

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

RECEIVED

JAN 31 2017

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

API 47-017-06404 County Doddridge District New Milton  
Quad New Milton 7.5' Pad Name Pennington South Pad Field/Pool Name ---  
Farm name Davis, Brian E. Well Number Pennington South Unit 1H  
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 4,339,295m Easting 522,369m  
Landing Point of Curve Northing 4,338,065.51m Easting 522,490.81m  
Bottom Hole Northing 4,335,871m Easting 523,248m

Elevation (ft) 1,060' 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 02/03/2014 Date drilling commenced 06/16/2014 Date drilling ceased 09/19/2014  
Date completion activities began 10/20/2014 Date completion activities ceased 12/25/2014  
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 45' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1,642' Void(s) encountered (Y/N) depths None  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths None  
Is coal being mined in area (Y/N) No

Reviewed by:

\_\_\_\_\_

API 47-017 - 06404 Farm name Davis, Brian E. Well number Pennington South Unit 1H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	40'	New	94#; H-40	N/A	Yes
Surface	17 1/2"	13 3/8"	450'	New	48#; H-40	N/A	Yes
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,500'	New	36#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	18,350'	New	23#; P-110	N/A	Yes
Tubing		2 3/8"	6,979'		4.7#; N-80	N/A	
Packer type and depth set		N/A					

Comment Details SIDETRACK at 10,730'

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	196 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	553 sx	15.6	1.18	313	0'	8 Hrs.
Coal							
Intermediate 1	Class A	863 sx	15.2	1.86	783	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	964 sx (Lead); 1,808 sx (Tail)	14.5 (Lead); 15.2 (Tail)	1.3 (Lead); 1.86 (Tail)	3,746	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 18,392' MD; 6,920' TVD (BHL); 6,924' TVD (Deepest Point Drilled) Loggers TD (ft) 18,392'

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

Plug back procedure N/A

Kick off depth (ft) 6,285'

\*\*This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Lincoln Unit 1H, API #47-017-06403). Please reference the wireline logs submitted with Form WR-35 for the Lincoln 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- 017 - 06404 Farm name Davis, Brian E. Well number Pennington South Unit 1H

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- 017 - 06404 Farm name Davis, Brian E. Well number Pennington South Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6,701' (top)</u> TVD	<u>7,110' (top)</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3,950 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs

OPEN FLOW Gas 7,965 mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ 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>	
	<u>0</u>		<u>0</u>		

**\* PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC  
 Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company STRC  
 Address 1560 Good Hope Pike City Clarksburg State WV Zip 26301

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

Stimulating Company Halliburton  
 Address 121 Champion Way, Suite 200 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Samantha Marsh Telephone 303-357-7345  
 Signature *Samantha Marsh* Title Permitting Agent Date 10/31/2016

API 47-017-06404 Farm Name Davis, Brian E. Well Number Pennington South Unit 1H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	20-Oct-14	18,091	18,259	60	Marcellus
2	10-Nov-14	17,892	18,060	60	Marcellus
3	11-Nov-14	17,694	17,861	60	Marcellus
4	11-Nov-14	17,495	17,662	60	Marcellus
5	12-Nov-14	17,296	17,464	60	Marcellus
6	12-Nov-14	17,097	17,265	60	Marcellus
7	13-Nov-14	16,898	17,066	60	Marcellus
8	13-Nov-14	16,699	16,867	60	Marcellus
9	15-Nov-14	16,500	16,668	60	Marcellus
10	15-Nov-14	16,302	16,469	60	Marcellus
11	16-Nov-14	16,103	16,271	60	Marcellus
12	16-Nov-14	15,904	16,072	60	Marcellus
13	16-Nov-14	15,705	15,873	60	Marcellus
14	17-Nov-14	15,506	15,674	60	Marcellus
15	17-Nov-14	15,307	15,475	60	Marcellus
16	17-Nov-14	15,109	15,276	60	Marcellus
17	18-Nov-14	14,910	15,077	60	Marcellus
18	18-Nov-14	14,711	14,879	60	Marcellus
19	18-Nov-14	14,512	14,680	60	Marcellus
20	18-Nov-14	14,313	14,481	60	Marcellus
21	19-Nov-14	14,114	14,282	60	Marcellus
22	19-Nov-14	13,916	14,083	60	Marcellus
23	19-Nov-14	13,717	13,884	60	Marcellus
24	20-Nov-14	13,518	13,686	60	Marcellus
25	20-Nov-14	13,319	13,487	60	Marcellus
26	20-Nov-14	13,120	13,288	60	Marcellus
27	21-Nov-14	12,921	13,089	60	Marcellus
28	21-Nov-14	12,723	12,890	60	Marcellus
29	21-Nov-14	12,524	12,691	60	Marcellus
30	22-Nov-14	12,325	12,493	60	Marcellus
31	22-Nov-14	12,126	12,294	60	Marcellus
32	22-Nov-14	11,927	12,095	60	Marcellus
33	23-Nov-14	11,728	11,896	60	Marcellus
34	23-Nov-14	11,529	11,697	60	Marcellus
35	23-Nov-14	11,331	11,498	60	Marcellus
36	23-Nov-14	11,132	11,300	60	Marcellus
37	24-Nov-14	10,933	11,101	60	Marcellus
38	24-Nov-14	10,734	10,902	60	Marcellus
39	24-Nov-14	10,535	10,703	60	Marcellus
40	24-Nov-14	10,336	10,504	60	Marcellus
41	25-Nov-14	10,138	10,305	60	Marcellus
42	25-Nov-14	9,939	10,106	60	Marcellus
43	25-Nov-14	9,740	9,908	60	Marcellus
44	25-Nov-14	9,541	9,709	60	Marcellus
45	26-Nov-14	9,342	9,510	60	Marcellus
46	26-Nov-14	9,143	9,311	60	Marcellus
47	26-Nov-14	8,945	9,112	60	Marcellus
48	26-Nov-14	8,746	8,913	60	Marcellus
49	27-Nov-14	8,547	8,715	60	Marcellus
50	27-Nov-14	8,348	8,516	60	Marcellus
51	27-Nov-14	8,149	8,317	60	Marcellus
52	27-Nov-14	7,950	8,118	60	Marcellus
53	28-Nov-14	7,752	7,919	60	Marcellus
54	28-Nov-14	7,553	7,720	60	Marcellus
55	27-Nov-14	7,354	7,522	60	Marcellus
56	28-Nov-14	7,155	7,323	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	10-Nov-14	62.5	7,460	6,009	4,828	208,804	6,410	N/A
2	10-Nov-14	58.9	7,416	6,418	4,572	163,302	7,199	N/A
3	11-Nov-14	61.9	7,022	5,817	3,911	210,938	6,547	N/A
4	11-Nov-14	62.5	7,060	5,750	3,994	197,484	6,967	N/A
5	12-Nov-14	59.7	6,894	5,872	5,210	139,333	6,301	N/A
6	12-Nov-14	58.7	6,939	5,583	4,421	227,248	7,296	N/A
7	13-Nov-14	60.7	7,063	5,664	4,141	201,426	7,276	N/A
8	13-Nov-14	54.4	7,023	5,597	7,578	177,242	6,351	N/A
9	15-Nov-14	60.6	7,117	5,534	5,045	167,203	7,205	N/A
10	15-Nov-14	59.0	7,216	5,608	5,423	211,686	7,010	N/A
11	16-Nov-14	58.0	7,347	6,288	4,704	173,127	6,510	N/A
12	16-Nov-14	61.3	7,497	6,090	4,756	162,863	6,620	N/A
13	16-Nov-14	61.2	7,175	5,983	5,085	225,172	7,067	N/A
14	17-Nov-14	61.3	7,218	5,821	5,458	132,843	6,630	N/A
15	17-Nov-14	65.2	7,702	6,277	5,400	189,062	7,200	N/A
16	17-Nov-14	58.6	7,865	6,052	4,455	89,799	6,946	N/A
17	18-Nov-14	67.5	7,431	6,195	4,999	226,530	7,031	N/A
18	18-Nov-14	66.8	7,450	6,082	5,722	243,378	6,521	N/A
19	18-Nov-14	63.9	7,257	5,955	5,306	240,051	6,461	N/A
20	18-Nov-14	69.1	7,185	6,122	5,163	243,447	6,687	N/A
21	19-Nov-14	67.0	6,947	5,573	5,167	243,739	6,536	N/A
22	19-Nov-14	68.3	7,160	6,028	4,594	191,622	6,938	N/A
23	19-Nov-14	69.8	7,011	5,452	5,238	244,097	6,387	N/A
24	20-Nov-14	68.7	6,735	5,168	4,962	243,603	6,538	N/A
25	20-Nov-14	68.0	6,727	5,622	4,959	243,283	6,374	N/A
26	20-Nov-14	69.8	7,001	5,538	5,006	244,499	6,753	N/A
27	21-Nov-14	70.3	6,929	5,433	4,951	242,045	6,435	N/A
28	21-Nov-14	67.4	6,621	5,333	5,104	243,614	6,491	N/A
29	21-Nov-14	70.3	6,826	5,095	5,136	242,985	6,301	N/A
30	22-Nov-14	70.3	6,874	5,512	5,091	243,060	6,427	N/A
31	22-Nov-14	65.1	6,780	5,667	5,268	217,783	6,766	N/A
32	22-Nov-14	70.7	7,015	5,756	5,317	242,924	6,758	N/A
33	23-Nov-14	70.4	7,088	5,883	5,376	241,222	6,288	N/A
34	23-Nov-14	67.2	6,752	5,763	5,219	235,586	6,092	N/A
35	23-Nov-14	67.8	6,597	5,277	5,271	240,216	6,050	N/A
36	23-Nov-14	68.7	6,929	6,146	5,251	240,652	6,194	N/A
37	24-Nov-14	70.0	6,873	6,277	5,025	242,168	6,187	N/A
38	24-Nov-14	68.5	6,544	5,791	5,110	240,539	6,023	N/A
39	24-Nov-14	67.7	6,496	5,412	5,194	244,079	6,004	N/A
40	24-Nov-14	67.0	6,772	5,633	5,398	211,056	6,608	N/A
41	25-Nov-14	63.4	6,537	6,090	5,438	242,770	6,188	N/A
42	25-Nov-14	66.8	6,126	5,860	5,521	245,706	6,205	N/A
43	25-Nov-14	66.9	6,402	5,190	5,464	243,266	6,058	N/A
44	25-Nov-14	64.2	6,319	5,461	5,374	243,563	6,032	N/A
45	26-Nov-14	64.1	6,451	5,678	5,491	244,220	6,062	N/A
46	26-Nov-14	66.4	6,521	5,599	5,509	240,900	6,043	N/A
47	26-Nov-14	67.0	6,729	6,205	5,696	244,400	6,035	N/A
48	26-Nov-14	63.5	6,385	5,519	5,334	241,876	6,013	N/A
49	27-Nov-14	63.6	6,568	5,949	5,429	243,892	6,016	N/A
50	27-Nov-14	66.2	6,551	5,703	5,632	238,863	5,993	N/A
51	27-Nov-14	67.0	6,516	5,774	5,757	240,100	5,885	N/A
52	27-Nov-14	64.3	6,463	6,133	5,462	245,623	5,992	N/A
53	28-Nov-14	63.7	6,470	5,680	5,356	241,396	6,015	N/A
54	28-Nov-14	65.6	6,466	5,587	5,329	244,629	6,032	N/A
55	28-Nov-14	67.6	6,529	5,667	5,507	243,916	5,890	N/A
56	28-Nov-14	64.2	6,538	5,950	5,459	249,525	5,954	N/A
AVG=		<b>65.2</b>	<b>6,885</b>	<b>5,770</b>	<b>5,189</b>	<b>12,464,355</b>	<b>360,795</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	45'	N/A	45'	N/A
Sandstone	0	47	0	47
Shale/ Siltstone	est. 47	227	est. 47	227
Siltstone/ Trace Coal	est. 227	267	est. 227	267
Siltstone/ Sandstone	est. 267	847	est. 267	847
Siltstone/ Limestone	est. 847	907	est. 847	907
Siltstone/ Shale	est. 907	1,287	est. 907	1,287
Siltstone/ Sandstone	est. 1287	1,447	est. 1287	1,447
Siltstone/ Trace Coal	est. 1447	1,467	est. 1447	1,467
Siltstone	est. 1467	1,552	est. 1467	1,552
Sandstone/ Trace Coal	est. 1552	1,647	est. 1552	1,647
Siltstone/ Shale	est. 1647	1,767	est. 1647	1,767
Siltstone/ Trace Coal	est. 1767	1,787	est. 1767	1,787
Siltstone/ Shale	est. 1787	1,895	est. 1787	1,895
Big Lime	1,895	1,980	1,895	1,980
Big Injun	1,980	2,240	1,980	2,240
Gantz Sand	2,240	2,412	2,240	2,412
Fifty Foot Sandstone	2,412	2,642	2,412	2,642
Gordon	2,642	2,971	2,642	2,972
Fifth Sandstone	2,971	3,026	2,972	3,027
Bayard	3,026	3,353	3,027	3,353
Warren	3,353	3,652	3,353	3,653
Speechley	3,652	3,836	3,653	3,837
Baltown	3,836	4,478	3,837	4,479
Bradford	4,478	4,915	4,479	4,923
Benson	4,915	5,131	4,923	5,152
Alexander	5,131	5,384	5,152	5,423
Elk	5,384	5,881	5,423	5,949
Rhinestreet	5,881	6,318	5,949	6,447
Sycamore	6,318	6,466	6,447	6,630
Middlesex	6,466	6,599	6,630	6,843
Burkett	6,599	6,638	6,843	6,923
Tully	6,638	6,701	6,923	7,110
Marcellus	6,701	NA	7,110	NA

\*Please note Antero determines shallow 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.

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/9/2014
Job End Date:	11/28/2014
State:	West Virginia
County:	Doddridge
API Number:	47-017-06404-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Pennington South Unit 1H
Longitude:	-80.74099200
Latitude:	39.20260300
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,887
Total Base Water Volume (gal):	16,743,338
Total Base Non Water Volume:	0



## 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
Fresh Water	Operator	Base Fluid	Fresh Water	7732-18-5	100.00000	92.04285	Density = 8.330
SAND - PREMIUM WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	7.62481	
HCl > 10%	Halliburton	Solvent	Hydrochloric Acid 10-30%	7647-01-0	30.00000	0.18605	
WG-36 GELLING AGENT	Halliburton	Gelling Agent	Guar gum	9000-30-0	100.00000	0.05812	
FR-66	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01873	
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00000	0.00172	
Scalechek(R) LP-65 Scale Inhibitor	Halliburton	Scale Inhibitor	Ammonium chloride	12125-02-9	10.00000	0.00150	
CA-1	Halliburton	Solvent					



BE-9	Halliburton	Biocide	Paraffinic solvent	Confidential	100.00000	0.00103	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E, Houston, TX 77032 281-871-6226
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00078	
HAL-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	87-56-1	60.00000	0.00009	
			Propargyl alcohol	107-19-7	10.00000	0.00002	
Ingredients shown above are subject to 29 CFR 1910.1200(j) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
		Other Ingredient(s)					
		Other Ingredient(s)	Water	7732-18-5		0.05429	
		Other Ingredient(s)	Polyacrylamide copolymer	Confidential		0.01873	
		Other Ingredient(s)	Organic phosphonate	Confidential		0.00899	
		Other Ingredient(s)	Sodium chloride	7647-14-5		0.00312	
		Other Ingredient(s)	Amide	Confidential		0.00312	
		Other Ingredient(s)	Ammonium chloride	12125-02-9		0.00312	
		Other Ingredient(s)	Alcohols ethoxylated	Confidential		0.00312	
			Bentonite, benzyl(hydrogenated tallow alkyl) dimethylammonium stearate complex	121888-68-4		0.00291	
		Other Ingredient(s)	Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00062	
		Other Ingredient(s)	Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00062	
		Other Ingredient(s)	Silica gel	112926-00-8		0.00058	
		Other Ingredient(s)	Surfactant mixture	Confidential		0.00058	
		Other Ingredient(s)	Surfactant mixture	Confidential		0.00058	
		Other Ingredient(s)	Formaldehyde	50-00-0		0.00015	
		Other Ingredient(s)	Crystalline Silica, Quartz	14808-60-7		0.00006	

			Alcohols, C14-C15, ethoxylated	58951-67-7			0.00005
	Other Ingredient(s)		Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	38527-49-1			0.00005
	Other Ingredient(s)		Fatty acids, tall oil	Confidential			0.00005
	Other Ingredient(s)		Olefins	Confidential			0.00001
	Other Ingredient(s)		Olefins	Confidential			0.00001
	Other Ingredient(s)		Sodium sulfate	7757-82-6			0.00000
	Other Ingredient(s)		Olefins	Confidential			0.00000
	Other Ingredient(s)		Olefins	Confidential			0.00000

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water  
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

LATITUDE 39°12'30"

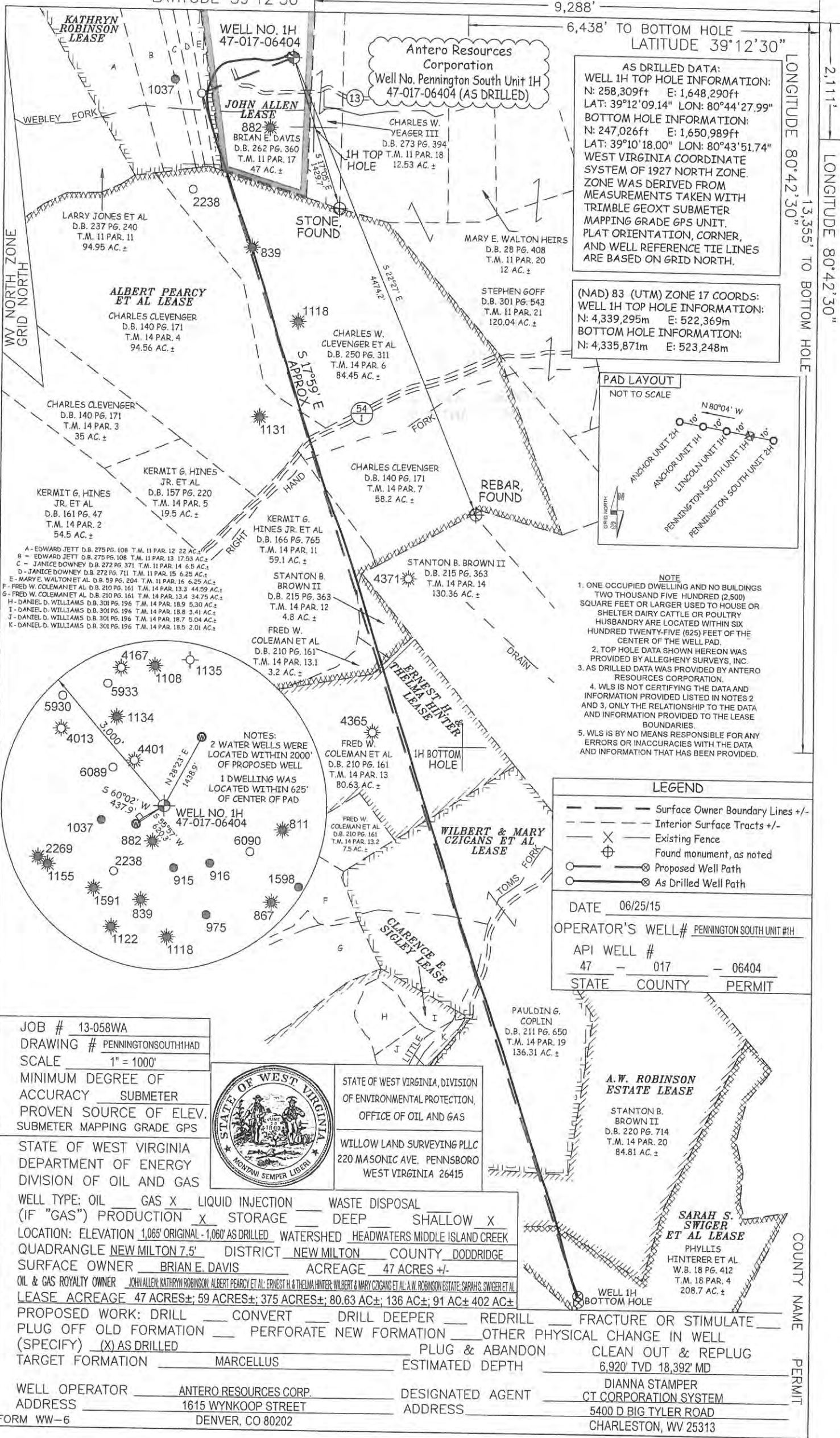
9,288'

6,438' TO BOTTOM HOLE  
LATITUDE 39°12'30"

LONGITUDE 80°42'30"

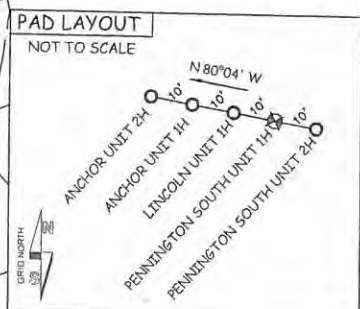
2,111'  
LONGITUDE 80°42'30"

13,355' TO BOTTOM HOLE



**AS DRILLED DATA:**  
**WELL 1H TOP HOLE INFORMATION:**  
 N: 258,309ft E: 1,648,290ft  
 LAT: 39°12'09.14" LON: 80°44'27.99"  
**BOTTOM HOLE INFORMATION:**  
 N: 247,026ft E: 1,650,989ft  
 LAT: 39°10'18.00" LON: 80°43'51.74"  
 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 1H TOP HOLE INFORMATION:**  
 N: 4,339,295m E: 522,369m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,335,871m E: 523,248m

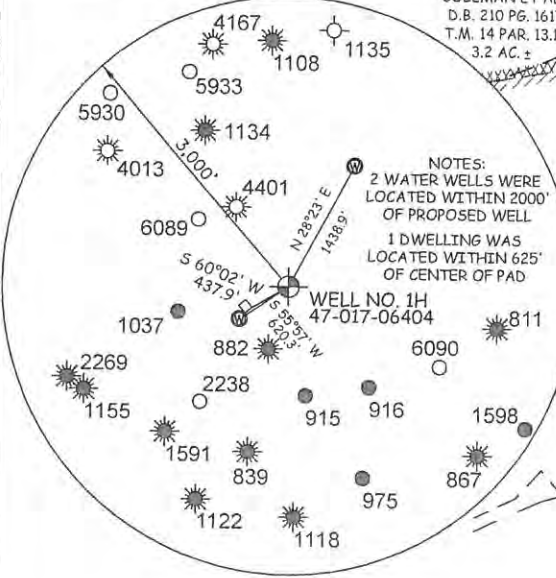


- NOTE**
- ONE OCCUPIED DWELLING AND NO BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  - TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  - AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  - 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.
  - WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

**LEGEND**

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

DATE 06/25/15  
 OPERATOR'S WELL# PENNINGTON SOUTH UNIT #1H  
 API WELL # 47 - 017 - 06404  
 STATE COUNTY PERMIT



JOB # 13-058WA  
 DRAWING # PENNINGTONSOUTH1HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
 (IF "GAS") PRODUCTION \_\_\_ STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X

LOCATION: ELEVATION 1,065' ORIGINAL - 1,060' AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE NEW MILTON 7.5' DISTRICT NEW MILTON COUNTY DODDRIDGE

SURFACE OWNER BRIAN E. DAVIS ACREAGE 47 ACRES +/-

OIL & GAS ROYALTY OWNER JOHN ALLEN, KATHRYN ROBINSON, ALBERT PEARCY ET AL, ERNEST H. & THELMA HINTER, WILBERT & MARY CZIGANS ET AL, A.W. ROBINSON ESTATE, SARAH S. SWIGER ET AL  
 LEASE ACREAGE 47 ACRES±; 59 ACRES±; 375 ACRES±; 80.63 AC±; 136 AC±; 91 AC±; 402 AC±

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  
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,920' TVD 18,392' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM  
 FORM WW-6 DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

**A.W. ROBINSON ESTATE LEASE**

STANTON B. BROWN II  
 D.B. 220 PG. 714  
 T.M. 14 PAR. 20  
 84.81 AC. ±

**SARAH S. SWIGER ET AL LEASE**

PHYLLIS HINTERER ET AL  
 W.B. 18 PG. 412  
 T.M. 18 PAR. 4  
 208.7 AC. ±

COUNTY NAME PERMIT