

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

API 47 - 017 - 06894 County Doddridge District West Union
Quad Smithburg 7.5' Pad Name George Scott Pad Field/Pool Name -----
Farm name George S. Wyckoff Well Number Laser 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 4350954m Easting 522987m
Landing Point of Curve Northing 4351129.96m Easting 522553.09m
Bottom Hole Northing 4353872m Easting 521711m

Elevation (ft) 1283' 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

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Date permit issued 6/25/2019 Date drilling commenced 9/26/2019 Date drilling ceased 12/29/2019
Date completion activities began 2/27/2020 Date completion activities ceased 4/7/2020
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 128', 433' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 596', 1750' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 450' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:
SDW

API 47- 017 - 06894 Farm name George S. Wyckoff Well number Laser 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"	105'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	561'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2601'	New	36#, H-40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17601'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7284'		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	204 sx	15.6	1.18	244	0'	8 Hrs.
Surface	Class A	490 sx	15.6	1.19	402	0'	8 Hrs.
Coal							
Intermediate 1	Class A	877 sx	15.6	1.18	1047	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	798 sx (Lead) 2632 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)	2819	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17620' MD, 7090' TVD (BHL), 7091' (Deepest Point Drilled) Loggers TD (ft) 17620' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6015'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

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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 - 06894 Farm name George S. Wyckoff Well number Laser Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
<u>Marcellus</u>	<u>6945' (TOP)</u>	<u>TVD</u>	<u>7318' (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 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 8894 mcfpd Oil 94 bpd NGL --- bpd Water 130 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 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Nine Energy Services
Address 125 Museum Road City Washington State PA Zip 15301

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 1/21/20

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

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API 47-017-06894 Farm Name George S. Wyckoff Well Number Laser Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	3/6/2020	17492.6	17448.9	60	Marcellus
2	3/6/2020	17411.094	17245.064	60	Marcellus
3	3/6/2020	17209.458	17043.428	60	Marcellus
4	3/7/2020	17007.822	16841.792	60	Marcellus
5	3/7/2020	16806.186	16640.156	60	Marcellus
6	3/7/2020	16604.55	16438.52	60	Marcellus
7	3/7/2020	16402.914	16236.884	60	Marcellus
8	3/8/2020	16201.278	16035.248	60	Marcellus
9	3/8/2020	15999.642	15833.612	60	Marcellus
10	3/8/2020	15798.006	15631.976	60	Marcellus
11	3/9/2020	15596.37	15430.34	60	Marcellus
12	3/9/2020	15394.734	15228.704	60	Marcellus
13	3/9/2020	15193.098	15027.068	60	Marcellus
14	3/9/2020	14991.462	14825.432	60	Marcellus
15	3/9/2020	14789.826	14623.796	60	Marcellus
16	3/10/2020	14588.19	14422.16	60	Marcellus
17	3/10/2020	14386.554	14220.524	60	Marcellus
18	3/10/2020	14184.918	14018.888	60	Marcellus
19	3/10/2020	13983.282	13817.252	60	Marcellus
20	3/10/2020	13781.646	13615.616	60	Marcellus
21	3/11/2020	13580.01	13413.98	60	Marcellus
22	3/11/2020	13378.374	13212.344	60	Marcellus
23	3/11/2020	13176.738	13010.708	60	Marcellus
24	3/11/2020	12975.102	12809.072	60	Marcellus
25	3/11/2020	12773.466	12607.436	60	Marcellus
26	3/12/2020	12571.83	12405.8	60	Marcellus
27	3/12/2020	12370.194	12204.164	60	Marcellus
28	3/12/2020	12168.558	12002.528	60	Marcellus
29	3/13/2020	11966.922	11800.892	60	Marcellus
30	3/13/2020	11765.286	11599.256	60	Marcellus
31	3/13/2020	11563.65	11397.62	60	Marcellus
32	3/13/2020	11362.014	11195.984	60	Marcellus
33	3/14/2020	11160.378	10994.348	60	Marcellus
34	3/14/2020	10958.742	10792.712	60	Marcellus
35	3/15/2020	10958.742	10792.712	60	Marcellus
36	3/16/2020	10757.106	10591.076	60	Marcellus
37	3/17/2020	10555.47	10389.44	60	Marcellus
38	3/17/2020	10353.834	10187.804	60	Marcellus
39	3/17/2020	10152.198	9986.168	60	Marcellus
40	3/17/2020	9950.562	9784.532	60	Marcellus
41	3/18/2020	9748.926	9582.896	60	Marcellus
42	3/18/2020	9547.29	9381.26	60	Marcellus
43	3/18/2020	9345.654	9179.624	60	Marcellus
44	3/18/2020	9144.018	8977.988	60	Marcellus
45	3/19/2020	8942.382	8776.352	60	Marcellus
46	3/19/2020	8740.746	8574.716	60	Marcellus
47	3/19/2020	8539.11	8373.08	60	Marcellus
48	3/19/2020	8337.474	8171.444	60	Marcellus
49	3/19/2020	8135.838	7969.808	60	Marcellus
50	3/20/2020	7934.202	7768.172	60	Marcellus
51	3/20/2020	7732.566	7566.536	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 (bbbls)	Amount of Nitrogen/ other (units)
1	3/6/2020	77.78	8177	6136	4399	162760	4625.405	N/A
2	3/6/2020	84.94	8482	5466	3936	401600	7320.571	N/A
3	3/6/2020	85.77	8442	5932	4470	405180	7287	N/A
4	3/7/2020	84.87	8302	5776	4087	404800	7246.738	N/A
5	3/7/2020	85.85	8512	5544	3749	408080	7265.333	N/A
6	3/7/2020	85.21	8591	5419	3627	407640	7341.5	N/A
7	3/7/2020	84.82	8504	5614	3661	398640	7141.238	N/A
8	3/8/2020	85.79	8486	5540	3927	404020	7306.333	N/A
9	3/8/2020	85.75	8450	5431	4222	398160	7253.381	N/A
10	3/8/2020	85.85	8299	5378	4034	399000	7129.595	N/A
11	3/9/2020	84.99	8454	5524	3816	399360	7131.476	N/A
12	3/9/2020	85.86	8440	5380	3912	400860	7144.929	N/A
13	3/9/2020	85.18	8523	5237	4190	408540	7206.524	N/A
14	3/9/2020	85	8502	5105	3872	400240	7155.5	N/A
15	3/9/2020	84.97	8410	5885	3824	403200	7125.905	N/A
16	3/10/2020	85.41	8367	6017	3747	401660	7091.333	N/A
17	3/10/2020	85.4	8338	6222	3948	403860	7170.167	N/A
18	3/10/2020	85.03	8559	5173	3732	402100	7223.905	N/A
19	3/10/2020	85.73	8216	5296	3519	411140	7135.381	N/A
20	3/10/2020	70.36	8184	7269	3987	405940	7078.905	N/A
21	3/11/2020	85.46	7928	5113	4059	406940	7070.857	N/A
22	3/11/2020	85.76	7973	5851	4167	401120	7160	N/A
23	3/11/2020	85.78	8084	5208	4575	403900	7102.833	N/A
24	3/11/2020	85.72	8172	5997	4162	412800	7095.238	N/A
25	3/11/2020	84.99	8426	5593	3849	404740	7034.452	N/A
26	3/12/2020	85.11	8244	5619	3577	401640	7020.095	N/A
27	3/12/2020	81.98	8287	6050	4273	410660	7169.071	N/A
28	3/12/2020	85.36	8078	5247	3619	404780	7048.452	N/A
29	3/13/2020	84	8156	5120	3169	405580	7025.333	N/A
30	3/13/2020	84.11	8255	5177	3984	405580	8653.619	N/A
31	3/13/2020	85.68	8207	4801	3903	403420	7117.571	N/A
32	3/13/2020	84.94	8007	5438	4330	401160	6999.667	N/A
33	3/14/2020	84.7	7846	5207	3755	404940	6996.571	N/A
34	3/14/2020	10.35	5708	5248	5890	0	2333.69	N/A
35	3/15/2020	3.8	5749	0	0	0	382.3571	N/A
36	3/16/2020	82.46	7547	6480	3390	406000	8947.786	N/A
37	3/17/2020	84.7	7567	5283	3609	407580	7003.214	N/A
38	3/17/2020	84.9	7863	5652	3799	404800	7021.238	N/A
39	3/17/2020	80.12	7466	5339	4031	405500	6931.548	N/A
40	3/17/2020	84.67	7769	5387	5079	404640	7131.738	N/A
41	3/18/2020	84.71	7686	5279	3680	403120	7147.429	N/A
42	3/18/2020	82.73	7783	5148	4617	406220	8776.595	N/A
43	3/18/2020	84.93	7256	5631	5080	404900	7033.381	N/A
44	3/18/2020	85.38	7159	4985	4558	405760	7023.405	N/A
45	3/19/2020	85.45	7072	6310	4770	407400	6987.714	N/A
46	3/19/2020	85.26	6840	5189	4022	403440	6990.262	N/A
47	3/19/2020	84.96	6692	4954	4366	404440	6891.5	N/A
48	3/19/2020	85.61	6948	6071	4736	407280	7060.024	N/A
49	3/19/2020	85.34	6797	5400	4240	406940	7053.548	N/A
50	3/20/2020	85.69	6839	5586	5112	404520	6912	N/A
51	3/20/2020	85.67	6541	4988	4976	406840	7013.833	N/A
52	3/20/2020	85.8	6352	5043	4734	402800	7014.595	N/A
	AVG=	80.6	8,079	5,425	3,892	15,525,680	281,774	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Sandstone	100	300	100	300
Siltstone	300	580	300	580
Limestone	580	600	580	600
Shaly Siltstone	600	720	600	720
Shaly Limestone	720	800	720	800
Siltstone w/ trace coal	800	870	800	870
Shale	870	980	870	980
Silty Sandstone	980	1,040	980	1,040
Limestone w/ trace coal	1,040	1,080	1,040	1,080
Shaly Sandstone	1,080	1,350	1,080	1,350
Sandstone w/ interbedded co	1,350	1,820	1,350	1,820
Shale	1,820	2,020	1,820	2,020
Limestone	2,020	2,120	2,020	2,120
Sandy Shale	2,120	2,127	2,120	2,131
Big Lime	2,127	2,768	2,106	2,773
Fifty Foot Sandstone	2,768	2,846	2,748	2,851
Gordon	2,846	3,138	2,826	3,147
Fifth Sandstone	3,138	3,344	3,122	3,358
Bayard	3,344	3,991	3,333	4,028
Speechley	3,991	4,274	4,003	4,325
Balltown	4,274	4,701	4,300	4,771
Bradford	4,701	5,181	4,746	5,268
Benson	5,181	5,467	5,243	5,567
Alexander	5,467	6,732	5,542	6,923
Sycamore	6,493	6,707	6,646	6,898
Middlesex	6,707	6,850	6,898	7,107
Burkett	6,850	6,881	7,107	7,163
Tully	6,881	6,945	7,163	7,318
Marcellus	6,945	NA	7,318	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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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/6/2020
Job End Date:	3/20/2020
State:	West Virginia
County:	Doddridge
API Number:	47-017-06894-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Laser 2H
Latitude:	39.30758000
Longitude:	-80.73355000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,090
Total Base Water Volume (gal):	15,713,657
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
Produced Mixture	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	86.81218	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.17389	

LD-2950	MultiChem	Friction Reducer					
				Listed Below			
HYDROCHLORIC ACID, 22 BAUME	Halliburton	Solvent					
				Listed Below			
Legend LD-2555	MultiChem	Additive					
				Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
OilPerm A	Halliburton	Non-ionic Surfactant					
				Listed Below			
HAI-501	Halliburton	Acid Corrosion Inhibitor					
				Listed Below			
Legend LD-2990	MultiChem	Friction Reducer					

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				Listed Below			
OPTIFLO-II DELAYED RELEASE 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	12.99019	
			Hydrochloric acid	7647-01-0	30.00000	0.03956	
			Complex Amine Compound	Proprietary	60.00000	0.01602	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01477	
			Complex Amine Compound	Proprietary	60.00000	0.01351	
			Guar gum	9000-30-0	100.00000	0.00366	
			Glutaraldehyde	111-30-8	30.00000	0.00246	
			Ethoxylated alcohols	Proprietary	5.00000	0.00134	
			Polyethoxylated fatty amine salt	61791-26-2	30.00000	0.00129	
			Sobitan, mono-9- octadecenoate, (Z)	1338-43-8	5.00000	0.00113	
			Surfactant	Proprietary	5.00000	0.00113	
			Quaternary ammonium compounds, benzyl-C12- 16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00041	
			Methanol	67-56-1	100.00000	0.00033	
			Adipic acid	124-04-9	1.00000	0.00027	
			Poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega- hydroxy-, branched	69011-36-5	1.00000	0.00027	
			Organic chloride compound	Proprietary	1.00000	0.00023	
			Ethoxylated alcohols	Proprietary	1.00000	0.00023	

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			Alkoxyated polyhydric alcohol	Proprietary	1.00000	0.00023
			Ammonium persulfate	7727-54-0	100.00000	0.00012
			Ethanol	64-17-5	60.00000	0.00011
			Modified thiourea polymer	Proprietary	30.00000	0.00007
			Mixture of dimer and trimer fatty acids of indefinite composition derived from tall oil	61790-12-3	30.00000	0.00007
			Oxylated phenolic resin	Proprietary	30.00000	0.00003
			Acrylamide	79-06-1	0.10000	0.00002
			Organic salt #1	Proprietary	0.10000	0.00002
			Oxyalkylated nonyl phenolic resin	Proprietary	30.00000	0.00001
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00001
			Propargyl alcohol	107-19-7	5.00000	0.00001
			Ethoxylated alcohols	Proprietary	5.00000	0.00001
			Hexadecene	629-73-2	5.00000	0.00001
			Phosphoric acid	7664-38-2	0.10000	0.00001
			Oxyalkylated phenolic resin	Proprietary	10.00000	0.00000
			Sodium glycollate	2836-32-0	0.01000	0.00000
			Formaldehyde	50-00-0	0.01000	0.00000
			Organic salt #3	Proprietary	0.01000	0.00000
			Organic salt #2	Proprietary	0.01000	0.00000
			Sodium hydroxide	1310-73-2	0.01000	0.00000
			Nitrated acetate salt	Proprietary	0.01000	0.00000
			Naphthalene	91-20-3	5.00000	0.00000
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00000
			C.I. pigment Orange 5	3468-63-1	1.00000	0.00000
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00000

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			Ethylene oxide	75-21-8	0.01000	0.00000	
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* 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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ANTERO RESOURCES CORPORATION

Location: Doddridge Co., WV
 Field: Doddridge
 Facility: George Scott Pad

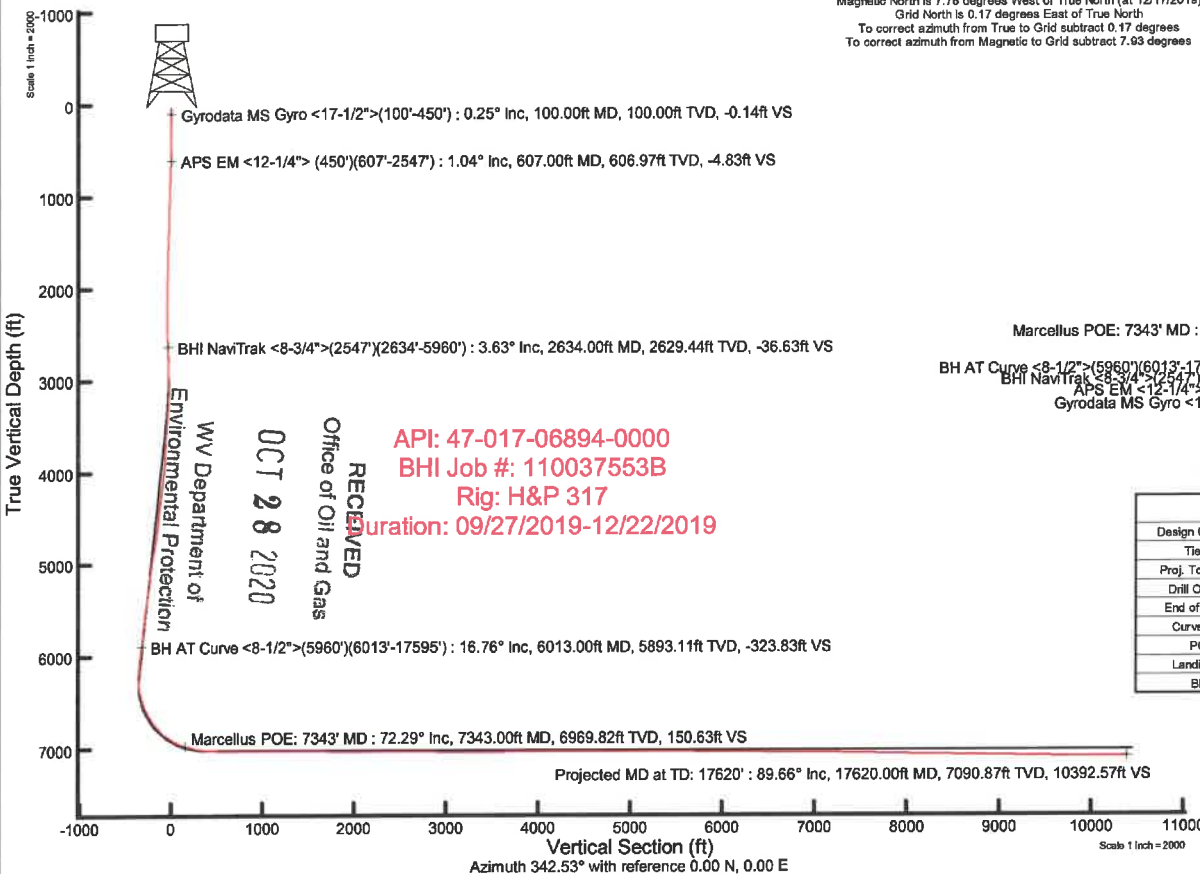
Slot: Slot #02
 Well: Laser Unit 2H
 Wellbore: Laser Unit 2H PWB



Plot reference wellpath is Laser Unit 2H PWP Rev-B.0	Grid System: NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to H&P 317 (RKB)	North Reference: Grid north
Reference wellpath measured depths are referenced to H&P 317 (RKB)	Scale: True distance
H&P 317 (RKB) to Mean Sea Level: 1308.5 feet	Coordinates are in feet referenced to Slot
Mean Sea Level to Ground level (At Slot: Slot #02): -1283 feet	Depths are in feet
Offset wellpath MDs are referenced to each path's default MD datum	Created by: delaset on 2018-12-27; Database: WA_MPL_EasternUS_Data

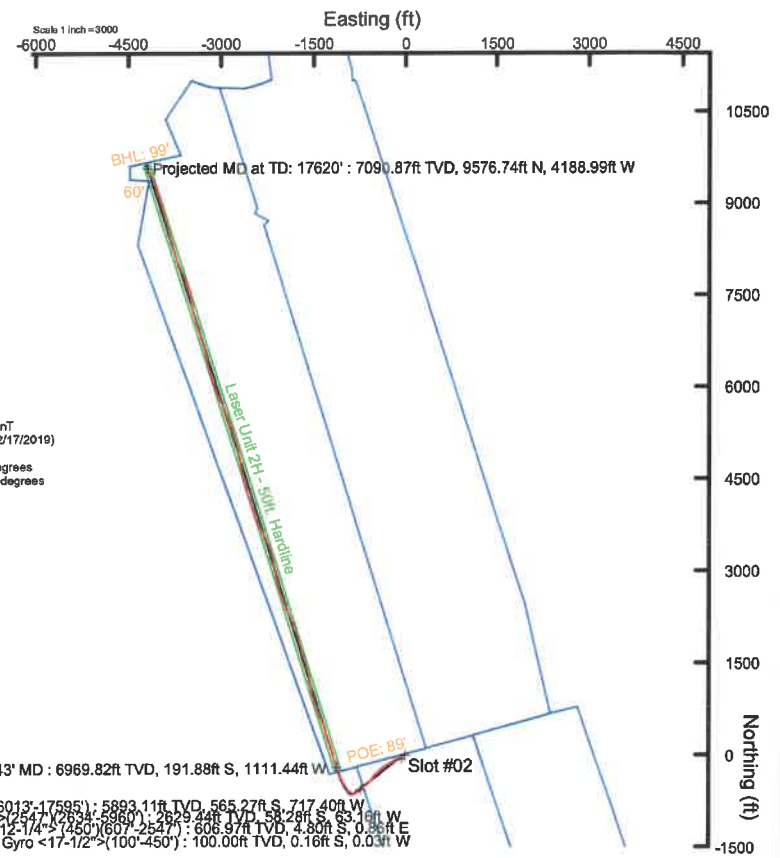
Location Information				
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
George Scott Pad	1715804.693	14274033.226	39°18'27.2500"N	80°44'0.5480"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)
Slot #02	5.41	-19.27	1715785.430	14274038.630
H&P 317 (RKB) to Ground level (At Slot: Slot #02)	25.5ft			
Mean Sea Level to Ground level (At Slot: Slot #02)	-1283ft			
H&P 317 (RKB) to Mean Sea Level	1308.5ft			

Well Data			
Slot	Well	Wellbore	Wellpath
Slot #02	Laser Unit 2H	Laser Unit 2H AWB	Laser Unit 2H AWP Proj: 17620'
Slot #02	Laser Unit 2H	Laser Unit 2H PWB	Laser Unit 2H PWP Rev-B.0



RECEIVED
 Office of Oil and Gas
 OCT 28 2020
 WV Department of
 Environmental Protection

API: 47-017-06894-0000
 BHI Job #: 110037553B
 Rig: H&P 317
 Duration: 09/27/2019-12/22/2019



North
 Grid

W E

U.S. GEOLOGICAL SURVEY

User specified (HDGM) Dip: 68.36° Field: 51920 nT
 Magnetic North is 7.76 degrees West of True North (at 12/17/2019)
 Grid North is 0.17 degrees East of True North
 To correct azimuth from True to Grid subtract 0.17 degrees
 To correct azimuth from Magnetic to Grid subtract 7.93 degrees

Well Profile Data							
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	VS (ft)
Tie On	2547.00	3.510	292.680	2542.61	-60.18	-58.10	-39.97
Proj. To Bottom	2620.00	3.510	292.680	2615.47	-58.47	-62.22	-37.09
Drill Out Casg	2720.00	3.510	292.680	2715.28	-58.12	-67.88	-33.16
End of 3D Arc	3477.88	16.542	231.361	3481.11	-114.93	-174.19	-57.34
Curve KOP	8373.81	16.542	231.361	6237.20	-629.77	-818.21	-355.09
POE	7323.91	66.353	342.532	6971.00	-229.72	-1099.86	111.06
Landing PL	7581.99	90.000	342.532	7017.00	11.17	-1175.67	363.60
BHL	17659.34	90.000	342.532	7017.00	9623.61	-4200.59	10440.85

LATITUDE 39°20'00"

7,136'

11,294' TO BOTTOM HOLE

LATITUDE 39°22'30"

LONGITUDE 80°42'30"

9,379'

TO BOTTOM HOLE

LONGITUDE 80°42'30"

Antero Resources Corporation Well No. Laser Unit 2H

AS DRILLED DATA: WELL 2H TOP HOLE INFORMATION: N: 296,535ft E: 1,650,956ft LAT: 39°18'27.30" LON: 80°44'00.79" BOTTOM HOLE INFORMATION: N: 306,180ft E: 1,646,927ft LAT: 39°20'02.08" LON: 80°44'53.74" 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 2H TOP HOLE INFORMATION: N: 4,350,954m E: 522,987m BOTTOM HOLE INFORMATION: N: 4,353,872m E: 521,711m

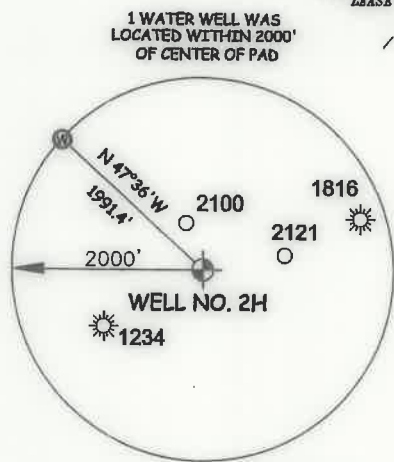
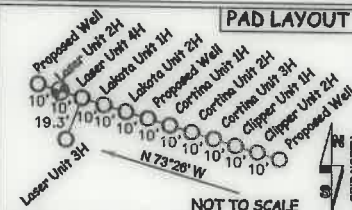
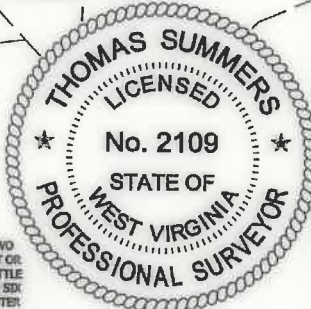


Table listing well numbers and names, including Grant District - Doddridge County and West Union District - Doddridge County.

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



JOB # 17-025WA DRAWING # LASER2HAD SCALE 1" = 2000' MINIMUM DEGREE OF ACCURACY SUBMETER PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

THOMAS SUMMERS P.S. 2109

DATE 06/18/20 OPERATOR'S WELL# LASER UNIT #2H

- 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 ANTERO RESOURCES CORPORATION. 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 47 017 08894 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 1,283' -AS-BUILT WATERSHED HEADWATERS MIDDLE ISLAND CREEK QUADRANGLE SMITHBURG 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE SURFACE OWNER GEORGE S. WYCKOFF ACREAGE 104.27 ACRES +/- OIL & GAS ROYALTY OWNER Y.B. CHAPMAN ET UX; JOHNSON B. SMITH ET UX; CAROLYN S. GASTON; JAMES S. KISSEL; S. A. SMITH ET AL; LEASE ACREAGE 158 ACRES; 180 ACRES; 12,125 ACRES; 17,011 ACRES; 18,110 ACRES; EQT PROD. COMP.; APPALACHIAN ROYALTIES, INC.; DIXIE J. CRAIG; PAMELA R. SCOTT; MICHAEL T. O'BRIEN ET UX; 18.1 ACRES; 12.13 ACRES; 66.75 ACRES; 32 ACRES; 27 ACRES; ED BROOME INC.; ED BROOME, INC.; GMH GAS COMPANY, INC.; MARIE K. COX ET AL 20 ACRES; 17.45 ACRES; 37.35 ACRES; 07 ACRES; 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 7,090' TVD 17,620' 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°20'00"

7,136'

11,294' TO BOTTOM HOLE

LATITUDE 39°22'30"

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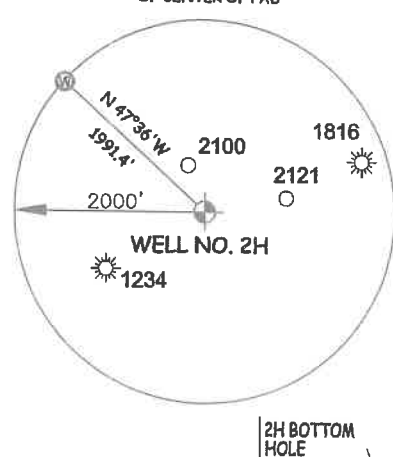
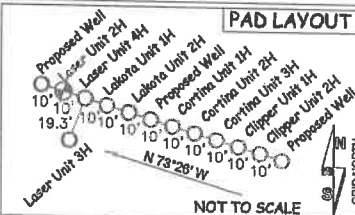
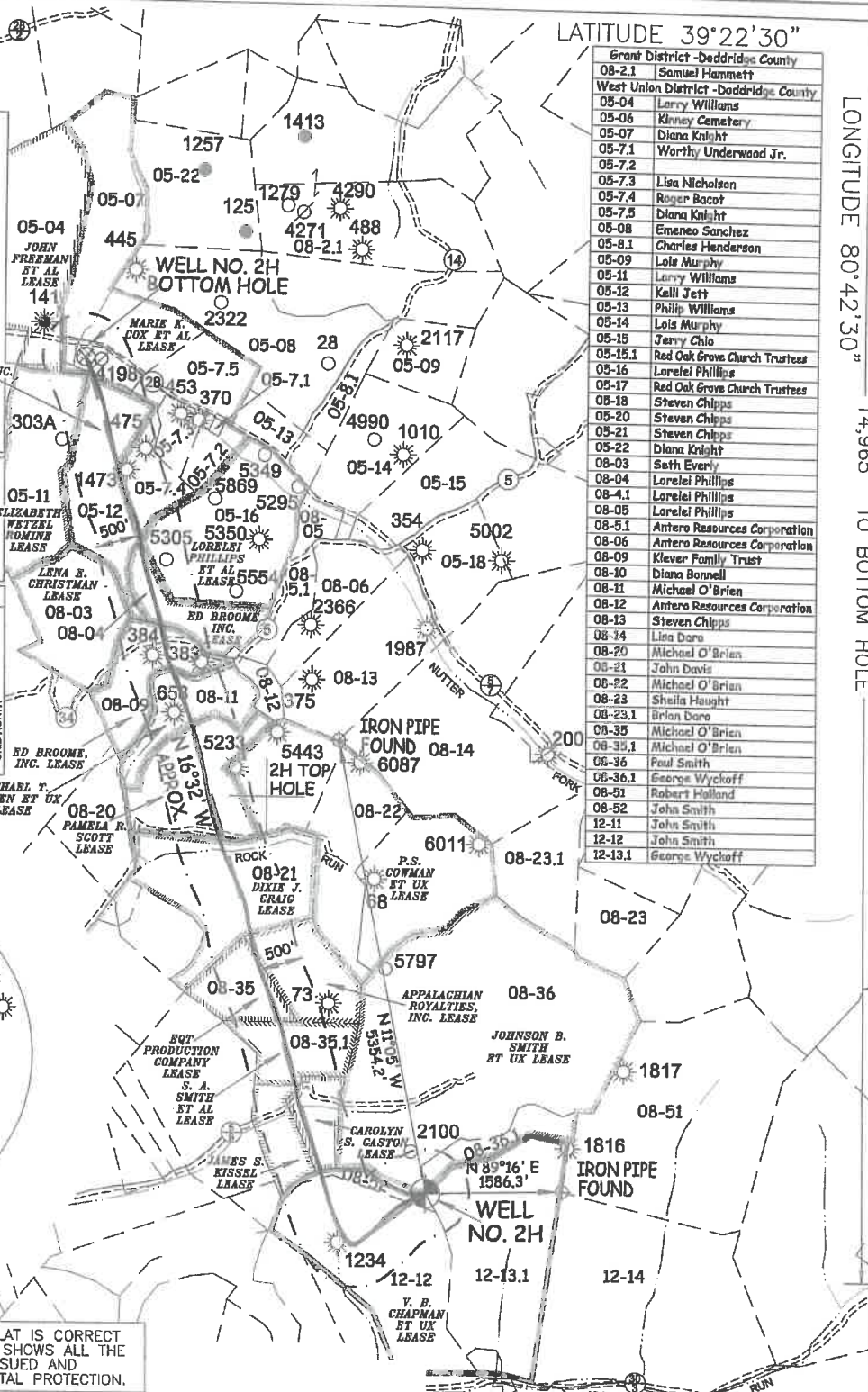


Table listing landowners and lease information for the area. Includes names like Samuel Hammett, Larry Williams, and various lease numbers.

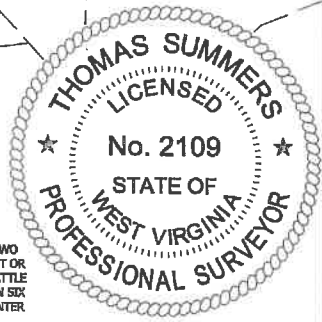


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STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

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



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

THOMAS SUMMERS P.S. 2109 DATE 06/18/20 OPERATOR'S WELL# LASER UNIT #2H

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 ANTERO RESOURCES CORPORATION. 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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