

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

API 47-085-10244 County Ritchie District Clay  
Quad Pennsboro 7.5' Pad Name Buck Run Pad Field/Pool Name ----  
Farm name Stephen C. Jackson, et al Well Number Charleston Unit 3H  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4351839m Easting 504544m  
Landing Point of Curve Northing 4351647.43m Easting 504504.36m  
Bottom Hole Northing 4349208m Easting 505496m

Elevation (ft) 1127' 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 9/16/2015 Date drilling commenced 11/28/2015 Date drilling ceased 3/28/2016  
Date completion activities began 1/31/2016 Date completion activities ceased 10/8/2016  
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 55', 227', 439' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1921' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

**APPROVED**

NAME: Michael Doff  
DATE: 5/10/2017

Reviewed by: \_\_\_\_\_

**05/26/2017**

RECEIVED  
Office of Oil and Gas  
MAR 28 2017

WV Department of  
Environmental Protection

API 47-085 - 10244 Farm name Stephen C. Jackson, et al Well number Charleston Unit 3H

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# K-55	N/A	Y
Surface	17-1/2"	13-3/8"	560'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2519'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15531'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6493'		5.95# N-80		
Packer type and depth set		N/A					

Comment Details Cement Squeeze performed on 3/20/2016 from 5700'-4612' with 380 sx of Class A cement

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	100 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	662 sx	15.6	1.19	389	0'	8 Hrs.
Coal							
Intermediate 1	Class A	972 sx	15.6	1.18	789	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	837 sx (Lead) 1413 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.84 (Tail)	3096	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15531' MD, 6410' TVD (BHL), 6428' (Deepest Point Drilled) Loggers TD (ft) 15531' MD

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

Plug back procedure N/A

Kick off depth (ft) 5776'

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Jackknife Unit 1H API #47-085-10178). Please reference the wireline logs submitted with Form WR-35 for Jackknife Unit 1H. A Cement Bond Log has been included with this submittal.

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

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

Conductor - 0  
Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface  
Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface  
Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

API 47- 085 - 10244 Farm name Stephen C. Jackson, et al Well number Charleston Unit 3H

### PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
<b>*PLEASE SEE ATTACHED EXHIBIT 1</b>					

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)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

API 47- 085 - 10244 Farm name Stephen C. Jackson, et al Well number Charleston Unit 3H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>			
<u>Marcellus</u>	<u>6378' (TOP)</u>	<u>TVD</u>	<u>6645' (TOP)</u>	<u>MD</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

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

OPEN FLOW Gas 13076 mcfpd Oil 224 bpd NGL --- bpd Water 318 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

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

Logging Company Allied Horizontal Wireline Services  
Address 381 Colonial Manor Rd. City North Huntingdon State PA Zip 15642

Cementing Company BJ Services  
Address 1036 East Main St. 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  Title Permitting Agent Date 3/21/2017

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

05/26/2017

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	31-Jan-16	15,260	15,428	60	Marcellus
2	4-Aug-16	15,061	15,229	60	Marcellus
3	4-Aug-16	14,861	15,029	60	Marcellus
4	4-Aug-16	14,662	14,830	60	Marcellus
5	4-Aug-16	14,463	14,631	60	Marcellus
6	5-Aug-16	14,263	14,431	60	Marcellus
7	5-Aug-16	14,064	14,232	60	Marcellus
8	5-Aug-16	13,865	14,033	60	Marcellus
9	6-Aug-16	13,665	13,834	60	Marcellus
10	6-Aug-16	13,466	13,634	60	Marcellus
11	6-Aug-16	13,267	13,435	60	Marcellus
12	6-Aug-16	13,068	13,236	60	Marcellus
13	7-Aug-16	12,868	13,036	60	Marcellus
14	7-Aug-16	12,669	12,837	60	Marcellus
15	7-Aug-16	12,470	12,638	60	Marcellus
16	7-Aug-16	12,270	12,438	60	Marcellus
17	8-Aug-16	12,071	12,239	60	Marcellus
18	8-Aug-16	11,872	12,040	60	Marcellus
19	8-Aug-16	11,672	11,840	60	Marcellus
20	8-Aug-16	11,473	11,641	60	Marcellus
21	8-Aug-16	11,274	11,442	60	Marcellus
22	9-Aug-16	11,074	11,243	60	Marcellus
23	9-Aug-16	10,875	11,043	60	Marcellus
24	9-Aug-16	10,676	10,844	60	Marcellus
25	9-Aug-16	10,477	10,645	60	Marcellus
26	10-Aug-16	10,277	10,445	60	Marcellus
27	10-Aug-16	10,078	10,246	60	Marcellus
28	10-Aug-16	9,879	10,047	60	Marcellus
29	10-Aug-16	9,679	9,847	60	Marcellus
30	11-Aug-16	9,480	9,648	60	Marcellus
31	11-Aug-16	9,281	9,449	60	Marcellus
32	11-Aug-16	9,081	9,249	60	Marcellus
33	11-Aug-16	8,882	9,050	60	Marcellus
34	12-Aug-16	8,683	8,851	60	Marcellus
35	12-Aug-16	8,483	8,652	60	Marcellus
36	12-Aug-16	8,284	8,452	60	Marcellus
37	12-Aug-16	8,085	8,253	60	Marcellus
38	12-Aug-16	7,886	8,054	60	Marcellus
39	13-Aug-16	7,686	7,854	60	Marcellus
40	13-Aug-16	7,487	7,655	60	Marcellus
41	13-Aug-16	7,288	7,456	60	Marcellus
42	13-Aug-16	7,088	7,256	60	Marcellus
43	14-Aug-16	6,889	7,057	60	Marcellus
44	14-Aug-16	6,690	6,858	60	Marcellus

## 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	3-Aug-16	71.4	7,550	0	3,870	324,000	11,474	N/A
2	4-Aug-16	74.1	7,626	5,143	3,526	403,000	11,083	N/A
3	4-Aug-16	77.0	7,572	5,272	3,383	403,125	10,373	N/A
4	4-Aug-16	70.2	7,482	5,368	3,591	404,900	10,349	N/A
5	4-Aug-16	74.0	7,437	5,604	4,706	334,500	9,645	N/A
6	5-Aug-16	75.6	7,207	5,611	3,208	406,400	10,270	N/A
7	5-Aug-16	76.9	7,307	5,942	3,934	406,500	10,266	N/A
8	5-Aug-16	68.9	7,172	5,840	3,667	383,100	12,206	N/A
9	6-Aug-16	68.9	6,926	6,495	3,891	405,800	10,184	N/A
10	6-Aug-16	58.5	8,493	6,992	4,742	222,400	11,669	N/A
11	6-Aug-16	74.1	6,948	5,547	3,501	405,100	10,168	N/A
12	6-Aug-16	76.2	7,146	5,958	3,287	405,200	11,451	N/A
13	7-Aug-16	77.4	7,107	5,693	3,533	405,400	10,253	N/A
14	7-Aug-16	79.1	7,477	5,933	3,902	384,000	10,486	N/A
15	7-Aug-16	73.7	7,446	5,815	4,299	405,070	13,106	N/A
16	7-Aug-16	76.0	7,101	5,769	4,807	405,200	10,133	N/A
17	8-Aug-16	76.8	7,266	6,101	3,201	406,400	10,123	N/A
18	8-Aug-16	74.0	6,879	5,808	3,655	405,250	10,022	N/A
19	8-Aug-16	73.0	6,803	6,573	3,566	404,600	9,998	N/A
20	8-Aug-16	75.1	7,035	6,151	3,544	404,900	10,007	N/A
21	8-Aug-16	76.0	7,011	6,534	3,566	405,200	9,990	N/A
22	9-Aug-16	79.0	7,085	5,976	3,507	404,750	10,490	N/A
23	9-Aug-16	77.0	7,063	6,205	3,884	406,100	10,023	N/A
24	9-Aug-16	69.9	7,063	6,098	4,771	342,300	11,366	N/A
25	9-Aug-16	71.8	6,924	6,044	3,362	404,100	10,076	N/A
26	10-Aug-16	74.0	7,017	6,555	3,562	404,250	10,018	N/A
27	10-Aug-16	77.0	6,694	5,937	3,741	404,250	9,997	N/A
28	10-Aug-16	79.1	7,042	5,990	3,712	403,530	9,987	N/A
29	10-Aug-16	75.8	7,169	5,836	3,333	403,900	10,144	N/A
30	11-Aug-16	75.8	6,851	5,940	3,508	403,800	9,911	N/A
31	11-Aug-16	80.0	7,664	6,022	4,270	327,000	10,885	N/A
32	11-Aug-16	77.0	7,371	5,615	3,945	401,500	10,534	N/A
33	11-Aug-16	74.7	6,869	5,980	3,312	403,200	10,880	N/A
34	12-Aug-16	73.4	6,786	5,951	3,279	403,300	10,687	N/A
35	12-Aug-16	75.3	7,208	6,137	3,521	402,825	10,101	N/A
36	12-Aug-16	72.8	6,943	6,543	3,619	404,235	9,957	N/A
37	12-Aug-16	78.8	6,969	5,923	3,716	404,260	9,944	N/A
38	12-Aug-16	73.2	6,962	7,027	3,412	403,100	9,964	N/A
39	13-Aug-16	73.8	6,962	6,169	3,533	403,700	9,937	N/A
40	13-Aug-16	75.5	7,636	5,807	4,038	403,595	9,829	N/A
41	13-Aug-16	72.6	6,968	6,158	4,011	403,635	9,812	N/A
42	13-Aug-16	76.0	6,678	6,019	3,680	401,580	9,816	N/A
43	14-Aug-16	73.0	6,948	6,269	3,490	403,300	9,869	N/A
44	14-Aug-16	75.0	6,930	6,680	3,237	403,450	9,787	N/A
AVG=		<b>74.5</b>	<b>7,154</b>	<b>5,887</b>	<b>3,723</b>	<b>17,275,705</b>	<b>10,393</b>	TOTAL

## 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	55'	N/A	55'	N/A
Fresh Water	227'	N/A	227'	N/A
Fresh Water	439'	N/A	439'	N/A
Siltstone	0	567	0	567
Shale	567	627	567	627
Sandstone	627	647	627	647
Siltstone	647	867	647	867
Shale	867	987	867	987
Sandstone	987	1067	987	1067
Shale	1067	1247	1067	1247
Sandstone	1247	1387	1247	1387
Coaly Sandstone	1387	1647	1387	1647
Shale	1647	1867	1647	1867
Sandstone	1867	1907	1867	1907
Shale	1907	1988	1907	1990
Big Lime	1988	2126	1990	2128
Big Injun	2126	2497	2128	2499
Gantz Sand	2497	2880	2499	2882
Fifty Foot Sandstone	2880	2979	2882	2981
Gordon	2979	3350	2981	3352
Fifth Sandstone	3350	3414	3352	3416
Bayard	3414	3556	3416	3558
Warren	3556	3958	3558	3960
Speechley	3958	4222	3960	4224
Baltown	4222	4611	4224	4613
Bradford	4611	5000	4613	5002
Benson	5000	5237	5002	5239
Alexander	5237	5548	5239	5550
Elk	5548	5823	5550	5826
Rhinestreet	5823	6130	5826	6157
Sycamore	6130	6224	6157	6282
Middlesex	6224	6331	6282	6483
Burkett	6331	6358	6483	6569
Tully	6358	6378	6569	6645
Marcellus	6378	NA	6645	NA

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/3/2016
Job End Date:	8/14/2016
State:	West Virginia
County:	Ritchie
API Number:	47-085-10244-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Charleston 3H
Latitude:	39.18571000
Longitude:	-80.56508400
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,428
Total Base Water Volume (gal):	19,670,064
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract 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	90.22350	
Sand	J.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	9.50131	
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.10224	
			Hydrogen Chloride	7647-01-0	18.00000	0.02442	
WFRA-405	J.S. Well Services	Friction Reducer					
			Water	7732-18-5	60.00000	0.04190	
			2-Propanoic acid, polymer with 2-propanamide	9003-06-9	30.00000	0.02095	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01687	
			Ethoxylated alcohol blend	68002-97-1	4.00000	0.00279	
LGC-15	J.S. Well Services	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.01915	
			Petroleum Distillates	64742-47-8	60.00000	0.01813	
			Suspending agent (solid)	14808-60-7	3.00000	0.00293	



SI-1100s	U.S. Well Services	Scale Inhibitor	Surfactant	68439-51-0	3.00000	0.00115
			Water	7732-18-5	80.00000	0.01015
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00150
			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	0.00082
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00082
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033
BIOCLEAR 2000	U.S. Well Services	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropanamide	10222-01-2	30.00000	0.00642
			Deionized Water	7732-18-5	28.00000	0.00244
AP One	U.S. Well Services	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00062
AI-302	U.S. Well Services	Acid Corrosion Inhibitors				
			Water	7732-18-5	95.00000	0.00022
			2-Propyn-1-ol compound with methylxirane	38172-91-7	15.00000	0.00004

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)

LATITUDE 39°20'00"

8,711'

LATITUDE 39°20'00"

LONGITUDE 80°55'00"

6,365'

LONGITUDE 80°55'00"

15,001' TO BOTTOM HOLE

Antero Resources Corporation  
Well No. Charleston Unit 3H  
A.P.I. 47-085-10244

WELL NO. 3H  
47-085-10244

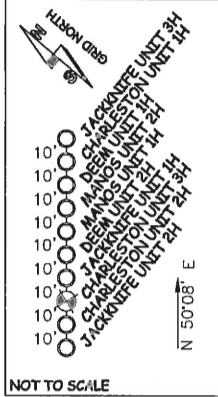
AS DRILLED DATA:  
WELL 3H TOP HOLE INFORMATION:  
N: 300,452ft E: 1,590,484ft  
LAT: 39°18'57.10" LON: 80°56'50.84"  
BOTTOM HOLE INFORMATION:  
N: 291,766ft E: 1,593,465ft  
LAT: 39°17'31.73" LON: 80°56'11.15"  
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.  
SYSTEM WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:  
WELL 3H TOP HOLE INFORMATION:  
N: 4,351,839m E: 504,544m  
BOTTOM HOLE INFORMATION:  
N: 4,349,208m E: 505,496m

NOTE

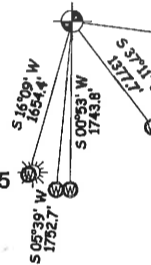
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

PAD LAYOUT



NOT TO SCALE

WELL NO. 3H  
47-085-10244



LEGEND

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

DATE 02/09/17

OPERATOR'S WELL# CHARLESTON UNIT #3H

JOB # 15-037WA

DRAWING # CHARLESTON3HAD

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



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

WILLOW LAND SURVEYING PLLC  
P.O. BOX 17 PENNSBORO WEST VIRGINIA 26415

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION \_\_\_ STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
LOCATION: ELEVATION 1,162' ORIGINAL - 1,127' AS-DRILLED WATERSHED NORTH FORK HUGHES RIVER

QUADRANGLE PENNSBORO 7.5'

DISTRICT CLAY

COUNTY RITCHIE

SURFACE OWNER STEPHEN C. JACKSON ET AL ACREAGE 40.835 ACRES +/-

OIL & GAS ROYALTY OWNER HARVEY WEIGLE HEIRS; CONSTANCE K. GRIFFITH; M. H. JONES ET UX; LEASE ACREAGE 51 ACRES+; 31 AC+; 200 ACRES+;

ORMA M. WILSON JOHNSON; EDWARD J. JONES ET AL; CARLTON BOYCE ET UX 42 ACRES+; 73 ACRES+; 201 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 \_\_\_ ESTIMATED DEPTH 6,410' TVD 15,531' MD

TARGET FORMATION MARCELLUS

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

FORM WW-6

05/26/2017

LATITUDE 39°20'00"

8,711'

LATITUDE 39°20'00"

LONGITUDE 80°55'00"

6,365'

LONGITUDE 80°55'00"

15,001' TO BOTTOM HOLE

COUNTY NAME PERMIT

Antero Resources Corporation  
Well No. Charleston Unit 3H  
A.P.I. 47-085-10244

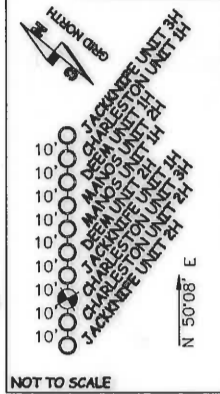
WELL NO. 3H  
47-085-10244

AS DRILLED DATA:  
WELL 3H TOP HOLE INFORMATION:  
N: 300,452ft E: 1,590,484ft  
LAT: 39°18'57.10" LON: 80°56'50.84"  
BOTTOM HOLE INFORMATION:  
N: 291,766ft E: 1,593,465ft  
LAT: 39°17'31.73" LON: 80°56'11.15"  
WEST VIRGINIA COORDINATE  
SYSTEM OF 1927 NORTH ZONE.  
ZONE WAS DERIVED FROM  
MEASUREMENTS TAKEN WITH  
TRIMBLE GEOXT SUBMETER  
MAPPING GRADE GPS UNIT.  
PLAT ORIENTATION, CORNER,  
AND WELL REFERENCE TIE LINES  
ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:  
WELL 3H TOP HOLE INFORMATION:  
N: 4,351,839m E: 504,544m  
BOTTOM HOLE INFORMATION:  
N: 4,349,208m E: 505,496m

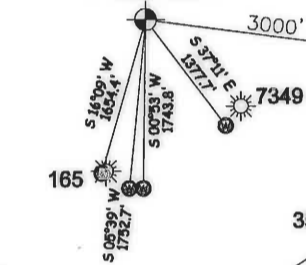
- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
  5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

**PAD LAYOUT**



NOTE:  
4 WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF THE CENTER  
OF PROPOSED PAD

WELL NO. 3H  
47-085-10244



**LEGEND**

- Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- ⊕ Found monument, as noted
- Proposed Well Path
- ⊙ As Drilled Well Path

DATE 02/09/17

OPERATOR'S WELL# CHARLESTON UNIT #3H

JOB # 15-037WA

DRAWING # CHARLESTON3HAD

SCALE 1" = 1000'

MINIMUM DEGREE OF ACCURACY SUBMETER

PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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DEPARTMENT OF ENERGY  
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