9	Burkett
6,921.0	6,811.4	-165.8	-222.9	Tully
7,464.0	7,005.7	-584.9	-469.4	Marcellus

Checked By: _____ Approved By: _____ Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/9/2013
Job End Date:	3/20/2013
State:	West Virginia
County:	Harrison
API Number:	47-033-05619-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Cottrill Unit 1HRB
Longitude:	-80.47938610
Latitude:	39.26572200
Datum:	NAD27
Federal/Tribal Well:	NO
Total Base Water Volume (gal):	4,467,708
Total Base Non Water Volume:	243,256

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

RECEIVED
Office of Oil and Gas
APR 15 2015
WV Department of
Environmental Protection

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Operator	Carrier					
			Water	7732-18-5	100.00000	87.75754	
Sand, White, 40/70	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	6.25328	
Sand, White, 20/40	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	3.93035	
Sand, White, 100 mesh	Baker Hughes	Proppant					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	1.66870	
HCl, 10.1 - 15%	Baker Hughes	Acidizing					
			Water	7732-18-5	85.00000	0.11615	
			Hydrochloric Acid	7647-01-0	15.00000	0.02050	
GW-3LDF	Baker Hughes	Gelling Agent					
			Guar Gum	9000-30-0	60.00000	0.05280	SmartCare Product
			Petroleum Distillates	64742-47-8	30.00000	0.02640	SmartCare Product
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.02640	SmartCare Product
			Cyrstalline Silica, Quartz (SiO2)	14808-60-7	5.00000	0.00440	SmartCare Product
			Isotridecanol, ethoxylated	9043-30-5	5.00000	0.00440	SmartCare Product
			1-Butoxy-2-Propanol	5131-66-8	5.00000	0.00440	SmartCare Product
FRW-18	Baker Hughes	Friction Reducer					
			Petroleum Distillates	64742-47-8	30.00000	0.01761	SmartCare Product

Enzyme G-NE	Baker Hughes	Breaker					
			Water	7732-18-5	95.00000	0.01603	
			Hemicellulase Enzyme Concentrate	9025-56-3	5.00000	0.00084	
Alpha 1427	Baker Hughes	Biocide					
			Glutaraldehyde	111-30-8	30.00000	0.00729	SmartCare Product
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00243	SmartCare Product
			Quatemary Ammonium Compound	68424-85-1	5.00000	0.00122	SmartCare Product
			Ethanol	64-17-5	5.00000	0.00122	SmartCare Product
Scaletrol 720	Baker Hughes	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00517	
			Calcium Chloride	10043-52-4	5.00000	0.00086	
Ferrotrol 300L	Baker Hughes	Iron Control					
			Citric Acid	77-92-9	60.00000	0.00053	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor					
			Polyoxyalkylenes	Trade Secret	30.00000	0.00007	
			Fatty Acids	Trade Secret	10.00000	0.00002	
			Propargyl Alcohol	107-19-7	5.00000	0.00001	
			Olefin	Trade Secret	5.00000	0.00001	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
		Other Chemicals					
			Water	7732-18-5		0.05291	
			Poly (acrylamide-co-acrylic acid)	Trade Secret		0.01761	
			Polyacrylate	Trade Secret		0.00345	
			Sorbitan Monooleate	Trade Secret		0.00294	
			Salt	Trade Secret		0.00294	
			Ethoxylated Alcohol	Trade Secret		0.00117	
			Methanol	67-56-1		0.00024	
			2-Butoxy-1-Propanol	15821-83-7		0.00007	
			Modified Thiorea Polymer	68527-49-1		0.00002	
			Potassium Chloride	7447-40-7		0.00001	
			Sodium Chloride	7647-14-5		0.00001	
			Formaldehyde	50-00-0		0.00000	
			Hydrochloric Acid	7647-01-0		0.00000	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

AS-DRILLED

Antero Resources
Well No. Cottrill Unit 1H
As-Drilled Plat
Antero Resources Corporation

5,265' to Bottom Hole

6,059' to Top Hole

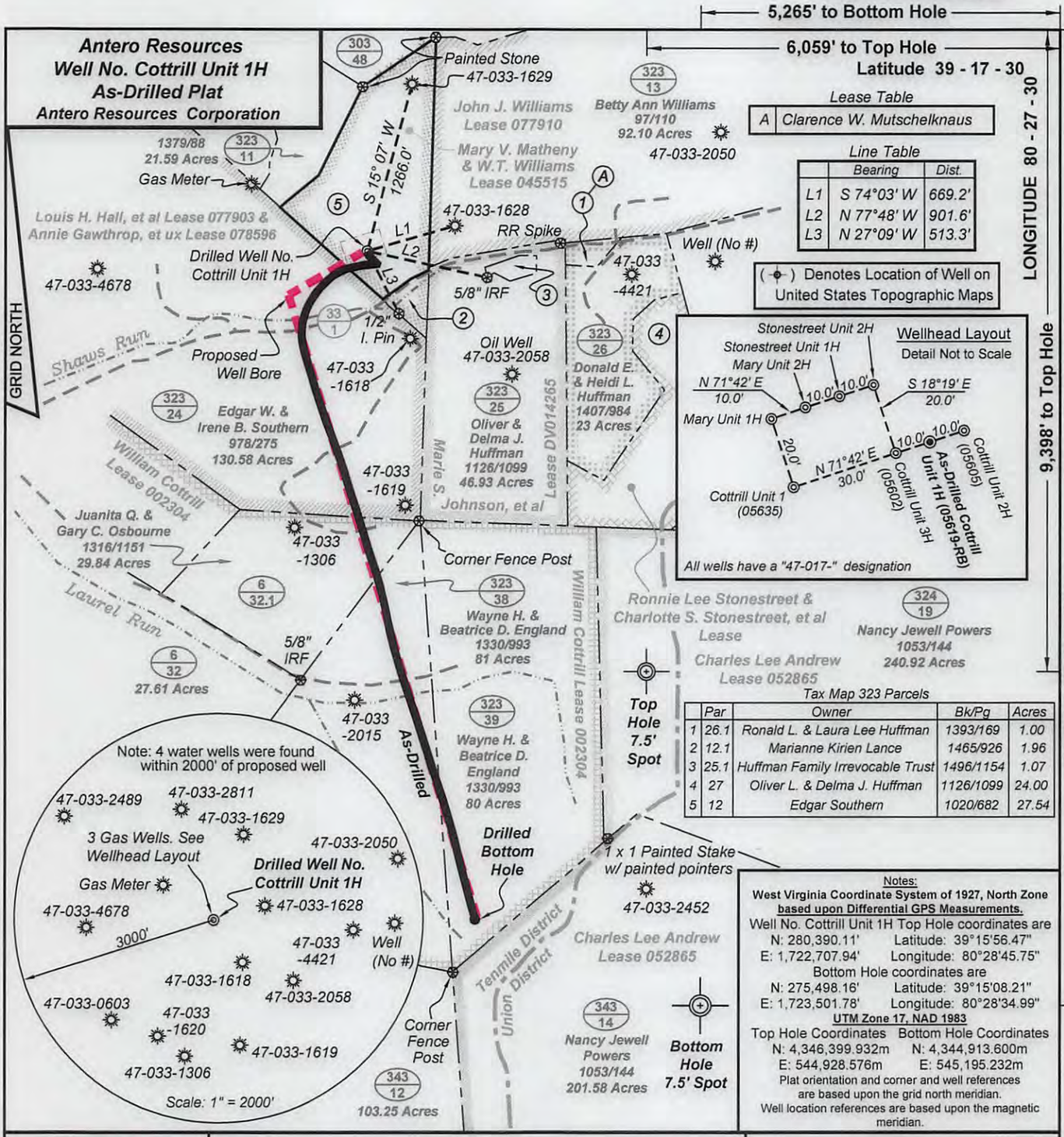
Latitude 39 - 17 - 30

LONGITUDE 80 - 27 - 30

9,398' to Top Hole

14,290' to Bottom Hole

GRID NORTH



Lease Table

A	Clarence W. Mutschelknaus

Line Table

	Bearing	Dist.
L1	S 74°03' W	669.2'
L2	N 77°48' W	901.6'
L3	N 27°09' W	513.3'

(⊕) Denotes Location of Well on United States Topographic Maps

Wellhead Layout
Detail Not to Scale

All wells have a "47-017-" designation

Tax Map 323 Parcels

	Par	Owner	Bk/Pg	Acres
1	26.1	Ronald L. & Laura Lee Huffman	1393/169	1.00
2	12.1	Marianne Kirien Lance	1465/926	1.96
3	25.1	Huffman Family Irrevocable Trust	1496/1154	1.07
4	27	Oliver L. & Delma J. Huffman	1126/1099	24.00
5	12	Edgar Southern	1020/682	27.54

Notes:

West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.

Well No. Cottrill Unit 1H Top Hole coordinates are
N: 280,390.11' Latitude: 39°15'56.47"
E: 1,722,707.94' Longitude: 80°28'45.75"
Bottom Hole coordinates are
N: 275,498.16' Latitude: 39°15'08.21"
E: 1,723,501.78' Longitude: 80°28'34.99"

UTM Zone 17, NAD 1983

Top Hole Coordinates	Bottom Hole Coordinates
N: 4,346,399.932m	N: 4,344,913.600m
E: 544,928.576m	E: 545,195.232m

Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

ALLEGHENY SURVEYS, INC.

Top Hole coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys, Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

Legend

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

FILE NO: 222-36-TM-11
DRAWING NO: Cottrill As-Drill Unit 1H
SCALE: 1" = 1000'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: CORS Glenville, WV

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

DATE: March 6 2015
OPERATOR'S WELL NO. Cottrill Unit 1H

API WELL NO
47 - 033 - 05619-RB
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION : ☐ STORAGE ☐ DEEP ☒ SHALLOW
LOCATION: ELEVATION: 1175' WATERSHED: Tenmile Creek QUADRANGLE: Wolf Summit
DISTRICT: Tenmile COUNTY: Harrison
05/26/2017
SURFACE OWNER: Edgar Southern Louis H. Hall, et al & Annie Gawthrop, et ux; ACREAGE: 27.54
ROYALTY OWNER: Mary V. Matheny & W.T. Williams; William Cottrill LEASE NO: 078596; 002304; 045515; 077903 ACREAGE: 30; 132; 330
PROPOSED WORK: ☐ DRILL ☐ CONVERT ☐ DRILL DEEPER ☐ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION
☐ PERFORATE NEW FORMATION ☒ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled
☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale DEPTH: 6,918' TVD 11,970' MD

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