

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

API 47-017-06193 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 2H
Operator (as registered with the OOG) Antero Resources Corportion
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 4343580m Easting 512717m
Landing Point of Curve Northing 4343706.37m Easting 512623.50m
Bottom Hole Northing 4345326m Easting 511836m

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 8/12/2013 Date drilling ceased 5/14/2014
Date completion activities began 6/5/2014 Date completion activities ceased 8/28/2014
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: JA
10/23/2015
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API 47-017 - 06193 Farm name Primm, Olin E. & Mary Well number Callie Unit 2H

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	24"	20"	40'	New	94# H-40	N/A	Y
Surface	17- 1/2"	13- 3/8"	336'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2509'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	12834'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6658'		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	196 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	402 sx	15.6	1.18	233	0'	8 Hrs.
Coal							
Intermediate 1	Class A	988 sx	15.6	1.18	786	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	886 sx (Lead) 1019 sx (Tail)	13.5 Lead 15.2 Tail	1.44 Lead 1.8 Tail	2480	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12834' MD, 6661' TVD (BHL); 6571' TVD (Deepest point drilled) Loggers TD (ft) 12785'
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5861'

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

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____ RECEIVED
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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____ AUG 10 2015

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____ WV Department of
 Environmental Protection

API 47- 017 - 06193 Farm name Primm, Olin E. & Mary Well number Callie Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Marcellus	6527' (TOP) TVD	6701' (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 6007 mcfpd Oil --- bpd NGL --- bpd Water 1597 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)
	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 8/3/2015

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

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EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	5-Jun-14	12,598	12,768	60	Marcellus
2	20-Jul-14	12,396	12,566	60	Marcellus
3	20-Jul-14	12,194	12,364	60	Marcellus
4	21-Jul-14	11,992	12,162	60	Marcellus
5	21-Jul-14	11,790	11,960	60	Marcellus
6	21-Jul-14	11,588	11,758	60	Marcellus
7	21-Jul-14	11,386	11,556	60	Marcellus
8	21-Jul-14	11,184	11,354	60	Marcellus
9	22-Jul-14	10,982	11,152	60	Marcellus
10	22-Jul-14	10,780	10,950	60	Marcellus
11	22-Jul-14	10,578	10,748	60	Marcellus
12	22-Jul-14	10,376	10,546	60	Marcellus
13	22-Jul-14	10,174	10,344	60	Marcellus
14	22-Jul-14	9,972	10,142	60	Marcellus
15	23-Jul-14	9,770	9,940	60	Marcellus
16	24-Jul-14	9,568	9,738	60	Marcellus
17	24-Jul-14	9,366	9,536	60	Marcellus
18	24-Jul-14	9,164	9,334	60	Marcellus
19	24-Jul-14	8,962	9,132	60	Marcellus
20	24-Jul-14	8,760	8,930	60	Marcellus
21	25-Jul-14	8,558	8,728	60	Marcellus
22	25-Jul-14	8,356	8,526	60	Marcellus
23	25-Jul-14	8,154	8,324	60	Marcellus
24	25-Jul-14	7,951	8,122	60	Marcellus
25	26-Jul-14	7,749	7,920	60	Marcellus
26	26-Jul-14	7,547	7,718	60	Marcellus
27	26-Jul-14	7,345	7,516	60	Marcellus
28	26-Jul-14	7,143	7,314	60	Marcellus
29	26-Jul-14	6,941	7,112	60	Marcellus
30	27-Jul-14	6,739	6,910	60	Marcellus

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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	20-Jul-14	77.5	7,321	5,389	5,186	252,900	6,817	N/A
2	20-Jul-14	77.0	7,302	6,051	3,955	242,200	6,576	N/A
3	20-Jul-14	79.0	7,456	5,515	4,202	242,800	6,919	N/A
4	21-Jul-14	78.0	7,145	5,625	4,892	252,600	6,623	N/A
5	21-Jul-14	77.0	7,346	5,558	3,923	256,300	6,487	N/A
6	21-Jul-14	76.0	7,564	5,593	4,313	258,250	6,477	N/A
7	21-Jul-14	78.0	7,145	5,522	4,721	256,700	6,470	N/A
8	21-Jul-14	78.0	7,165	5,683	4,621	259,150	6,455	N/A
9	22-Jul-14	78.0	7,198	5,583	4,699	256,600	6,439	N/A
10	22-Jul-14	77.0	7,110	5,558	4,030	257,250	6,421	N/A
11	22-Jul-14	77.0	7,177	5,783	4,159	257,100	6,416	N/A
12	22-Jul-14	78.0	6,730	5,293	4,810	258,600	6,298	N/A
13	22-Jul-14	79.0	7,455	5,368	5,919	238,050	6,579	N/A
14	22-Jul-14	78.0	6,896	5,343	4,771	250,100	6,290	N/A
15	23-Jul-14	82.0	6,714	5,382	5,171	242,450	7,122	N/A
16	24-Jul-14	77.0	6,783	5,329	4,778	258,750	6,343	N/A
17	24-Jul-14	74.0	6,954	5,121	3,480	255,100	6,341	N/A
18	24-Jul-14	76.0	6,988	5,354	3,487	257,450	6,318	N/A
19	24-Jul-14	74.0	6,944	5,275	4,467	214,500	6,299	N/A
20	24-Jul-14	74.0	6,984	5,345	4,318	255,650	6,296	N/A
21	25-Jul-14	78.0	6,706	5,661	3,909	256,250	6,280	N/A
22	25-Jul-14	77.0	6,500	5,450	3,666	258,450	6,265	N/A
23	25-Jul-14	80.0	6,659	5,389	3,784	255,830	6,257	N/A
24	25-Jul-14	79.0	6,563	5,379	3,737	255,540	6,251	N/A
25	26-Jul-14	77.0	6,321	5,454	3,641	259,150	6,224	N/A
26	26-Jul-14	77.0	6,821	5,625	3,605	257,000	6,211	N/A
27	26-Jul-14	76.0	7,058	3,022	3,859	193,750	6,487	N/A
28	26-Jul-14	78.0	6,789	5,563	3,944	254,800	6,184	N/A
29	26-Jul-14	78.0	6,716	6,566	3,819	254,600	6,168	N/A
30	27-Jul-14	74.0	6,411	6,759	3,319	256,250	6,100	N/A
AVG=		77.3	6,964	5,485	4,240	7,524,120	192,413	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	1970	est. 1683	1970
Big Lime	1970	2040	1970	2040
Big Injun	2040	2330	2040	2330
Weir	2330	2440	2330	2440
Fifty Foot Sandstone	2440	2615	2440	2615
Gordon	2615	2800	2615	2800
Fifth Sandstone	2800	3079	2800	3079
Bayard	3079	3400	3079	3400
Speechley	3400	4080	3400	4080
Baltown	4080	4538	4080	4538
Bradford	4538	4954	4538	4954
Benson	4954	5218	4954	5218
Alexander	5218	6182	5218	6187
Sycamore	6182	6350	6187	6382
Middlesex	6350	6470	6382	6573
Burkett	6470	6497	6573	6625
Tully	6497	6527	6625	6701
Marcellus	6527	NA	6701	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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Callie Unit 2H
 Doddridge County WV
 Northing: 14249847.77
 Easting: 1682092.43
 As Drilled



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WELL DETAILS: Callie Unit 2H

+N/S	+E/W	Northing	Easting	Latitude	Longitude
0.0	0.0	14249847.77	1682092.43	14° 28' 07.4" N	81° 10' 03.8" W

LEGEND

- Callie Unit 2H, Original Wellpath, As Drilled V0
- △ Ahouse Unit 1H, Original Wellpath, As Drilled V0
- ▽ Ahouse Unit 2H, Original Wellpath, As Drilled V0
- Callie Unit 2H, Original Wellpath, Plan 3 Rev 1 V0
- As Drilled

PROJECT DETAILS: Doddridge County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: Clarke 1866
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level

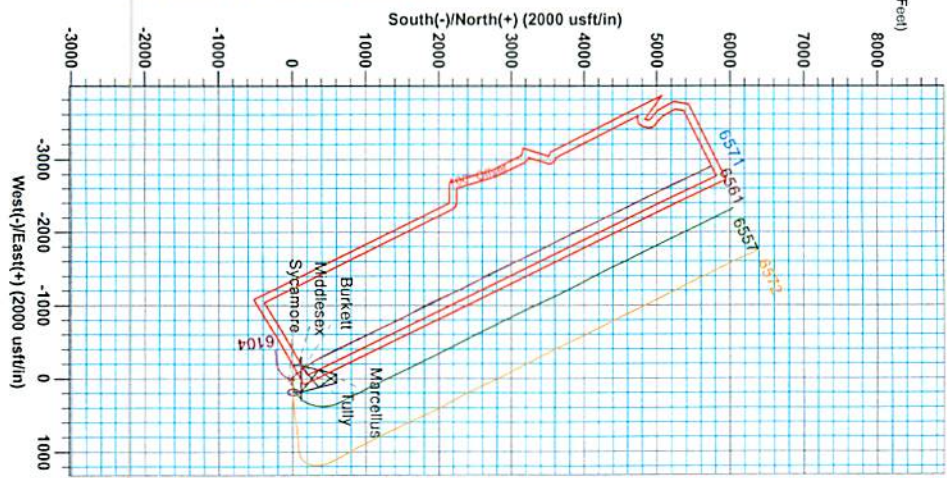
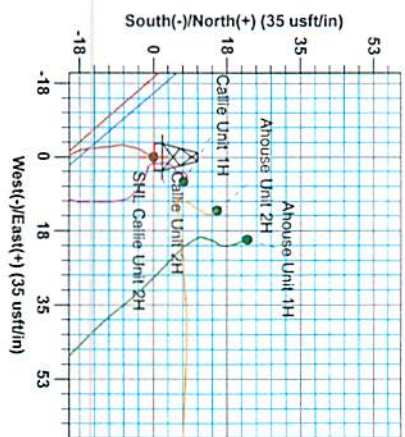
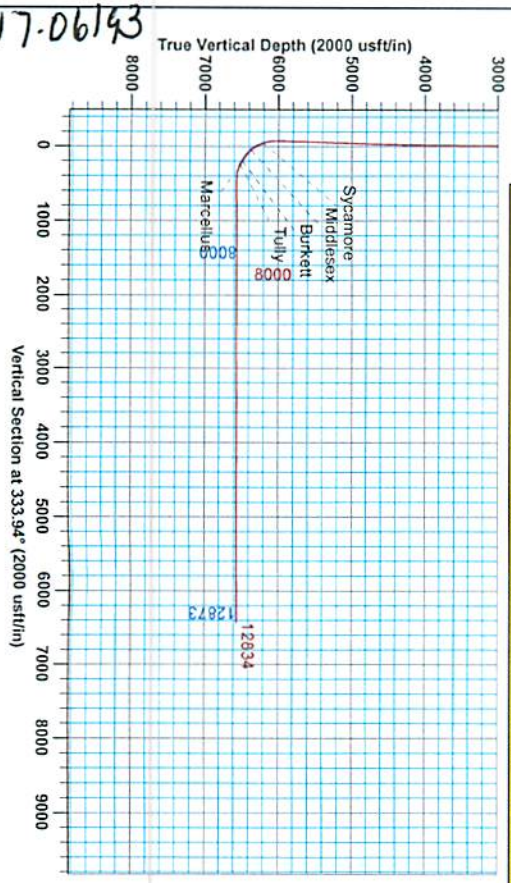
SITE DETAILS: Ahouse / Callie Pad

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

Genie Lightfoot
 9/25, May 15 2014
 Scientific Drilling
 421 South Eagle Lane
 Oklahoma City, OK 73178

DESIGN TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
SHL Callie Unit 2H	0.0	0.0	0.0	14249847.77	1682092.43	14° 28' 07.4" N	81° 10' 03.8" W
Actual BH: Callie Unit 2H	6560.8	5728.3	-2891.6	14255576.09	1679200.85	15° 25' 55.9" N	80° 51' 46.753" W



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

Magnetic Field
 Strength: 52351.45 nT
 Decline: 813.2013
 Model: BCGM2014

17-06193



Antero Resources

Doddridge County WV
Ahouse / Callie Pad
Callie Unit 2H
Original Wellpath

Design: As Drilled

EOW Completion Report

15 May, 2014

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Scientific Drilling

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Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Well:	Callie Unit 2H	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 Fee	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
From:	Map	Easting:	1,682,112.06 usft
Position Uncertainty:	2.8 usft	Slot Radius:	13-3/16"
		Latitude:	39° 14' 29.095 N
		Longitude:	80° 51' 9.848 W
		Grid Convergence:	0.09 °

Well	Callie Unit 2H					
Well Position	+N/-S	0.0 usft	Northing:	14,249,847.77 usft	Latitude:	39° 14' 28.874 N
	+E/-W	0.0 usft	Easting:	1,682,092.43 usft	Longitude:	80° 51' 10.098 W
Position Uncertainty		2.8 usft	Wellhead Elevation:	1,023.0 usft	Ground Level:	1,005.0 usft

Wellbore	Original Wellpath		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	8/13/2013	-8.41	66.92	52,351

Design	As Drilled		
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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	333.94

Survey Program	Date	5/15/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	5,861.0	Survey #3 Def Gyro to KOP (Original Well	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
5,898.0	12,834.0	Survey #4 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	0.63	202.90	105.0	-0.5	-0.2	-0.4	0.60
205.0	0.54	211.22	205.0	-1.4	-0.7	-1.0	0.12
305.0	0.42	210.93	305.0	-2.2	-1.1	-1.4	0.12
405.0	0.41	217.82	405.0	-2.8	-1.5	-1.8	0.05
505.0	0.30	200.45	505.0	-3.3	-1.8	-2.1	0.15
605.0	0.31	195.17	605.0	-3.8	-2.0	-2.5	0.03
705.0	0.37	197.57	705.0	-4.4	-2.2	-3.0	0.06
805.0	0.48	190.74	805.0	-5.1	-2.3	-3.5	0.12
905.0	0.41	196.64	905.0	-5.8	-2.5	-4.1	0.08
1,005.0	0.39	196.80	1,005.0	-6.5	-2.7	-4.6	0.02

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Site:	Ahouse / Callie Pad	MD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Well:	Callie Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

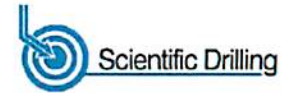
Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)		
1,105.0	0.46	184.54	1,105.0	-7.2	-2.9	-5.2	0.11		
1,205.0	0.42	171.13	1,205.0	-8.0	-2.8	-5.9	0.11		
1,305.0	0.21	180.50	1,305.0	-8.5	-2.8	-6.4	0.22		
1,405.0	0.48	168.18	1,405.0	-9.1	-2.7	-7.0	0.28		
1,505.0	0.47	165.79	1,505.0	-9.9	-2.5	-7.8	0.02		
1,605.0	0.33	185.89	1,605.0	-10.6	-2.4	-8.5	0.20		
1,705.0	0.31	172.88	1,705.0	-11.2	-2.4	-9.0	0.08		
1,805.0	0.54	175.01	1,805.0	-11.9	-2.4	-9.7	0.23		
1,905.0	0.43	166.71	1,905.0	-12.7	-2.2	-10.5	0.13		
2,005.0	0.30	172.04	2,004.9	-13.4	-2.1	-11.1	0.13		
2,105.0	0.27	183.23	2,104.9	-13.9	-2.1	-11.5	0.06		
2,205.0	0.23	184.61	2,204.9	-14.3	-2.1	-11.9	0.04		
2,305.0	0.34	185.50	2,304.9	-14.8	-2.2	-12.3	0.11		
2,405.0	0.25	163.21	2,404.9	-15.3	-2.1	-12.8	0.14		
2,505.0	0.22	165.41	2,504.9	-15.7	-2.0	-13.2	0.03		
2,605.0	0.29	164.34	2,604.9	-16.1	-1.9	-13.7	0.07		
2,705.0	0.26	171.33	2,704.9	-16.6	-1.8	-14.1	0.04		
2,805.0	0.31	161.48	2,804.9	-17.1	-1.7	-14.6	0.07		
2,905.0	0.28	159.33	2,904.9	-17.6	-1.5	-15.1	0.03		
3,005.0	0.24	164.29	3,004.9	-18.0	-1.4	-15.6	0.05		
3,105.0	0.35	157.07	3,104.9	-18.5	-1.2	-16.1	0.12		
3,205.0	0.37	151.43	3,204.9	-19.0	-0.9	-16.7	0.04		
3,305.0	0.29	150.54	3,304.9	-19.5	-0.6	-17.3	0.08		
3,405.0	0.29	158.94	3,404.9	-20.0	-0.4	-17.8	0.04		
3,505.0	0.31	146.60	3,504.9	-20.5	-0.2	-18.3	0.07		
3,605.0	0.29	149.43	3,604.9	-20.9	0.1	-18.8	0.02		
3,705.0	0.31	152.91	3,704.9	-21.4	0.4	-19.3	0.03		
3,805.0	0.37	142.36	3,804.9	-21.9	0.7	-19.9	0.09		
3,905.0	0.42	143.58	3,904.9	-22.4	1.1	-20.6	0.05		
4,005.0	0.58	140.22	4,004.9	-23.1	1.6	-21.5	0.16		
4,105.0	0.77	124.98	4,104.9	-23.9	2.5	-22.5	0.26		
4,205.0	0.96	126.74	4,204.9	-24.8	3.7	-23.9	0.19		
4,305.0	1.17	123.36	4,304.9	-25.8	5.3	-25.5	0.22		
4,405.0	1.40	125.34	4,404.9	-27.1	7.1	-27.5	0.23		
4,505.0	1.55	129.83	4,504.8	-28.7	9.1	-29.8	0.19		
4,605.0	1.69	129.31	4,604.8	-30.5	11.3	-32.3	0.14		
4,705.0	1.82	135.35	4,704.7	-32.5	13.6	-35.2	0.23		
4,805.0	1.85	135.09	4,804.7	-34.8	15.8	-38.2	0.03		
4,905.0	1.88	139.91	4,904.6	-37.2	18.0	-41.3	0.16		
5,005.0	1.99	139.08	5,004.6	-39.8	20.2	-44.6	0.11		
5,105.0	2.04	141.89	5,104.5	-42.5	22.5	-48.0	0.15		
5,205.0	1.99	140.33	5,204.5	-45.2	24.7	-51.4	0.07		
5,305.0	1.69	137.27	5,304.4	-47.6	26.8	-54.5	0.32		
5,405.0	1.72	137.92	5,404.4	-49.8	28.8	-57.4	0.04		

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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Well:	Callie Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

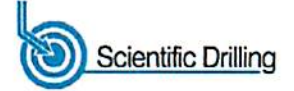
Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	
5,505.0	1.69	137.87	5,504.3	-52.0	30.8	-60.3	0.03	
5,605.0	1.66	137.84	5,604.3	-54.2	32.7	-63.1	0.03	
5,705.0	1.66	138.87	5,704.2	-56.4	34.7	-65.9	0.03	
5,805.0	1.53	144.72	5,804.2	-58.5	36.4	-68.6	0.21	
5,861.0	1.38	144.88	5,860.2	-59.7	37.2	-70.0	0.27	
5,898.0	1.12	138.28	5,897.2	-60.3	37.7	-70.8	0.80	
5,990.0	1.05	139.96	5,989.1	-61.7	38.8	-72.5	0.08	
6,083.0	5.36	303.70	6,082.0	-59.9	35.8	-69.5	6.85	
6,114.0	9.80	311.27	6,112.8	-57.4	32.6	-65.8	14.65	
6,145.0	13.32	315.96	6,143.1	-53.0	28.1	-60.0	11.74	
6,176.0	16.49	318.39	6,173.1	-47.2	22.7	-52.4	10.42	
6,205.0	19.72	318.73	6,200.6	-40.4	16.8	-43.7	11.14	
Sycamore								
6,206.0	19.83	318.74	6,201.6	-40.2	16.5	-43.4	11.14	
6,237.0	22.91	318.43	6,230.4	-31.7	9.1	-32.5	9.94	
6,268.0	26.08	317.86	6,258.6	-22.1	0.5	-20.1	10.25	
6,299.0	29.67	318.62	6,286.0	-11.3	-9.2	-6.1	11.64	
6,330.0	33.04	319.50	6,312.5	0.9	-19.7	9.4	10.97	
6,361.0	36.42	320.89	6,338.0	14.4	-31.0	26.6	11.20	
6,392.0	40.17	321.87	6,362.3	29.4	-43.0	45.3	12.25	
6,400.0	41.17	321.98	6,368.4	33.5	-46.2	50.4	12.58	
Middlesex								
6,423.0	44.06	322.27	6,385.3	45.8	-55.8	65.7	12.58	
6,453.0	47.92	322.26	6,406.1	62.9	-69.0	86.8	12.87	
6,484.0	51.20	321.93	6,426.3	81.5	-83.5	109.9	10.61	
6,515.0	53.25	321.03	6,445.2	100.7	-98.7	133.8	7.00	
6,546.0	55.09	321.11	6,463.4	120.2	-114.5	158.3	5.94	
6,577.0	56.60	320.94	6,480.8	140.2	-130.7	183.3	4.89	
6,591.0	57.48	320.63	6,488.4	149.3	-138.1	194.8	6.55	
Burkett								
6,608.0	58.55	320.27	6,497.4	160.4	-147.3	208.8	6.55	
6,639.0	61.16	321.49	6,513.0	181.2	-164.2	234.9	9.08	
6,643.0	61.66	321.72	6,514.9	183.9	-166.4	238.3	13.57	
Tully								
6,670.0	65.07	323.23	6,527.0	203.1	-181.1	262.0	13.57	
6,700.0	68.97	324.39	6,538.7	225.4	-197.4	289.2	13.48	
6,719.0	70.87	326.11	6,545.2	240.0	-207.5	306.8	13.12	
Marcellus								
6,731.0	72.08	327.17	6,549.0	249.5	-213.8	318.1	13.12	
6,762.0	76.59	328.68	6,557.4	274.8	-229.6	347.8	15.29	
6,793.0	81.25	329.21	6,563.4	300.9	-245.3	378.1	15.13	
6,824.0	85.23	330.10	6,567.0	327.4	-260.9	408.8	13.15	
6,923.0	90.22	333.51	6,570.9	414.6	-307.6	507.6	6.10	
7,016.0	90.13	333.42	6,570.7	497.8	-349.1	600.6	0.145	
7,108.0	91.28	333.51	6,569.5	580.1	-390.2	692.5	1.25	

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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Well:	Callie Unit 2H	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)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
7,201.0	91.19	334.39	6,567.5	663.6	-431.1	785.5	0.95
7,294.0	90.84	334.65	6,565.9	747.6	-471.1	878.5	0.47
7,386.0	90.22	334.22	6,565.0	830.6	-510.8	970.5	0.82
7,479.0	89.52	333.78	6,565.2	914.1	-551.5	1,063.5	0.89
7,571.0	91.19	334.74	6,564.7	997.0	-591.5	1,155.5	2.09
7,664.0	90.31	335.09	6,563.4	1,081.2	-630.9	1,248.5	1.02
7,756.0	89.78	335.01	6,563.4	1,164.6	-669.7	1,340.5	0.58
7,849.0	89.69	335.80	6,563.8	1,249.2	-708.4	1,433.4	0.85
7,942.0	89.43	336.32	6,564.5	1,334.2	-746.2	1,526.4	0.63
8,035.0	88.90	333.16	6,565.9	1,418.3	-785.8	1,619.3	3.44
8,127.0	89.78	332.55	6,566.9	1,500.1	-827.8	1,711.3	1.16
8,220.0	89.96	332.19	6,567.1	1,582.5	-870.9	1,804.3	0.43
8,312.0	90.13	330.52	6,567.1	1,663.3	-915.0	1,896.2	1.82
8,405.0	90.66	331.40	6,566.4	1,744.6	-960.2	1,989.0	1.10
8,500.0	89.69	333.07	6,566.1	1,828.6	-1,004.4	2,084.0	2.03
8,594.0	90.40	334.13	6,566.1	1,912.8	-1,046.2	2,178.0	1.36
8,689.0	89.34	337.12	6,566.3	1,999.4	-1,085.4	2,272.9	3.34
8,784.0	88.96	336.61	6,567.7	2,086.7	-1,122.7	2,367.8	0.67
8,879.0	89.78	336.32	6,568.7	2,173.8	-1,160.7	2,462.7	0.92
8,973.0	89.96	335.80	6,569.0	2,259.7	-1,198.8	2,556.6	0.59
9,067.0	89.60	334.48	6,569.3	2,345.0	-1,238.3	2,650.6	1.46
9,161.0	90.66	331.05	6,569.1	2,428.6	-1,281.3	2,744.6	3.82
9,256.0	90.84	331.32	6,567.9	2,511.8	-1,327.1	2,839.5	0.34
9,350.0	90.92	330.96	6,566.4	2,594.1	-1,372.5	2,933.3	0.39
9,443.0	90.40	333.34	6,565.3	2,676.3	-1,415.9	3,026.3	2.62
9,536.0	89.69	334.22	6,565.3	2,759.8	-1,457.0	3,119.3	1.22
9,628.0	91.54	335.36	6,564.3	2,843.0	-1,496.2	3,211.3	2.36
9,721.0	90.84	335.80	6,562.3	2,927.6	-1,534.6	3,304.2	0.89
9,813.0	90.75	334.83	6,561.1	3,011.2	-1,573.1	3,396.2	1.06
9,906.0	88.55	335.01	6,561.6	3,095.5	-1,612.5	3,489.1	2.37
9,999.0	88.99	335.09	6,563.6	3,179.8	-1,651.7	3,582.1	0.48
10,091.0	89.25	334.92	6,565.0	3,263.1	-1,690.6	3,674.1	0.34
10,184.0	90.22	332.72	6,565.5	3,346.6	-1,731.6	3,767.1	2.59
10,276.0	90.84	332.90	6,564.6	3,428.4	-1,773.6	3,859.0	0.70
10,369.0	90.57	332.81	6,563.5	3,511.2	-1,816.1	3,952.0	0.31
10,462.0	90.48	332.37	6,562.6	3,593.7	-1,858.9	4,045.0	0.48
10,554.0	90.13	332.81	6,562.1	3,675.4	-1,901.2	4,137.0	0.61
10,647.0	90.13	333.42	6,561.9	3,758.3	-1,943.3	4,229.9	0.66
10,739.0	89.52	332.63	6,562.2	3,840.3	-1,985.0	4,321.9	1.08
10,832.0	90.66	335.62	6,562.1	3,924.0	-2,025.6	4,414.9	3.44
10,925.0	90.75	334.57	6,560.9	4,008.3	-2,064.8	4,507.9	1.13
11,017.0	89.43	336.15	6,560.8	4,091.9	-2,103.1	4,599.9	2.24
11,110.0	89.60	334.43	6,561.6	4,176.4	-2,142.0	4,692.9	1.86
11,202.0	89.43	334.83	6,562.3	4,259.6	-2,181.4	4,784.8	0.47
11,295.0	89.52	335.53	6,563.2	4,344.0	-2,220.4	4,877.8	0.76

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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Callie Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Site:	Ahouse / Callie Pad	MD Reference:	Precision 522: 1005' GL +18' RKB @ 1023.0usft
Well:	Callie Unit 2H	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)
11,388.0	88.69	334.10	6,564.6	4,428.1	-2,260.0	4,970.8	1.78
11,481.0	89.69	333.34	6,566.0	4,511.5	-2,301.2	5,063.8	1.35
11,573.0	90.22	334.57	6,566.0	4,594.1	-2,341.6	5,155.8	1.46
11,666.0	90.22	335.36	6,565.7	4,678.4	-2,380.9	5,248.7	0.85
11,758.0	89.69	333.51	6,565.8	4,761.4	-2,420.6	5,340.7	2.09
11,851.0	90.40	332.99	6,565.7	4,844.4	-2,462.5	5,433.7	0.95
11,944.0	90.22	332.46	6,565.2	4,927.1	-2,505.1	5,526.7	0.60
12,036.0	89.87	331.40	6,565.1	5,008.3	-2,548.4	5,618.6	1.21
12,129.0	90.66	331.14	6,564.7	5,089.8	-2,593.1	5,711.5	0.89
12,222.0	90.92	333.69	6,563.4	5,172.2	-2,636.2	5,804.5	2.76
12,314.0	90.13	335.01	6,562.5	5,255.2	-2,676.0	5,896.5	1.67
12,407.0	89.87	335.09	6,562.5	5,339.5	-2,715.2	5,989.5	0.29
12,500.0	91.36	335.62	6,561.5	5,424.0	-2,754.0	6,082.4	1.70
12,592.0	89.96	335.45	6,560.5	5,507.7	-2,792.1	6,174.4	1.53
12,685.0	89.69	335.27	6,560.8	5,592.3	-2,830.8	6,267.4	0.35
12,775.0	90.13	336.24	6,560.9	5,674.3	-2,867.8	6,357.3	1.18
12,834.0	90.13	336.24	6,560.8	5,728.3	-2,891.6	6,416.3	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,205.0	6,200.6	-40.4	16.8	Sycamore
6,400.0	6,368.4	33.5	-46.2	Middlesex
6,591.0	6,488.4	149.3	-138.1	Burkett
6,643.0	6,514.9	183.9	-166.4	Tully
6,719.0	6,545.2	240.0	-207.5	Marcellus

Checked By: _____ Approved By: _____ Date: _____

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Hydraulic Fracturing Fluid Product Component Information Disclosure



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Job Start Date:	7/20/2014
Job End Date:	7/27/2014
State:	West Virginia
County:	Doddridge
API Number:	47-017-06193-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Callie Unit 2H
Longitude:	-80.85263600
Latitude:	39.24143600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,570
Total Base Water Volume (gal):	8,081,346
Total Base Non Water Volume:	374,009



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	89.69139	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	10.01283	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.08974	
			Hydrogen Chloride	7641-01-1	18.00000	0.02144	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.04283	
			Petroleum Distillates	64742-47-8	60.00000	0.04056	
			Suspending agent (solid)	14808-60-7	3.00000	0.00655	
			Surfactant	68439-51-0	3.00000	0.00257	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	Anionic Polyacrylamide	Proprietary		0.02375	
			Water	7732-18-5	40.00000	0.02375	
			Petroleum Distillates	64742-47-8	22.00000	0.01912	
			Crystalline Salt	12125-02-9	5.00000	0.00297	

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			Ethoxylated alcohol blend	Proprietary	5.00000	0.00297
SI-1000	U.S. Well Services, LLC	Scale Inhibitor				
			Anionic Copolymer	Proprietary		0.00405
			Ethylene Glycol	107-21-1	20.00000	0.00366
			Water	7732-18-5	30.00000	0.00305
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00428
			Deionized Water	7732-18-5	28.00000	0.00244
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00152
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene Glycol	107-21-1	31.00000	0.00024
			Cinnamaldehyde	104-55-2	5.00000	0.00007
			N,N-Dimethylformamide	68-12-2	15.00000	0.00007
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00006
			2-Butoxyethanol	111-76-2	7.00000	0.00006
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002
			Water	7732-18-5	20.00000	0.00002
			Triethyl Phosphate	78-40-0	3.00000	0.00001
			Isopropyl Alcohol	67-63-0	3.00000	0.00001

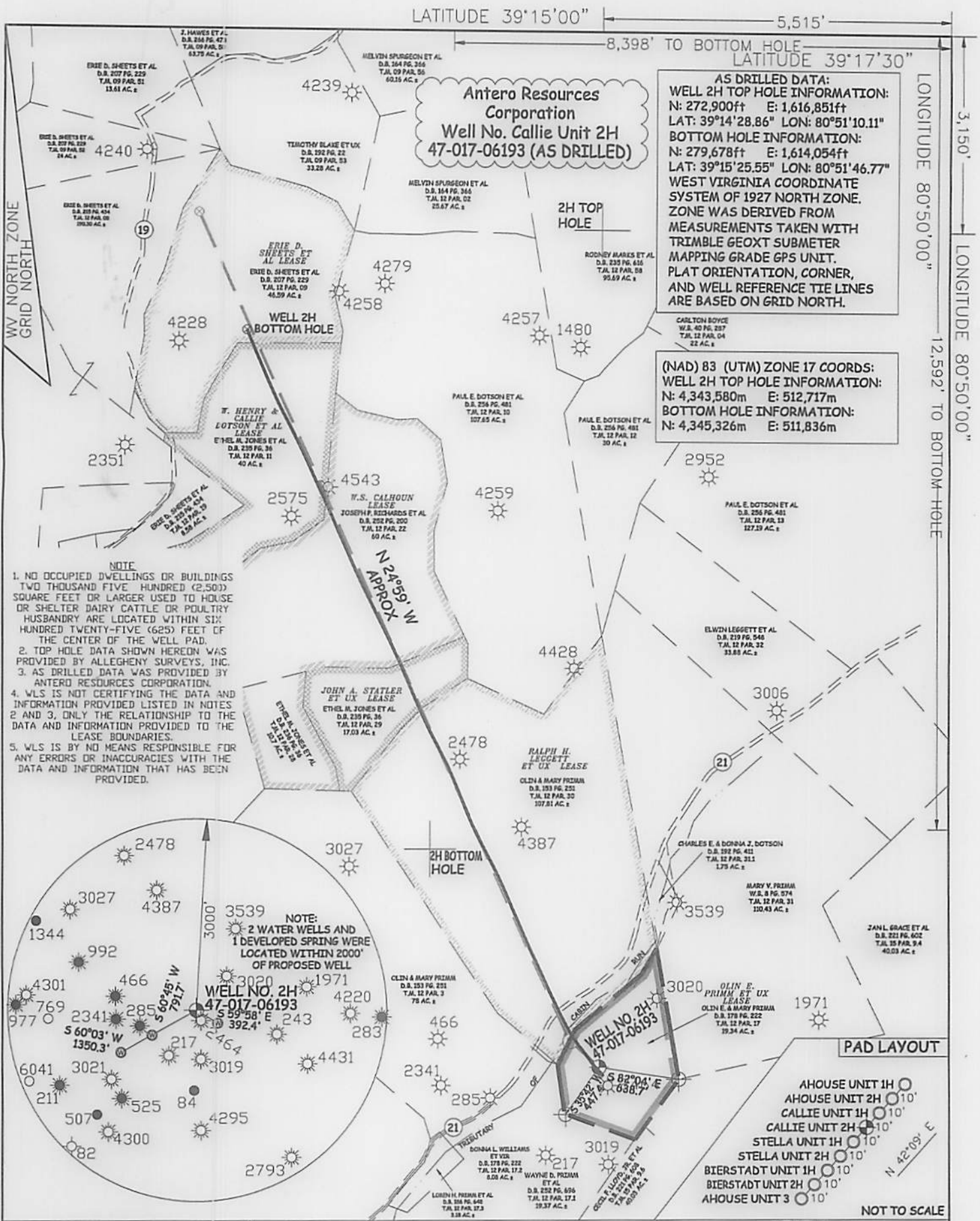
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* 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
 DRAWING # CALLIE2HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA
 DEPARTMENT OF ENERGY
 DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
 LOCATION: ELEVATION 1,030' ORIGINAL - 1,008' AS DRILLED
 QUADRANGLE OXFORD 7.5' DISTRICT CENTRAL COUNTY DODD
 SURFACE OWNER OLIN E. & MARY PRIMM ACREAGE 19.34 ACRES +/-
 OIL & GAS ROYALTY OWNER OLIN E. PRIMM ET UX; RALPH H. LEGGETT ET UX;
JOHN A. STATLER ET UX; W.S. CALHOUN; W. HENRY & CALLIE DOTSON ET AL; ERIE D. SHEETS ET AL LEASE ACREAGE 19.34 ACRES +/-; 108 ACRES +/-; 17 ACRES +/-; 63 ACRES +/-; 50.25 ACRES +/-; 47 ACRES +/-
 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 6,560' TVD 12,834' MD

WELL OPERATOR ANTERO RESOURCES APPALACHIAN CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

STATE OF WEST VIRGINIA, DIVISION
 OF ENVIRONMENTAL PROTECTION,
 OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO
 WEST VIRGINIA 26415

DATE 05/26/15
 OPERATOR'S WELL # CALLIE UNIT #2H
 API WELL # 47 - 017 - 06193
 STATE COUNTY PERMIT 10/23/2015

COUNTY NAME DODD
 PERMIT 10/23/2015

LEGEND

- — — Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- X Existing Fence
- ⊕ Found monument, as noted
- Proposed Well Path
- ⊗ As Drilled Well Path

