AL 08/12/2016

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

API <u>47</u> 085 <u>10139</u> County Ritchie	D	istrict Union	
	Disk and a David	eld/Pool Name	•
Farm name Richards, John Wayne	v	Vell Number Stalr	naker Unit 3H
Operator (as registered with the OOG) Antero Resources	S Corporation		
Address 1615 Wynkoop St. City De	nver	_ State CO	_{Zip} <u>80202</u>
As Drilled location NAD 83/UTM Attach an as-drill Top hole Northing 4339585m Landing Point of Curve Northing 4341079m Bottom Hole Northing 4341079m	Eastin	deviation survey g 506952m g 506746.34m g 506502m	
Elevation (ft) 1025' GL Type of Well	■New □ Existing	Type of Report	□Interim B Final
Permit Type Deviated Horizontal Horizontal	ntal 6A 🛭 Vertical	Depth Type	□ Deep ■ Shallow
Type of Operation Convert Deepen Drill	□ Plug Back □ Redrilli	ng □ Rework	■ Stimulate
Well Type □ Brine Disposal □ CBM ■ Gas ■ Oil □ Se	condary Recovery	ntion Mining 🗆 Sto	orage Other
Type of Completion ■ Single □ Multiple Fluids Produ	uced □ Brine ■Gas	□ NGL ■ Oil	□ Other
Drilled with □ Cable ■ Rotary			
Drilling Media Surface hole Air Mud Fresh W. Production hole Air Mud Fresh Water Brin Mud Type(s) and Additive(s) Air-Foam & 4% KCL		Office	B 1 1 Zuib
Mud- Polymer			
Date permit issued8/11/2014 Date drilling compate completion activities began9/4/2015 Verbal plugging (Y/N) N/A Date permission grants	_ Date completion activity	Date drilling of ties ceased1 Granted by	
Please note: Operator is required to submit a plugging applie	cation within 5 days of ver	bal permission to pl	ug
Freshwater depth(s) ft 42', 52', 172'	Open mine(s) (Y/N) dep	oths	No
Salt water depth(s) ft None Identified	Void(s) encountered (Y/	•	No
Coal depth(s) ft None Identified	Cavern(s) encountered (No
Is coal being mined in area (Y/N) No	ROVI		Reviewed by:
NAME: ^^ DATE: 6	ushout Haff		A+ 08/12/20

WR-35 Rev. 8/23/13								Page of	
API 47- 085	10139	Farm n	ame_F	Richards, Joh	n Wayne	Well	numberStalnal	ker Unit 3H	
CASING STRINGS	Hole Size	Casing Size	Г		w or Grade			cement circulate (Y/ N) rovide details below*	
Conductor	30"	20"				# K-55	N/A	Y	
Surface	17- 1/2"	13- 3/8"	_			# H-40	N/A	Y	
Coal									
Intermediate 1	12-1/4"	9-5/8"	2	519' N	lew 36#	# J-55	N/A	Y	
Intermediate 2									
Intermediate 3					_				
Production	8-3/4" & 8-1/2"	5-1/2"	1	1929' N	lew 23#	P-110	N/A	Y	
Tubing		2-3/8"		500'		# N-80	N/A	·	
Packer type and d	lepth set	N/A		1	7.77	71100	1073		
CEMENT DATA Conductor	Class/Type of Cement	of Sack	s	Slurry wt (ppg)	Yield (ft ³/sks)	Volume (£2)	Cement Top (MD)	WOC (hrs)	
Surface	Class A	150 s	-	15.6	1.18	38	0'	8 Hrs.	
Coal	Class A	490 s	<u> </u>	15.6	1.18	290	0'	8 Hrs.	
Intermediate 1	 								
Intermediate 2	Class A	980 s	<u> </u>	15.6	1.00	789	0'	8 Hrs	
Intermediate 3				_					
Production									
Tubing	Class H	859 sx (Lead) 900	6 sx (Tail)	14.5 Lead 15.2 Tail	1.44 Lead 1.80 Tail	2270	~500' into Intermediate C	esing 8 Hrs.	
•	tion penetrated	TVD (BHL), 6411' (Dee	pest Poin		gers TD (ft) 118 g back to (ft) N/A				
Kick off depth	, ,	□ caliper □ neutron			deviated/directi gamma ray		wireline l (Duckwoi reference WR-35 fo Log has b	s a subsequent well. Antero onlogs on one well on a multi-well th Unit 3H API #47-085-10103 the wireline logs submitted with or Duckworth Unit 3H. A Ceme seen included with this submittation.	
	Yes A No			□ Sidewall			collected □ Yes		
DESCRIBE T Conductor- 0	HE CENTRAL	IZER PLACEM	ENT (ISED FOR EA	CH CASING S	IRING			
Surface- 1 above guid		float, 1 every 4th joint to s					Daa	einod —	
		pat collar, 1 every 4th joint collar, 1 every 3rd joint to						•	
	noat joint, 1 below noat	Country Sto Joint to	op or cen	ien (t			Office **	MER PAR	
WAS WELL (COMPLETED	AS SHOT HOLE		Yes A No	DETAILS		FEB 1	1 556	
WAS WELL (COMPLETED	OPEN HOLE?	□ Ye	es 🖪 No	DETAILS				
WERE TRAC	ERS USED	⊒Yes ■ No	TY	PE OF TRACE	ER(S) USED _				

Page _	of
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API	47- 085 -	10139	Farm name	Richards, John Wayne	Well number	Stalnaker Unit 3H
VI I	~/~		I allii hame_		_ wen nameer	

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
		PLEASE S	SEE ATT	ACHED	EVUIDIT 4
		FLEASE	DEE ATT	ACHED I	

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)
		*PLE	ASE SEE	ATTAC	HED EX	(HIBIT 2	2	
					Recei Office of C	ii & Gas		
					FEB 1 1	2016		

Please insert additional pages as applicable.

API 47- 085 - 10139		Farm	Farm name Richards, John Wayne				Well number_Stalnaker Unit 3H		
PRODUCING	FORMATION(S)		DEPTHS						
Marcellus			6352' (TOP)	771.775	6569' (TOP)	1.00			
iviaicellus		-	0352 (TOP)	_ TVD	0309 (TOP)	MD			
		- (_		_			
		_		_					
		_	-	_					
Please insert ac	dditional pages as	applicable.							
GAS TEST	□ Build up □ □	Drawdown	Open Flow		OIL TEST	Flow □ Pu	mp		
SHUT-IN PRE	SSURE Surfac	e 3000	_psi Botto	m Hole	psi	DURATIO	N OF TEST	hrs	
OPEN FLOW	Gas	Oil	NGL		Water	GASMEA	SURED BY		
OT LIVI LOW		21		bpd				Pilot	
LITHOLOGY/	ТОР	воттом	TOP	BOTTON	И				
FORMATION	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	DEPTH IN	FT DESCRIBE	ROCK TYPE A	ND RECORD QUANT	TTYAND	
	NAME TVD	TVD	MD	MD	TYPE OF F	LUID (FRESHW	ATER, BRINE, OIL,	GAS, H ₂ S, ETC)	
	0		0						
	*PL	EASE	SEE A	TTAC	HEDE	XHIBIT	3		
Diana in ant a	1 1111 1	125-461-							
	dditional pages as a								
	ector Frontier Drillin	ig LLC							
Address 562 Sp	oring Run Rd.		City	Pennsboro)	State W	Zip 26415		
Logging Comp	any Rush Wellsite	Services							
Address 600 Al			City	Canonsbu	rg	State PA	Zip 15317		
				12.	Re	ceived			
	mpany Nabors Cor	mpletion & P					28 - 20270		
Address 1650 F	lackers Creek		City	Jane Lew		State	Zip 26378		
Stimulating Co	mpany US Well S	Services			FEB	1 1 2016			
Address 533 Inc			City	Jane Lew		State W	Zip 26378		
	iditional pages as a	applicable.							
						000 055 55	20		
Completed by	Kara Quackenbus	MALM	mi. S	rmit Dans-	_ Telephone	303-357-723	1/26/2016		
Signature	my Ormina	V VV V V (Title Pe	ermit Repres	ociilalive	Dat	e 1/26/2016	-	

AF	API 47-085-10139 Farm Name Richards, John Wayne Well Number Stalnaker Unit 3H							
		EXH	IIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations			
1	4-Sep-15	11,666	11,836	60	Marcellus			
2	17-Oct-15	11,464	11,634	60	Marcellus			
3	17-Oct-15	11,261	11,432	60	Marcellus			
4	17-Oct-15	11,059	11,230	60	Marcellus			
5	18-Oct-15	10,857	11,028	60	Marcellus			
6	18-Oct-15	10,655	10,825	60	Marcellus			
7	18-Oct-15	10,453	10,623	60	Marcellus			
8	19-Oct-15	10,251	10,421	60	Marcellus			
9	19-Oct-15	10,049	10,219	60	Marcellus			
10	20-Oct-15	9,846	10,017	60	Marcellus			
11	20-Oct-15	9,644	9,815	60	Marcellus			
12	20-Oct-15	9,442	9,613	60	Marcellus			
13	21-Oct-15	9,240	9,410	60	Marcellus			
14	21-Oct-15	9,038	9,208	60	Marcellus			
15	21-Oct-15	8,836	9,006	60	Marcellus			
16	22-Oct-15	8,634	8,804	60	Marcellus			
17	22-Oct-15	8,431	8,602	60	Marcellus			
18	22-Oct-15	8,229	8,400	60	Marcellus			
19	22-Oct-15	8,027	8,198	60	Marcellus			
20	22-Oct-15	7,825	7,995	60	Marcellus			
21	23-Oct-15	7,623	7,793	60	Marcellus			
22	23-Oct-15	7,421	7,591	60	Marcellus			
23	23-Oct-15	7,219	7,389	60	Marcellus			
24	23-Oct-15	7,016	7,187	60	Marcellus			
25	23-Oct-15	6,814	6,985	60	Marcellus			
26	24-Oct-15	6,612	6,783	60	Marcellus			

Received
Office of Oil & Gas
FEB 1 1 2016

	API <u>47</u>	7-085-101 <u>39</u>	Farm Name <u>F</u>	Richards, John	<u>Wayne</u> Well	Number Stalnaker Unit	<u>3H</u>	
				EXHIBIT	Γ2			
	I		Avg	Max				Amount of
			Treatment	Breakdown		_	Amount of	Nitrogen/
	Stimulations	Avg Pump	Pressure	Pressure		Amount of Proppant	Water	other
Stage No.	Date	Rate	(PSI)	(PSI)	ISIP (PSI)	(lbs)	(bbls)	(units)
1	17-Oct-15	68.2	7,539	6,203	5,141	213,421	6,665	N/A
2	17-Oct-15	74.2	7,125	6,128	4,887	247,368	6,513	N/A
3	17-Oct-15	66.0	7,102	6,260	4,708	195,880	6,661	N/A
4	17-Oct-15	68.0	7,222	5,664	4,720	151,380	5,717	N/A
5	18-Oct-15	73.2	7,224	5,942	5,169	254,970	6,527	N/A
6	18-Oct-15	68.0	6,911	6,209	3,648	257,510	6,513	N/A
7	18-Oct-15	66.0	7,262	5,523	4,356	199,710	6,307	N/A
8	19-Oct-15	73.0	6,975	5,559	4,548	221,440	6,625	N/A
9	19-Oct-15	73.0	6,949	5,947	4,931	168,460	4,416	N/A
10	20-Oct-15	69.0	6,745	6,190	4,592	245,330	6,355	N/A
11	20-Oct-15	68.0	7,134	6,260	3,626	223,030	7,015	N/A
12	20-Oct-15	72.0	7,080	5,947	4,735	237,770	6,813	N/A
13	21-Oct-15	72.0	6,641	6,079	4,047	258,580	6,597	N/A
14	21-Oct-15	69.0	6,600	6,285	3,280	256,810	6,405	N/A
15	21-Oct-15	70.0	6,667	6,153	3,672	257,300	6,475	N/A
16	22-Oct-15	71.0	6,688	6,046	4,529	253,830	6,314	N/A
17	22-Oct-15	73.0	6,645	5,879	5,377	256,160	6,346	N/A
18	22-Oct-15	73.0	6,757	5,882	5,042	235,180	6,186	N/A
19	22-Oct-15	68.0	6,851	6,147	5,298	246,360	6,254	N/A
20	22-Oct-15	72.0	6,872	6,076	5,607	257,330	6,320	N/A
21	23-Oct-15	70.0	6,765	5,879	5,074	257,740	6,408	N/A
22	23-Oct-15	72.0	6,461	6,063	5,331	255,960	6,286	N/A
23	23-Oct-15	73.0	6,344	6,239	5,228	258,050	6,316	N/A
24	23-Oct-15	68.0	6,305	5,986	5,151	249,920	6,822	N/A
25	23-Oct-15	72.0	6,443	6,421	4,942	257,110	6,277	N/A
26	24-Oct-15	71.0	6,295	6,043	3,493	256,300	6,422	N/A
	AVG=	70.5	6,831	6,039	4,659	6,172,899	165,555	TOTAL

Received
Office of Oil & Gas
FEB 1 1 2016

API 47-	085-10139 Farm Name F	Richards, John Wayne Well No	umber Stalnaker Unit 31	1
		EXHIBIT 3		
	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
LITHOLOGY/ FORMATION	From Surface	From Surface	From Surface	From Surface
Fresh Water	42'	N/A	42'	N/A
Fresh Water	52'	N/A	52'	N/A
Fresh Water	172'	N/A	172'	N/A
Sandstone	0	97	0	97
Shale/ Sandstone	est. 97	417	est. 97	417
Sandstone	est. 417	657	est. 417	657
Shale	est. 657	697	est. 657	697
Sandstone	est. 697	737	est. 697	737
Shale	est. 737	817	est. 737	817
Sandy Shale	est. 817	1317	est. 817	1317
Sandstone	est. 1317	1357	est. 1317	1357
Shale	est. 1357	1417	est. 1357	1417
Sandstone/ Shale	est. 1417	1497	est. 1417	1497
Sandstone	est. 1497	1577	est. 1497	1577
Shale/ Coal	est. 1577	1637	est. 1577	1637
Sandstone/ Trace Coal	est. 1637	1817	est. 1637	1817
Shale	est. 1817	1945	est. 1817	1945
Big Lime	est. 1945	2009	est. 1945	2009
Big Injun	est. 2009	2263	est. 2009	2263
Gantz Sand	est. 2263	2426	est. 2263	2426
Fifty Foot Sandstone	est. 2426	2640	est. 2426	2640
Gordon	est. 2640	2924	est. 2640	2924
Fifth Sandstone	est. 2924	3028	est. 2924	3028
Bayard	est. 3028	3405	est. 3028	3405
Warren	est. 3405	3801	est. 3405	3801
Speechley	est. 3801	3929	est. 3801	3929
Baltown	est. 3929	4493	est. 3929	4493
Bradford	est. 4493	4857	est. 4493	4857
Benson	est. 4857	5098	est. 4857	5098
Alexander	est. 5098	5299	est. 5098	5299
Elk	est. 5299	5698	est. 5299	5698
Rhinestreet	est. 5698	6040	est. 5698	6085
Sycamore	6040	6197	6085	6273
Middlesex	6197	6305	6273	6444
Burkett	6305	6332	6444	6507
Tully	6332	6352	6507	6569
Marcellus	6352	NA	6569	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.

Office of Oil & Gas

FEB 1 1 2016



Stalnaker Unit 3H Ritchie County WV Northing: 14236739.00

Easting: 1663177.49

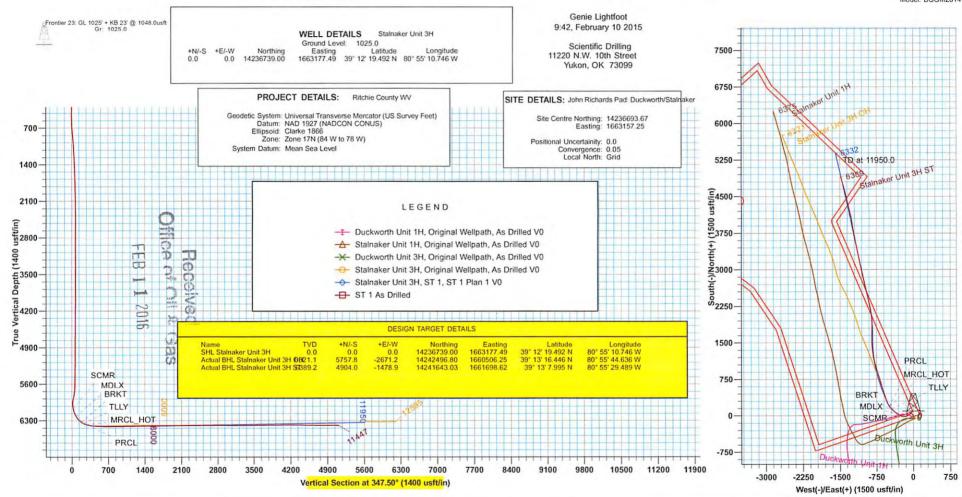
ST 1 As Drilled





To convert Magnetic North to Grid, Subtract 8.43° To convert True North to Grid, Subtract 0.05° Azimuths to Grid North True North: -0.05° Magnetic North: -8.43°

Magnetic Field Strength: 52156.5snT Dip Angle: 66.77° Date: 1/23/2015 Model: BGGM2014





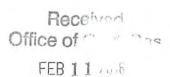
Antero

Ritchie County WV John Richards Pad: Duckworth/Stalnaker Stalnaker Unit 3H ST 1

Design: ST 1 As Drilled

EOW Completion Report

19 June, 2015









Company: Project:

Antero

Ritchie County WV

Site:

John Richards Pad: Duckworth/Stalnaker

Well:

Stalnaker Unit 3H

Wellbore:

ST 1

Design: ST 1 As Drilled Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference: Survey Calculation Method:

Database:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Minimum Curvature

Oklahoma District

Project Ritchie County WV, Ritchie County WV, WV North

Map System: Geo Datum: Map Zone:

Universal Transverse Mercator (US Survey Fee System Datum:

NAD 1927 (NADCON CONUS)

Zone 17N (84 W to 78 W)

Mean Sea Level

Site

From:

John Richards Pad: Duckworth/Stalnaker

Site Position:

Map

Northing: Easting:

14,236,693.67 usft 1,663,157.25 usft

Latitude:

Longitude:

39° 12' 19.044 N 80° 55' 11.004 W

Position Uncertainty:

0.0 usft

Slot Radius:

13-3/16"

Grid Convergence:

0.05

Well

Stalnaker Unit 3H, Marcellus

Well Position

+N/-S +E/-W 0.0 usft 0.0 usft

Northing: Easting:

14,236,739.00 usft 1,663,177.49 usft Latitude: Longitude:

39° 12' 19.492 N 80° 55' 10.746 W

Position Uncertainty

2.0 usft

Wellhead Elevation:

1,048.0 usft

Ground Level:

1,025.0 usft

52,157

Wellbore

ST₁

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	1/23/2015	-8.38	66.77	52,1

Design

ST 1 As Drilled

Audit Notes:

Version:

1.0

Phase:

ACTUAL

Tie On Depth:

6.704.0

Vertical Section:

Depth From (TVD)

+E/-W (usft)

+N/-S Direction (usft) (usft) (°) 0.0 347.50 0.0 0.0

Survey Program
From
(usft)

Date 6/19/2015

To (usft) Survey (Wellbore) **Tool Name**

Description

Standard Wireline Keeper ver 1.0.4

25.0 5,655.0 6,799.0

6,704.0 Survey #5 MWD (Original Wellpath) 11,929.0 Survey #6 SDI MWD (ST 1)

5,617.6 Survey #4 Final Gyro Survey (Original We Standard Keeper 104 SDI MWD SDI MWD

Scientific Drilling Intl. MWD - Standard ver 1.0.1 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
25.0	0.64	137.76	25.0	-0.1	0.1	0.1	2.56
50.0	0.57	144.71	50.0	-0.3	0.3 HE	-0.4	0.41
75.0	0.54	140.05	75.0	-0.5	Office	-0.6	0.22
100.0	0.61	127.48	100.0	-0.7	0.6	-0.8	0.58
125.0	0.73	138.51	125.0	-0.9	_{0.8} FEB	11 -1.0	0.70
150.0	0.61	154.42	150.0	-1.1	1.0	-1.3	0.88
175.0	1.06	147.80	175.0	-1.4	1.1	-1.6	1.84
200.0	0.40	160.39	200.0	-1.7	1.3	-1.9	2.70
225.0	0.36	143.73	225.0	-1.9	1.4	-2.1	0.47





Company: Project: Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST 1

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference:

MD Reference: North Reference:

Survey Calculation Method:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

esign:	ST 1 As	Drilled		Database		Oklahoma District		
Survey								
MD (usft)		Inc (°)	Azi (azimuth)	TVD (usft)	N/S (usft)		V. Sec (usft)	DLeg (°/100usft)
	250.0	0.40	141.61	250.0	-2.0	1.5	-2.3	0.1
	275.0	0.49	143.23	275.0	-2.1	1.6	-2.4	0.3
	300.0	0.44	145.89	300.0	-2.3	1.7	-2.6	0.2
	325.0	0.37	136.68	325.0	-2.4	1.8	-2.8	0.3
	350.0	0.48	135.76	350.0	-2.6	1.9	-2.9	0.4
	375.0	0.50	163.48	375.0	-2.8	2.0	-3.1	0.9
	400.0	0.40	163.93	400.0	-2.9	2.1	-3.3	0.4
	425.0	0.21	81.72	425.0	-3.0	2.2	-3.4	1.7
	450.0	0.06	356.28	450.0	-3.0	2.2	-3.4	0.8
	475.0	0.43	314.86	475.0	-2.9	2.2	-3.3	1.5
	500.0	0.82	328.05	500.0	-2.7	2.0	-3.1	1.6
	525.0	1.27	316.87	525.0	-2.3	1.7	-2.7	1.9
	550.0	1.72	319.25	550.0	-1.9	1.3	-2.1	1.8
	575.0	2.04	316.85	575.0	-1.3	0.7	-1.4	1.3
	600.0	2.53	315.34	599.9	-0.5	0.0	-0.5	1.9
	625.0	3.13	317.19	624.9	0.4	-0.8	0.5	2.4
	650.0	3.78	318.10	649.9	1.5	-1.8	1.8	2.6
	675.0	4.15	316.09	674.8	2.7	-3.0	3.3	1.5
	700.0	4.64	318.90	699.7	4.2	-4.3	5.0	2.1
	725.0	5.17	318.90	724.6	5.8	-5.7	6.9	2.1
	750.0	5.48	320.95	749.5	7.5	-7.2	8.9	1.4
	775.0	5.47	321.89	774.4	9.4	-8.7	11.1	0.3
	800.0	5.61	322.05	799.3	11.3	-10.2	13.2	0.5
	825.0	5.74	322.20	824.2	13.3	-11.7	15.5	0.5
	850.0	5.88	322.34	849.0	15.3	-13.2	17.8	0.5
	875.0	5.89	320.35	873.9	17.3	-14.8	20.1	0.8
	900.0	6.13	320.36	898.8	19.3	-16.5	22.4	0.9
	925.0	5.72	320.38	923.6	21.3	-18.2	24.7	1.6
	950.0	4.86	322.90	948.5	23.1	-19.6	26.8	3.5
	975.0	4.71	324.22	973.4	24.7	-20.8	28.7	0.7
1	,000.0	4.47	324.18	998.4	26.4	-22.0	30.5	0.9
1.	,025.0	4.39	324.05	1,023.3	27.9	-23.1	32.3	0.3
1	,050.0	4.27	323.36	1,048.2	29.5	-24.3	34.0	0.5
	,075.0	4.16	322.07	1,073.2	30.9	-25.4	35.7	0.5
1,	,100.0	3.91	323.12	1,098.1	32.3	-26.4	37.3	1.0
1.	,125.0	3.65	322.20	1,123.0	33.6	Received	38.8	1.0
1.	,150.0	3.62	322.63	1,148.0	34.9	ce of C28.42 G	40.2	0.1
1.	,175.0	3.55	322.92	1,172.9	36.111	ce of Canada G	41.6	0.2
1.	,200.0	3.23	321.51	1,197.9	37.3	FFD # #30,816	43.0	1.3
	,225.0	3.12	318.79	1,222.9	38.4	FEB 1 130.816	44.2	0.7
1	,250.0	3.02	319.46	1,247.8	39.4	-32.0	45.4	0.4
1.	,275.0	2.90	320.09	1,272.8	40.4	-32.8	46.5	0.5
1	,300.0	2.82	320.47	1,297.8	41.3	-33.6	47.6	0.3
	,325.0	2.71	319.92	1,322.7	42.2	-34.4	48.7	0.4
	,350.0	2.59	320.78	1,347.7	43.1	-35.2	49.7	0.5





Company: Antero

Project: Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST 1

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference: Survey Calculation Method:

Database:

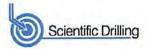
Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

gn: S	1 1 As Drilled		Database		Oklanoma District		
rey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W V. S (usft) (us		DLeg (°/100usft)
1,375.0	2.60	320.19	1,372.7	44.0	-35.9	50.7	0.1
1,400.0	2.34	317.46	1,397.6	44.8	-36.6	51.7	1.1
1,425.0	2.57	314.34	1,422.6	45.6	-37.3	52.6	1.0
1,450.0	2.49	320.25	1,447.6	46.4	-38.1	53.5	1.0
1,475.0	2.40	317.95	1,472.6	47.2	-38.8	54.5	0.5
1,500.0	2.30	319.64	1,497.6	48.0	-39.4	55.4	0.4
1,525.0	2.13	319.88	1,522.5	48.7	-40.1	56.2	0.6
1,550.0			1,547.5	49.4	-40.7	57.0	0.6
1,575.0			1,572.5	50.0	-41.2	57.8	0.3
1,600.0			1,597.5	50.7	-41.7	58.5	0.5
1,625.0	1.91	312.47	1,622.5	51.3	-42.3	59.2	0.9
1,650.0			1,647.5	51.8	-42.9	59.9	0.6
1,675.0			1,672.5	52.3	-43.5	60.5	0.2
1,700.0			1,697.4	52.8	-44.1	61.0	0.7
1,725.0			1,722.4	53.2	-44.6	61.6	0.7
1,750.0			1,747.4	53.6	-45.2	62.1	0.6
1,775.0			1,772.4	53.9	-45.6	62.5	0.0
1,800.0				54.2	-45.6 -46.1		0.
1,825.0			1,797.4 1,822.4	54.5	-46.5	62.9 63.3	0.
1,850.0			1,847.4	54.7	-46.9	63.5	0.6
1,875.0			1,872.4	54.9	-47.3	63.8	0.3
1,900.0		300.77	1,897.4	55.1	-47.6	64.1	0.0
1,925.0			1,922.4	55.2	-48.0	64.3	0.0
1,950.0			1,947.4	55.5	-48.3	64.6	1.0
1,975.0			1,972.4	55.6	-48.6	64.9	1.0
2,000.0			1,997.4	55.8	-49.0	65.1	0.5
2,025.0			2,022.4	55.9	-49.4	65.3	0.7
2,050.0			2,047.4	56.1	-49.7	65.6	0.2
2,075.0			2,072.4	56.3	-50.1	65.8	0.3
2,100.0	0.76	300.81	2,097.4	56.4	-50.4	66.0	0.7
2,125.0	0.72	296.24	2,122.4	56.6	-50.7	66.2	0.3
2,150.0	0.74	296.96	2,147.4	56.7	-51.0	66.4	0.0
2,175.0	0.83	292.86	2,172.4	56.8	-51.3	66.6	0.4
2,200.0	0.81	289.44	2,197.4	57.0	-51.6	66.8	0.3
2,225.0	0.75	286.32	2,222.4	57.1	-51.9	67.0	0.2
2,250.0	0.78	285.36	2,247.4	57.2	-52.3	67.1	0.
2,275.0			2,272.4	57.3			0.8
2,300.0		291.87	2,297.4	57.4	152.5 1528ceiver	67.5	0.4
2,325.0			2,322.4	57.6	Office3of Oil		0.1
2,350.0		283.88	2,347.4	57.6	-53.4	67.8	0.0
2,375.0	0.69		2,372.4	57.7	F-53% 1 1 20	68.0	0.4
2,400.0	0.62		2,397.4	57.8	-53.9	68.1	0.3
2,425.0	0.58	279.02	2,422.3	57.8	-54.2	68.2	0.2
2,450.0			2,447.3	57.9	-54.4	68.3	0.4





Company: Project: Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

MD	lan	Azi (azimuth)	TVD	N/S	E/W	V. Sec	DLeg
MD (usft)	Inc (°)	Azi (azimuth) (°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)
2,475.0	0.62	292.90	2,472.3	57.9	-54.7	68.4	0
2,500.0	0.58	284.03	2,497.3	58.0	-55.0	68.5	0
2,525.0	0.56	273.79	2,522.3	58.1	-55.2	68.6	0
2,550.0	0.88	254.56	2,547.3	58.0	-55.5	68.7	1
2,575.0	0.23	332.32	2,572.3	58.0	-55.7	68.7	3
2,600.0	0.61	262.42	2,597.3	58.0	-55.9	68.8	2
2,625.0	0.45	272.82	2,622.3	58.0	-56.1	68.8	0
2,650.0	0.30	287.87	2,647.3	58.1	-56.3	68.9	0
2,675.0	0.82	263.11	2,672.3	58.1	-56.5	68.9	2
2,700.0	0.69	261.27	2,697.3	58.0	-56.8	68.9	0
2,725.0	0.52	279.07	2,722.3	58.0	-57.1	69.0	1
2,750.0	0.84	263.71	2,747.3	58.0	-57.4	69.1	1
2,775.0	0.56	275.92	2,772.3	58.0	-57.7	69.1	
2,800.0	0.58	271.64	2,797.3	58.0	-57.9	69.2	(
2,825.0	0.64	267.89	2,822.3	58.0	-58.2	69.2	(
2,850.0	0.62	273.80	2,847.3	58.0	-58.5	69.3	(
2,875.0	0.69	267.03	2,872.3	58.0	-58.8	69.4	(
2,900.0	0.69	268.24	2,897.3	58.0	-59.1	69.4	(
2,925.0	0.67	266.94	2,922.3	58.0	-59.4	69.5	(
2,950.0	0.64	260.98	2,947.3	58.0	-59.7	69.5	(
2,975.0	0.59	260.78	2,972.3	57.9	-59.9	69.5	(
3,000.0	0.66	256.95	2,997.3	57.9	-60.2	69.5	(
3,025.0	0.64	260.53	3,022.3	57.8	-60.5	69.5	(
3,050.0	0.62	256.21	3,047.3	57.8	-60.7	69.5	(
3,075.0	0.66	252.52	3,072.3	57.7	-61.0	69.5	(
3,100.0	0.58	259.38	3,097.3	57.6	-61.3	69.5	(
3,125.0	0.62	256.61	3,122.3	57.6	-61.5	69.5	
3,150.0	0.66	248.16	3,147.3	57.5	-61.8	69.5	(
3,175.0	0.62	254.42	3,172.3	57.4	-62.0	69.5	
3,200.0	0.54	254.48	3,197.3	57.3	-62.3	69.4	
3,225.0	0.65	253.76	3,222.3	57.2	-62.5	69.4	(
3,250.0	0.71	253.90	3,247.3	57.2	-62.8	69.4	
3,275.0	0.67	253.59	3,272.3	57.1	-63.1	69.4	
3,300.0	0.69	252.27	3,297.3	57.0	-63.4	69.4	(
3,325.0	0.66	248.00	3,322.3	56.9	-63.7	69.3	(
3,350.0	0.71	254.34	3,347.3	56.8	Received	69.3	(
3,375.0	0.61	252.97	3,372.3	56.7	-64 2	69.3	(
3,400.0	0.64	253.31	3,397.3	56.6110	O 01 064.54 C	as 69.3	(
3,425.0	0.64	253.47	3,422.3	56.6	ED 1 1-64-8c	69.2	(
3,450.0	0.66	252.44	3,447.3	56.5	EB 1 1 65.06	69.2	(
3,475.0	0.65	249.28	3,472.3	56.4	-65.3	69.2	(
3,500.0	0.68	251.46	3,497.3	56.3	-65.6	69.1	(
3,525.0	0.69	252.42	3,522.3	56.2	-65.9	69.1	(
3,550.0	0.68	256.03	3,547.3	56.1	-66.2	69.1	(





Company: Project:

Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Stalnaker Unit 3H

Wellbore: ST 1

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference:

MD Reference: North Reference:

Survey Calculation Method:

Database:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

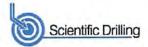
Minimum Curvature Oklahoma District

S	u	rv	е	y

Well:

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,575.0	0.67	252.92	3,572.3	56.0	-66.4	69.1	0.1
3,600.0	0.62	252.28	3,597.3	55.9	-66.7	69.1	0.2
3,625.0	0.65	253.62	3,622.3	55.9	-67.0	69.0	0.1
3,650.0	0.58	249.03	3,647.3	55.8	-67.2	69.0	0.3
3,675.0	0.56	252.03	3,672.3	55.7	-67.5	69.0	0.
3,700.0	0.60	244.31	3,697.3	55.6	-67.7	68.9	0.3
3,725.0	0.46	255.43	3,722.3	55.5	-67.9	68.9	0.
3,750.0	0.45	247.60	3,747.3	55.5	-68.1	68.9	0.
3,775.0	0.48	243.93	3,772.3	55.4	-68.3	68.8	0.
3,800.0	0.40	246.29	3,797.3	55.3	-68.5	68.8	0.
3,825.0	0.47	249.37	3,822.3	55.2	-68.6	68.8	0.
3,850.0	0.42	244.88	3,847.3	55.1	-68.8	68.7	0.:
3,875.0	0.49	240.68	3,872.3	55.1	-69.0	68.7	0.
3,900.0	0.46	228.23	3,897.3	54.9	-69.2	68.6	0.
3,925.0	0.32	215.01	3,922.3	54.8	-69.3	68.5	0.
3,950.0	0.39	219.91	3,947.3	54.7	-69.4	68.4	0.
3,975.0	0.33	218.09	3,972.3	54.6	-69.5	68.3	0.
4,000.0	0.35	208.67	3,997.3	54.4	-69.5	68.2	0.
4,025.0	0.30	206.31	4,022.3	54.3	-69.6	68.1	0.
4,050.0	0.15	143.29	4,047.3	54.2	-69.6	68.0	1.
4,075.0	0.18	106.63	4,072.3	54.2	-69.6	68.0	0.
4,100.0	0.26	121.01	4,097.3	54.2	-69.5	67.9	0.
4,125.0	0.30	105.82	4,122.3	54.1	-69.4	67.8	0.
4,150.0	0.26	120.49	4,147.3	54.1	-69.2	67.8	0.
4,175.0	0.26	125.93	4,172.3	54.0	-69.2	67.7	0.
4,200.0	0.35	90.67	4,197.3	54.0	-69.0	67.6	0.
4,225.0	0.43	88.67	4,222.3	54.0	-68.9	67.6	0.
4,250.0	0.58	67.54	4,247.3	54.0	-68.7	67.6	0.
4,275.0	0.60	63.85	4,272.3	54.1	-68.4	67.6	0.
4,300.0	0.70	67.57	4,297.3	54.2	-68.2	67.7	0.
4,325.0	0.71	71.33	4,322.3	54.3	-67.9	67.7	0.
4,350.0	0.88	71.89	4,347.3	54.5	-67.5	67.8	0.
4,375.0	0.89	72.79	4,372.2	54.6	-67.2	67.8	0.
4,400.0	0.99	77.80	4,397.2	54.7	-66.8	67.8	0
4,425.0	0.97	72.66	4,422.2	54.8	-66.4	67.8	0.
4,450.0	0.93	71.73	4,447.2	54.9	-66.0	67.9	0.
4,475.0	0.80	76.17	4,472.2	55.0	-65.6	67.9	0.
4,500.0	0.93	79.70	4,497.2	55.1	-65.2	67.9	0.
4,525.0	0.93	83.51	4,522.2	55.2	Bonc64.8	67.9	0.
4,550.0	0.86	83.99	4,547.2	55.2	Rece ^{64,8} d ce of ^{64,4}	67.8	0.
4,575.0	0.94	84.11	4,572.2				0.
4,600.0	0.92	88.78	4,597.2	55.3	FEB 1 1 2016		0.
4,625.0	0.97	88.41	4,622.2	55.3	-63.2	67.6	0.
4,650.0	0.92	90.23	4,647.2	55.3	-62.8	67.6	0.





Company: Project: Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST 1

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference: Survey Calculation Method:

Database:

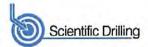
Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

rey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
4,675.0	0.89	100.92	4,672.2	55.2	-62.4	67.4	0.
4,700.0	1.03	95.23	4,697.2	55.2	-62.0	67.3	0.
4,725.0	1.12	98.21	4,722.2	55.1	-61.6	67.1	0.
4,750.0	1.06	95.88	4,747.2	55.1	-61.1	67.0	0.
4,775.0	1.07	96.15	4,772.2	55.0	-60.6	66.8	0
4,800.0	0.94	99.32	4,797.2	55.0	-60.2	66.7	0
4,825.0	0.89	105.09	4,822.2	54.9	-59.8	66.5	0
4,850.0	0.87	108.20	4,847.2	54.8	-59.4	66.3	0
4,875.0	0.91	112.34	4,872.2	54.6	-59.1	66.1	0.
4,900.0	0.92	107.25	4,897.2	54.5	-58.7	65.9	0.
4,925.0	0.86	104.15	4,922.2	54.4	-58.3	65.7	0.
4,950.0	0.73	103.16	4,947.2	54.3	-58.0	65.6	0.
4,975.0	0.73	104.76	4,972.2	54.2	-57.6	65.4	0
5,000.0	0.96	106.33	4,997.2	54.1	-57.3	65.2	0
5,025.0	1.03	104.53	5,022.2	54.0	-56.8	65.0	0
5,050.0	0.91	95.06	5,047.2	53.9	-56.4	64.9	0
5,075.0	1.14	105.12	5,072.2	53.8	-56.0	64.7	1
5,100.0	1.11	112.65	5,097.2	53.7	-55.5	64.4	0.
5,125.0	1.33	104.32	5,122.1	53.5	-55.0	64.2	1.
5,150.0	1.39	101.93	5,147.1	53.4	-54.4	63.9	0
5,175.0	1.24	106.34	5,172.1	53.3	-53.9	63.7	0
5,200.0	1.33	112.29	5,197.1	53.1	-53.4	63.4	0.
5,225.0	1.43	105.10	5,222.1	52.9	-52.8	63.0	0.
5,250.0	1.52	108.38	5,247.1	52.7	-52.2	62.7	0
5,275.0	1.41	110.98	5,272.1	52.5	-51.6	62.4	0
5,300.0	1.47	113.94	5,297.1	52.2	-51.0	62.0	0
5,325.0	1.65	114.19	5,322.1	52.0	-50.4	61.6	0
5,350.0	1.51	111.51	5,347.1	51.7	-49.7	61.2	0
5,375.0	1.37	120.41	5,372.1	51.4	-49.2	60.8	1
5,400.0	1.40	116.69	5,397.1	51.1	-48.6	60.4	0
5,425.0	1.50	114.21	5,422.1	50.9	-48.1	60.1	0
5,450.0	1.32	118.71	5,447.0	50.6	-47.5	59.7	0
5,475.0	1.35	121.70	5,472.0	50.3	-47.0	59.3	0
5,500.0	1.46	119.77	5,497.0	50.0	-46.5	58.9	0.
5,525.0	1.32	119.83	5,522.0	49.7	-46.0	58.4	0
5,550.0	1.24	123.09	5,547.0	49.4	-45.5	58.1	0
5,575.0	1.54	107.30	5,572.0	49.1	-44.9	57.7	1
5,600.0	1.21	117.66	5,597.0	48.9	-44.4	57.4	1
					44.1	57.1	0.
5,617.6	1.08	123.02	5,614.6 5,652.0	48.7 47.8	Received	56.4	10.
5,655.0 5,687.0	3.56	232.41 237.07	5,652.0 5,683.8			en 55.4	15
	8.42		5,683.8 5,715.2		fice of 101 &	Gas 55.1	
5,719.0 5,751.0	12.97 16.63	237.02 235.90	5,715.2 5,746.2	42.7 38.2		50.1	14. 11.
					FEB 1-59.32016		
5,784.0	19.71	233.81	5,777.5	32.3	-67.7	46.1	9





Company: Project:

Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST 1

ST 1 As Drilled Design:

Local Co-ordinate Reference:

TVD Reference:

MD Reference: North Reference:

Survey Calculation Method:

Database:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Surve	y
	,

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,816.0	22.47	232.99	5,807.4	25.4	-76.9	41.4	8.6
5,847.0	25.79	231.70	5,835.7	17.7	-86.9	36.0	10.8
5,880.0	28.82	230.42	5,865.0	8.1	-98.7	29.3	9.3
5,912.0	30.25	236.04	5,892.8	-1.3	-111.3	22.8	9.7
5,944.0	30.82	244.16	5,920.4	-9.4	-125.4	18.0	13.0
5,976.0	31.01	254.03	5,947.9	-15.2	-140.7	15.6	15.8
6,008.0	30.47	258.75	5,975.4	-19.1	-156.6	15.3	7.7
6,040.0	29.04	262.97	6,003.2	-21.6	-172.3	16.2	7.9
6,072.0	27.83	269.56	6,031.3	-22.6	-187.4	18.5	10.5
6,104.0	27.59	276.33	6,059.6	-21.8	-202.3	22.5	9.8
6,136.0	28.17	282.64	6,087.9	-19.4	-217.0	28.1	9.3
6,168.0	30.78	288.20	6,115.8	-15.2	-232.2	35.4	11.8
6,200.0	33.68	292.02	6,142.9	-9.3	-248.2	44.7	11.0
6,232.0	35.36	295.49	6,169.2	-2.0	-264.8	55.4	8.0
6,264.0	37.48	300.90	6,195.0	7.0	-281.5	67.8	12.0
6,296.0	40.43	303.40	6,219.9	17.7	-298.5	81.9	10.4
6,328.0	43.73	304.83	6,243.6	29.8	-316.3	97.5	10.7
6,360.0	47.58	306.30	6,266.0	43.1	-334.9	114.5	12.4
6,392.0	51.69	306.91	6,286.7	57.6	-354.4	133.0	12.9
6,424.0	55.57	307.44	6,305.7	73.2	-374.9	152.6	12.2
6,456.0	59.97	309.00	6,322.7	89.9	-396.2	173.6	14.3
6,488.0	63.67	311.23	6,337.8	108.1	-417.8	196.0	13.0
6,519.0	67.03	313.92	6,350.8	127.2	-438.5	219.1	13.4
6,551.0	69.74	317.54	6,362.6	148.5	-459.3	244.4	13.5
6,583.0	73.34	322.42	6,372.7	171.7	-478.8	271.3	18.3
6,615.0	76.44	326.28	6,381.0	196.8	-496.7	299.7	15.1
6,647.0	79.42	330.79	6,387.7	223.5	-513.1	329.3	16.6
6,679.0	81.16	334.21	6,393.1	251.5	-527.6	359.7	11.8
6,704.0	82.93	337.46	6,396.6	274.1	-537.8	384.0	14.6
6,799.0	86.48	343.99	6,405.4	363.3	-568.9	477.8	7.8
6,894.0	88.62	341.69	6,409.4	454.0	-596.9	572.4	3.3
6,990.0	90.07	342.31	6,410.5	545.3	-626.6	668.0	1.6
7,086.0	90.17	343.41	6,410.3	637.0	-654.9	763.7	1.
7,183.0	90.03	344.96	6,410.2	730.3	-681.3	860.5	1.6
7,279.0	89.73	343.55	6,410.4	822.7	-707.4	956.3	1.5
7,376.0	91.61	342.10	6,409.2	915.4	-736.0	1,053.0	2.4
7,472.0	91.28	343.62	6,406.8	1,007.1	-764.3	1,148.6	1.6
7,568.0	90.61	346.02	6,405.2	1,099.7	-789.4	1,244.5	2.6
7,664.0	92.42	348.45	6,402.7	1,193.3	-810.6	1,340.5	3.1
7,760.0	91.71	352.58	6,399.2	1,287.9	Re826,4/ed	1,436.3	4.3
7,857.0	89.33	355.27	6,398.3			1,532.6	3.7
7,953.0	90.40	357.48	6,398.6	1,480.1	ffice 0836-7il &	1,627.5	2.5
8,050.0	91.44	0.15	6,397.0	1,577.1			2.9
8,146.0	90.71	1.44	6,395.2	1,673.1	FEB -844/8 2016	1,816.0	1.5





Company: A Project: R

Antero

Ritchie County WV

Site: John Richards Pad: Duckworth/Stalnaker

Stalnaker Unit 3H

Wellbore: ST 1

Design: ST 1 As Drilled

Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference:

Survey Calculation Method: Database: Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Grid

Minimum Curvature Oklahoma District

Survey

Well:

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
8,241.0	91.28	0.86	6,393.6	1,768.0	-841.5	1,908.3	0.8
8,337.0	89.60	0.30	6,392.8	1,864.0	-840.6	2,001.8	1.3
8,434.0	89.23	355.90	6,393.8	1,960.9	-843.8	2,097.1	4.
8,530.0	89.23	352.28	6,395.1	2,056.4	-853.7	2,192.4	3.
8,626.0	91.17	352.16	6,394.8	2,151.5	-866.7	2,288.1	2.
8,722.0	90.20	347.14	6,393.6	2,245.9	-883.9	2,384.0	5.
8,818.0	90.60	346.54	6,393.0	2,339.4	-905.8	2,480.0	0.
8,914.0	90.94	346.93	6,391.7	2,432.8	-927.8	2,576.0	0
9,005.0	91.21	347.03	6,390.0	2,521.5	-948.3	2,667.0	0
9,097.0	88.99	346.30	6,389.8	2,611.0	-969.5	2,758.9	2
9,188.0	90.20	346.90	6,390.4	2,699.5	-990.6	2,849.9	1
9,278.0	89.13	347.04	6,391.0	2,787.2	-1,010.9	2,939.9	1
9,369.0	89.36	346.95	6,392.2	2,875.8	-1,031.4	3,030.9	0
9,460.0	89.97	346.82	6,392.7	2,964.5	-1,052.0	3,121.9	0
9,551.0	90.17	348.74	6,392.6	3,053.4	-1,071.3	3,212.9	2
9,641.0	90.57	349.41	6,392.0	3,141.8	-1,088.3	3,302.9	0
9,732.0	90.07	347.93	6,391.5	3,231.0	-1,106.2	3,393.8	1
9,823.0	90.67	348.24	6,390.9	3,320.0	-1,125.0	3,484.8	0
9,914.0	91.21	347.97	6,389.4	3,409.1	-1,143.7	3,575.8	0
10,005.0	89.46	347.77	6,388.9	3,498.0	-1,162.9	3,666.8	1
10,101.0	89.33	348.08	6,389.9	3,591.9	-1,182.9	3,762.8	0
10,197.0	90.87	349.81	6,389.7	3,686.1	-1,201.4	3,858.8	2
10,293.0	91.64	349.53	6,387.6	3,780.5	-1,218.6	3,954.7	0
10,389.0	90.20	348.76	6,386.1	3,874.8	-1,236.6	4,050.6	1
10,485.0	90.17	351.33	6,385.8	3,969.3	-1,253.2	4,146.5	2
10,580.0	89.87	348.17	6,385.7	4,062.8	-1,270.1	4,241.4	3
10,676.0	90.91	346.02	6,385.1	4,156.4	-1,291.6	4,337.4	2
10,772.0	90.10	346.17	6,384.2	4,249.6	-1,314.6	4,433.4	0
10,868.0	88.15	347.36	6,385.7	4,343.0	-1,336.6	4,529.3	2
10,964.0	88.72	348.20	6,388.3	4,436.8	-1,356.9	4,625.3	1
11,060.0	89.09	345.45	6,390.2	4,530.2	-1,378.8	4,721.3	2
11,157.0	89.76	345.32	6,391.1	4,624.1	-1,403.3	4,818.2	0
11,255.0	90.23	344.46	6,391.1	4,718.7	-1,428.8	4,916.1	1
11,351.0	90.40	344.29	6,390.6	4,811.1	-1,454.7	5,012.0	0
11,447.0	91.28	346.39	6,389.2	4,904.0	-1,479.0	5,107.9	2
11,543.0	90.10	348.72	6,388.1	4,997.7	-1,499.7	5,203.9	2
11,639.0	90.87	348.08	6,387.2	5,091.8	-1,519.0	5,299.8	1
11,736.0	90.27	348.18	6,386.3	5,186.7	-1,538.9	5,396.8	0
11,851.0	90.40	348.25	6,385.6	5,299.3	-1,562.4	5,511.8	0
11,873.0	90.17	347.04	6,385.5	5,320.8	Re1:567,1 ad	5,533.8	5
11,929.0	90.17	347.04	6,385.3	5,375.8	fice di ⁵⁷⁹ 71 &		0
PTB	-5,50,65		- Contract	Oi	nee or on a	Gar	

FEB 1 1 2016





Company: Project:

Antero

Ritchie County WV

Site:

John Richards Pad: Duckworth/Stalnaker

Well: Stalnaker Unit 3H

Wellbore: ST 1

ST 1 As Drilled Design:

Local Co-ordinate Reference:

TVD Reference:

MD Reference: North Reference:

Survey Calculation Method:

Database:

Well Stalnaker Unit 3H

Frontier 23: GL 1025' + KB 23' @ 1048.0usft Frontier 23: GL 1025' + KB 23' @ 1048.0usft

Minimum Curvature Oklahoma District

Design Annotations

Measured Depth (usft)

11,929.0

Vertical Depth (usft)

6,385.3

Local Coordinates +N/-S (usft)

+E/-W (usft)

Comment

5,375.3 -1,579.7 PTB

Checked By:	Approved By:	Date:

Received Office of Oil 8 FEB 1 1 2016

Hydraulic Fracturing Fluid Product Component Information Disclosure

10/17/2015	Job Start Date:
10/24/2015	Job End Date:
West Virginia	State:
Ritchie	County:
47-085-10139-00-00	API Number:
Antero Resources Corporation	Operator Name:
Stalnaker 3H	Well Name and Number:
-80.91948100	Longitude:
39.20550300	Latitude:
NAD83	Datum:
NO	Federal/Tribal Well:
6,411	True Vertical Depth:
7,146,048	Total Base Water Volume (gal):
0	Total Base Non Water Volume:
0	otal Base Non Water Volume:







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	6 m				
	Park and a State of the Control of t		Water	7732-18-5	100.00000	90.16706	
Sand	U.S. Well Services, LLC	Proppant	(f)				
			Crystalline Silica, quartz	14808-60-7	100.00000	9.33910	
HCL Acid (12.6%- 18.0%)	U.S. Well Services, LLC	Bulk Acid	100			HP T	11 一个中国生活。
				7732-18-5	87.50000	0.18199	
			Hydrogen Chloride	7647-01-0	18.00000	0.04347	
LGC-15	U.S. Well Services	Gelling Agents		7-1-7-2			
			Guar Gum	9000-30-0	50.00000	0.07925	
			Petroleum Distillates	64742-47-8	60.00000	0.07506	
			Suspending agent (solid)	14808-60-7	3.00000	0.01212	
			Surfactant	68439-51-0	3.00000	0.00476	
WFRA-405	U.S. Well Services	Friction Reducer					
			Water	7732-18-5	40.00000	0.02729	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.02729	
			Petroleum Distillates	64742-47-8	20.00000	0.01098	
			Ethoxylated alcohol blend	68002-97-1	4.00000	0.00341	
SI-1100	U.S. Well Services	Scale Inhibitor					

			Water	7732-18-5	80.00000	0.01023	
			Ethylene Glycol	107-21-1	25.00000	0.00361	
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00151	
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00129	
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00083	
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00083	
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033	
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent					
			2,2-dibromo-3- nitrilopropionamide	10222-01-2	20.00000	0.00440	
			Deionized Water	7732-18-5	28.00000	0.00251	
AP One	U.S. Well Services	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00232	
AI-301	U.S. Well Services	Acid Corrosion Inhibitors					
			Diethylene Glycol	111-46-6	30.00000	0.00014	
			Methenamine	100-97-0	20.00000	0.00011	
			Hydrogen Chloride	7647-01-0	10.00000	0.00005	
			Polyethylene polyamine	68603-67-8	10.00000	0.00004	
			Coco amine	61791-14-8	5.00000	0.00002	

* 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)



