



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

March 27, 2020

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells off of the **Meredith Pad**:

- Horst Unit 2H-3H
- Sarahlene Unit 1H-2H
- Sterling Unit 1H-3H

If you have any questions, please feel free to contact me at (303)-357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "MGriffith", written over a light blue horizontal line.

Megan Griffith  
Permitting Agent  
Antero Resources Corporation

Enclosures

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

API 47-095-02531 County Tyler District Centerville  
Quad West Union 7.5' Pad Name Meredith Pad Field/Pool Name -----  
Farm name Roy A. Meredith Well Number Horst 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 4355477m Easting 511219m  
Landing Point of Curve Northing 4355280.28m Easting 510795.56m  
Bottom Hole Northing 4352740m Easting 511664m

Elevation (ft) 1111' 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 9/21/2018 Date drilling commenced 10/7/2018 Date drilling ceased 2/17/2019  
Date completion activities began 9/4/2019 Date completion activities ceased 10/11/2019  
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 463', 683' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1521', 2109' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 63', 1239' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

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

API 47- 095 - 02531 Farm name Roy A. Meredith Well number Horst 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"	97'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	821'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2602'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16166'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6996'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details \_\_\_\_\_

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	204 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	670 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	915 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	735 sx (Lead) 1385 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.40 (Lead), 1.26 (Tail)		~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16340' MD, 6546' TVD (BHL), 6558' (Deepest Point Drilled) Loggers TD (ft) 16340' MD

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

Plug back procedure N/A

Kick off depth (ft) 6050'

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 N/A

API 47- 095 - 02531 Farm name Roy A. Meredith Well number Horst 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- 095 - 02531 Farm name Roy A. Meredith Well number Horst Unit 3H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6487' (TOP)	TVD	7073' (TOP) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11432 mcfpd Oil 114 bpd NGL --- bpd Water 241 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 <sub>2</sub> S, ETC)
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**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

Drilling Contractor Patterson UTI Drilling Company LLC  
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company KLX Energy Services  
Address 3040 Post Oak Boulevard City Houston State TX Zip 77056

Cementing Company C&J Energy Services  
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes  
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223  
Signature  Title Permitting Agent Date 3-27-20

API 47-095-02531 Farm Name Roy A. Meredith Well Number Horst Unit 3H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/4/2019	16008.5	16063.9	60	Marcellus
2	9/4/2019	15810.93333	15977.5722	60	Marcellus
3	9/4/2019	15613.36667	15780.0056	60	Marcellus
4	9/5/2019	15415.8	15582.4389	60	Marcellus
5	9/5/2019	15218.23333	15384.8722	60	Marcellus
6	9/5/2019	15020.66667	15187.3056	60	Marcellus
7	9/6/2019	14823.1	14989.7389	60	Marcellus
8	9/6/2019	14625.53333	14792.1722	60	Marcellus
9	9/6/2019	14427.96667	14594.6056	60	Marcellus
10	9/6/2019	14230.4	14397.0389	60	Marcellus
11	9/7/2019	14032.83333	14199.4722	60	Marcellus
12	9/7/2019	13835.26667	14001.9056	60	Marcellus
13	9/7/2019	13637.7	13804.3389	60	Marcellus
14	9/7/2019	13440.13333	13606.7722	60	Marcellus
15	9/8/2019	13242.56667	13409.2056	60	Marcellus
16	9/8/2019	13045	13211.6389	60	Marcellus
17	9/8/2019	12847.43333	13014.0722	60	Marcellus
18	9/8/2019	12649.86667	12816.5056	60	Marcellus
19	9/9/2019	12452.3	12618.9389	60	Marcellus
20	9/9/2019	12254.73333	12421.3722	60	Marcellus
21	9/9/2019	12057.16667	12223.8056	60	Marcellus
22	9/10/2019	11859.6	12026.2389	60	Marcellus
23	9/10/2019	11662.03333	11828.6722	60	Marcellus
24	9/10/2019	11464.46667	11631.1056	60	Marcellus
25	9/11/2019	11266.9	11433.5389	60	Marcellus
26	9/11/2019	11069.33333	11235.9722	60	Marcellus
27	9/11/2019	10871.76667	11038.4056	60	Marcellus
28	9/12/2019	10674.2	10840.8389	60	Marcellus
29	9/12/2019	10476.63333	10643.2722	60	Marcellus
30	9/13/2019	10279.06667	10445.7056	60	Marcellus
31	9/13/2019	10081.5	10248.1389	60	Marcellus
32	9/13/2019	9883.93333	10050.5722	60	Marcellus
33	9/14/2019	9686.36667	9853.0056	60	Marcellus
34	9/14/2019	9488.8	9655.43889	60	Marcellus
35	9/14/2019	9291.23333	9457.87222	60	Marcellus
36	9/15/2019	9093.66667	9260.30556	60	Marcellus
37	9/15/2019	8896.1	9062.73889	60	Marcellus
38	9/15/2019	8698.53333	8865.17222	60	Marcellus
39	9/16/2019	8500.96667	8667.60556	60	Marcellus
40	9/16/2019	8303.4	8470.03889	60	Marcellus
41	9/17/2019	8105.83333	8272.47222	60	Marcellus
42	9/17/2019	7908.26667	8074.90556	60	Marcellus
43	9/17/2019	7710.7	7877.33889	60	Marcellus
44	9/17/2019	7513.13333	7679.77222	60	Marcellus
45	9/18/2019	7315.56667	7482.20556	60	Marcellus
46	9/18/2019	7118	7284.63889	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	9/4/2019	69.24744	7912.749	6916	4594	172500	4996	N/A
2	9/4/2019	75.57176	7692.277	5377	4828	397950	8689	N/A
3	9/4/2019	76.42884	7807.675	5978	4604	398850	8572	N/A
4	9/5/2019	77.30129	7798.654	5543	4252	398600	8527	N/A
5	9/5/2019	77.58462	7872.174	5857	3699	399800	8653	N/A
6	9/5/2019	72.63461	7620.702	5536	3692	398550	8607	N/A
7	9/6/2019	71.76914	7682.066	6296	3518	398250	8552	N/A
8	9/6/2019	67.40095	7886.895	6462	3826	398800	10175	N/A
9	9/6/2019	76.22961	7822.143	6292	3680	398600	8575	N/A
10	9/6/2019	75.80649	7798.608	6226	3805	398550	8580	N/A
11	9/7/2019	75.21862	7773.335	6525	3624	398700	8525	N/A
12	9/7/2019	77.60869	7849.949	5991	3712	399000	8647	N/A
13	9/7/2019	80.63234	7910.871	6271	3542	398500	8552	N/A
14	9/7/2019	76.02445	7858.713	6364	3775	398350	8602	N/A
15	9/8/2019	79.29162	7765.713	6572	3473	398160	8575	N/A
16	9/8/2019	77.70866	7899.057	6364	3328	399100	8545	N/A
17	9/8/2019	78.00303	7915.287	6612	3737	398400	8551	N/A
18	9/8/2019	75.95815	7701.54	6262	3692	398350	8496	N/A
19	9/9/2019	78.74706	7809.685	6238	3576	398600	8544.5	N/A
20	9/9/2019	77.53682	7977.99	6287	3593	398700	8665.8	N/A
21	9/9/2019	76.2885	7791.621	6301	3742	399600	8535.9	N/A
22	9/10/2019	73.182	7903.461	6968	3800	398250	8533.1	N/A
23	9/10/2019	78.38381	7991.399	6926	3479	398600	8606.3	N/A
24	9/10/2019	76.50311	7595.585	6396	3360	398400	8434.4	N/A
25	9/11/2019	78.30884	7850.793	6454	3441	398900	8548.2	N/A
26	9/11/2019	78.9672	7802.046	6524	3661	398850	8497.7	N/A
27	9/11/2019	81.28055	7958.826	6284	3613	398300	8378.8	N/A
28	9/12/2019	81.38122	7830.654	6538	3517	398500	8407.6	N/A
29	9/12/2019	80.81892	7665.124	6371	3534	398800	8435.3	N/A
30	9/13/2019	80.35521	8155.774	6858	3676	398600	8410.5	N/A
31	9/13/2019	83.93744	8043.427	6647	3602	399000	8472.9	N/A
32	9/13/2019	80.24629	7730.279	6417	4017	398250	8579.4	N/A
33	9/14/2019	82.50273	7968.238	6763	3734	398700	8418.9	N/A
34	9/14/2019	80.00611	7427.972	6535	3416	398900	8467.2	N/A
35	9/14/2019	83.61239	8226.643	6588	4156	398500	8482.2	N/A
36	9/15/2019	84.77829	8122.302	6346	3804	398350	8389.7	N/A
37	9/15/2019	81.90279	7746.502	6262	3707	398480	8514	N/A
38	9/15/2019	85.11318	7829.486	6240	4049	398600	8145.7	N/A
39	9/16/2019	65.66335	7957.427	7909	4195	398800	10162.6	N/A
40	9/16/2019	85.00552	7591.79	6684	4088	397900	8355.1	N/A
41	9/17/2019	84.63658	7813.139	6631	3706	398100	8411.6	N/A
42	9/17/2019	84.2015	6773.129	5412	4099	398800	8394.1	N/A
43	9/17/2019	79.67552	6788.786	6776	3864	398600	8412.1	N/A
44	9/17/2019	86.79563	7432.966	6258	4114	398500	8194.3	N/A
45	9/18/2019	86.94664	7549.691	6524	4100	398750	7952.8	N/A
46	9/18/2019	85.78492	7170.608	6546	3908	398900	8372.1	N/A
	<b>AVG</b>	<b>78.6</b>	<b>7,776</b>	<b>6,391</b>	<b>3,801</b>	<b>17,711,340</b>	<b>381,770</b>	<b>TOTAL</b>

**EXHIBIT 3**

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Silty Sandstone	85	145	85	145
Sandstone	145	185	145	185
Silty sandstone tr coal	185	540	185	540
Shaly siltstone tr coal	540	655	540	655
Shaly siltstone	655	705	655	705
Silty Sandstone	705	985	705	985
Silty sandstone	985	1,035	985	1,035
Silty Sandstone	1,035	1,105	1,035	1,105
Siltstone	1,105	1,285	1,105	1,285
Siltstone tr coal	1,285	1,405	1,285	1,405
Sandstone tr coal	1,405	1,635	1,405	1,635
Shaly siltstone tr coal	1,635	1,725	1,635	1,725
Silty sandstone tr coal	1,725	1,971	1,725	1,991
Big Lime	1,986	2,878	1,966	2,884
Fifty Foot Sandstone	2,878	2,951	2,859	2,960
Gordon	2,951	3,106	2,935	3,119
Fifth Sandstone	3,106	3,294	3,094	3,310
Bayard	3,294	3,788	3,285	3,832
Speechley	3,788	4,047	3,807	4,117
Balltown	4,047	4,601	4,092	4,734
Bradford	4,601	5,006	4,709	5,181
Benson	5,006	5,267	5,156	5,468
Alexander	5,267	6,336	5,443	6,699
Sycamore	6,190	6,311	6,507	6,674
Middlesex	6,311	6,421	6,674	6,867
Burkett	6,421	6,455	6,867	6,952
Tully	6,455	6,487	6,952	7,073
Marcellus	6,487	NA	7,073	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.



State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Discharge Monitoring Report  
Oil and Gas General Permit

Company Name: Antero Resources Corporation  
API No: 47-095-02531 County: Tyler  
District: Centerville Well No: Horst Unit 3H  
Farm Name: Roy A. Meredith et al  
Discharge Date/s From: (MMDDYY) 10/21/19 To: (MMDDYY) 11/20/19  
Discharge Times. From: 0:00 To: 24:00  
Total Volume to be Disposed from this facility (gallons): 719,859

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: \_\_\_\_\_ (Include a topographical map of the Area.)  
(2) UIC: 1,522 Permit No. 3416729731  
(3) Offsite Disposal: \_\_\_\_\_ Site Location: \_\_\_\_\_  
(4) Reuse: 718,337 Alternate Permit Number: \_\_\_\_\_  
(5) Centralized Facility: \_\_\_\_\_ Permit No. \_\_\_\_\_  
(6) Other method: \_\_\_\_\_ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: n/a Cl- mg/l n/a DO mg/l

1. Do you have permission to use expedited treatment from the Director or his representative?  
(Y/N) n/a If yes, who? \_\_\_\_\_ and place a four (4) on line 7.  
If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4  
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a If yes, go to line 6  
If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l? (Y/N) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: n/a No Pit on Site

Name of Principal Exec. Officer: Gretchen Kohler

Title of Officer: Senior Environmental and Regulatory Manager

Date Completed: 3/16/20

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

  
Signature of a Principal Exec. Officer or Authorized agent.

Category 1  
Sampling Results  
API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\*\*\* Al is only reported if the pH is above 9.0

Category 2  
Sampling Results  
API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_

Date: \_\_\_\_\_

\*\* Include a description of your aeration technique.

Aeration Code: \_\_\_\_\_

\*\*\* Al is only reported if the pH is above 9.0

Category 3  
Sampling Results  
API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_ Date: \_\_\_\_\_  
 \*\* Include a description of your aeration technique. Aeration Code: \_\_\_\_\_  
 \*\*\* Al is only reported if the pH is above 9.0.

Category 4  
Sampling Results  
API No: \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/B1
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_ Date: \_\_\_\_\_

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/4/2019
Job End Date:	9/18/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02531-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Horst Unit 3H
Latitude:	39.34857500
Longitude:	-80.86996900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,557
Total Base Water Volume (gal):	16,992,913
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
Water	Supplied by Operator	Base Fluid	Water	7732-18-5	100.00000	88.42027	
Sand (Proppant)	CWS	Propping Agent					
				Listed Below			



					Listed Below				
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.									
					Crystalline silica (Quartz)	14808-60-7	100.00000	11.29297	
					Illite	12173-60-3	1.00000	0.11292	
					Hydrochloric acid	7647-01-0	37.00000	0.05586	
					Polymer	26100-47-0	45.00000	0.02093	
					Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01396	
					Ilmenite	98072-94-7	0.10000	0.01129	
					Goethite	1310-14-1	0.10000	0.01129	
					Apatite	64476-38-6	0.10000	0.01129	
					Biotite	1302-27-8	0.10000	0.01129	
					Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.00825	
					Guar gum	9000-30-0	60.00000	0.00825	
					Polyethylene glycol mixture	25322-68-3	54.50000	0.00640	
					Ammonium chloride	12125-02-9	11.00000	0.00512	
					2,2-Dibromo-3-Nitripropionamide	10222-01-2	20.00000	0.00235	
					Sorbitan monooleate	1338-43-8	4.00000	0.00186	
					Polyethylene glycol monooleate	9004-96-0	3.00000	0.00140	
					Sorbitol tetraoleate	61723-83-9	2.00000	0.00093	
					Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00069	
					Citric acid	77-92-9	60.00000	0.00051	
					Sodium bromide	7647-15-6	4.00000	0.00047	
					Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00047	
					Dibromoacetonitrile	3252-43-5	3.00000	0.00035	
					Ammonium Persulfate	7727-54-0	100.00000	0.00025	

				Alkylxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00023	
				Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00021	
				Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00005	
				Acrylamide	79-06-1	0.10000	0.00005	
				Ethylene Glycol	107-21-1	40.00000	0.00003	
				Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	
				Isopropyl alcohol	67-63-0	5.00000	0.00001	
				Cinnamaldehyde	104-55-2	10.00000	0.00001	
				Tar bases, quinolone derivs, benzyl chloride- quatenized	72480-70-7	10.00000	0.00001	
				Formic acid	64-18-6	10.00000	0.00001	
				Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
				Glycol	57-55-6			Proprietary Additive Concentration
				Organic Acid Salts	9003-04-7			Proprietary Additive Concentration

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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°22'30"

LATITUDE 39°20'00"

10,361'

8,917' TO BOTTOM HOLE

3,431' TO BOTTOM HOLE

9,624'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Horst Unit 3H

JANICE L. HURST  
LEASE

ROY A. MEREDITH  
W.S. 17 PG. 226  
T.J.L. 17 PAR. 02  
154.85 AC.±

ROY A. MEREDITH  
ET UX LEASE

WELL NO. 3H

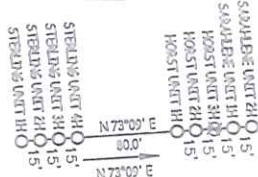
1120

1119

AS DRILLED DATA:  
 WELL 3H TOP HOLE INFORMATION:  
 N: 312,023ft E: 1,612,587ft  
 LAT: 39°20'54.87" LON: 80°52'11.89"  
 BOTTOM HOLE INFORMATION:  
 N: 303,019ft E: 1,613,896ft  
 LAT: 39°19'26.09" LON: 80°51'53.47"  
 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: 4,355,477m E: 511,219m  
 BOTTOM HOLE INFORMATION:  
 N: 4,352,740m E: 511,664m

PAD LAYOUT



NOT TO SCALE

WV NORTH ZONE  
GRID NORTH

DOUGLAS R. ROWE  
 LICENSED  
 No. 2202  
 STATE OF  
 WEST VIRGINIA  
 PROFESSIONAL SURVEYOR

STERLING T. KING ET AL  
D.S. 196 PG. 417  
T.J.L. 17 PAR. 01  
44.62 AC.±

GENE P. BOND  
D.S. 231 PG. 211  
T.J.L. 17 PAR. 32  
14.04 AC.±

MAE BOND  
D.S. 05 PG. 223  
T.J.L. 17 PAR. 07  
20 AC.±

MAE BOND  
D.S. 207 PG. 43  
T.J.L. 17 PAR. 07.2  
30 AC.±

MAE BOND  
D.S. 207 PG. 43  
T.J.L. 17 PAR. 07.1  
17 AC.±

O.W. GRIFFIN  
ET UX LEASE  
DAVID W. CLASURE GR.  
W.S. 26 PG. 484  
T.J.L. 17 PAR. 09.1  
14.24 AC.±

ELEANOR E. FOWLER ET AL  
D.S. 279 PG. 79  
T.J.L. 17 PAR. 03  
146 AC.±

LELLA WASHBURN  
ET AL LEASE

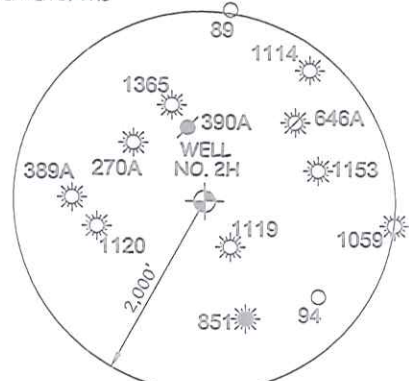
JOB # 17-011WA  
 DRAWING # HORST3HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Proposed Well Path
- As Drilled Well Path

DOUGLAS R. ROWE P.S. 2202  
 DATE 02/18/20

NOTE:  
 NO WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

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

- 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 ONE HUNDRED TWENTY-FIVE (125) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY
  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 LEASEE BOUNDARIES.
  5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION: ELEVATION 1,111' - AS DRILLED \_\_\_\_\_ WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE WEST UNION 7.5' \_\_\_\_\_ DISTRICT CENTERVILLE COUNTY TYLER  
 SURFACE OWNER ROY A. MEREDITH \_\_\_\_\_ ACREAGE 59.39 ACRES +/-  
 OIL & GAS ROYALTY OWNER ROY A. MEREDITH ET UX; JANICE L. HURST; COLLEEN GRIFFIN ASH; LEASE ACREAGE 80 AC.±; 97.63 AC.±; 44.187 AC.±;  
 MAE BOND; O.W. GRIFFIN ET UX; CAMMIE GATRELL ET AL; NATHAN CAIN ET AL; EUGENE R. WALTON ET AL 67 AC.±; 222 AC.±; 139.75 AC.±; 278 AC.±; 137 AC.±  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL   
 (SPECIFY) AS DRILLED \_\_\_\_\_ PLUG & ABANDON \_\_\_\_\_ CLEAN OUT & REPLUG \_\_\_\_\_  
 TARGET FORMATION MARCELLUS \_\_\_\_\_ ESTIMATED DEPTH 6,546' TVD 16,340' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. \_\_\_\_\_ DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1615 WYNKOOP ST. \_\_\_\_\_ ADDRESS 5400 D BIG TYLER ROAD  
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT