

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

API 47-017-06854 County Doddridge District West Union
Quad West Union 7.5' Pad Name Alexander Pad Field/Pool Name ----
Farm name Antero Resources Corporation Well Number Edgar 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 4354076m Easting 519364m
Landing Point of Curve Northing 4354216m Easting 519408m
Bottom Hole Northing 4356815m Easting 518367m

Elevation (ft) 1181' 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 9/15/2017 Date drilling commenced 1/18/2018 Date drilling ceased 6/5/2018
Date completion activities began 11/27/2018 Date completion activities ceased 1/2/2019
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 None Identified Open mine(s) (Y/N) depths No
Salt water depth(s) ft None Identified 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

Reviewed by:

WR-35
Rev. 8/23/13

API 47-017 - 06854 Farm name Antero Resources Corporation Well number Edgar 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"	105'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	561.4'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2536.1'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16597.7'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7030'		4.7#, P-110		
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	241	0'	8 Hrs.
Surface	Class A	530 sx	15.6	1.21	641	0'	8 Hrs.
Coal							
Intermediate 1	Class A	880 sx	15.6	1.21	1065	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	840 sx (Lead) 1438sx (Tail)	14(Lead), 15.2 (Tail)	1.45 (Lead), 1.94(Tail)	4008	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16597' MD, 6855' TVD (BHL), 6886' (Deepest Point Drilled) Loggers TD (ft) 16597' MD

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

Plug back procedure N/A

Kick off depth (ft) 6299'

** This is a subsequent Well. Antero only runs wireline logs on one well on a multi-well pad (Scorpio Unit 2H API#47-017-06861). Please reference the wireline logs submitted with Form WR-35 for Scorpio Unit 2H. 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 N/A

WR-35
Rev. 8/23/13

API 47- 017 - 06854 Farm name Antero Resources Corporation Well number Edgar Unit 1H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6822' (TOP)	TVD	7085' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11431 mcfpd Oil 113 bpd NGL --- bpd Water 469 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 ₂ 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 Patterson - UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

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

Cementing Company Halliburton
Address 121 Champion Way City Canonsburg State PA Zip 15317

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

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 4/30/2019

API 47-017-06854 Farm Name Matthew W. Alexander & Linda Marie Muhly Well Number Edgar Unit 1H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	11/27/2018	16395.9	16494.5	60	Marcellus
2	11/27/2018	16198.746	16365.041	60	Marcellus
3	11/27/2018	16001.592	16167.887	60	Marcellus
4	11/28/2018	15804.438	15970.733	60	Marcellus
5	11/28/2018	15607.284	15773.579	60	Marcellus
6	11/28/2018	15410.13	15576.425	60	Marcellus
7	11/28/2018	15212.976	15379.271	60	Marcellus
8	11/28/2018	15015.822	15182.117	60	Marcellus
9	11/29/2018	14818.668	14984.963	60	Marcellus
10	11/29/2018	14621.514	14787.809	60	Marcellus
11	11/29/2018	14424.36	14590.655	60	Marcellus
12	11/30/2018	14227.206	14393.501	60	Marcellus
13	11/30/2018	14030.052	14196.347	60	Marcellus
14	11/30/2018	13832.898	13999.193	60	Marcellus
15	12/1/2018	13635.744	13802.039	60	Marcellus
16	12/1/2018	13438.59	13604.885	60	Marcellus
17	12/2/2018	13241.436	13407.731	60	Marcellus
18	12/2/2018	13044.282	13210.577	60	Marcellus
19	12/2/2018	12847.128	13013.423	60	Marcellus
20	12/2/2018	12649.974	12816.269	60	Marcellus
21	12/3/2018	12452.82	12619.115	60	Marcellus
22	12/3/2018	12255.666	12421.961	60	Marcellus
23	12/3/2018	12058.512	12224.807	60	Marcellus
24	12/3/2018	11861.358	12027.653	60	Marcellus
25	12/4/2018	11664.204	11830.499	60	Marcellus
26	12/4/2018	11467.05	11633.345	60	Marcellus
27	12/4/2018	11269.896	11436.191	60	Marcellus
28	12/4/2018	11072.742	11239.037	60	Marcellus
29	12/5/2018	10875.588	11041.883	60	Marcellus
30	12/5/2018	10678.434	10844.729	60	Marcellus
31	12/5/2018	10481.28	10647.575	60	Marcellus
32	12/5/2018	10284.126	10450.421	60	Marcellus
33	12/6/2018	10086.972	10253.267	60	Marcellus
34	12/6/2018	9889.818	10056.113	60	Marcellus
35	12/6/2018	9692.664	9858.959	60	Marcellus
36	12/6/2018	9495.51	9661.805	60	Marcellus
37	12/7/2018	9298.356	9464.651	60	Marcellus
38	12/7/2018	9101.202	9267.497	60	Marcellus
39	12/7/2018	8904.048	9070.343	60	Marcellus
40	12/7/2018	8706.894	8873.189	60	Marcellus
41	12/8/2018	8509.74	8676.035	60	Marcellus
42	12/8/2018	8312.586	8478.881	60	Marcellus
43	12/8/2018	8115.432	8281.727	60	Marcellus
44	12/8/2018	7918.278	8084.573	60	Marcellus
45	12/9/2018	7721.124	7887.419	60	Marcellus
46	12/9/2018	7523.97	7690.265	60	Marcellus
47	12/9/2018	7326.816	7493.111	60	Marcellus
48	12/9/2018	7129.662	7295.957	60	Marcellus

API 47-017-06854 Farm Name Matthew W. Alexander & Linda Marie Muhly Well Number Edgar Unit 1H**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	11/27/2018	74.46	7935	7524	4403	280180	6637	N/A
2	11/27/2018	73.29	7630	5708	4039	405220	7648	N/A
3	11/27/2018	72.65	7882	5710	3915	401040	7462	N/A
4	11/28/2018	74.66	8272	6260	5337	402740	7923	N/A
5	11/28/2018	72.25	8327	6321	5052	400720	8163	N/A
6	11/28/2018	70.73	8131	6032	4777	414140	7459	N/A
7	11/28/2018	73.78	7949	5765	5279	409760	7904	N/A
8	11/28/2018	72.03	7787	6041	5224	397920	7447	N/A
9	11/29/2018	73.48	7851	6189	5362	408900	7564	N/A
10	11/29/2018	75.62	7937	6063	5058	410060	7455	N/A
11	11/29/2018	76.06	7898	5872	4647	407500	7599	N/A
12	11/30/2018	75.89	7801	5994	5011	415720	7548	N/A
13	11/30/2018	75.73	7599	5614	5011	406920	7349	N/A
14	11/30/2018	75.23	8235	5981	5002	400840	9333	N/A
15	12/1/2018	51.37	8301	6152	5370	128900	7055	N/A
16	12/1/2018	68.59	8061	5656	4067	404140	8389	N/A
17	12/2/2018	75.63	7925	6069	3979	405420	7169	N/A
18	12/2/2018	75.65	7923	6061	3964	397740	8084	N/A
19	12/2/2018	72.29	7926	5883	3867	405480	7288	N/A
20	12/2/2018	74.21	7909	5840	4069	401520	9222	N/A
21	12/3/2018	77.89	7411	5977	4022	403100	7176	N/A
22	12/3/2018	74.1	7786	6358	3975	406160	7318	N/A
23	12/3/2018	74.9	7724	6185	3941	415740	7404	N/A
24	12/3/2018	66.65	7746	6110	3845	405960	7967	N/A
25	12/4/2018	74.73	7716	6223	4014	407980	7291	N/A
26	12/4/2018	74.75	7796	6250	4012	399880	7116	N/A
27	12/4/2018	73.9	7470	6093	4084	411640	7154	N/A
28	12/4/2018	75.22	7536	6225	4261	404860	7133	N/A
29	12/5/2018	76.77	7484	6339	4129	406780	7245	N/A
30	12/5/2018	75.9	7488	6281	4048	404120	7157	N/A
31	12/5/2018	77.8	7197	6376	4274	415120	7241	N/A
32	12/5/2018	78.39	7249	6178	3973	406700	7234	N/A
33	12/6/2018	71.9	7271	6441	3986	401900	7233	N/A
34	12/6/2018	77.46	7289	5686	3938	412220	7245	N/A
35	12/6/2018	76.38	7107	5194	3935	409980	9276	N/A
36	12/6/2018	76.74	7165	6001	4214	407540	7195	N/A
37	12/7/2018	70.09	7436	5897	3974	412220	9005	N/A
38	12/7/2018	77.29	7288	5912	4704	408800	7144	N/A
39	12/7/2018	65.76	7548	5528	4121	406500	9282	N/A
40	12/7/2018	72.95	7471	6047	4014	407140	8071	N/A
41	12/8/2018	74.75	7531	5937	4161	410460	7196	N/A
42	12/8/2018	79.85	7490	6271	4142	413320	7371	N/A
43	12/8/2018	78.39	7390	5971	4606	403480	8004	N/A
44	12/8/2018	78.97	7423	7980	4140	407640	8652	N/A
45	12/9/2018	79.34	7082	6914	4115	414580	7413	N/A
46	12/9/2018	78.11	6655	4759	4376	406900	7973	N/A
47	12/9/2018	80.07	6476	4796	4332	409460	7284	N/A
48	12/9/2018	80.26	6491	4523	4655	393960	6954	N/A
AVG=		74	7,604	6,025	4,363	19,119,000	367,432	TOTAL

API 47-017-06854 Farm Name Matthew W. Alexander & Linda Marie Muhly Well Number Edgar Unit 1H

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Shaly Sandstone	0	155	0	155
Sandy Shale	est 155	215	est 155	215
Shaly Sandstone	est 215	255	est 215	255
Sandstone	est 255	395	est 255	395
Shaly Sandstone	est 395	505	est 395	505
Sandstone	est 505	575	est 505	575
Carbonaceous shale	est 575	615	est 575	615
Sandstone	est 615	765	est 615	765
Shaly sandstone tr coal	est 765	1,025	est 765	1,025
Shaly Siltstone	est 1025	1,305	est 1025	1,305
Sandstone	est 1305	1,455	est 1305	1,455
Sandy siltstone	est 1455	1,855	est 1455	1,855
Sandstone	est 1855	2,087	est 1855	2,088
Big Lime	2,087	2,661	2,088	2,662
Fifty Foot Sandstone	2,661	2,872	2,662	2,873
Gordon	2,872	3,077	2,873	3,080
Fifth Sandstone	3,077	3,136	3,080	3,139
Bayard	3,136	3,921	3,139	3,933
Speechley	3,921	4,224	3,933	4,239
Balltown	4,224	4,713	4,239	4,733
Bradford	4,713	5,171	4,733	5,197
Benson	5,171	5,435	5,197	5,465
Alexander	5,435	6,437	5,465	6,497
Sycamore	6,437	6,611	6,497	6,711
Middlesex	6,611	6,744	6,711	6,913
Burkett	6,744	6,775	6,913	6,972
Tully	6,775	6,822	6,972	7,085
Marcellus	6,822	NA	7,085	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:	11/26/2018
Job End Date:	12/9/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06854-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Edgar 1H
Latitude:	39.33580600
Longitude:	-80.77545000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,886
Total Base Water Volume (gal):	15,935,908
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					
			Water	7732-18-5	100.00000	87.10640	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.23794	

Brine Water	Operator	Base Fluid						
			Water		7732-18-5	100.00000	0.05432	Density = 9.800
EXCELERATE PS-2	Halliburton	Friction Reducer						
				Listed Below				
SAND-PREMIUM WHITE-30/50, BULK	Halliburton	Proppant						
				Listed Below				
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant						
				Listed Below				
SCALECHEK LP-70	Halliburton	Scale Inhibitor						
				Listed Below				
SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant						
				Listed Below				
WG-36 GELLING AGENT	Halliburton	Gelling Agent						
				Listed Below				
HYDROCHLORIC ACID	Halliburton	Solvent						

FDP-S1296-17	Halliburton	Corrosion Inhibitor			Listed Below				
MC B-8614	Halliburton	Biocide			Listed Below				
SP BREAKER	Halliburton	Breaker			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	12.55235			
			Hydrochloric acid	7647-01-0	15.00000	0.02756			
			Acrylamide acrylate polymer	Proprietary	30.00000	0.01916			Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01916			
			Inorganic salt	Proprietary	30.00000	0.01916			
			Guar gum	9000-30-0	100.00000	0.01561			
			Ethylene glycol	107-21-1	60.00000	0.00848			
			Glutaraldehyde	111-30-8	30.00000	0.00267			
			Telmer	Proprietary	10.00000	0.00141			
			Sodium persulfate	7775-27-1	100.00000	0.00053			
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00045			
			Methanol	67-56-1	100.00000	0.00015			
			Sodium polyacrylate	9003-04-7	1.00000	0.00014			

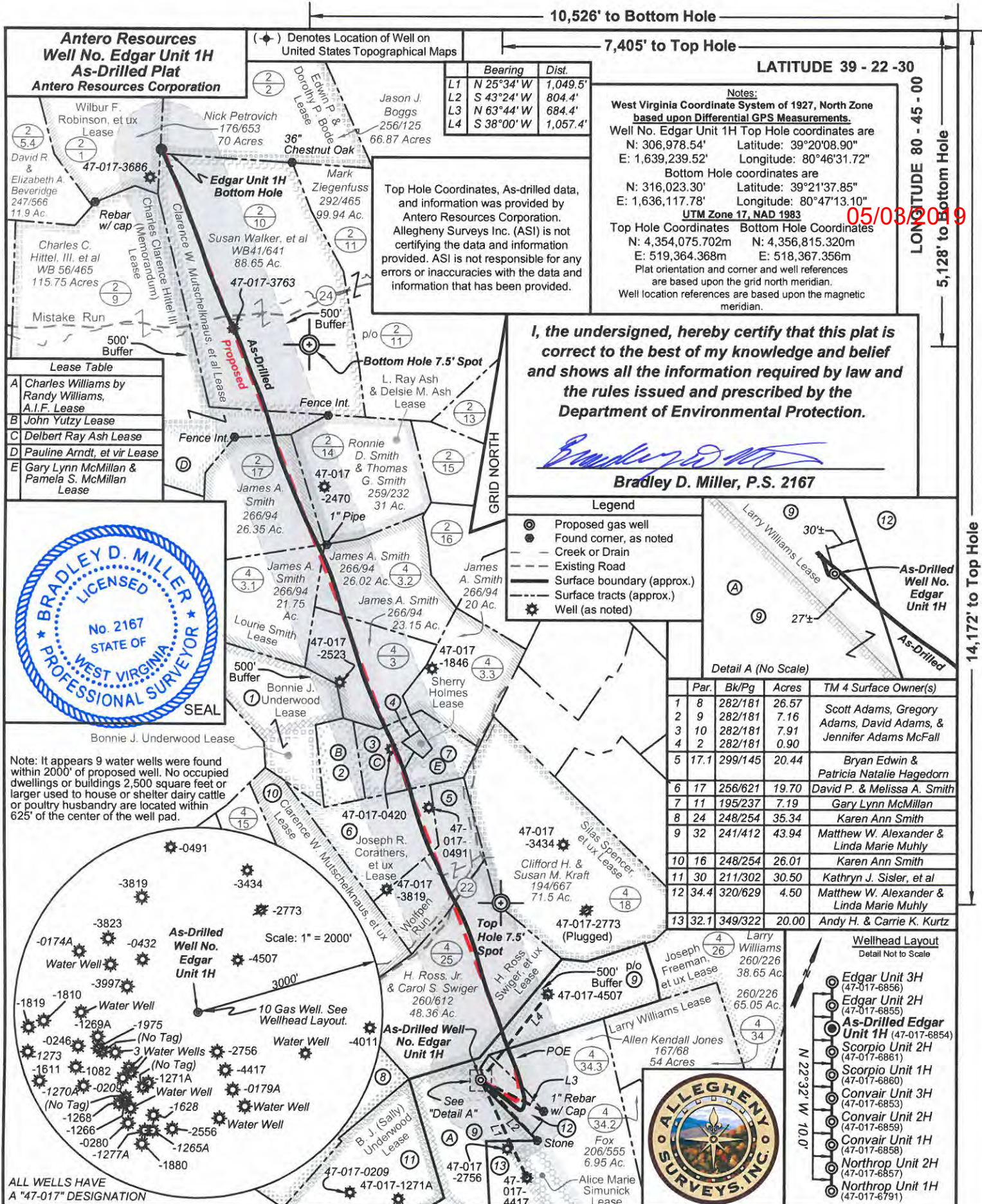
			Ethanol	64-17-5	1.00000	0.00009
			Modified thiourea polymer	Proprietary	30.00000	0.00004
			Phosphoric acid	7664-38-2	0.10000	0.00001
			Propargyl alcohol	107-19-7	5.00000	0.00001
			Ethoxylated alcohols	Proprietary	5.00000	0.00001
			Acrylic acid	79-10-7	0.01000	0.00000
			Sodium sulfate	7757-82-6	0.10000	0.00000

* 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)



FILE NO: 40-30-WU-14
DRAWING NO: Edgar 1H Well Plat
SCALE: 1" = 1200'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: October 8 20 18
Operator's Well No. Edgar Unit 1H
API WELL NO
47 - 017 - 06854
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Drilled Grade - 1181' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge 88.65;
SURFACE OWNER: Matthew W. Alexander & Linda Marie Muhly Clarence W. Mutschelknaus, et al; Edwin P. & Dorothy P. Bode Delbert Ray Ash; Pauline Arndt, et vir; Joseph R. Corathers, et ux Gary Lynn McMillan & Pamela S. McMillan; ACREAGE: 43.94 7.19; 48.36;
ROYALTY OWNER: H. Ross Swiger, et ux; Joseph Freeman, et ux; Larry Williams; Lourie Smith LEASE NO: _____ ACREAGE: 59; 7.91; 428.51;
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,855' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 16,597' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313