

**Reviewed**

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

RECEIVED  
Office of Oil and Gas

APR 30 2018

WV Department of  
Environmental Protection

API 47-017-06779 County Doddridge District Central  
Quad West Union 7.5' Pad Name Long Run Pad Field/Pool Name -----  
Farm name Richard F. McCullough, et al Well Number Mossor 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 4350120m Easting 511744m  
Landing Point of Curve Northing 4350425.38m Easting 512506.45m  
Bottom Hole Northing 4352712m Easting 511785m

Elevation (ft) 1021' 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 10/25/2016 Date drilling commenced 12/16/2016 Date drilling ceased 4/11/2017  
Date completion activities began 6/17/2017 Date completion activities ceased 10/28/2017  
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 53' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 884' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:

06/01/2018

API 47- 017 - 06779 Farm name Richard F. McCullough, et al Well number Mossor 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"	65'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	532'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2615'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15485'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6790'		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	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	982 sx	15.6	1.19	1169	0'	8 Hrs.
Coal							
Intermediate 1	Class A	1014 sx	15.6	1.18	1197	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	745 sx (Lead) 1539 sx (Tail)	13.50 (Lead), 15.20 (Tail)	1.56 (Lead), 1.83 (Tail)	3979	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15485' MD, 6480' TVD (BHL), 6496' (Deepest Point Drilled) Loggers TD (ft) 15485' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6673'

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- 017 - 06779 Farm name Richard F. McCullough, et al Well number Mossor 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- 017 - 06779 Farm name Richard F. McCullough, et al Well number Mossor Unit 3H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6452' (TOP)</u>	<u>TVD</u>	<u>7338' (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 3100 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 10664 mcfpd Oil 51 bpd NGL --- bpd Water 13 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

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

**\*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 Pro Oil & Gas Services LLC  
Address 3035 Lynnwood Drive City Hermitage State PA Zip 16148

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 Mallory Stanton Telephone 303-357-7182  
Signature \_\_\_\_\_ Title Permitting Supervisor Date 4/27/2018

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

API 47-017-06779 Farm Name Richard F. McCullough et al Well Number Mossor Unit 3H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/29/2017	15213	15383	60	Marcellus
2	9/30/2017	15011	15181	60	Marcellus
3	9/30/2017	14810	14980	60	Marcellus
4	10/1/2017	14609	14778	60	Marcellus
5	10/1/2017	14407	14577	60	Marcellus
6	10/2/2017	14206	14376	60	Marcellus
7	10/2/2017	14004	14174	60	Marcellus
8	10/3/2017	13803	13973	60	Marcellus
9	10/4/2017	13602	13771	60	Marcellus
10	10/4/2017	13400	13570	60	Marcellus
11	10/4/2017	13199	13369	60	Marcellus
12	10/5/2017	12997	13167	60	Marcellus
13	10/5/2017	12796	12966	60	Marcellus
14	10/6/2017	12595	12764	60	Marcellus
15	10/6/2017	12393	12563	60	Marcellus
16	10/7/2017	12192	12362	60	Marcellus
17	10/7/2017	11990	12160	60	Marcellus
18	10/8/2017	11789	11959	60	Marcellus
19	10/10/2017	11588	11757	60	Marcellus
20	10/11/2017	11386	11556	60	Marcellus
21	10/12/2017	11185	11355	60	Marcellus
22	10/12/2017	10983	11153	60	Marcellus
23	10/13/2017	10782	10952	60	Marcellus
24	10/13/2017	10581	10751	60	Marcellus
25	10/14/2017	10379	10549	60	Marcellus
26	10/14/2017	10178	10348	60	Marcellus
27	10/15/2017	9977	10146	60	Marcellus
28	10/15/2017	9775	9945	60	Marcellus
29	10/16/2017	9574	9744	60	Marcellus
30	10/16/2017	9372	9542	60	Marcellus
31	10/17/2017	9171	9341	60	Marcellus
32	10/17/2017	8970	9139	60	Marcellus
33	10/17/2017	8768	8938	60	Marcellus
34	10/18/2017	8567	8737	60	Marcellus
35	10/18/2017	8365	8535	60	Marcellus
36	10/18/2017	8164	8334	60	Marcellus
37	10/19/2017	7963	8132	60	Marcellus
38	10/19/2017	7761	7931	60	Marcellus
39	10/19/2017	7560	7730	60	Marcellus
40	10/19/2017	7358	7528	60	Marcellus

06/01/2018

**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	9/29/2017	74.4	7144	8471	4143	412350	8615	N/A
2	9/30/2017	73.7	7079	6422	3701	407650	8745	N/A
3	9/30/2017	75.7	7177	6026	3631	408300	8922	N/A
4	10/1/2017	77.1	7121	5713	3471	412550	8847	N/A
5	10/1/2017	73	7168	5602	3782	407250	8607	N/A
6	10/2/2017	77.1	7223	5753	3580	410000	8608	N/A
7	10/2/2017	76.2	7073	5973	3490	409200	8802	N/A
8	10/3/2017	70.5	7188	6044	3414	409850	8771	N/A
9	10/4/2017	74.7	6910	6114	3640	410700	8517	N/A
10	10/4/2017	72	7690	5876	5182	395850	10123	N/A
11	10/4/2017	73.3	7282	6006	5406	409250	8880	N/A
12	10/5/2017	69.7	7406	6360	5732	410050	8957	N/A
13	10/5/2017	65.8	7376	6242	5410	411209	10976	N/A
14	10/6/2017	75.2	7417	6310	5865	409100	9165	N/A
15	10/6/2017	71.5	6734	5851	4965	413750	8989	N/A
16	10/7/2017	76.4	6689	5796	5347	410000	8486	N/A
17	10/7/2017	75.8	7159	5429	5400	409800	10983	N/A
18	10/8/2017	33.7	8387.1	5876	5222	29000	10546	N/A
19	10/10/2017	72.5	7449	5572	5215	366900	10782	N/A
20	10/11/2017	74.2	7127	5678	5973	257300	6115	N/A
21	10/12/2017	74.9	6777	6028	5209	409550	9689	N/A
22	10/12/2017	78.5	6953	6178	5051	411200	8418	N/A
23	10/13/2017	65.8	7664	5753	5067	305000	11708	N/A
24	10/13/2017	76.4	6808	5598	5388	394700	8360	N/A
25	10/14/2017	74.2	7251	5822	4249	410200	10468	N/A
26	10/14/2017	77.2	7267	6592	5139	410650	9578	N/A
27	10/15/2017	55.9	7650	5569	3911	410000	10983	N/A
28	10/15/2017	75.9	6738	5960	5235	411450	8314	N/A
29	10/16/2017	75.1	6621	6248	5084	410900	8194	N/A
30	10/16/2017	75.4	6640	6320	5280	409050	8388	N/A
31	10/17/2017	78.4	7062	6114	5195	410850	8333	N/A
32	10/17/2017	78.2	6647	5890	4971	409850	8423	N/A
33	10/17/2017	78.7	6839	6125	4729	412400	8272	N/A
34	10/18/2017	76.7	6575	5790	4676	410700	8294	N/A
35	10/18/2017	78	6668	5510	4460	409450	9592	N/A
36	10/18/2017	77.9	6926	6592	4860	410400	8342	N/A
37	10/19/2017	79.3	6441	5859	5271	418500	8334	N/A
38	10/19/2017	79.3	6439	6064	5349	412800	8182	N/A
39	10/19/2017	79.1	6499	5792	5459	405375	8231	N/A
40	10/19/2017	80.4	6297	5955	5027	411390	8267	N/A
	AVG=	72.5	7,152	6,037	4,761	12,413,459	293,292	TOTAL

## EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	53'	N/A	N/A	N/A
Sandy siltstone	0	80	0	80
Silty sandstone	80	120	80	120
Sandy siltstone	120	400	120	400
Silty sandstone (tr coal)	400	600	400	600
Sandy shale	600	640	600	640
Silty limestone	640	720	640	720
Silty shale	720	800	720	800
Siltstone	800	880	800	880
Sandstone	880	960	880	960
Shaly sandstone	960	1,080	960	1,080
Silty sandstone (tr coal)	1,080	1,280	1,080	1,280
Silty shale	1,280	1,520	1,280	1,520
Sandy shale (tr coal)	1,520	1,690	1,520	1,690
Shaly sandstone	1,690	1,740	1,690	1,740
Silty shale	1,740	1,907	1,740	1,944
Big Lime	1,907	2,553	1,944	2,623
Fifty Foot Sandstone	2,553	2,633	2,623	2,707
Gordon	2,633	3,149	2,707	3,268
Fifth Sandstone	3,149	3,198	3,268	3,326
Bayard	3,198	3,696	3,326	3,921
Speechley	3,696	3,969	3,921	4,244
Baltown	3,969	4,482	4,244	4,837
Bradford	4,482	4,887	4,837	5,315
Benson	4,887	5,154	5,315	5,636
Alexander	5,154	5,761	5,636	6,340
Rhinestreet	5,761	6,105	6,340	6,754
Sycamore	6,105	6,269	6,754	6,970
Middlesex	6,269	6,391	6,970	7,178
Burkett	6,391	6,419	7,178	7,242
Tully	6,419	6,452	7,242	7,338
Marcellus	6,452	NA	7,338	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.

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/29/2017
Job End Date:	10/19/2017
State:	West Virginia
County:	Doddridge
API Number:	47-017-06779-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Mossor Unit 3H
Latitude:	39.30037200
Longitude:	-80.86379700
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,482
Total Base Water Volume (gal):	15,770,418
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	70.00000	88.94100	
DWP-111	CWS	Gel Slurry		Listed Below			



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Hydrochloric Acid	CWS	Clean Perforations		Listed Below				
CI-9100G	CWS	Corrosion Inhibitor		Listed Below				
DAP-902	CWS	Scale Inhibitor		Listed Below				
DAP-103	CWS	Iron Control		Listed Below				
SANIFRAC 8844	CWS	Biocide		Listed Below				
Sand (Proppant)	CWS	Propping Agent		Listed Below				
Calbreak 5501	CWS	Breaker		Listed Below				
DWP-641	CWS	Friction Reducer		Listed Below				
Other Chemical (s)	Listed Above	See Trade Name (s) List		Listed Below				

Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.		Listed Below				
	Crystalline silica (Quartz)	14808-60-7	100.00000	10.62376		
	Calcite	471-34-1	1.00000	0.08111		
	Guar gum	9000-30-0	60.00000	0.06387		
	Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.06387		
	Hydrochloric acid	7647-01-0	37.00000	0.05943		
	Polymer	26100-47-0	45.00000	0.03172		
	Illite	12173-60-3	1.00000	0.02508		
	Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.02115		
	Ammonium Persulfate	64742-47-8	100.00000	0.01236		
	Apatite	64476-38-6	0.10000	0.01062		
	Goethite	1310-14-1	0.10000	0.01062		
	Biotite	1302-27-8	0.10000	0.01062		
	Ammonium chloride	12125-02-9	11.00000	0.00775		
	Polyethylene glycol mixture	25322-68-3	54.50000	0.00625		
	2-Propenoic acid, homopolymer, sodium salt	9003-04-7	40.00000	0.00617		
	Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00532		
	Sorbitan monooleate	1338-43-8	4.00000	0.00282		
	Ilmenite	98072-94-7	0.10000	0.00251		
	Vinylidene chloride-methyl acrylate copolymer	69418-26-4	20.00000	0.00247		
	2,2-Dibromo-3-Nitriopropionamide	10222-01-2	20.00000	0.00229		
	Polyethylene glycol monooleate	9004-96-0	3.00000	0.00211		

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			Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00160	
			1,2-Propanediol	57-55-6	10.00000	0.00154	
			Sorbitol tetraoleate	61723-83-9	2.00000	0.00141	
			Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00070	
			Citric acid	77-92-9	60.00000	0.00054	
			Sodium bromide	7647-15-6	4.00000	0.00046	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00035	
			Dibromoacetonitrile	3252-43-5	3.00000	0.00034	
			Acrylamide	79-06-1	0.10000	0.00007	
			Ethylene glycol	107-21-1	40.00000	0.00003	
			Diethylene glycol (mono) methyl ether	34590-94-8	20.00000	0.00002	
			Diethylene glycol	111-46-6	1.00000	0.00001	
			Isopropanol	67-63-0	5.00000	0.00001	
			Tar bases, quinolone derivs	68513-87-1	1.00000	0.00001	
			Ethoxylated alcohols	Proprietary	10.00000	0.00001	Proprietary CAS
			Cinnamaldehyde	104-55-2	10.00000	0.00001	
			Tar bases, quinolone derivs, benzyl chloride- quaternized	72480-70-7	10.00000	0.00001	
			Formic Acid	64-18-6	10.00000	0.00001	

\* 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°20'00"

8,669'

8,518' TO BOTTOM HOLE

LATITUDE 39°20'00"

LONGITUDE 80°50'00"

3,524' TO BOTTOM HOLE

12,033'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Mossor Unit 3H  
A.P.I. 47-017-06779

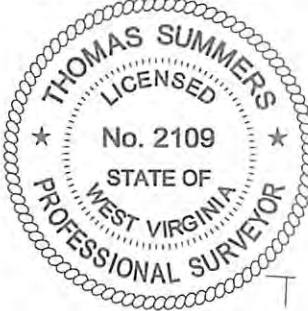
LEGEND

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

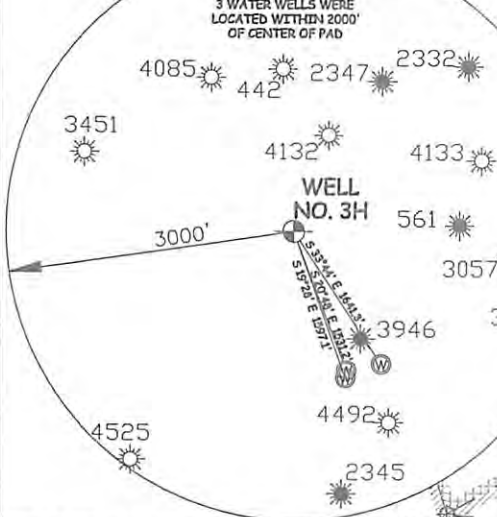
AS DRILLED DATA:  
 WELL 3H TOP HOLE INFORMATION:  
 N: 294,414ft E: 1,614,017ft  
 LAT: 39°18'01.07" LON: 80°51'50.28"  
 BOTTOM HOLE INFORMATION:  
 N: 302,920ft E: 1,614,294ft  
 LAT: 39°19'25.17" LON: 80°51'48.39"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS 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: 4,350,120m E: 511,744m  
 BOTTOM HOLE INFORMATION:  
 N: 4,352,712m E: 511,785m

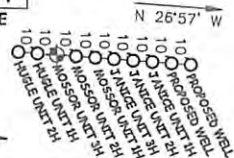
- NOTES
- NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  - TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY 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.



NOTE:  
 3 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD



PAD LAYOUT  
 NOT TO SCALE



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 REGULATIONS 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

THOMAS SUMMERS P.S. 2109

DATE 01/24/18  
 OPERATOR'S WELL# MOSSOR UNIT #3H  
 API WELL # 47 - 017 - 06779  
 STATE COUNTY PERMIT

06/01/2018

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS  
 WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION: ELEVATION 1,021' - AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE  
 SURFACE OWNER RICHARD F. MCCULLOUGH ACREAGE 39 ACRES +/-  
 OIL & GAS ROYALTY OWNER HARRIS HEIRS; VIRGIL DEEM; MICHAEL D. HARRIS; C. BURKE MORRIS ET AL; LAWRENCE L. JAMES; LEASE ACREAGE 217 AC +/-; 107 AC +/-; 217 AC +/-; 94 AC +/-; 215 AC +/-; CINDA L. FLEMING ET VIR; RICHARD F. MCCULLOUGH ET UY; JOHN A. STATLER ET AL; JUDY K. JESSE; RICHARD F. MCCULLOUGH; EUGENE R. WALTON 99.25 AC +/-; 61.5 AC +/-; 51 AC +/-; 8 AC +/-; 105.61 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  
 TARGET FORMATION MARCELLUS PLUG & ABANDON  CLEAN OUT & REPLUG   
 WELL OPERATOR ANTERO RESOURCES CORP. ESTIMATED DEPTH 6,480' TVD 15,485' MD  
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
 DENVER, CO 80202 CHARLESTON, WV 25313

LATITUDE 39°20'00"

8,669'

8,518' TO BOTTOM HOLE

LATITUDE 39°20'00"

LONGITUDE 80°50'00"

12,033'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Mossor Unit 3H  
A.P.I. 47-017-06779

NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER RANGY CATTLE OR HOURLY PASTURED AGE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

MARY LOU WALTON  
D.B. 266 PG. 197  
T.J.L. 20 PAR. 10.1  
77.3 AC. ±

EUGENE R. WALTON  
LEASE

MARY LOU WALTON  
D.B. 266 PG. 197  
T.J.L. 20 PAR. 10  
137 AC. ±

RICHARD F. MCCULLOUGH  
LEASE

RICHARD MCCULLOUGH  
D.B. 353 PG. 488  
T.J.L. 20 PAR. 13  
105.81 AC. ±

JOHN A. STATLER ET AL  
LEASE

JOHN A. STATLER ET AL  
LEASE  
D.B. 299 PG. 030  
T.J.L. 3 PAR. 17  
71 AC. ±

RICHARD MCCULLOUGH  
W.B. 28 PG. 375  
T.J.L. 3 PAR. 07  
14.78 AC. ±

RICHARD MCCULLOUGH  
D.B. 376 PG. 457  
T.J.L. 3 PAR. 72  
18.97 AC. ±

RICHARD MCCULLOUGH  
D.B. 154 PG. 222  
T.J.L. 3 PAR. 10  
63.37 AC. ±

RICHARD F. MCCULLOUGH  
ET UX  
LEASE

JEFFREY JAMES  
D.B. 243 PG. 641  
T.J.L. 3 PAR. 12  
58.25 AC. ±

CINDA L. FLEMING  
ET VIR  
LEASE

THELMA JAMES ET AL  
W.B. 33 PG. 226  
T.J.L. 3 PAR. 13  
33 AC. ±

LAWRENCE L. JAMES  
LEASE

THELMA JAMES  
D.B. 240 PG. 25  
T.J.L. 3 PAR. 15  
212.10 AC. ±

JEFFREY JAMES  
D.B. 227 PG. 67  
T.J.L. 3 PAR. 13.1  
2.90 AC. ±

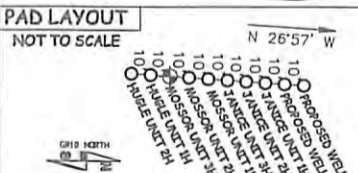
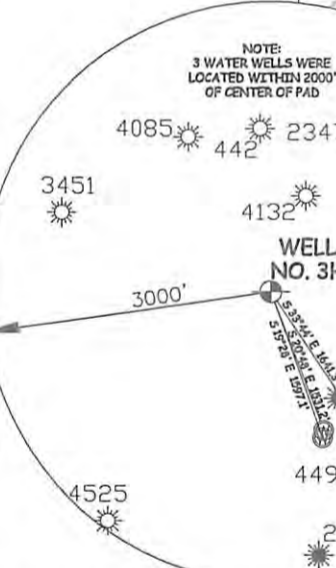
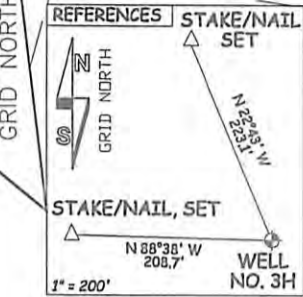
RICHARD MCCULLOUGH  
D.B. 240 PG. 112  
T.J.L. 3 PAR. 13  
14.93 AC. ±

JEFFREY JAMES  
D.B. 233 PG. 304  
T.J.L. 3 PAR. 16  
86.13 AC. ±

C. BURKE MORRIS  
ET AL  
LEASE

THELMA JAMES  
D.B. 243 PG. 659  
T.J.L. 4 PAR. 01  
94 AC. ±

DONNA SPELLMAN  
D.B. 244 PG. 628  
T.J.L. 5 PAR. 01  
32.53 AC. ±



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220 MASONIC AVE. PENNSBORO  
WEST VIRGINIA 26415

THOMAS SUMMERS P.S. 2109  
DATE 01/24/18  
OPERATOR'S WELL# MOSSOR UNIT #3H  
API WELL # 47 - 017 - 06779  
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS  
WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
LOCATION: ELEVATION 1,021' - AS DRILLED \_\_\_ WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE  
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CINDA L. FLEMING ET VIR; RICHARD F. MCCULLOUGH ET UX; JOHN A. STATLER ET AL; JUDY K. JESSE; RICHARD F. MCCULLOUGH; EUGENE R. WALTON 99.25 AC. ±; 61.5 AC. ±; 54 AC. ±; 8 AC. ±; 105.61 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) MOD POE \_\_\_ PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,480' TVD 15,485' MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
DENVER, CO 80202 CHARLESTON, WV 25313

06/01/2018

LATITUDE 39°20'00"

8,669'

LATITUDE 39°20'00"

LONGITUDE 80°50'00"

3,524' TO BOTTOM HOLE

LONGITUDE 80°50'00"

COUNTY NAME

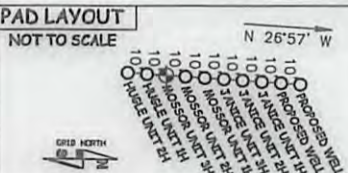
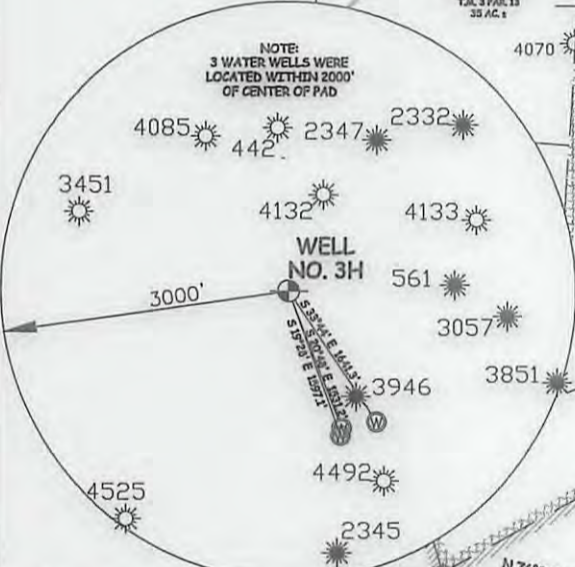
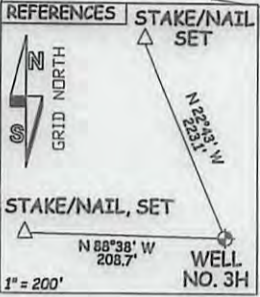
PERMIT

Antero Resources Corporation  
Well No. Mossor Unit 3H  
A.P.I. 47-017-06779

**LEGEND**  
- - - Surface Owner Boundary Lines +/-  
- - - Interior Surface Tracts +/-  
- - - Existing Fence  
⊕ Monument, Found As Specified

**NOTES:**  
WELL 3H TOP HOLE INFORMATION:  
N: 294,414ft E: 1,614,017ft  
LAT: 39°18'01.07" LON: 80°51'50.28"  
BOTTOM HOLE INFORMATION:  
N: 302,920ft E: 1,614,294ft  
LAT: 39°19'25.17" LON: 80°51'48.39"  
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: 4,350,120m E: 511,744m  
BOTTOM HOLE INFORMATION:  
N: 4,352,712m E: 511,785m

**NOTE:**  
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.



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THOMAS SUMMERS P.S. 2109  
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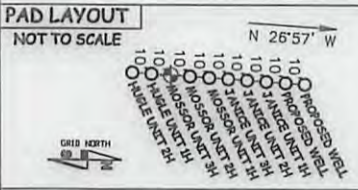
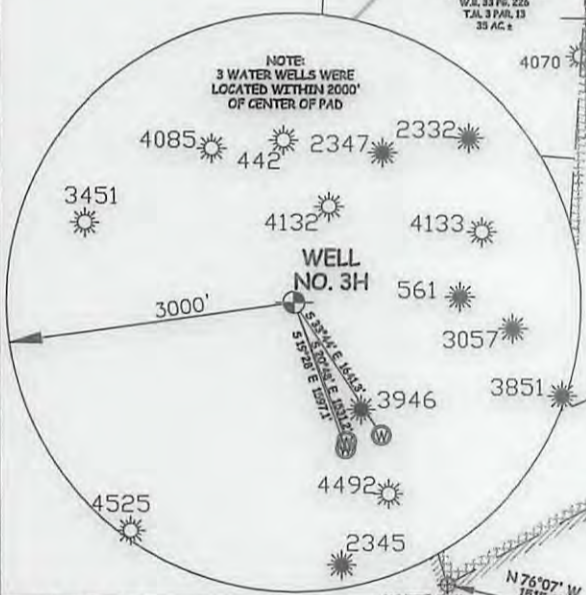
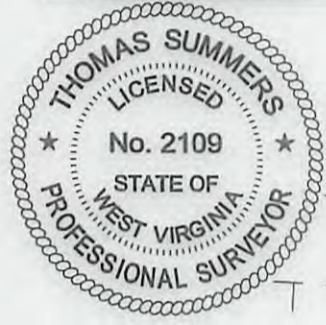
**LEGEND**

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

**AS DRILLED DATA:**  
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  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.



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