

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

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API 47-095-02545 County Tyler District McElroy
Quad Shirley 7.5' Pad Name Alta Pad Field/Pool Name -----
Farm name Stephen Grimm Well Number Braden 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 4360577m Easting 521817m
Landing Point of Curve Northing 4360598.69m Easting 521423.32m
Bottom Hole Northing 4363912m Easting 520365m

Elevation (ft) 827' 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 3/1/2019 Date drilling commenced 12/2/2018 Date drilling ceased 4/21/2019
Date completion activities began 6/12/2019 Date completion activities ceased 8/13/2019
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 29, 66, 369 Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1093, 1159, 1260 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

Reviewed by:

JCB
12/20/2020

API 47-095 - 02545 Farm name Stephen Grimm Well number Braden 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"	98'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	565'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2617'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19090'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6976'		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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	294 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	470 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	890 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	835 sx (Lead) 2641 sx (Tail)	14.0 (Lead), 15.2 (Tail)	1.47 (Lead), 1.83 (Tail)		-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 19110' MD, 6579' TVD (BHL), 6665' (Deepest Point Drilled) Loggers TD (ft) 19110' MD

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

Plug back procedure N/A

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Kick off depth (ft) 6508'

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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 - 02545 Farm name Stephen Grimm Well number Braden Unit 1H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE SEE ATTACHED EXHIBIT 1					
					RECEIVED Office of Oil and Gas JAN 14 2020 WV Department of Environmental Protection

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)
*PLEASE SEE ATTACHED EXHIBIT 2								

Please insert additional pages as applicable.

API 47- 095 - 02545 Farm name Stephen Grimm Well number Braden Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6560' (TOP)</u> TVD	<u>7036' (TOP)</u> 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 2748 mcfpd Oil 22 bpd NGL --- bpd Water 2 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 ₂ S, ETC)
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***PLEASE SEE ATTACHED EXHIBIT 3**

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Please insert additional pages as applicable.

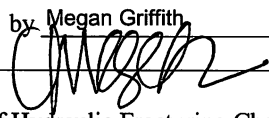
Drilling Contractor Patterson UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

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 1/13/2020

API 47-095-02545 Farm Name Stephen Grimm Well Number Braden Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	6/12/2019	18943		60	Marcellus
2	6/12/2019	18743.74	18911.79	60	Marcellus
3	6/13/2019	18544.48	18712.53	60	Marcellus
4	6/13/2019	18345.22	18513.27	60	Marcellus
5	6/14/2019	18145.96	18314.01	60	Marcellus
6	6/14/2019	17946.7	18114.75	60	Marcellus
7	6/15/2019	17747.44	17915.49	60	Marcellus
8	6/15/2019	17548.18	17716.23	60	Marcellus
9	6/15/2019	17348.92	17516.97	60	Marcellus
10	6/16/2019	17149.66	17317.71	60	Marcellus
11	6/16/2019	16950.4	17118.45	60	Marcellus
12	6/17/2019	16751.14	16919.19	60	Marcellus
13	6/17/2019	16551.88	16719.93	60	Marcellus
14	6/18/2019	16352.62	16520.67	60	Marcellus
15	6/18/2019	16153.36	16321.41	60	Marcellus
16	6/19/2019	15954.1	16122.15	60	Marcellus
17	6/19/2019	15754.84	15922.89	60	Marcellus
18	6/20/2019	15555.58	15723.63	60	Marcellus
19	6/20/2019	15356.32	15524.37	60	Marcellus
20	6/20/2019	15157.06	15325.11	60	Marcellus
21	6/21/2019	14957.8	15125.85	60	Marcellus
22	6/21/2019	14758.54	14926.59	60	Marcellus
23	6/22/2019	14559.28	14727.33	60	Marcellus
24	6/22/2019	14360.02	14528.07	60	Marcellus
25	6/23/2019	14160.76	14328.81	60	Marcellus
26	6/23/2019	13961.5	14129.55	60	Marcellus
27	6/24/2019	13762.24	13930.29	60	Marcellus
28	6/24/2019	13562.98	13731.03	60	Marcellus
29	6/25/2019	13363.72	13531.77	60	Marcellus
30	6/25/2019	13164.46	13332.51	60	Marcellus
31	6/25/2019	12965.2	13133.25	60	Marcellus
32	6/26/2019	12765.94	12933.99	60	Marcellus
33	6/26/2019	12566.68	12734.73	60	Marcellus
34	6/27/2019	12367.42	12535.47	60	Marcellus
35	6/27/2019	12168.16	12336.21	60	Marcellus
36	6/27/2019	11968.9	12136.95	60	Marcellus
37	6/28/2019	11769.64	11937.69	60	Marcellus
38	6/29/2019	11570.38	11738.43	60	Marcellus
39	6/29/2019	11371.12	11539.17	60	Marcellus
40	6/30/2019	11171.86	11339.91	60	Marcellus
41	6/30/2019	10972.6	11140.65	60	Marcellus
42	7/1/2019	10773.34	10941.39	60	Marcellus
43	7/1/2019	10574.08	10742.13	60	Marcellus
44	7/2/2019	10374.82	10542.87	60	Marcellus
45	7/2/2019	10175.56	10343.61	60	Marcellus
46	7/2/2019	9976.3	10144.35	60	Marcellus
47	7/3/2019	9777.04	9945.09	60	Marcellus
48	7/3/2019	9577.78	9745.83	60	Marcellus
49	7/4/2019	9378.52	9546.57	60	Marcellus
50	7/4/2019	9179.26	9347.31	60	Marcellus
51	7/4/2019	8980	9148.05	60	Marcellus
52	7/5/2019	8780.74	8948.79	60	Marcellus
53	7/5/2019	8581.48	8749.53	60	Marcellus
54	7/6/2019	8382.22	8550.27	60	Marcellus
55	7/6/2019	8182.96	8351.01	60	Marcellus
56	7/8/2019	7983.7	8151.75	60	Marcellus
57	7/9/2019	7784.44	7952.49	60	Marcellus
58	7/9/2019	7585.18	7753.23	60	Marcellus
59	7/10/2019	7385.92	7553.97	60	Marcellus
60	7/10/2019	7086	7246	60	Marcellus

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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	6/12/2019	64.7314	7964.021	6158	4711	172650	5998.13	N/A
2	6/12/2019	65.93778	7929.867	5779	5092	400950	10522.1	N/A
3	6/13/2019	70.90798	8117.836	5900	4943	400150	8811.46	N/A
4	6/13/2019	67.30721	7991.961	5848	4662	402800	8834.82	N/A
5	6/14/2019	67.89206	8203.124	5926	4363	401250	8750.62	N/A
6	6/14/2019	73.24378	8661.098	5598	4253	406252	8749.37	N/A
7	6/15/2019	74.00019	8689.773	5889	4207	400500	8722.6	N/A
8	6/15/2019	73.92673	8719.109	6424	4362	400700	8724.83	N/A
9	6/15/2019	71.5845	8575.636	5691	5000	400500	8784.31	N/A
10	6/16/2019	73.47452	8673.141	6238	4862	400500	8668.7	N/A
11	6/16/2019	72.90634	8705.522	6388	4717	400550	8698.78	N/A
12	6/17/2019	70.39802	8806.089	6225	4619	400550	8736.54	N/A
13	6/17/2019	72.69979	8506.927	6134	4690	400940	8719.99	N/A
14	6/18/2019	72.85403	8542.524	6276	4787	400330	8689.33	N/A
15	6/18/2019	74.73353	8532.64	6364	5177	407960	9715.88	N/A
16	6/19/2019	78.73803	8583.902	6414	4644	400950	8581.34	N/A
17	6/19/2019	77.2256	8250.2	6259	4154	400590	8722.72	N/A
18	6/20/2019	76.21072	8485.698	5938	4268	400400	8626.82	N/A
19	6/20/2019	73.98775	8428.525	6439	4254	403300	8688.84	N/A
20	6/20/2019	78.71717	8626.801	5979	4362	400530	8659.07	N/A
21	6/21/2019	76.22921	8229.757	6449	4325	400450	8582.89	N/A
22	6/21/2019	76.12649	8599.293	6173	4394	400530	8523.99	N/A
23	6/22/2019	77.81302	8329.24	6280	4152	400800	8566.02	N/A
24	6/22/2019	79.85374	8458.303	6560	4352	400910	8645.98	N/A
25	6/23/2019	78.83229	8588.11	6250	4486	400800	8719.65	N/A
26	6/23/2019	79.99248	8573.993	5635	4406	401100	8634.58	N/A
27	6/24/2019	78.2408	8430.139	6726	4386	400650	8592.74	N/A
28	6/24/2019	78.77458	8493.174	6519	4467	400700	8645.47	N/A
29	6/25/2019	80.25944	8742.239	6650	4408	400750	8522.89	N/A
30	6/25/2019	77.34025	8271.714	6016	4552	401050	8596.54	N/A
31	6/25/2019	79.19755	8461.969	6562	4516	400310	8538.46	N/A
32	6/26/2019	77.42015	8286.125	6468	4284	400800	8596.57	N/A
33	6/26/2019	80.33248	8591.909	6379	4286	400450	8576.26	N/A
34	6/27/2019	81.11204	8660.623	6812	4409	400600	8556.47	N/A
35	6/27/2019	75.87257	7954.815	5985	4562	400500	8479.87	N/A
36	6/27/2019	59.38256	8649.925	6250	4935	400500	10777.8	N/A
37	6/28/2019	80.22034	7937.682	6459	5508	400600	9753.27	N/A
38	6/29/2019	78.52646	8038.525	6611	5285	400500	8593.35	N/A
39	6/29/2019	78.382	7654.438	6687	5526	400200	10956.39	N/A
40	6/30/2019	76.27654	7758.637	6569	5250	400350	8367.26	N/A
41	6/30/2019	80.01498	7954.354	6674	4451	400300	8515.02	N/A
42	7/1/2019	67.32899	8118.88	6311	4215	400550	12675.59	N/A
43	7/1/2019	77.30469	7725.287	7000	4800	401530	8779.62	N/A
44	7/2/2019	77.36077	7700.993	5663	4465	401000	8434.82	N/A
45	7/2/2019	77.45437	7400.939	6088	4515	400800	8395.87	N/A
46	7/2/2019	85.86269	7990.963	6343	4822	400250	8534.23	N/A
47	7/3/2019	82.47488	7741.889	5977	5076	401000	9887.32	N/A
48	7/3/2019	81.82702	7815.92	6656	4659	400350	8475.7	N/A
49	7/4/2019	83.53386	7780.381	6379	4381	400250	8501.91	N/A
50	7/4/2019	81.04705	7396	6119	5028	400400	8354.16	N/A
51	7/4/2019	83.1507	7469.219	6249	4577	398839	8398.44	
52	7/5/2019	83.33102	7667.105	6257	4564	400850	8416.32	N/A
53	7/5/2019	82.39196	7572.23	6000	4756	401100	8190.099	N/A
54	7/6/2019	83.14533	7722.714	5916	4657	400850	8357.61	N/A
55	7/6/2019	79.10888	7659.687	6718	4983	400650	9641.35	N/A
56	7/8/2019	81.19133	7561.015	7118	4701	401250	8237.61	N/A
57	7/9/2019	81.85417	7532.316	6631	4273	400600	8327.05	N/A
58	7/9/2019	81.24958	7749.799	7395	4525	401050	8375.45	N/A
59	7/10/2019	81.87087	7572.381	6831	4368	400400	8343.15	N/A
60	7/10/2019	79.48699	7283.021	6726	4309	401100	8466.17	N/A
	AVG	75.1	8,325	6,259	4,601	17,819,082	398,434	TOTAL

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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	155	215	155	215
Shaly Sandstone	215	255	215	255
Sandstone	255	395	255	395
Shaly Sandstone	395	505	395	505
Sandstone	505	575	505	575
Carbonaceous shale	575	615	575	615
Sandstone	615	765	615	765
Shaly sandstone tr coal	765	1,025	765	1,025
Shaly Siltstone	1,025	1,305	1,025	1,305
Sandstone	1,305	1,455	1,305	1,455
Sandy siltstone	1,455	1,685	1,455	1,685
Sandstone	1,685	1,750	1,685	1,752
Big Lime	1,775	2,658	1,752	2,660
Fifty Foot Sandstone	2,658	2,724	2,635	2,726
Gordon	2,724	3,051	2,701	3,056
Fifth Sandstone	3,051	3,118	3,031	3,125
Bayard	3,118	3,602	3,100	3,620
Speechley	3,602	3,913	3,595	3,953
Balltown	3,913	4,463	3,928	4,556
Bradford	4,463	4,903	4,531	5,034
Benson	4,903	5,166	5,009	5,324
Alexander	5,166	6,381	5,299	6,671
Sycamore	6,189	6,351	6,450	6,641
Middlesex	6,351	6,479	6,646	6,836
Burkett	6,479	6,506	6,841	6,893
Tully	6,506	6,560	6,898	7,036
Marcellus	6,560	NA	7,036	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.

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LATITUDE 39°25'00"

10,875'

LATITUDE 39°27'30" 3,833' TO BOTTOM HOLE

LONGITUDE 80°45'00"

8,136'

12,354' TO BOTTOM HOLE

LONGITUDE 80°42'30"

Antero Resources Corporation Well No. Braden Unit 1H

Table with 4 columns: TM-Par, Surface Owner, Book/Pg, Acreage. Lists various land parcels and owners.

AS DRILLED DATA: WELL 1H TOP HOLE INFORMATION: N: 328,178ft E: 1,647,643ft... BOTTOM HOLE INFORMATION: N: 339,202ft E: 1,643,062ft...

(NAD) 83 (UTM) ZONE 17 COORDS: WELL 1H TOP HOLE INFORMATION: N: 4,360,577m E: 521,817m... BOTTOM HOLE INFORMATION: N: 4,363,912m E: 520,365m

WV NORTH ZONE GRID NORTH

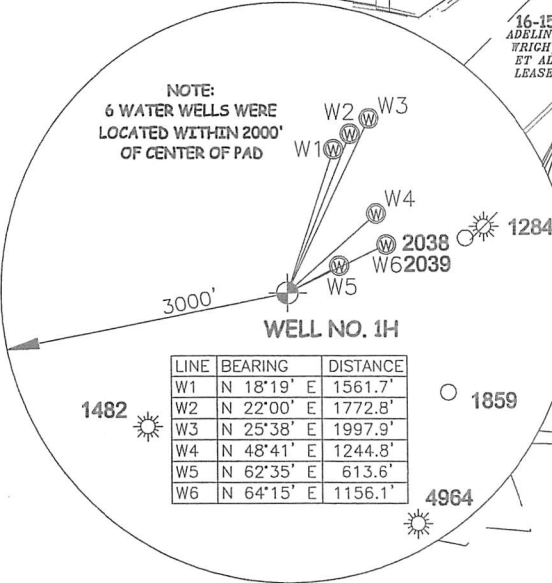
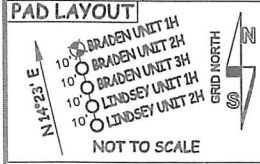
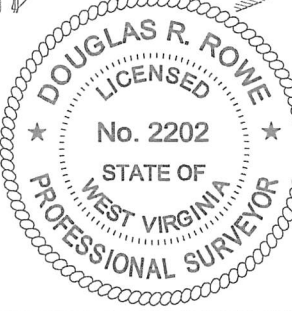


Table with 3 columns: LINE, BEARING, DISTANCE. Lists well location data for W1-W6.

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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

Table with 4 columns: TM-Par, Surface Owner, Book/Pg, Acreage. Lists land parcels and owners.

JOB # 18-002WA, DRAWING # BRADEN1HAD, SCALE 1" = 2000', 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. Signature of Douglas R. Rowe, P.S. 2202, DATE 11/19/19, OPERATOR'S WELL # BRADEN UNIT #1H

- 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 SIX HUNDRED TWENTY-FIVE (625) 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 LEASE 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 X LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 095 - 02545 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 827' - AS BUILT WATERSHED McELROY CREEK QUADRANGLE TH - CENTERPOINT 7.5' BH - SHIRLEY 7.5' DISTRICT McELROY COUNTY TYLER SURFACE OWNER STEPHEN GRIMM ACREAGE 44.38 ACRES +/- OIL & GAS ROYALTY OWNER M. V. B. GEORGE; C.B. MORRIS & S.A. SMITH IRREVOCABLE TRUST; LEASE ACREAGE 300 AC±; 50 AC±; MARY JO FOSTER LIVING TRUST; RANDI MICHAEL; DONNA FOGUS; BAYARD SWEENEY JR. ET UX; 94 AC±; 320.94 AC±; 60.91 AC±; 111.11 AC±; LIFE & ABEY, LLC; LIFE & ABEY, LLC; 33 AC±; 35 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 6,579' TVD 19,110' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD DENVER, CO 80202 CHARLESTON, WV 25313

LATITUDE 39°25'00"

10,875'

LATITUDE 39°27'30" 3,833' TO BOTTOM HOLE

LONGITUDE 80°45'00"

8,136'

12,354' TO BOTTOM HOLE

LONGITUDE 80°42'30"

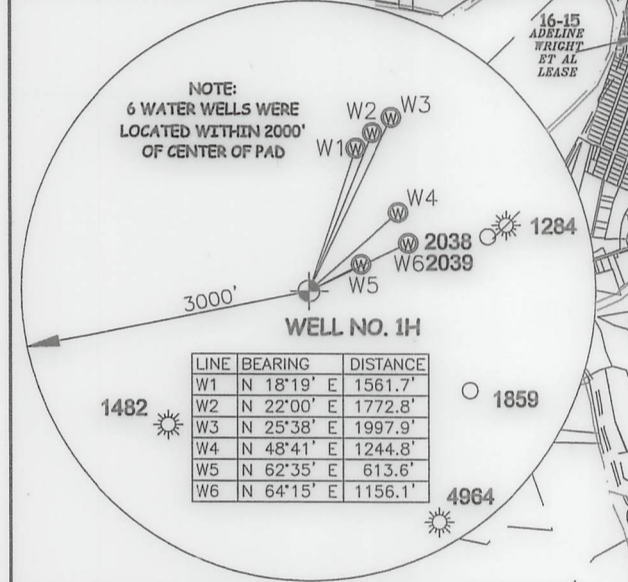
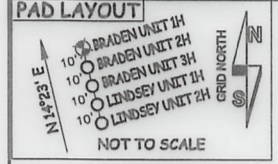
Antero Resources Corporation Well No. Braden Unit 1H

Table with 4 columns: TM-Par, Surface Owner, Book/Pg, Acreage. Lists various land parcels and owners.

AS DRILLED DATA: WELL 1H TOP HOLE INFORMATION: N: 328,178ft E: 1,647,643ft ... BOTTOM HOLE INFORMATION: N: 339,202ft E: 1,643,062ft ...

(NAD) 83 (UTM) ZONE 17 COORDS: WELL 1H TOP HOLE INFORMATION: N: 4,360,577m E: 521,817m ...

WV NORTH ZONE GRID NORTH



NOTE: 6 WATER WELLS WERE LOCATED WITHIN 2000' OF CENTER OF PAD

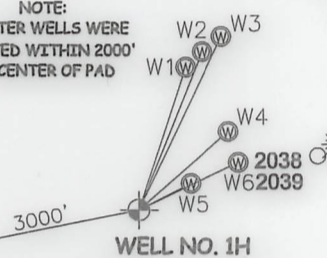
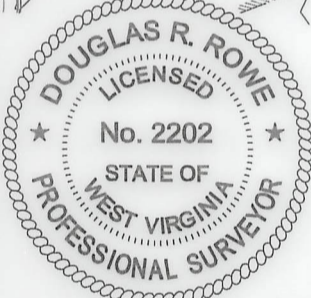


Table with 3 columns: LINE, BEARING, DISTANCE. Lists measurements for lines W1 through W6.



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

Table with 4 columns: TM-Par, Surface Owner, Book/Pg, Acreage. Lists parcels owned by Antero Resources Corporation.

JOB # 18-002WA, DRAWING # BRADEN1HAD, SCALE 1" = 2000', 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. Includes signature of Douglas R. Rowe and date 11/19/19.

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 SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD. 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ...

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/12/2019
Job End Date:	7/10/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02545-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Braden 1H
Latitude:	39.39432780
Longitude:	-80.74681100
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,581
Total Base Water Volume (gal):	22,939,135
Total Base Non Water Volume:	0



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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	88.65389	
Hydrochloric Acid	CWS	Clean Perforations					
				Listed Below			

DAP-902	CWS	Scale Inhibitor					
				Listed Below			
SaniFrac 8844	CWS	Biocide					
				Listed Below			
CalGel 4000	CWS	Gel Slurry					
				Listed Below			
Sand (Proppant)	CWS	Propping Agent					
				Listed Below			
Calbreak 5501	CWS	Breaker					
				Listed Below			
DAP-103	CWS	Iron Control					
				Listed Below			
CI-9100G	CWS	Corrosion Inhibitor					
				Listed Below			
DWP-641	CWS	Friction Reducer					
				Listed Below			
Other Chemical (s)	Listed Above	See Trade Name (s) List					

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				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	11.03400	
			Illite	12173-60-3	1.00000	0.11033	
			Hydrochloric acid	7647-01-0	37.00000	0.06961	
			Polymer	26100-47-0	45.00000	0.02174	
			Guar gum	9000-30-0	60.00000	0.01462	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.01462	
			Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01449	
			Ilmenite	98072-94-7	0.10000	0.01103	
			Biotite	1302-27-8	0.10000	0.01103	
			Goethite	1310-14-1	0.10000	0.01103	
			Apatite	64476-38-6	0.10000	0.01103	
			Polyethylene glycol mixture	25322-68-3	54.50000	0.00630	
			Ammonium chloride	12125-02-9	11.00000	0.00531	
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	20.00000	0.00231	
			Sorbitan monooleate	1338-43-8	4.00000	0.00193	
			Polyethylene glycol monooleate	9004-96-0	3.00000	0.00145	
			Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00122	
			Sorbitol tetraoleate	61723-83-9	2.00000	0.00097	
			Citric acid	77-92-9	60.00000	0.00062	
			Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00048	
			Sodium bromide	7647-15-6	4.00000	0.00046	
			Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00037	

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			Ammonium Persulfate	7727-54-0	100.00000	0.00035	
			Dibromoacetonitrile	3252-43-5	3.00000	0.00035	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00024	
			Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00007	
			Acrylamide	79-06-1	0.10000	0.00005	
			Ethylene Glycol	107-21-1	40.00000	0.00004	
			Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	
			Formic acid	64-18-6	10.00000	0.00001	
			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	
			Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
			Organic Acid Salts	9003-04-7			Proprietary Additive Concentration
			Glycol	57-55-6			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)

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