WR-35
Rev (9-11)

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

DATE: 1/10/2015
API #: 47-039-02160

Farm name: Bailey, Clay and Bailey Operator Well No.: Cassie Bailey #1

LOCATION: Elevation: 650.40 Quadrangle: Pocatalico

District: Union County: Kanawha
Latitude: 14,167 Feet South of 38 Deg. 28 Min. 9.5 Sec.
Longitude 11,229 Feet West of 81 Deg. 42 Min. 57.3 Sec.

Company: Viking Energy Corp.

Address: 8113 Sissonville Dr.	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Sissonville, WV 25320	13 3/8	84'	84'	45 sacks
Agent: Michael Pinkerton	8 5/8	1777	1777'	475 sacks
Inspector: Terry Urban	5 1/2	5327'	5327'	200 sacks
Date Permit Issued: 2/18/2014				
Date Well Work Commenced: 4/7/2014				
Date Well Work Completed: 9/19/2014				
Verbal Plugging: Bridge plug				
Date Permission granted on: 2/18/2014				
Rotary ☐ Cable ☐ Rig ☐				
Total Vertical Depth (ft): 5422'				
Total Measured Depth (ft): 5422'				
Fresh Water Depth (ft.): 140'				
Salt Water Depth (ft.): 1,600'				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				
Void(s) encountered (N/Y) Depth(s) None				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)
Producing formation Oriskany Pay zone depth (ft) 5245-5295
Gas: Initial open flow 40 MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow 40 MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests 24 Hours
Static rock Pressure 110 psig (surface pressure) after 24 Hours

Second producing formation_____ Pay zone depth (ft)_____
Gas: Initial open flow_____ MCF/d Oil: Initial open flow_____ Bbl/d
Final open flow_____ MCF/d Final open flow_____ Bbl/d
Time of open flow between initial and final tests_____ Hours
Static rock Pressure_____ psig (surface pressure) after _____ Hours

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I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the 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.

Michael Pinkerton 1-10-15
Signature Date

Were core samples taken? Yes_____ No X_____ Were cuttings caught during drilling? Yes_____ No X_____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list no

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Perforated 20 shots 5245-5295

water used 589 bbl of cross link

Sand - 26'800 #'s pumped at 1-3 pound per gallon

Average pressure 4106

Average rate 21.9 barrels per min.

Acid 500 gal 15% HCl

Plug Back Details Including Plug Type and Depth(s): Bridge Plug set 5315'

Formations Encountered: Top Depth 0 / 5422 Bottom Depth
Surface:

SAND CLAY SHALE	0/55	SHALE	1777-2111
SAND	55-83	SHALE & LIME	2111-2451
SAND SHALE	83-128	SHALE	2451-4572
SHALE SAND	128-469	LIME	4572-4950
SHALEY SAND	469-528	LIME & DOLOMITE	4950-5145
SHALE	528-540	LIME & ORISKANY	5145-5315
SAND & SHALE	540-1016	LIME & SHALE	5315-5345
SHALE & SAND	1016-1053	LIME & NEWBURG	5345-5416
SAND	1053-1462	SAND	5416-5422
SHALEY SAND	1462-1475		
SAND	1475-1512		
SHALEY SAND	1512-1553		
LIME	1553-1625		
SHALE	1625-1679		
SAND & SHALE	1679-1777		

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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 - 085 - 10005 County Ritchie District Union
Quad Pullman 7.5' Pad Name Ness Pad Field/Pool Name --
Farm name Ness, Ashley E., Jr. Well Number Ireland Unit 1H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop St. 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		Easting	
Landing Point of Curve	Northing	4338227.45m	Easting	508131.45m
Bottom Hole	Northing	4336024.85m	Easting	509094.94m

Elevation (ft) 1075' 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 1/31/2013 Date drilling commenced 4/15/2013 Date drilling ceased 4/3/2014
Date completion activities began 4/12/2014 Date completion activities ceased 7/23/2014
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 62' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1620', 1838' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 456' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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API 47- 085 - 10005 Farm name Ness, Ashley E., Jr. Well number Ireland 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	28"	20"	40'	New	94# H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	392'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2535'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	15017'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6506'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details

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	203 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	499 sx	15.6	1.18	297	0'	8 Hrs.
Coal							
Intermediate 1	Class A	997 sx	15.6	1.18	805	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1001 sx (Lead) 1284 sx (Tail)	14.5 Lead 15.2 Tail	1.30 Lead 1.86 Tail	2966	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15017' MD, 6520' TVD Loggers TD (ft) 14968'

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

Plug back procedure N/A

Kick off depth (ft) 6326'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Rufus Unit 1H API #47-085-10046). Please reference the wireline logs submitted with Form WR-35 for Rufus Unit 1H. A Cement Bond Log has been included with this submittal.

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

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

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

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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

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API 47- 085 - 10005 Farm name Ness, Ashley E., Jr. Well number Ireland Unit 1H

PERFORATION RECORD

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

*PLEASE SEE 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 EXHIBIT 2

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PRODUCING FORMATION(S)	DEPTHS			
Marcellus	6418' (TOP)	TVD	6818' (TOP)	MD

Please insert additional pages as applicable.

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

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole — psi DURATION OF TEST — hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	10117 mcfpd	47 bpd	— bpd	— 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 EXHIBIT 3

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Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carolton Dr. City Eighty Four State PA Zip 15330

Logging Company Casedhole Solutions
Address 100 Arentzen Blvd. City Charleroi State PA Zip 15022

Cementing Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permitting Agent Date 1/20/2015

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

API 47-085-10005 Farm Name Ness, Ashley E., Jr. Well Number Ireland Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	12-Apr-14	14,801	14,927	60	Marcellus
2	26-May-14	14,653	14,778	60	Marcellus
3	27-May-14	14,504	14,630	60	Marcellus
4	27-May-14	14,355	14,481	60	Marcellus
5	27-May-14	14,207	14,333	60	Marcellus
6	27-May-14	14,058	14,184	60	Marcellus
7	28-May-14	13,910	14,036	60	Marcellus
8	28-May-14	13,761	13,887	60	Marcellus
9	28-May-14	13,613	13,739	60	Marcellus
10	29-May-14	13,464	13,590	60	Marcellus
11	30-May-14	13,316	13,442	60	Marcellus
12	30-May-14	13,167	13,293	60	Marcellus
13	30-May-14	13,019	13,146	60	Marcellus
14	30-May-14	12,870	12,996	60	Marcellus
15	31-May-14	12,722	12,848	60	Marcellus
16	31-May-14	12,573	12,699	60	Marcellus
17	31-May-14	12,425	12,551	60	Marcellus
18	1-Jun-14	12,276	12,402	60	Marcellus
19	1-Jun-14	12,128	12,253	60	Marcellus
20	1-Jun-14	11,979	12,105	60	Marcellus
21	1-Jun-14	11,831	11,956	60	Marcellus
22	2-Jun-14	11,682	11,808	60	Marcellus
23	2-Jun-14	11,534	11,659	60	Marcellus
24	3-Jun-14	11,385	11,511	60	Marcellus
25	3-Jun-14	11,237	11,362	60	Marcellus
26	3-Jun-14	11,088	11,214	60	Marcellus
27	3-Jun-14	10,940	11,065	60	Marcellus
28	4-Jun-14	10,791	10,917	60	Marcellus
29	4-Jun-14	10,643	10,765	60	Marcellus
30	4-Jun-14	10,494	10,620	60	Marcellus
31	5-Jun-14	10,345	10,471	60	Marcellus
32	5-Jun-14	10,197	10,323	60	Marcellus
33	5-Jun-14	10,048	10,174	60	Marcellus
34	6-Jun-14	9,900	10,026	60	Marcellus
35	6-Jun-14	9,751	9,877	60	Marcellus
36	6-Jun-14	9,603	9,729	60	Marcellus
37	6-Jun-14	9,454	9,580	60	Marcellus
38	6-Jun-14	9,306	9,432	60	Marcellus
39	7-Jun-14	9,157	9,283	60	Marcellus
40	7-Jun-14	9,009	9,135	60	Marcellus
41	7-Jun-14	8,860	8,986	60	Marcellus
42	8-Jun-14	8,712	8,838	60	Marcellus
43	8-Jun-14	8,563	8,689	60	Marcellus
44	8-Jun-14	8,415	8,541	60	Marcellus
45	8-Jun-14	8,266	8,392	60	Marcellus
46	8-Jun-14	8,118	8,243	60	Marcellus
47	9-Jun-14	7,969	8,095	60	Marcellus
48	9-Jun-14	7,821	7,946	60	Marcellus
49	10-Jun-14	7,672	7,798	60	Marcellus
50	10-Jun-14	7,524	7,649	60	Marcellus
51	10-Jun-14	7,375	7,501	60	Marcellus
52	10-Jun-14	7,227	7,352	60	Marcellus
53	10-Jun-14	7,078	7,204	60	Marcellus
54	10-Jun-14	6,930	7,055	60	Marcellus

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API 47-085-10005 Farm Name Ness, Ashley E., Jr. Mary F. Well Number Ireland 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	26-May-14	31.0	8,726	N/A	7,422	2,079	5,739	N/A
2	26-May-14	75.0	8,250	5,785	6,203	199,556	5,587	N/A
3	27-May-14	78.0	7,284	5,610	5,593	199,233	6,413	N/A
4	27-May-14	76.0	7,498	5,655	4,858	183,544	6,105	N/A
5	27-May-14	75.0	7,654	5,313	5,003	221,133	5,953	N/A
6	27-May-14	74.0	7,494	5,831	5,498	229,076	5,912	N/A
7	28-May-14	76.0	7,384	5,536	4,130	220,995	5,893	N/A
8	28-May-14	77.0	7,401	5,158	3,464	224,863	5,872	N/A
9	28-May-14	76.0	7,619	6,130	5,267	224,928	5,910	N/A
10	29-May-14	71.0	7,938	5,531	6,995	134,574	6,079	N/A
11	30-May-14	76.0	7,616	5,654	6,280	185,646	6,356	N/A
12	30-May-14	76.0	7,650	5,605	6,207	225,009	5,766	N/A
13	30-May-14	75.0	7,224	5,605	5,434	219,182	5,686	N/A
14	30-May-14	75.0	7,805	5,442	5,358	221,242	5,757	N/A
15	31-May-14	78.0	7,007	5,544	5,518	227,579	5,779	N/A
16	31-May-14	75.0	7,518	5,703	6,280	222,374	5,727	N/A
17	31-May-14	76.0	7,534	5,247	4,892	169,553	6,085	N/A
18	1-Jun-14	77.0	7,455	5,282	6,425	177,963	6,161	N/A
19	1-Jun-14	78.0	7,540	5,512	5,887	202,607	5,494	N/A
20	1-Jun-14	74.0	7,780	5,741	5,148	222,856	5,724	N/A
21	1-Jun-14	73.0	7,489	5,956	2,938	224,376	5,730	N/A
22	2-Jun-14	68.0	7,524	6,711	5,082	179,728	6,480	N/A
23	2-Jun-14	52.0	7,949	6,066	6,316	36,903	6,009	N/A
24	3-Jun-14	64.0	6,970	5,585	5,219	103,564	5,981	N/A
25	3-Jun-14	73.0	7,146	5,617	4,796	218,047	5,750	N/A
26	3-Jun-14	73.0	7,238	5,482	4,668	223,317	5,860	N/A
27	3-Jun-14	74.0	7,169	5,402	2,963	228,124	5,730	N/A
28	4-Jun-14	79.0	7,107	5,666	4,900	225,253	5,786	N/A
29	4-Jun-14	76.0	7,191	6,028	4,500	220,225	5,699	N/A
30	4-Jun-14	75.0	7,291	5,562	4,174	214,554	5,522	N/A
31	5-Jun-14	76.0	7,150	5,760	2,920	222,306	5,663	N/A
32	5-Jun-14	78.0	7,170	5,500	5,105	198,949	5,303	N/A
33	5-Jun-14	72.0	7,353	5,666	4,963	195,274	5,418	N/A
34	6-Jun-14	73.0	7,663	5,578	5,342	212,061	5,518	N/A
35	6-Jun-14	79.0	7,002	5,211	4,237	221,615	5,543	N/A
36	6-Jun-14	78.0	6,847	5,574	3,543	219,435	5,566	N/A
37	6-Jun-14	72.0	6,662	5,402	4,818	219,643	5,505	N/A
38	6-Jun-14	73.0	6,879	5,385	4,797	224,323	5,358	N/A
39	7-Jun-14	73.0	6,651	5,512	4,377	218,769	5,294	N/A
40	7-Jun-14	79.6	6,818	5,345	5,307	222,257	5,290	N/A
41	7-Jun-14	72.0	6,787	5,462	4,745	204,938	5,450	N/A
42	8-Jun-14	79.8	6,921	5,533	5,191	224,191	5,340	N/A
43	8-Jun-14	78.5	7,046	5,226	4,617	227,694	5,500	N/A
44	8-Jun-14	79.4	6,939	5,425	4,007	225,656	5,453	N/A
45	8-Jun-14	78.7	6,751	5,225	4,968	228,056	5,343	N/A
46	8-Jun-14	79.7	6,925	5,590	3,621	222,605	5,245	N/A
47	9-Jun-14	79.7	6,925	5,590	3,621	217,100	5,431	N/A
48	9-Jun-14	72.0	6,906	5,590	5,945	217,100	5,231	N/A
49	10-Jun-14	72.0	6,580	5,675	4,459	218,327	5,494	N/A
50	10-Jun-14	80.2	6,605	5,782	4,053	223,907	5,495	N/A
51	10-Jun-14	82.4	6,390	5,594	5,247	224,484	5,265	N/A
52	10-Jun-14	81.4	6,628	5,356	5,204	220,732	5,431	N/A
53	10-Jun-14	73.0	6,295	5,371	5,223	228,881	5,493	N/A
54	10-Jun-14	72.0	6,490	5,396	4,700	206,226	5,129	N/A
	AVG=	74	7,219	5,579	4,971	11,032,612	306,303	TOTAL

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API 47-085-10005 Farm Name Ness, Ashley E., Jr. Well Number Ireland 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**
Siltstone	0	456	0	456
Coal	est 456	486	est 456	486
Sand	est 486	516	est 486	516
Shale	est 516	1,266	est 516	1,266
Sandstone	est 1266	1,296	est 1266	1,296
Shale	est 1296	1,356	est 1296	1,356
Sandstone	est 1356	1,386	est 1356	1,386
Shale	est 1386	1,506	est 1386	1,506
Sandstone	est 1506	1,906	est 1506	1,906
Limestone	est 1906	2004	est 1906	2,004
Big Lime	2,004	2,004	2,004	2,004
Big Injun	2,004	2,336	2,004	2,336
Gantz Sand	2,336	2,518	2,336	2,518
Fifty Foot Sandstone	2,518	2,709	2,518	2,709
Gordon	2,709	2,994	2,709	2,994
Fifth Sandstone	2,994	3,091	2,994	3,091
Bayard	3,091	3,450	3,091	3,457
Warren	3,450	3,830	3,457	3,866
Speechley	3,830	4,039	3,866	4,095
Baltown	4,039	4,517	4,095	4,618
Bradford	4,517	4,910	4,618	5,048
Benson	4,910	5,144	5,048	5,304
Alexander	5,144	5,361	5,304	5,543
Elk	5,361	5,744	5,543	5,957
Rhinestreet	5,744	6,099	5,957	6,347
Sycamore	6,099	6,264	6,347	6,549
Middlesex	6,264	6,368	6,549	6,707
Burkett	6,368	6,398	6,707	6,767
Tully	6,398	6,418	6,767	6,818
Marcellus	6,418	NA	6,818	14,993

*Please note Antero determines formation tops based on wireline logs that are only run on one well on a multi-well pad (Please reference Rufus Unit 1H API# 47-085-10046). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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Ireland Unit 1H
Ritchie County WV

Northing: 14233081.84
Easting: 1668389.35
As Drilled

Antero Resources

Scientific Drilling

To convert Magnetic North to Grid, Subtract 8.42°
To convert True North to Grid, Subtract 0.06°

Azimuths to Grid North
True North: -0.06°
Magnetic North: -8.42°

Magnetic Field
Strength: 52299.5nT
Dip Angle: 66.78°
Date: 2/18/2014
Model: IGRF2010

85-10005

WELL DETAILS Ireland Unit 1H
Ground Level: 1075.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	14233081.84	1668389.35	9° 11' 43.280 N	80° 54' 4.563 W

Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Gr: 1075.0

PROJECT DETAILS: Ritchie County WV

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

LEGEND

Ireland Unit 1H, Original Wellpath, Plan 4 V0
As Drilled

Genie Lightfoot
8:26, April 01 2014

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK 73128

SITE DETAILS: DeBerry/Rufus/Langford

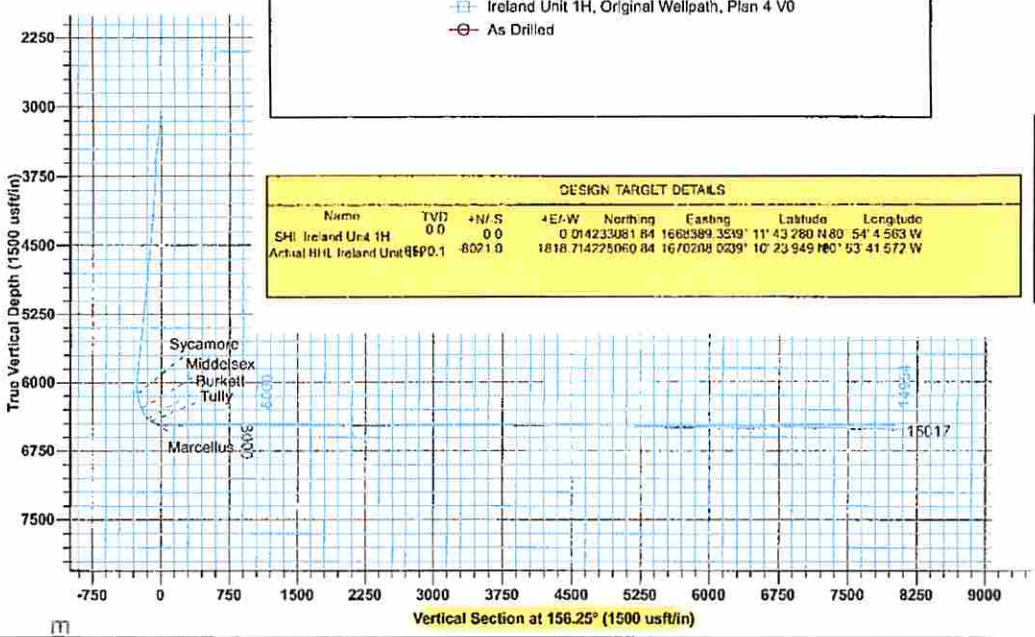
Site Center: Deberry 1H
Ness Pad

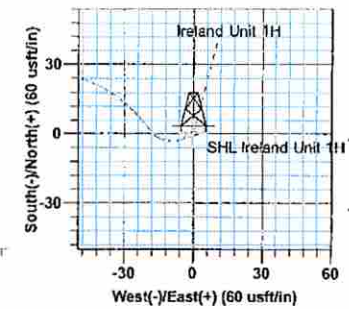
Site Centre Northing: 14233087.17
Easting: 1668409.26

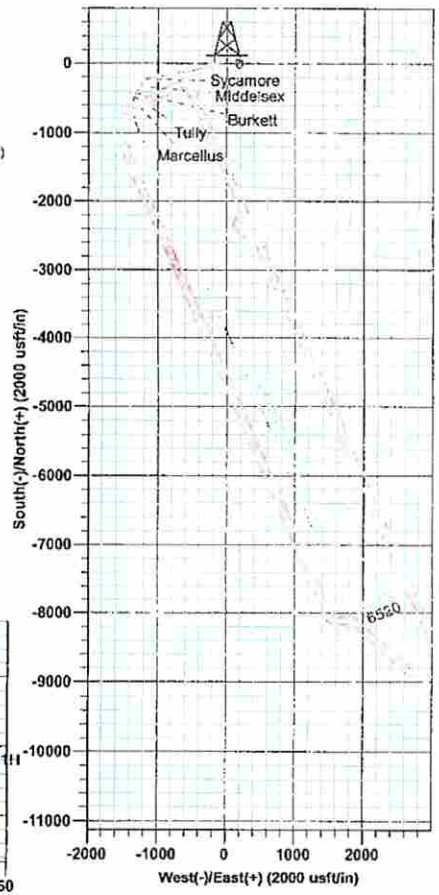
Positional Uncertainty: 0.0
Convergence: 0.06
Local North: Grid

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Ireland Unit 1H	0.0	0.0	0.0	14233081.84	1668389.35	9° 11' 43.280 N	80° 54' 4.563 W
Actual BHL Ireland Unit 6	P0.1	-8021.0	1818.7	14225060.84	1670208.0	39° 10' 23.949 N	80° 53' 41.572 W







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Antero Resources

Ritchie County WV
DeBerry/Rufus/Langford
Ireland Unit 1H
Original Wellpath

Design: As Drilled

EOW Completion Report

31 March, 2014

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Scientific Drilling

Antero Resources

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Ireland Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Project Ritchie County WV, Ritchie County WV, WV North

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 DeBerry/Rufus/Langford, Site Center Deberry 1H

Site Position:		**Northing:**	14,233,087.17 usft	**Latitude:**	39° 11' 43.333 N
From:	Map	**Easting:**	1,668,409.26 usft	**Longitude:**	80° 54' 4.310 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.06 °

Well Ireland Unit 1H, Marcellus

Well Position	**+N/-S**	0.0 usft	**Northing:**	14,233,081.84 usft	**Latitude:**	39° 11' 43.280 N
	+E/-W	0.0 usft	**Easting:**	1,668,389.35 usft	**Longitude:**	80° 54' 4.563 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**	1,099.0 usft	**Ground Level:**	1,075.0 usft

Wellbore Original Wellpath

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	2/18/2014	-8.36	66.78	52,299

Design As Drilled

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	156.25

Survey Program **Date** 3/31/2014

From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
100.0	2,835.3	Survey #2 Gyro to INT (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
2,900.0	4,819.8	Survey #3 Gyro to KOP (Original Wellpath	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper
4,819.8	15,017.0	Survey #4 SDI MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 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
100.0	0.14	231.07	100.0	-0.1	-0.1	0.0	0.14
200.0	0.17	208.54	200.0	-0.3	-0.3	0.2	0.07
300.0	0.11	214.70	300.0	-0.5	-0.4	0.3	0.06
400.0	0.15	228.69	400.0	-0.7	-0.5	0.4	0.05
500.0	0.12	207.16	500.0	-0.8	-0.7	0.5	0.06
600.0	0.11	214.98	600.0	-1.0	-0.8	0.6	0.02
700.0	0.11	207.03	700.0	-1.2	-0.9	0.7	0.02
800.0	0.11	232.46	800.0	-1.3	-1.0	0.8	0.05
900.0	0.11	212.83	900.0	-1.5	-1.1	0.9	0.04

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Antero

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Ireland Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,000.0	0.12	245.85	1,000.0	-1.6	-1.3	0.9	0.07
1,100.0	0.12	259.38	1,100.0	-1.6	-1.5	0.9	0.03
1,200.0	0.10	286.16	1,200.0	-1.6	-1.7	0.8	0.05
1,300.0	0.11	305.01	1,300.0	-1.6	-1.8	0.7	0.04
1,400.0	0.13	308.59	1,400.0	-1.4	-2.0	0.5	0.02
1,500.0	0.05	330.55	1,500.0	-1.3	-2.1	0.4	0.09
1,600.0	0.04	358.42	1,600.0	-1.3	-2.1	0.3	0.02
1,700.0	0.06	252.55	1,700.0	-1.2	-2.2	0.2	0.08
1,800.0	0.07	266.26	1,800.0	-1.3	-2.3	0.2	0.02
1,900.0	0.06	218.60	1,900.0	-1.3	-2.4	0.2	0.05
2,000.0	0.07	306.49	2,000.0	-1.3	-2.5	0.2	0.09
2,100.0	0.17	296.58	2,100.0	-1.2	-2.6	0.0	0.10
2,200.0	0.09	220.24	2,200.0	-1.2	-2.8	0.0	0.17
2,300.0	0.09	262.32	2,300.0	-1.3	-3.0	0.0	0.06
2,400.0	0.15	277.90	2,400.0	-1.3	-3.2	-0.1	0.07
2,500.0	0.24	218.34	2,500.0	-1.4	-3.4	-0.1	0.21
2,600.0	0.22	236.26	2,600.0	-1.7	-3.7	0.0	0.07
2,700.0	0.23	231.54	2,700.0	-1.9	-4.0	0.1	0.02
2,800.0	0.50	230.90	2,800.0	-2.3	-4.5	0.3	0.27
2,835.3	0.63	236.83	2,835.3	-2.5	-4.8	0.4	0.40
2,900.0	0.87	253.40	2,900.0	-2.8	-5.6	0.4	0.50
3,000.0	2.79	262.63	2,999.9	-3.4	-8.7	-0.4	1.94
3,100.0	3.73	293.73	3,099.8	-2.4	-14.1	-3.5	1.97
3,200.0	7.27	324.20	3,199.3	4.1	-20.8	-12.1	4.47
3,300.0	10.45	309.76	3,298.1	15.0	-31.5	-26.4	3.86
3,400.0	12.73	286.72	3,396.1	24.0	-49.0	-41.7	5.11
3,500.0	16.46	267.96	3,492.9	26.7	-73.7	-54.1	5.98
3,600.0	18.81	254.90	3,588.3	21.9	-103.5	-61.8	4.59
3,700.0	22.41	250.16	3,681.9	11.3	-137.0	-65.5	3.97
3,800.0	25.59	249.73	3,773.2	-2.7	-175.2	-68.1	3.18
3,900.0	25.56	249.36	3,863.4	-17.8	-215.6	-70.6	0.16
4,000.0	24.58	255.70	3,954.0	-30.5	-256.0	-75.2	2.86
4,100.0	24.19	254.69	4,045.1	-41.1	-295.9	-81.6	0.57
4,200.0	24.45	253.41	4,136.2	-52.4	-335.5	-87.2	0.59
4,300.0	23.04	255.21	4,227.7	-63.3	-374.3	-92.8	1.59
4,400.0	23.19	255.75	4,319.7	-73.1	-412.3	-99.1	0.26
4,500.0	24.32	256.51	4,411.2	-82.8	-451.4	-106.0	1.17
4,600.0	23.59	255.73	4,502.6	-92.5	-490.8	-113.0	0.80
4,700.0	24.54	257.13	4,593.9	-102.1	-530.4	-120.2	1.11
4,800.0	24.16	260.85	4,685.0	-110.0	-570.9	-129.3	1.58
4,819.8	23.91	260.92	4,703.1	-111.2	-578.8	-131.3	1.27
4,901.0	22.83	259.60	4,777.7	-116.7	-610.6	-139.1	1.48
4,995.0	23.60	260.72	4,864.1	-123.0	-647.1	-148.0	0.94
5,088.0	24.33	259.87	4,949.0	-129.4	-684.3	-157.2	0.87
5,182.0	24.39	260.57	5,034.7	-136.0	-722.5	-166.6	0.31

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EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Ireland Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099 0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,276.0	24.22	261.35	5,120.3	-142.0	-760.7	-176.4	0.39
5,370.0	25.43	259.72	5,205.6	-148.5	-799.7	-186.1	1.48
5,465.0	24.10	258.08	5,291.9	-156.2	-838.7	-194.8	1.58
5,560.0	23.03	259.12	5,379.0	-163.7	-875.9	-202.9	1.21
5,653.0	22.25	260.82	5,464.8	-169.9	-911.2	-211.4	1.09
5,747.0	22.31	259.81	5,551.8	-175.9	-946.3	-220.1	0.41
5,841.0	22.85	260.25	5,638.6	-182.2	-981.9	-228.7	0.60
5,934.0	22.12	259.24	5,724.5	-188.5	-1,016.9	-237.0	0.89
6,029.0	23.88	259.76	5,812.0	-195.3	-1,053.3	-245.5	1.86
6,122.0	26.10	260.80	5,896.3	-201.9	-1,092.1	-255.0	2.43
6,186.0	24.42	259.07	5,954.1	-206.6	-1,119.0	-261.5	2.87
6,232.0	23.09	257.67	5,996.2	-210.4	-1,137.1	-265.4	3.14
6,279.0	23.47	246.89	6,039.4	-216.0	-1,154.7	-267.3	9.09
6,326.0	24.96	233.88	6,082.3	-225.5	-1,171.4	-265.3	11.76
6,371.0	26.82	225.30	6,122.8	-238.3	-1,186.3	-259.7	9.28
Sycamore							
6,373.0	26.91	224.95	6,124.6	-238.9	-1,186.9	-259.3	9.28
6,420.0	30.23	222.72	6,165.9	-255.1	-1,202.4	-250.7	7.42
6,467.0	34.11	222.39	6,205.7	-273.6	-1,219.4	-240.7	8.26
6,514.0	38.11	222.17	6,243.6	-294.1	-1,238.0	-229.4	8.52
6,561.0	41.99	220.75	6,279.6	-316.7	-1,258.0	-216.7	8.48
6,573.0	42.60	219.22	6,288.5	-322.9	-1,263.2	-213.2	10.00
Middelsex							
6,608.0	44.50	214.95	6,313.8	-342.2	-1,277.7	-201.4	10.00
6,655.0	47.94	210.18	6,346.4	-370.8	-1,295.9	-182.6	10.35
6,702.0	53.75	207.42	6,376.0	-402.7	-1,313.4	-160.4	13.17
6,731.0	56.95	205.15	6,392.5	-424.1	-1,324.0	-145.1	12.77
Burkett							
6,749.0	58.95	203.82	6,402.1	-438.0	-1,330.3	-134.9	12.77
6,791.0	63.71	199.63	6,422.2	-472.2	-1,343.9	-109.0	14.30
Tully							
6,796.0	64.28	199.16	6,424.4	-476.4	-1,345.4	-105.8	14.30
6,842.0	70.44	193.48	6,442.1	-517.2	-1,357.3	-73.3	17.59
Marcellus							
6,843.0	70.58	193.36	6,442.5	-518.1	-1,357.5	-72.5	17.59
6,890.0	75.55	187.07	6,456.2	-562.3	-1,365.4	-35.3	16.60
6,937.0	80.57	180.16	6,465.9	-608.1	-1,368.3	5.6	17.91
6,955.0	82.50	177.66	6,468.5	-625.9	-1,368.0	22.0	17.43
7,018.0	88.69	172.29	6,473.4	-688.5	-1,362.5	81.4	12.99
7,126.0	90.40	166.31	6,474.2	-794.5	-1,342.4	186.6	5.76
7,220.0	91.18	161.68	6,472.9	-884.8	-1,316.5	279.7	4.99
7,314.0	91.41	157.38	6,470.8	-972.9	-1,283.6	373.5	4.58
7,409.0	90.47	155.29	6,469.3	-1,059.9	-1,245.5	468.5	2.41
7,503.0	89.19	152.77	6,469.5	-1,144.4	-1,204.4	562.4	3.01
7,597.0	91.31	155.45	6,469.1	-1,228.9	-1,163.3	656.3	3.64

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Antero Resources

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Ireland Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,691.0	91.71	154.98	6,466.7	-1,314.2	-1,123.9	750.3	0.66
7,786.0	91.41	157.25	6,464.1	-1,401.0	-1,085.5	845.2	2.41
7,880.0	90.17	157.62	6,462.8	-1,487.8	-1,049.4	939.2	1.38
7,974.0	90.57	157.10	6,462.2	-1,574.6	-1,013.2	1,033.2	0.70
8,068.0	89.70	157.88	6,461.9	-1,661.4	-977.2	1,127.1	1.24
8,162.0	89.50	157.39	6,462.6	-1,748.4	-941.5	1,221.1	0.56
8,256.0	89.39	156.40	6,463.5	-1,834.8	-904.6	1,315.1	1.06
8,351.0	89.56	156.48	6,464.4	-1,921.9	-866.6	1,410.1	0.20
8,445.0	90.13	156.70	6,464.6	-2,008.1	-829.3	1,504.1	0.65
8,539.0	90.74	155.02	6,463.9	-2,093.9	-790.8	1,598.1	1.90
8,633.0	88.96	157.14	6,464.2	-2,179.8	-752.7	1,692.1	2.94
8,728.0	88.99	156.85	6,465.9	-2,267.3	-715.6	1,787.1	0.31
8,822.0	88.32	156.62	6,468.1	-2,353.6	-678.5	1,881.0	0.75
8,915.0	88.22	157.49	6,470.9	-2,439.2	-642.3	1,974.0	0.94
9,009.0	88.79	156.55	6,473.3	-2,525.7	-605.6	2,067.9	1.17
9,100.0	88.66	154.85	6,475.4	-2,608.6	-568.1	2,158.9	1.87
9,191.0	88.53	155.91	6,477.6	-2,691.3	-530.2	2,249.9	1.17
9,282.0	89.13	156.15	6,479.4	-2,774.5	-493.3	2,340.8	0.71
9,373.0	93.46	157.03	6,477.4	-2,857.9	-457.1	2,431.8	4.86
9,464.0	91.98	156.87	6,473.1	-2,941.6	-421.5	2,522.7	1.64
9,555.0	90.44	155.77	6,471.1	-3,024.9	-385.0	2,613.7	2.08
9,647.0	91.51	156.60	6,469.6	-3,109.0	-347.9	2,705.6	1.47
9,737.0	91.18	156.21	6,467.5	-3,191.5	-311.8	2,795.6	0.57
9,828.0	90.74	154.59	6,465.9	-3,274.2	-274.0	2,886.6	1.84
9,919.0	89.09	154.76	6,466.1	-3,356.5	-235.0	2,977.5	1.82
10,010.0	90.10	156.94	6,466.7	-3,439.5	-197.8	3,068.5	2.64
10,103.0	88.56	156.17	6,467.8	-3,524.8	-160.8	3,161.5	1.85
10,197.0	89.93	157.99	6,469.1	-3,611.4	-124.2	3,255.5	2.42
10,291.0	89.36	158.41	6,469.6	-3,698.6	-89.3	3,349.4	0.75
10,385.0	89.90	156.48	6,470.2	-3,785.5	-53.3	3,443.4	2.13
10,479.0	89.66	157.14	6,470.6	-3,871.9	-16.2	3,537.4	0.75
10,573.0	89.40	156.52	6,471.4	-3,958.3	20.7	3,631.4	0.72
10,667.0	89.09	154.74	6,472.6	-4,043.9	59.5	3,725.4	1.92
10,761.0	89.56	154.94	6,473.7	-4,129.0	99.5	3,819.4	0.54
10,855.0	89.33	154.61	6,474.6	-4,214.0	139.5	3,913.3	0.43
10,949.0	89.93	156.26	6,475.2	-4,299.5	178.6	4,007.3	1.87
11,044.0	89.46	156.81	6,475.7	-4,386.6	216.4	4,102.3	0.76
11,138.0	89.60	157.10	6,476.5	-4,473.1	253.2	4,196.3	0.34
11,231.0	91.01	157.11	6,476.0	-4,558.8	289.4	4,289.3	1.52
11,326.0	91.08	157.28	6,474.3	-4,646.3	326.2	4,384.2	0.19
11,420.0	90.24	157.15	6,473.2	-4,733.0	362.6	4,478.2	0.90
11,514.0	90.87	157.05	6,472.3	-4,819.6	399.2	4,572.2	0.68
11,608.0	88.79	156.32	6,472.6	-4,905.9	436.4	4,666.2	2.35
11,702.0	89.03	156.17	6,474.4	-4,991.9	474.3	4,760.2	0.30
11,796.0	87.85	155.31	6,476.9	-5,077.6	512.9	4,854.1	1.55

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Antero

EOW Completion Report

Scientific Drilling

Company:	Antero Resources	**Local Co-ordinate Reference:**	Well Ireland Unit 1H
Project:	Ritchie County WV	**TVD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
11,890.0	88.36	154.93	6,480.0	-5,162.8	552.4	4,948.1	0.68
11,984.0	87.78	155.19	6,483.2	-5,248.0	592.0	5,042.0	0.68
12,078.0	88.32	155.73	6,486.4	-5,333.5	631.0	5,135.9	0.81
12,173.0	88.29	154.74	6,489.2	-5,419.7	670.8	5,230.9	1.04
12,267.0	89.46	157.27	6,491.0	-5,505.5	709.0	5,324.8	2.96
12,361.0	89.03	157.14	6,492.3	-5,592.2	745.4	5,418.8	0.48
12,455.0	88.69	156.10	6,494.2	-5,678.5	782.7	5,512.8	1.16
12,549.0	88.99	155.40	6,496.1	-5,764.1	821.3	5,606.8	0.81
12,643.0	90.74	156.68	6,496.3	-5,850.0	859.5	5,700.8	2.31
12,737.0	88.79	156.05	6,496.7	-5,936.2	897.2	5,794.8	2.18
12,831.0	88.09	155.51	6,499.2	-6,021.8	935.7	5,888.7	0.94
12,924.0	88.99	157.72	6,501.6	-6,107.2	972.6	5,981.7	2.57
13,019.0	88.53	154.61	6,503.7	-6,194.0	1,011.0	6,076.7	3.31
13,113.0	90.03	154.69	6,504.8	-6,279.0	1,051.3	6,170.6	1.60
13,207.0	89.77	154.91	6,505.0	-6,364.0	1,091.3	6,264.6	0.36
13,301.0	90.57	157.00	6,504.7	-6,449.9	1,129.6	6,358.6	2.38
13,395.0	90.77	158.35	6,503.6	-6,536.8	1,165.3	6,452.5	1.45
13,489.0	91.34	157.29	6,501.9	-6,623.8	1,200.8	6,546.5	1.28
13,583.0	90.50	156.63	6,500.4	-6,710.3	1,237.5	6,640.5	1.14
13,678.0	90.50	155.76	6,499.5	-6,797.2	1,275.9	6,735.5	0.92
13,772.0	89.40	155.09	6,499.6	-6,882.7	1,315.0	6,829.4	1.37
13,866.0	90.13	156.56	6,500.0	-6,968.5	1,353.5	6,923.4	1.75
13,960.0	89.43	156.95	6,500.4	-7,054.8	1,390.6	7,017.4	0.85
14,054.0	89.09	156.37	6,501.6	-7,141.1	1,427.8	7,111.4	0.72
14,148.0	89.06	156.30	6,503.1	-7,227.2	1,465.5	7,205.4	0.08
14,242.0	88.99	156.39	6,504.7	-7,313.3	1,503.2	7,299.4	0.12
14,336.0	89.83	155.86	6,505.7	-7,399.3	1,541.3	7,393.4	1.06
14,430.0	88.76	156.25	6,506.8	-7,485.2	1,579.4	7,487.4	1.21
14,524.0	89.53	156.09	6,508.2	-7,571.2	1,617.4	7,581.4	0.84
14,618.0	87.71	155.84	6,510.5	-7,657.0	1,655.7	7,675.3	1.95
14,712.0	88.35	156.41	6,513.7	-7,742.9	1,693.7	7,769.3	0.91
14,806.0	88.49	154.95	6,516.3	-7,828.5	1,732.4	7,863.2	1.56
14,900.0	88.79	155.40	6,518.6	-7,913.8	1,771.9	7,957.2	0.58
14,958.0	89.26	156.40	6,519.5	-7,966.7	1,795.5	8,015.2	1.90
15,017.0	89.74	157.42	6,520.1	-8,021.0	1,818.7	8,074.2	1.91

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Site:	DeBerry/Rufus/Langford	**MD Reference:**	Ireland 1H 1075 GL + 24 KB @ 1099.0usft
Well:	Ireland Unit 1H	**North Reference:**	Grid
Wellbore:	Original Wellpath	**Survey Calculation Method:**	Minimum Curvature
Design:	As Drilled	**Database:**	Oklahoma District

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
6,371.0	6,122.8	-238.3	-1,186.3	Sycamore
6,573.0	6,288.5	-322.9	-1,263.2	Middelsex
6,731.0	6,392.5	-424.1	-1,324.0	Burkett
6,791.0	6,422.2	-472.2	-1,343.9	Tully
6,842.0	6,442.1	-517.2	-1,357.3	Marcellus

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/27/2014
Job End Date:	6/11/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10005-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Ireland Unit 1H
Longitude:	-80.90126700
Latitude:	39.19535600
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,520
Total Base Water Volume (gal):	13,741,602
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER

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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	90.77043	
Sand, White, 40/70	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		5.27130	
Sand, White, 20/40	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		3.00487	
Sand, White, 100 mesh	Baker Hughes	Proppant					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.46894	
HCl, 10.1 - 15%	Baker Hughes	Acidizing					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.22175	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.08874	SmartCare Product
FRW-18	Baker Hughes	Friction Reducer					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.05891	SmartCare Product
Scaletrol 720	Baker Hughes	Scale Inhibitor					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01556	SmartCare Product

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Enzyme G-NE	Baker Hughes	Breaker					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01288	SmartCare Product
Alpha 1427	Baker Hughes	Biocide					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.01265	SmartCare Product
Ferrotrol 300L	Baker Hughes	Iron Control					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00153	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor					
			MSDS and Non-MSDS Ingredients Listed Below	N/A		0.00036	SmartCare Product
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							
Ingredients in Additive (s) (MSDS and non-MSDS)	Baker Hughes	See Trade Name(s) List					
			Crystalline Silica (Quartz)	14808-60-7	100.00000	8.73818	
			Water	7732-18-5	95.00000	0.24026	
			Mineral Oil	8042-47-5	70.00000	0.06207	
			Guar Gum	9000-30-0	60.00000	0.05320	
			Hydrochloric Acid	7647-01-0	15.00000	0.03324	
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.02660	
			Poly (acrylamide-co-acrylic acid) partial sodium salt	62649-23-4	30.00000	0.01766	
			Hydrotreated Light Distillate	64742-47-8	30.00000	0.01766	
			Ethylene Glycol	107-21-1	45.00000	0.00701	
			Crystalline Silica: Quartz	14808-60-7	5.00000	0.00443	
			Isotridecanol, ethoxylated	9043-30-5	5.00000	0.00443	
			1-butoxy-2-propanol	5131-66-8	5.00000	0.00443	
			Glutaraldehyde	111-30-8	30.00000	0.00379	
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9	20.00000	0.00311	
			Sodium Chloride	7647-14-5	5.00000	0.00310	
			Ammonium Chloride	12125-02-9	3.00000	0.00177	
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00126	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00118	
			Oleamide DEA	93-83-4	2.00000	0.00118	
			Citric Acid	77-92-9	60.00000	0.00092	
			Calcium Chloride	10043-52-4	5.00000	0.00076	
			Hemicellulase Enzyme Concentrate	9025-56-3	5.00000	0.00064	
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00063	
			Ethanol	64-17-5	5.00000	0.00063	
			Methanol	67-56-1	100.00000	0.00036	
			Polyoxythylene Sorbitan Monooleate	9005-65-6	0.50000	0.00029	
			Sorbitan Monooleate	1338-43-8	0.50000	0.00029	
			Potassium Chloride	7447-40-7	1.00000	0.00016	

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			Polyoxyalkylenes	68951-67-7	30.00000	0.00011	
			2-buloxy-1-propanol	15821-83-7	0.10000	0.00009	
			Fatty Acids	61790-12-3	10.00000	0.00004	
			Modified Thiourea Polymer	68527-49-1	7.00000	0.00002	
			Olefin	64743-02-8	5.00000	0.00002	
			Propargyl Alcohol	107-19-7	5.00000	0.00002	
			Formaldehyde	50-00-0	1.00000	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)

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