

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

API 47 - 017 - 06192 County Doddridge District Central
Quad Oxford 7.5' Pad Name Primm Pad Field/Pool Name ---
Farm name Primm, Olin E. & Mary Well Number Callie 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 4343582m Easting 512719m
Landing Point of Curve Northing 4343632.73m Easting 512438.82m
Bottom Hole Northing 4345235m Easting 511651m

Elevation (ft) 1008' 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 3/27/2013 Date drilling commenced 8/22/2013 Date drilling ceased 5/30/2014
Date completion activities began 6/8/2014 Date completion activities ceased 8/12/2014
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 225' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 743', 2147' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 437' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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Reviewed by: JR
10/23/2015
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WV Department
Environmental Protection

API 47-017 - 06192 Farm name Primm, Olin E. & Mary Well number Callie Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	30"	20"	40'	New	94# H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	337'	New	48# J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2527'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	12960'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6806'		5.95# 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	200 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	419 sx	15.6	1.18	234	0'	8 Hrs.
Coal							
Intermediate 1	Class A	933 sx	15.6	1.18	791	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	829 sx (Lead) 1083 sx (Tail)	13.5 Lead 15.2 Tail	1.44 Lead 1.8 Tail	2505	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12965 MD, 6540' TVD (BHL); 6564' TVD (Deepest point drilled) Loggers TD (ft) 12916'
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6217

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Callie Unit 2H API #47-017-06193). Please reference the wireline logs submitted with Form WR-35 for Callie Unit 2H. A Cement Bond Log has been included with this submittal.

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

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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API 47- 017 - 06192 Farm name Primm, Olin E. & Mary Well number Callie 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								

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Please insert additional pages as applicable.

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API 47- 017 - 06192 Farm name Primm, Olin E. & Mary Well number Callie Unit 1H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6518' (TOP) TVD	6873' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs
 OPEN FLOW Gas 7700 mcfpd Oil 33 bpd NGL --- bpd Water 459 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME 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 ₂ S, ETC)
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	0		0		

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP
 Address 2640 Reach Rd. City Williamsport State PA Zip 17701

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 US Well Services
 Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
 Signature *[Signature]* Title Permit Representative Date 7/29/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry WV Department of Environmental Protection
 AUG 10 2015
 10/23/2015

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	8-Jun-14	12,705	12,873	60	Marcellus
2	28-Jul-14	12,505	12,674	60	Marcellus
3	28-Jul-14	12,305	12,474	60	Marcellus
4	28-Jul-14	12,106	12,274	60	Marcellus
5	28-Jul-14	11,906	12,074	60	Marcellus
6	28-Jul-14	11,706	11,874	60	Marcellus
7	29-Jul-14	11,506	11,675	60	Marcellus
8	29-Jul-14	11,306	11,475	60	Marcellus
9	29-Jul-14	11,107	11,275	60	Marcellus
10	29-Jul-14	10,907	11,075	60	Marcellus
11	30-Jul-14	10,707	10,875	60	Marcellus
12	30-Jul-14	10,507	10,676	60	Marcellus
13	30-Jul-14	10,307	10,476	60	Marcellus
14	30-Jul-14	10,108	10,276	60	Marcellus
15	30-Jul-14	9,908	10,076	60	Marcellus
16	31-Jul-14	9,708	9,876	60	Marcellus
17	31-Jul-14	9,508	9,677	60	Marcellus
18	31-Jul-14	9,308	9,477	60	Marcellus
19	31-Jul-14	9,109	9,277	60	Marcellus
20	31-Jul-14	8,909	9,077	60	Marcellus
21	1-Aug-14	8,709	8,877	60	Marcellus
22	1-Aug-14	8,509	8,678	60	Marcellus
23	1-Aug-14	8,309	8,478	60	Marcellus
24	1-Aug-14	8,110	8,278	60	Marcellus
25	1-Aug-14	7,910	8,078	60	Marcellus
26	1-Aug-14	7,710	7,878	60	Marcellus
27	2-Aug-14	7,510	7,679	60	Marcellus
28	2-Aug-14	7,310	7,479	60	Marcellus
29	2-Aug-14	7,111	7,279	60	Marcellus
30	2-Aug-14	6,911	7,079	60	Marcellus

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API 47-017-06192 Farm Name Primm Olin E. & Mary Well Number Callie 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	27-Jul-14	72.0	7,093	N/A	4,902	249,300	7,072	N/A
2	28-Jul-14	72.0	6,535	5,329	4,578	255,800	7,008	N/A
3	28-Jul-14	77.0	6,784	6,155	3,791	254,850	6,459	N/A
4	28-Jul-14	77.0	6,733	5,976	3,458	256,800	6,454	N/A
5	28-Jul-14	77.0	6,627	5,214	5,679	248,750	6,329	N/A
6	28-Jul-14	76.0	7,116	5,786	4,796	254,350	6,401	N/A
7	29-Jul-14	77.0	6,857	5,482	3,651	254,850	6,382	N/A
8	29-Jul-14	77.0	6,853	6,144	3,662	253,700	6,369	N/A
9	29-Jul-14	78.3	6,954	5,525	4,971	252,095	6,356	N/A
10	29-Jul-14	74.3	7,031	5,801	4,814	188,400	6,076	N/A
11	30-Jul-14	79.2	6,856	5,307	5,618	253,040	6,328	N/A
12	30-Jul-14	78.0	6,671	5,436	4,063	251,150	6,310	N/A
13	30-Jul-14	78.0	6,961	5,332	4,796	242,300	6,718	N/A
14	30-Jul-14	78.9	7,060	5,336	4,653	211,930	6,151	N/A
15	30-Jul-14	78.8	6,612	5,600	5,075	251,470	6,278	N/A
16	31-Jul-14	77.4	6,701	5,611	4,991	254,545	6,266	N/A
17	31-Jul-14	76.0	6,731	5,550	3,809	254,250	6,245	N/A
18	31-Jul-14	78.0	6,568	5,586	3,841	252,300	6,230	N/A
19	31-Jul-14	79.7	6,808	5,214	4,971	251,220	6,238	N/A
20	31-Jul-14	75.2	6,523	5,472	4,789	249,600	6,275	N/A
21	1-Aug-14	73.9	6,839	5,229	5,232	212,620	5,789	N/A
22	1-Aug-14	78.0	6,797	5,354	4,277	232,450	6,666	N/A
23	1-Aug-14	77.0	6,653	5,797	3,659	250,800	6,173	N/A
24	1-Aug-14	77.0	6,528	5,647	4,116	250,050	6,157	N/A
25	1-Aug-14	76.7	6,469	5,558	4,832	250,450	6,139	N/A
26	1-Aug-14	76.4	6,182	5,332	4,495	252,240	6,171	N/A
27	2-Aug-14	76.7	6,347	4,950	5,153	254,560	6,111	N/A
28	2-Aug-14	69.0	7,164	5,533	4,978	130,825	6,433	N/A
29	2-Aug-14	77.0	6,320	4,799	3,473	252,500	6,094	N/A
30	2-Aug-14	77.0	6,637	4,338	9,230	236,400	5,716	N/A
AVG=		76.5	6,734	5,462	4,678	7,263,595	189,394	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	225'	N/A	225'	N/A
Shale	0	227	0	227
Sandstone	est. 227	437	est. 227	437
Coal	est. 437	457	est. 437	457
Sandy shale	est. 457	477	est. 457	477
Shale	est. 477	595	est. 477	595
Sandstone	est. 595	605	est. 595	605
Shale	est. 605	625	est. 605	625
Sandstone	est. 625	638	est. 625	638
Shale	est. 638	659	est. 638	659
Sandstone	est. 659	808	est. 659	808
Shale	est. 808	1175	est. 808	1175
Sandy shale	est. 1175	1235	est. 1175	1235
Trace coal	est. 1235	1257	est. 1235	1257
Shale	est. 1257	1421	est. 1257	1421
Sandstone	est. 1421	1445	est. 1421	1445
Sandy shale	est. 1445	1477	est. 1445	1477
Trace coal/shale	est. 1477	1542	est. 1477	1542
Sandstone	est. 1542	1683	est. 1542	1683
Sandy shale	est. 1683	1991	est. 1683	1991
Big Lime	1991	2035	1991	2035
Big Injun	2035	2330	2035	2330
Weir	2330	2637	2330	2637
Fifty Foot Sandstone	2637	2798	2637	2798
Gordon	2798	3078	2798	3078
Fifth Sandstone	3078	3101	3078	3101
Bayard	3101	3405	3101	3405
Speechley	3405	4090	3405	4090
Baltown	4090	4545	4090	4545
Bradford	4545	4973	4545	4975
Benson	4973	5228	4975	5236
Alexander	5228	6177	5236	6306
Sycamore	6177	6343	6306	6517
Middlesex	6343	6463	6517	6727
Burkett	6463	6489	6727	6786
Tully	6489	6518	6786	6873
Marcellus	6518	NA	6873	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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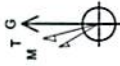
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10/23/2015

17-06192

Azimuths to Grid North
 True North: -0.09°
 Magnetic North: -8.50°
 Magnetic Field
 Strength: 52348 Gauss
 Dip Angle: 66.92°
 Date: 8/21/2013
 Model: BGM2014

To convert Magnetic North to Grid, Subtract 8.50°
 To convert True North to Grid, Subtract 0.09°



Callie Unit 1H
 Doddridge County WW
 Northing: 14249854.87
 Easting: 1682098.31
 As Drilled



WELL DETAILS: Callie Unit 1H

Ground Level:	1005.0	Latitude	Longitude
Northing	14249854.87	1682098.31	51° 10' 02.3" W

LEGEND

- Callie Unit 2H, Original Wellpath, As Drilled V0
- Callie Unit 1H, Original Wellpath, Plan 6 V0
- Ahouse Unit 1H, Original Wellpath, As Drilled V0
- As Drilled

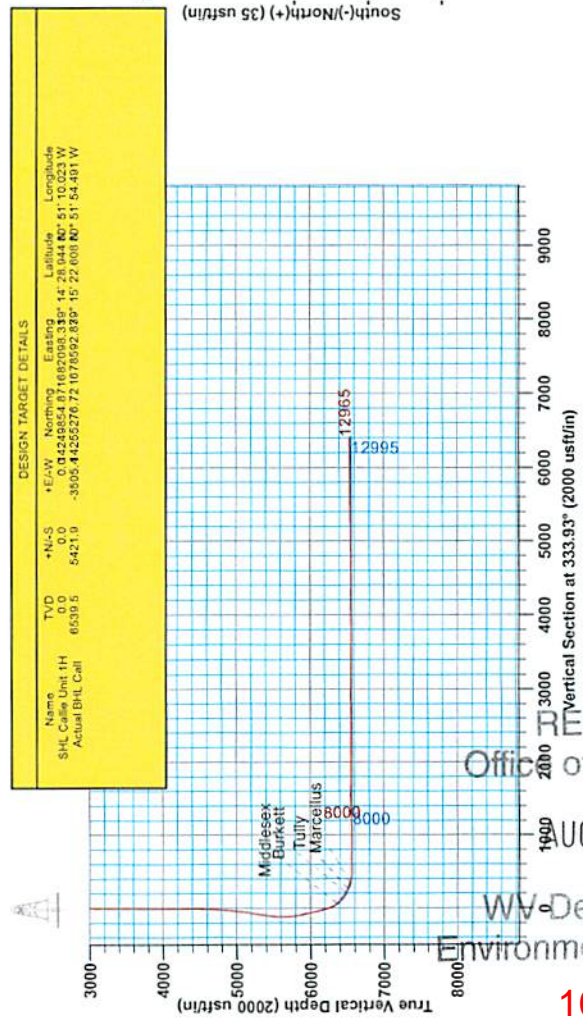
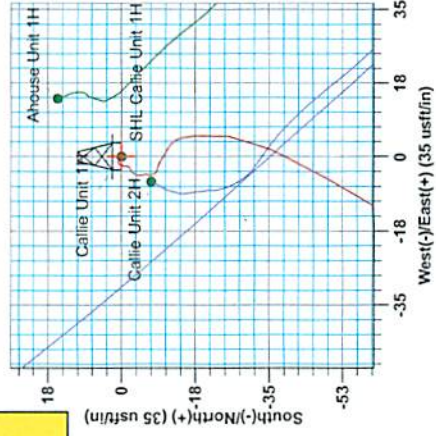
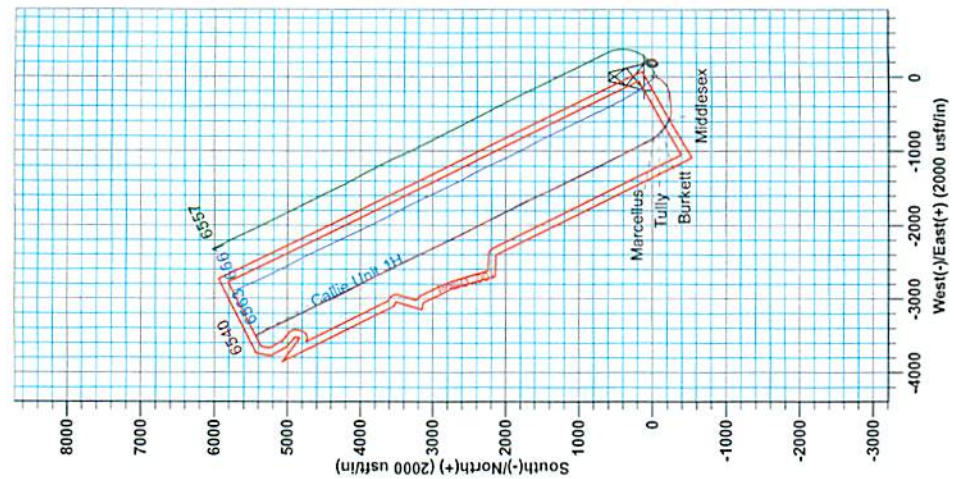
PROJECT DETAILS: Doddridge County WW

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

Genie Lightfoot
 15-38, May 29, 2014
 Scientific Drilling
 421 South Eagle Lane
 Oklahoma City, OK 73128

SITE DETAILS: Ahouse / Callie Pad

Site Center: Ahouse Unit 1H
 Site Centre Northing: 14249870.09
 Easting: 1682112.06
 Positional Uncertainty: 2.8
 Convergence: 0.09
 Local North: Grid



DESIGN TARGET DETAILS

Name	TVD	*N-S	*E-W	Northing	Easting	Latitude	Longitude
SHL Callie Unit 1H	0.0	0.0	0.0	14249854.87	1682098.31	51° 10' 02.3" W	142° 28' 04.4" W
Actual BHL Call	6539.5	5421.9	-3505.4	14255276.72	1070592.83	51° 22' 00.8" W	51° 54' 40.1" W

Pre 822 Callie 1H 1005.0L ± 18.4B @ 1023.0usft
 Gr. 1005.0

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Antero Resources

Doddridge County WV
Ahouse / Callie Pad
Callie Unit 1H
Original Wellpath

Design: As Drilled

EOW Completion Report

29 May, 2014



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10/23/2015

17-06192



EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 1H
Project:	Doddridge County WV	TVD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Well:	Callie Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Project	Doddridge County WV, McClellan District		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Ahouse / Callie Pad				
Site Position:		Northing:	14,249,870.09 usft	Latitude:	39° 14' 29.095 N
From:	Map	Easting:	1,682,112.06 usft	Longitude:	80° 51' 9.848 W
Position Uncertainty:	2.8 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.09 °

Well	Callie Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,249,854.87 usft	Latitude:	39° 14' 28.944 N
	+E/-W	0.0 usft	Easting:	1,682,098.31 usft	Longitude:	80° 51' 10.023 W
Position Uncertainty		2.8 usft	Wellhead Elevation:	1,023.0 usft	Ground Level:	1,005.0 usft

Wellbore	Original Wellpath				
-----------------	-------------------	--	--	--	--

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	8/21/2013	-8.41	66.92	52,349

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	97.60

Survey Program	Date	5/29/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	6,217.0	Survey #4 Def to KOP (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,271.0	12,965.0	Survey #5 SDI MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1	

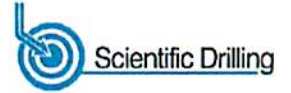
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
105.0	0.09	247.80	105.0	0.0	-0.1	-0.1	0.09
205.0	0.03	287.11	205.0	-0.1	-0.2	-0.2	0.07
305.0	0.10	338.57	305.0	0.0	-0.2	-0.2	0.08
405.0	0.22	273.92	405.0	0.1	-0.5	-0.5	0.20
505.0	0.07	259.06	505.0	0.1	-0.7	-0.7	0.15
605.0	0.12	15.83	605.0	0.2	-0.7	-0.8	0.16
705.0	0.16	268.47	705.0	0.3	-0.8	-0.9	0.23
805.0	0.10	30.35	805.0	0.4	-0.9	-1.0	0.23
905.0	0.10	327.37	905.0	0.5	-0.9	-1.0	0.10
1,005.0	0.19	285.77	1,005.0	0.7	-1.2	-1.2	0.13

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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 1H
Project:	Doddridge County WV	TVD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Well:	Callie 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)
1,105.0	0.08	136.86	1,105.0	0.7	-1.3	-1.3	0.26
1,205.0	0.13	26.47	1,205.0	0.7	-1.2	-1.2	0.17
1,305.0	0.15	291.23	1,305.0	0.9	-1.2	-1.3	0.21
1,405.0	0.19	222.33	1,405.0	0.8	-1.5	-1.6	0.20
1,505.0	0.01	290.06	1,505.0	0.7	-1.6	-1.7	0.19
1,605.0	0.18	234.93	1,605.0	0.6	-1.7	-1.8	0.17
1,705.0	0.16	216.82	1,705.0	0.4	-1.9	-2.0	0.06
1,805.0	0.19	190.87	1,805.0	0.1	-2.1	-2.0	0.08
1,905.0	0.33	200.19	1,905.0	-0.3	-2.2	-2.1	0.15
2,005.0	0.11	141.90	2,005.0	-0.7	-2.2	-2.1	0.29
2,105.0	0.16	252.65	2,105.0	-0.8	-2.3	-2.2	0.22
2,205.0	0.22	160.18	2,205.0	-1.0	-2.4	-2.2	0.28
2,305.0	0.16	158.86	2,305.0	-1.3	-2.3	-2.1	0.06
2,405.0	0.32	218.68	2,405.0	-1.7	-2.4	-2.1	0.28
2,505.0	0.53	241.82	2,505.0	-2.1	-3.0	-2.7	0.27
2,605.0	0.31	243.80	2,605.0	-2.5	-3.6	-3.3	0.22
2,705.0	0.41	194.79	2,705.0	-2.9	-3.9	-3.5	0.31
2,805.0	0.22	237.04	2,805.0	-3.4	-4.2	-3.7	0.29
2,905.0	0.26	196.90	2,905.0	-3.7	-4.4	-3.9	0.17
3,005.0	0.21	185.90	3,005.0	-4.1	-4.5	-3.9	0.07
3,105.0	0.33	170.05	3,105.0	-4.6	-4.5	-3.8	0.14
3,205.0	0.34	172.64	3,205.0	-5.1	-4.4	-3.7	0.02
3,305.0	0.15	152.29	3,305.0	-5.6	-4.3	-3.5	0.21
3,405.0	0.33	183.74	3,405.0	-6.0	-4.2	-3.4	0.22
3,505.0	0.31	194.15	3,505.0	-6.5	-4.3	-3.4	0.06
3,605.0	0.21	155.89	3,605.0	-6.9	-4.3	-3.4	0.19
3,705.0	0.24	190.94	3,705.0	-7.3	-4.3	-3.3	0.14
3,805.0	0.37	145.28	3,805.0	-7.8	-4.1	-3.1	0.27
3,905.0	0.34	133.65	3,905.0	-8.2	-3.7	-2.6	0.08
4,005.0	0.37	103.81	4,005.0	-8.5	-3.2	-2.1	0.19
4,105.0	0.55	104.36	4,105.0	-8.7	-2.4	-1.3	0.18
4,205.0	0.57	112.24	4,205.0	-9.0	-1.5	-0.3	0.08
4,305.0	0.85	125.82	4,305.0	-9.7	-0.5	0.8	0.32
4,405.0	0.91	119.76	4,404.9	-10.5	0.8	2.2	0.11
4,505.0	1.05	119.17	4,504.9	-11.3	2.3	3.8	0.14
4,605.0	1.50	149.09	4,604.9	-12.9	3.8	5.5	0.79
4,705.0	3.86	173.78	4,704.8	-17.4	4.8	7.1	2.57
4,805.0	5.20	185.64	4,804.5	-25.2	4.8	6.4	1.63
4,905.0	6.95	205.28	4,903.9	-35.2	1.7	6.4	2.69
5,005.0	10.05	208.51	5,002.8	-48.3	-5.0	1.4	3.14
5,105.0	11.40	210.75	5,101.1	-64.5	-14.2	5.6	1.41
5,205.0	16.61	201.38	5,198.1	-86.3	-24.5	-12.9	5.67
5,305.0	16.49	209.95	5,293.9	-111.9	-36.8	-21.7	2.44
5,405.0	19.10	224.04	5,389.2	-136.0	-55.3	-36.8	1.02

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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 1H
Project:	Doddridge County WV	TVD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Well:	Callie 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)
5,505.0	23.91	228.19	5,482.2	-161.3	-81.8	-59.7	5.04
5,605.0	24.26	237.92	5,573.5	-185.7	-114.3	-88.7	3.98
5,705.0	28.54	244.23	5,663.1	-207.0	-153.2	-124.5	5.11
5,805.0	25.93	255.93	5,752.1	-222.8	-196.0	-164.8	5.94
5,905.0	27.76	266.95	5,841.4	-229.3	-240.5	-208.1	5.29
6,005.0	33.39	266.06	5,927.4	-232.4	-291.3	-257.9	5.65
6,105.0	33.55	264.25	6,010.8	-237.1	-346.2	-311.8	1.01
6,205.0	33.44	263.60	6,094.2	-242.9	-401.1	-365.4	0.38
6,217.0	32.85	263.42	6,104.3	-243.7	-407.6	-371.8	4.98
6,271.0	32.07	263.37	6,149.8	-247.0	-436.4	-399.9	1.45
6,302.0	32.40	265.44	6,176.1	-248.6	-452.8	-416.0	3.72
6,333.0	32.80	270.44	6,202.2	-249.2	-469.5	-432.4	8.78
6,364.0	32.79	274.21	6,228.2	-248.5	-486.3	-449.1	6.59
6,394.0	33.33	277.76	6,253.4	-246.8	-502.6	-465.5	6.70
6,425.0	36.05	282.33	6,278.9	-243.7	-519.9	-483.1	12.14
6,456.0	38.78	287.28	6,303.5	-238.9	-538.1	-501.8	13.10
6,487.0	42.21	292.17	6,327.1	-232.1	-557.0	-521.4	15.07
6,518.0	45.64	296.22	6,349.4	-223.3	-576.6	-542.0	14.30
6,535.0	47.04	297.76	6,361.1	-217.7	-587.6	-553.6	10.52
Middlesex							
6,549.0	48.21	298.97	6,370.6	-212.8	-596.7	-563.3	10.52
6,580.0	50.91	301.40	6,390.7	-200.9	-617.1	-585.1	10.56
6,611.0	53.55	303.60	6,409.7	-187.7	-637.7	-607.3	10.20
6,641.0	55.77	305.23	6,427.0	-173.9	-657.9	-629.1	8.63
6,672.0	57.68	306.76	6,444.0	-158.7	-678.9	-651.9	7.42
6,703.0	59.79	308.87	6,460.1	-142.4	-699.8	-674.8	8.95
6,734.0	61.42	311.10	6,475.3	-125.0	-720.5	-697.6	8.18
6,745.0	61.86	311.93	6,480.6	-118.6	-727.7	-705.6	7.70
Burkett							
6,765.0	62.66	313.41	6,489.9	-106.6	-740.7	-720.1	7.70
6,796.0	64.87	315.61	6,503.6	-87.1	-760.6	-742.4	9.56
6,804.0	65.75	316.26	6,506.9	-81.9	-765.6	-748.1	13.24
Tully							
6,827.0	68.30	318.07	6,515.9	-66.4	-780.0	-764.4	13.24
6,857.0	71.49	321.78	6,526.2	-44.8	-798.1	-785.2	15.74
6,888.0	73.85	324.94	6,535.5	-21.1	-815.8	-805.8	12.35
6,891.0	73.98	325.17	6,536.3	-18.7	-817.4	-807.8	8.54
Marcellus							
6,919.0	75.19	327.31	6,543.7	3.7	-832.4	-825.6	8.54
6,950.0	76.67	329.95	6,551.3	29.4	-848.1	-844.5	9.54
6,981.0	80.54	332.24	6,557.4	56.0	-862.8	-862.6	14.43
7,012.0	85.10	333.14	6,561.3	83.3	-876.9	-880.2	14.99
7,105.0	92.86	332.43	6,562.9	165.9	-919.4	-933.2	8.38
7,198.0	91.01	332.60	6,559.8	248.4	-962.3	-986.7	2.00
7,291.0	88.02	331.37	6,560.6	330.5	-1,005.9	-1,040.8	3.48

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Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 1H
Project:	Doddridge County WV	TVD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Pre 522 Callie 1H 1005 GL + 18 KB @ 1023.0usft
Well:	Callie Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,383.0	88.11	332.34	6,563.7	411.5	-1,049.3	-1,094.5	1.06
7,476.0	91.10	333.31	6,564.3	494.3	-1,091.8	-1,147.6	3.38
7,571.0	91.98	333.75	6,561.8	579.3	-1,134.1	-1,200.8	1.04
7,665.0	91.54	333.57	6,558.9	663.5	-1,175.8	-1,253.2	0.51
7,760.0	91.01	333.48	6,556.8	748.5	-1,218.1	-1,306.4	0.57
7,855.0	90.84	333.13	6,555.2	833.4	-1,260.8	-1,360.0	0.41
7,949.0	91.01	335.06	6,553.7	917.9	-1,301.9	-1,411.8	2.06
8,044.0	91.01	334.10	6,552.0	1,003.7	-1,342.6	-1,463.6	1.01
8,138.0	88.64	334.71	6,552.3	1,088.5	-1,383.2	-1,515.1	2.60
8,232.0	88.37	334.01	6,554.8	1,173.2	-1,423.9	-1,566.6	0.80
8,327.0	88.72	334.10	6,557.2	1,258.6	-1,465.5	-1,619.0	0.38
8,421.0	88.99	334.98	6,559.1	1,343.4	-1,505.9	-1,670.3	0.98
8,515.0	90.13	336.47	6,559.8	1,429.1	-1,544.5	-1,719.9	2.00
8,607.0	89.87	335.24	6,559.8	1,513.1	-1,582.1	-1,768.3	1.37
8,700.0	90.22	335.59	6,559.7	1,597.6	-1,620.8	-1,817.9	0.53
8,793.0	89.87	335.77	6,559.6	1,682.4	-1,659.1	-1,867.1	0.42
8,885.0	90.84	334.80	6,559.1	1,765.9	-1,697.6	-1,916.2	1.49
8,978.0	89.80	334.70	6,558.6	1,850.0	-1,737.3	-1,966.7	1.12
9,070.0	89.96	333.22	6,558.7	1,932.7	-1,777.6	-2,017.6	1.62
9,163.0	89.43	332.52	6,559.2	2,015.5	-1,820.1	-2,070.6	0.94
9,256.0	91.71	333.31	6,558.3	2,098.3	-1,862.4	-2,123.5	2.59
9,348.0	91.01	332.08	6,556.1	2,180.0	-1,904.6	-2,176.2	1.54
9,441.0	89.16	331.11	6,556.0	2,261.8	-1,948.8	-2,230.8	2.25
9,533.0	89.25	332.16	6,557.3	2,342.7	-1,992.5	-2,284.9	1.15
9,626.0	89.25	331.64	6,558.5	2,424.8	-2,036.3	-2,339.1	0.56
9,719.0	90.57	334.36	6,558.6	2,507.6	-2,078.5	-2,391.9	3.25
9,811.0	90.57	333.75	6,557.7	2,590.3	-2,118.8	-2,442.8	0.66
9,904.0	89.43	334.10	6,557.7	2,673.9	-2,159.7	-2,494.3	1.28
9,997.0	89.46	334.17	6,558.6	2,757.6	-2,200.2	-2,545.6	0.08
10,089.0	89.25	333.48	6,559.7	2,840.1	-2,240.8	-2,596.8	0.78
10,182.0	88.99	334.36	6,561.1	2,923.6	-2,281.7	-2,648.3	0.99
10,274.0	90.66	336.21	6,561.4	3,007.2	-2,320.2	-2,697.5	2.71
10,367.0	90.92	335.77	6,560.1	3,092.1	-2,358.0	-2,746.2	0.55
10,460.0	91.36	335.68	6,558.2	3,176.9	-2,396.2	-2,795.3	0.48
10,552.0	91.01	336.12	6,556.3	3,260.9	-2,433.8	-2,843.7	0.61
10,645.0	90.31	334.10	6,555.3	3,345.2	-2,472.9	-2,893.6	2.30
10,738.0	88.64	332.96	6,556.1	3,428.5	-2,514.4	-2,943.5	2.17
10,830.0	88.99	333.22	6,558.0	3,510.5	-2,556.0	-2,997.8	0.47
10,923.0	89.69	333.66	6,559.1	3,593.7	-2,597.6	-3,050.0	0.89
11,015.0	89.78	332.87	6,559.5	3,675.8	-2,639.0	-3,101.9	0.86
11,108.0	90.66	332.69	6,559.2	3,758.5	-2,681.5	-3,155.0	0.97
11,201.0	91.28	330.49	6,557.6	3,840.3	-2,725.7	-3,209.7	2.46
11,293.0	91.10	331.29	6,555.7	3,920.7	-2,770.5	-3,264.7	0.89
11,386.0	90.84	333.04	6,554.1	4,002.9	-2,811.9	-3,318.6	1.90

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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)
11,479.0	90.84	332.43	6,552.7	4,085.5	-2,856.5	-3,371.7	0.66
11,571.0	89.78	332.34	6,552.2	4,167.1	-2,899.1	-3,424.8	1.16
11,664.0	89.08	333.66	6,553.2	4,249.9	-2,941.4	-3,477.6	1.61
11,757.0	90.84	335.68	6,553.2	4,334.0	-2,981.1	-3,528.2	2.88
11,849.0	91.71	336.03	6,551.2	4,417.9	-3,018.8	-3,576.5	1.02
11,942.0	91.45	335.77	6,548.6	4,502.8	-3,056.7	-3,625.4	0.40
12,035.0	90.40	336.03	6,547.1	4,587.6	-3,094.7	-3,674.3	1.16
12,127.0	89.69	334.36	6,547.0	4,671.2	-3,133.3	-3,723.6	1.97
12,220.0	89.52	333.39	6,547.7	4,754.7	-3,174.2	-3,775.2	1.06
12,313.0	90.84	332.43	6,547.4	4,837.4	-3,216.6	-3,828.1	1.76
12,405.0	91.45	333.31	6,545.5	4,919.3	-3,258.5	-3,880.5	1.16
12,498.0	90.22	334.36	6,544.2	5,002.8	-3,299.5	-3,932.2	1.74
12,590.0	90.04	334.36	6,544.0	5,085.7	-3,339.3	-3,982.6	0.20
12,683.0	90.66	334.45	6,543.4	5,169.6	-3,379.5	-4,033.5	0.67
12,776.0	90.48	333.57	6,542.5	5,253.2	-3,420.3	-4,085.0	0.97
12,868.0	90.84	333.48	6,541.4	5,335.5	-3,461.3	-4,136.5	0.40
12,905.0	91.19	332.78	6,540.8	5,368.5	-3,478.0	-4,157.5	2.11
12,965.0	91.19	332.78	6,539.5	5,421.9	-3,505.4	-4,191.7	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,535.0	6,361.1	-217.7	-587.6	Middlesex
6,745.0	6,480.6	-118.6	-727.7	Burkett
6,804.0	6,506.9	-81.9	-765.6	Tully
6,891.0	6,536.3	-18.7	-817.4	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/27/2014
Job End Date:	8/2/2014
State:	West Virginia
County:	Doddridge
API Number:	47-017-06192-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Callie Unit 1H
Longitude:	-80.85261400
Latitude:	39.24145600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,564
Total Base Water Volume (gal):	7,954,548
Total Base Non Water Volume:	268,822



17-06192

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	Antero Resources	Base Fluid	Water	7732-18-5	100.00000	92.37155	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	7.32891	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.09389	
			Hydrogen Chloride	7641-01-1	18.00000	0.02243	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.04082	
			Petroleum Distillates	64742-47-8	60.00000	0.03866	
			Suspending agent (solid)	14808-60-7	3.00000	0.00624	
			Surfactant	68439-51-0	3.00000	0.00245	
WFRA-405	U.S. Well Services,	Friction Reducer	Water	7732-18-5	40.00000	0.02407	
			Anionic Polyacrylamide	Proprietary		0.02407	
			Petroleum Distillates	64742-47-8	22.00000	0.01937	
			Crystalline Salt	12125-02-9	5.00000	0.00301	

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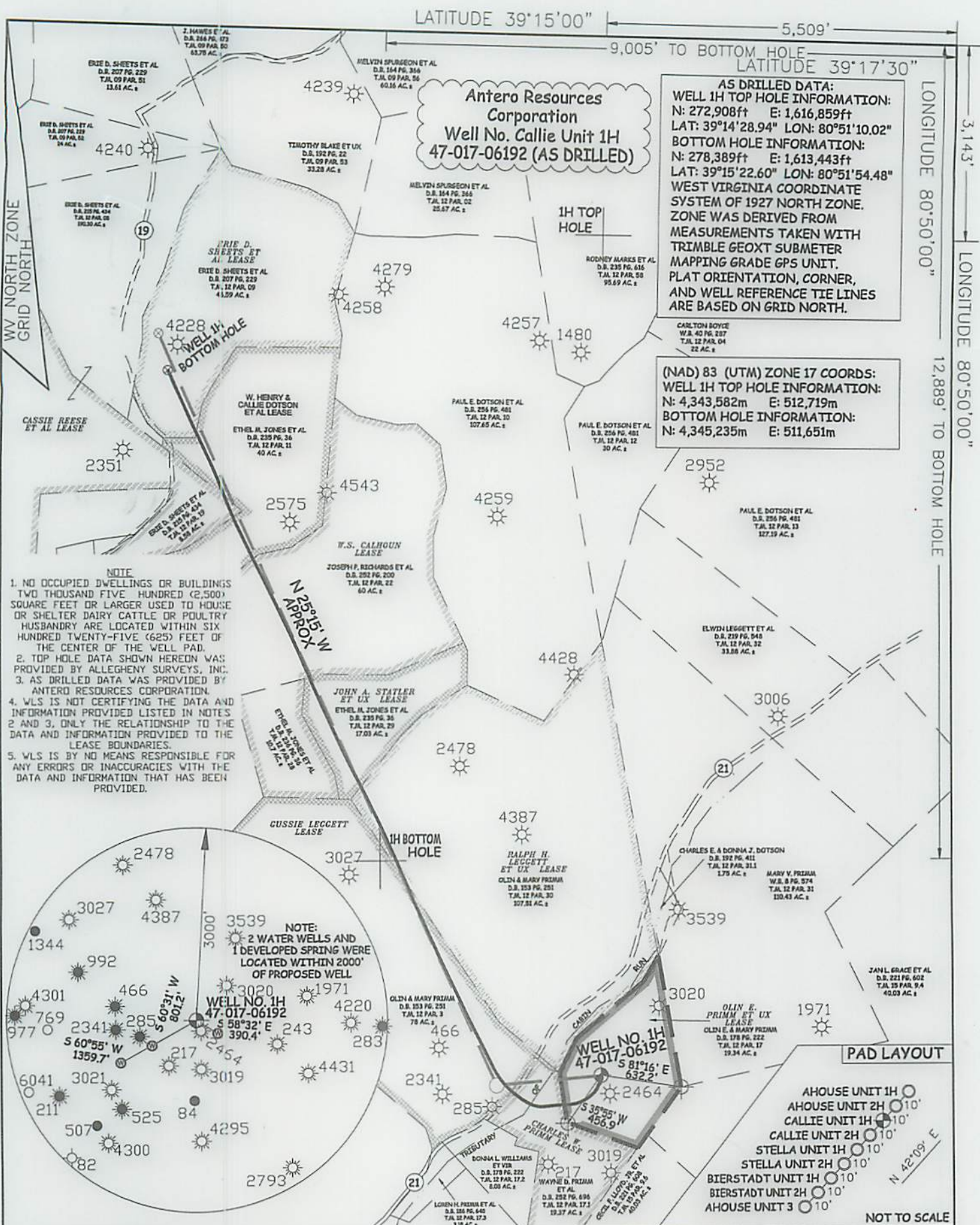
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00301
SI-1000	J.S. Well Services, LLC	Scale Inhibitor				
			Anionic Copolymer	Proprietary		0.00430
			Ethylene Glycol	107-21-1	20.00000	0.00389
			Water	7732-18-5	30.00000	0.00324
K-BAC 1020	J.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropanamide	10222-01-2	20.00000	0.00495
			Deionized Water	7732-18-5	28.00000	0.00283
AP One	J.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00175
AI-300	J.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene Glycol	107-21-1	31.00000	0.00025
			N,N-Dimethylformamide	68-12-2	15.00000	0.00008
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00007
			Cinnamaldehyde	104-55-2	5.00000	0.00007
			2-Butoxyethanol	111-76-2	7.00000	0.00006
			Water	7732-18-5	20.00000	0.00002
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002
			Isopropyl Alcohol	67-63-0	3.00000	0.00001
			Triethyl Phosphate	78-40-0	3.00000	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.

* 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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JOB # 12-157WA		STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS	LEGEND
DRAWING # CALLIE1HAD		WILLOW LAND SURVEYING PLLC	— Surface Owner Boundary Lines +/-
SCALE 1" = 1000'		220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415	- - - Interior Surface Tracts +/-
MINIMUM DEGREE OF ACCURACY SUBMETER			X Existing Fence
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS			⊕ Found monument, as noted
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS			○ Proposed Well Path
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL			⊗ As Drilled Well Path
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X			DATE 05/26/15
LOCATION: ELEVATION 1,030' ORIGINAL - 1,008' AS DRILLED			OPERATOR'S WELL# CALLIE UNIT #1H
QUADRANGLE OXFORD 7.5' DISTRICT CENTRAL COUNTY DODDRIIDGE			API WELL #
SURFACE OWNER OLIN E. & MARY PRIMM			47 - 017 - 06192
OIL & GAS ROYALTY OWNER OLIN E. PRIMM ET UX; CHARLES W. PRIMM; GUSSIE LEGGETT; RALPH H. LEGGETT ET UX; JOHN A. STATLER ET UX; W.S. CALHOUN; W. HENRY & CALLIE DOTSON ET AL; CASSIE REESE ET AL; ERIE D. SHEETS ET AL			STATE COUNTY PERMIT
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE			
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL			
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG			
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,540' TVD 12,965' MD			
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER			
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD			
DENVER, CO 80202 CHARLESTON, WV 25313			

10/23/2015