

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

API 47-017-06790 County Doddridge District West Union
 Quad West Union 7.5' Pad Name Strickling Pad Field/Pool Name -----
 Farm name John Paul Strickling, et al Well Number Jimmy Unit 2H
 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 4353670.188m Easting 518639.972m
 Landing Point of Curve Northing 4353488.11m Easting 518745.50m
 Bottom Hole Northing 4351111.612m Easting 519737.436m

Elevation (ft) 1065' 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 1/13/2017 Date drilling commenced 9/5/2017 Date drilling ceased 4/18/2018
 Date completion activities began 8/29/2018 Date completion activities ceased 10/1/2018
 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 - 06790 Farm name John Paul Strickling, et al Well number Jimmy Unit 2H

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"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	361'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2605'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15993'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6840'		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	284 sx	15.6	1.18	335	0'	8 Hrs.
Surface	Class A	325 sx	15.6	1.2	390	0'	8 Hrs.
Coal							
Intermediate 1	Class A	905 sx	15.6	1.18	1068	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	743sx (Lead) 1452 sx (Tail)	14(Lead), 15.2 (Tail)	1.45 (Lead), 1.83 (Tail)	3735	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15993' MD, 6757' TVD (BHL), 6787' (Deepest Point Drilled) Loggers TD (ft) 15993' MD

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

Plug back procedure N/A

Kick off depth (ft) 5947'

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

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API 47- 017 - 06790 Farm name John Paul Strickling, et al Well number Jimmy Unit 2H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6667' (TOP) TVD	6895' (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 10118.32 mcfpd Oil 111.32 bpd NGL --- bpd Water 507.58 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 Frontier Drilling LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Nine Energy Service
Address 125 Museum Rd City Washington State PA Zip 15301

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

Stimulating Company US Well Services
Address 533 Industrial Park Road City Lane Jew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature _____ Title Permitting Agent Date 2/25/2019

API 47-017-06790 Farm Name John Paul Strickling, et al Well Number Jimmy Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	8/29/2018	15847.4	15874	16	Marcellus
2	8/30/2018	15644.96	15815.66	48	Marcellus
3	8/30/2018	15442.52	15613.22	48	Marcellus
4	8/31/2018	15240.08	15410.78	48	Marcellus
5	8/31/2018	15037.64	15208.34	48	Marcellus
6	9/1/2018	14835.2	15005.9	48	Marcellus
7	9/1/2018	14632.76	14803.46	48	Marcellus
8	9/1/2018	14430.32	14601.02	48	Marcellus
9	9/2/2018	14227.88	14398.58	48	Marcellus
10	9/2/2018	14025.44	14196.14	48	Marcellus
11	9/3/2018	13823	13993.7	48	Marcellus
12	9/3/2018	13620.56	13791.26	48	Marcellus
13	9/3/2018	13418.12	13588.82	48	Marcellus
14	9/4/2018	13215.68	13386.38	48	Marcellus
15	9/4/2018	13013.24	13183.94	48	Marcellus
16	9/5/2018	12810.8	12981.5	48	Marcellus
17	9/5/2018	12608.36	12779.06	48	Marcellus
18	9/5/2018	12405.92	12576.62	48	Marcellus
19	9/6/2018	12203.48	12374.18	48	Marcellus
20	9/6/2018	12001.04	12171.74	48	Marcellus
21	9/7/2018	11798.6	11969.3	48	Marcellus
22	9/7/2018	11596.16	11766.86	48	Marcellus
23	9/8/2018	11393.72	11564.42	48	Marcellus
24	9/8/2018	11191.28	11361.98	48	Marcellus
25	9/9/2018	10988.84	11159.54	48	Marcellus
26	9/9/2018	10786.4	10957.1	48	Marcellus
27	9/9/2018	10583.96	10754.66	48	Marcellus
28	9/10/2018	10381.52	10552.22	48	Marcellus
29	9/11/2018	10179.08	10349.78	48	Marcellus
30	9/11/2018	9976.64	10147.34	48	Marcellus
31	9/12/2018	9774.2	9944.9	48	Marcellus
32	9/12/2018	9571.76	9742.46	48	Marcellus
33	9/13/2018	9369.32	9540.02	48	Marcellus
34	9/13/2018	9166.88	9337.58	48	Marcellus
35	9/13/2018	8964.44	9135.14	48	Marcellus
36	9/14/2018	8762	8932.7	48	Marcellus
37	9/14/2018	8559.56	8730.26	48	Marcellus
38	9/15/2018	8357.12	8527.82	48	Marcellus
39	9/15/2018	8154.68	8325.38	48	Marcellus
40	9/15/2018	7952.24	8122.94	48	Marcellus
41	9/16/2018	7749.8	7920.5	48	Marcellus
42	9/16/2018	7547.36	7718.06	48	Marcellus
43	9/17/2018	7344.92	7515.62	48	Marcellus
44	9/17/2018	7142.48	7313.18	48	Marcellus
45	9/17/2018	6940.04	7110.74	48	Marcellus

API 47-017-06790 Farm Name John Paul Strickling, et al Well Number Jimmy Unit 2H								
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	8/29/2018	74.4734	8246.195	6257	4376	256050	7344	N/A
2	8/30/2018	78.7551	7937.965	6006	4514	404300	8379	N/A
3	8/30/2018	79.4818	8024.937	6064	3908	405100	8100	N/A
4	8/31/2018	78.7503	7946.68	6042	4119	405670	8049	N/A
5	8/31/2018	76.9235	8066.349	5801	3877	405600	7982	N/A
6	9/1/2018	79.4258	8191.068	5682	4038	403840	7937	N/A
7	9/1/2018	78.7074	7906.355	5788	3694	403900	7993	N/A
8	9/1/2018	78.2867	8175.861	5815	3421	402300	8056	N/A
9	9/2/2018	78.629	7892.604	5764	3923	402960	7916	N/A
10	9/2/2018	78.5407	8064.824	5736	3827	404800	7916	N/A
11	9/3/2018	78.3067	8117.498	5524	3745	405160	7860	N/A
12	9/3/2018	78.27	7976.888	5713	3775	404140	7942	N/A
13	9/3/2018	78.1558	7867.965	5762	4022	406270	7862	N/A
14	9/4/2018	78.3447	8033.354	5869	3621	404220	7897	N/A
15	9/4/2018	78.188	7970.398	5843	3679	404100	7870	N/A
16	9/5/2018	79.164	7863.022	5667	4039	404300	7831	N/A
17	9/5/2018	78.8766	7797.397	5776	4282	404520	7861	N/A
18	9/5/2018	79.2878	7908.103	5733	4007	403460	7879	N/A
19	9/6/2018	75.2787	8055.092	6273	3882	403150	9950	N/A
20	9/6/2018	76.7789	7740.462	5561	3826	403170	7840	N/A
21	9/7/2018	79.4859	7255.673	5814	3951	403950	7967	N/A
22	9/7/2018	76.3853	7389.027	5742	4086	403900	8932	N/A
23	9/8/2018	78.0906	7760.327	5544	3689	402700	7781	N/A
24	9/8/2018	78.9459	7772.924	5485	4048	403360	7742	N/A
25	9/9/2018	78.9048	7781.511	5847	3978	404300	7785	N/A
26	9/9/2018	78.7847	7665.919	5907	3846	404120	8056	N/A
27	9/9/2018	78.5445	7669.977	5816	3836	401000	7739	N/A
28	9/10/2018	79.3054	7338.606	6007	3730	402950	7698	N/A
29	9/11/2018	78.9801	7428.279	5942	4779	404400	7708	N/A
30	9/11/2018	72.4902	6670.636	5634	5026	405600	7812	N/A
31	9/12/2018	79.6709	7237.933	5676	4576	404900	7768	N/A
32	9/12/2018	79.794	7356.8	5882	4164	403600	7745	N/A
33	9/13/2018	79.9177	7332.578	5859	4597	402200	7781	N/A
34	9/13/2018	78.4006	7244.619	6220	5273	404850	7830	N/A
35	9/13/2018	79.9487	7253.649	5819	5298	409200	7660	N/A
36	9/14/2018	79.6998	7199.996	5891	3552	405950	7711	N/A
37	9/14/2018	78.2877	7312.673	5896	4006	403850	7753	N/A
38	9/15/2018	79.1192	7307.98	5842	3680	404900	7677	N/A
39	9/15/2018	78.6491	7549.541	5950	4647	404350	7717	N/A
40	9/15/2018	78.5315	7249.427	5295	3790	402500	7691	N/A
41	9/16/2018	79.1965	7176.911	6073	3637	404400	7645	N/A
42	9/16/2018	79.6258	7381.305	5645	4117	403800	7747	N/A
43	9/17/2018	79.4776	7144.153	6226	3998	402800	7588	N/A
44	9/17/2018	77.9845	7445.95	5923	3950	401860	9161	N/A
45	9/17/2018	79.538	7081.8	6586	4099	408210	7628	N/A
	AVG=	78	7,640	5,849	4,065	18,040,660	356,786	TOTAL

API 47-017-06790 Farm Name John Paul Strickling, et al Well Number Jimmy Unit 2H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Sandstone	0	187	0	187
Sandstone tr coal	est 187	267	est 187	267
Sandy shale	est 267	807	est 267	807
Calcareous Shale	est 807	1,187	est 807	1,187
Shale tr coal	est 1187	1,207	est 1187	1,207
Sandy Shale	est 1207	1,527	est 1207	1,527
Sandstone	est 1527	1,567	est 1527	1,567
Silty shale	est 1567	1,667	est 1567	1,667
Sandstone	est 1667	1,787	est 1667	1,787
Sandy shale	est 1787	1,909	est 1787	1,929
Big Lime	1,909	2,484	1,929	2,513
Fifty Foot Sandstone	2,484	2,694	2,513	2,727
Gordon	2,694	2,900	2,727	2,935
Fifth Sandstone	2,900	2,957	2,935	2,992
Bayard	2,957	3,778	2,992	3,814
Speechley	3,778	4,057	3,814	4,092
Balltown	4,057	4,539	4,092	4,574
Bradford	4,539	4,988	4,574	5,023
Benson	4,988	5,257	5,023	5,193
Alexander	5,257	6,281	5,193	6,331
Sycamore	6,281	6,461	6,331	6,546
Middlesex	6,461	6,592	6,546	6,743
Burkett	6,592	6,619	6,743	6,791
Tully	6,619	6,667	6,791	6,895
Marcellus	6,667	N/A	6,895	N/A

*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:	8/29/2018
Job End Date:	9/17/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06790-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Jimmy 2H
Latitude:	39.33216900
Longitude:	-80.78389400
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,787
Total Base Water Volume (gal):	15,438,358
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	Antero Resources	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.52693	
Sand	U.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	12.26392	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	87.40000	0.12870	
			Hydrogen Chloride	7647-01-0	17.50000	0.02992	
			2-Propenoic acid, polymer with propanamide	29003-06-9	30.00000	0.01616	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01301	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.00631	
			Petroleum Distillates	64742-47-8	60.00000	0.00598	
			Suspending agent (solid)	14808-60-7	3.00000	0.00097	
			Surfactant	68439-51-0	3.00000	0.00038	

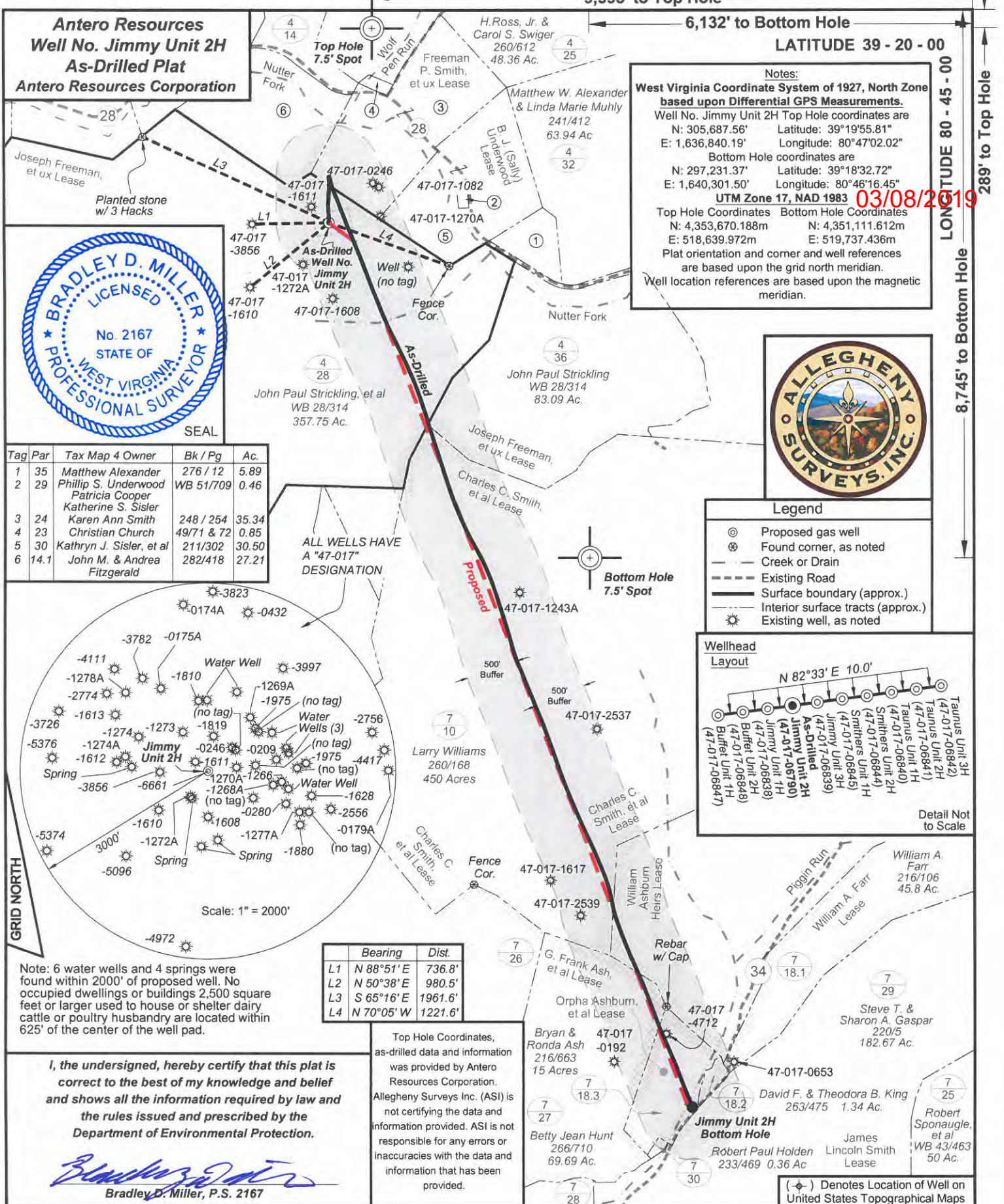
Biodlear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent							
			2,2-dibromo-3-nitropropionamide	10222-01-2		20.00000		0.00393	
			Deionized Water	7732-18-5		28.00000		0.00225	
SI-1200s	U.S. Well Services, LLC	Scale Inhibitor							
			Proprietary Scale Inhibitor	Proprietary		10.00000		0.00128	
AP One	U.S. Well Services, LLC	Gel Breakers							
			Ammonium Persulfate	7727-54-0		100.00000		0.00018	
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors							
			Ethylene glycol	107-21-1		40.00000		0.00004	
			Cinnamaldehyde	104-55-2		20.00000		0.00002	
			Formic acid	64-18-6		20.00000		0.00002	
			Butyl cellosolve	111-76-2		20.00000		0.00001	
			Polyether	60828-78-6		10.00000		0.00001	
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1		5.00000		0.00000	

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

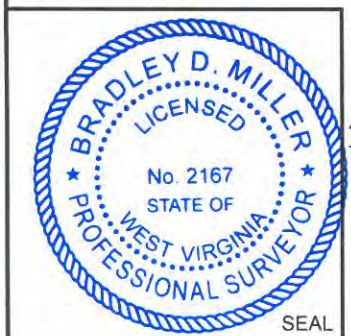
** Information is based on the maximum potential for concentration and thus the total may be over 100%

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



Antero Resources
Well No. Jimmy Unit 2H
As-Drilled Plat
Antero Resources Corporation

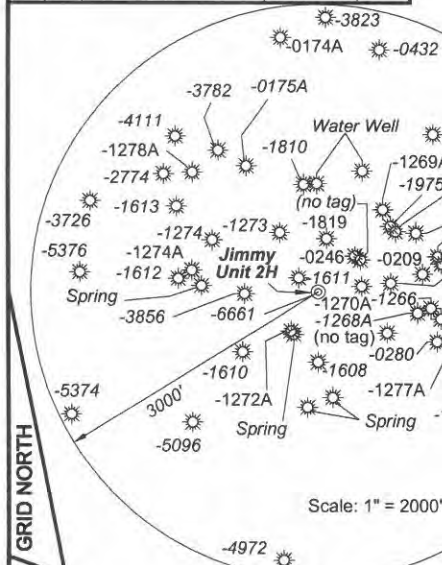
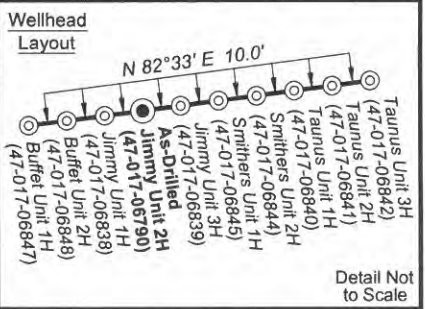
Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
 Well No. Jimmy Unit 2H Top Hole coordinates are
 N: 305,687.56' Latitude: 39°19'55.81"
 E: 1,636,840.19' Longitude: 80°47'02.02"
 Bottom Hole coordinates are
 N: 297,231.37' Latitude: 39°18'32.72"
 E: 1,640,301.50' Longitude: 80°46'16.45"
UTM Zone 17, NAD 1983
 Top Hole Coordinates Bottom Hole Coordinates
 N: 4,353,670.188m N: 4,351,111.612m
 E: 518,639.972m E: 519,737.436m
 Plat orientation and corner and well references are based upon the grid north meridian.
 Well location references are based upon the magnetic meridian.



Tag	Par	Tax Map 4 Owner	Bk / Pg	Ac.
1	35	Matthew Alexander	276 / 12	5.89
2	29	Phillip S. Underwood Patricia Cooper Katherine S. Sisler	WB 51/709	0.46
3	24	Karen Ann Smith	248 / 254	35.34
4	23	Christian Church	49/71 & 72	0.85
5	30	Kathryn J. Sisler, et al	211/302	30.50
6	14.1	John M. & Andrea Fitzgerald	282/418	27.21

Legend

- ⊙ Proposed gas well
- ⊗ Found corner, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)
- ⊙ Existing well, as noted



Note: 6 water wells and 4 springs were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

	Bearing	Dist.
L1	N 88°51' E	736.8'
L2	N 50°38' E	980.5'
L3	S 65°16' E	1961.6'
L4	N 70°05' W	1221.6'

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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
 Bradley D. Miller, P.S. 2167

Top Hole Coordinates, as-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

FILE NO: 50-30-WU-14
 DRAWING NO: Jimmy 2H As-Drilled 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: December 27 20 18
 OPERATOR'S WELL NO. Jimmy Unit 2H
 API WELL NO
 47 - 017 - 06790
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built - 1065' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
 DISTRICT: West Union COUNTY: Doddridge

SURFACE OWNER: John Paul Strickling, et al Freeman P. Smith, et ux; ACREAGE: 357.75 36; 450; 600
 Orpha Ashburn, et al; Joseph Freeman, et ux;
 ROYALTY OWNER: Charles C. Smith, et al; William Ashburn Heirs; G. Frank Ash, et al LEASE NO: ACREAGE: 120; 140; 22

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,757' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 15,993' 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