

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

API 47-017-06889 County Doddridge District West Union
Quad Smithburg 7.5' Pad Name George Scott Pad Field/Pool Name ----
Farm name George S. Wyckoff Well Number Cortina 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 4350950m Easting 523002m
Landing Point of Curve Northing 4351202.04m Easting 523071.96m
Bottom Hole Northing 4354252m Easting 522120m

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 10/5/2019 Date drilling ceased 11/25/2019
Date completion activities began 2/27/2020 Date completion activities ceased 4/12/2020
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:
S.D.C.J.

API 47- 017 - 06889 Farm name George S. Wyckoff Well number Cortina 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"	564'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2625'	New	36#, H-40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	18377'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7173'		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	876 sx	15.6	1.18	1047	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	798 sx (Lead) 2784 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) 18397' MD, 7110' TVD (BHL), 7111' (Deepest Point Drilled) Loggers TD (ft) 18397' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6625'

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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PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6549' (TOP)	TVD	7218' (TOP) 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 9660 mcfpd Oil 94 bpd NGL --- bpd Water 158 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	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

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

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EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/10/2020	21277.8	21232.9	60	Marcellus
2	1/11/2020	21195.2	21029.7	60	Marcellus
3	1/11/2020	20994.2	20828.7	60	Marcellus
4	1/11/2020	20793.2	20627.7	60	Marcellus
5	1/12/2020	20592.2	20426.7	60	Marcellus
6	1/12/2020	20391.2	20225.7	60	Marcellus
7	1/12/2020	20190.2	20024.7	60	Marcellus
8	1/13/2020	19989.2	19823.7	60	Marcellus
9	1/13/2020	19788.2	19622.7	60	Marcellus
10	1/14/2020	19587.2	19421.7	60	Marcellus
11	1/14/2020	19386.2	19220.7	60	Marcellus
12	1/14/2020	19185.2	19019.7	60	Marcellus
13	1/15/2020	18984.2	18818.7	60	Marcellus
14	1/15/2020	18783.2	18617.7	60	Marcellus
15	1/15/2020	18582.2	18416.7	60	Marcellus
16	1/16/2020	18381.2	18215.7	60	Marcellus
17	1/16/2020	18180.2	18014.7	60	Marcellus
18	1/17/2020	17979.2	17813.7	60	Marcellus
19	1/17/2020	17778.2	17612.7	60	Marcellus
20	1/18/2020	17577.2	17411.7	60	Marcellus
21	1/18/2020	17376.2	17210.7	60	Marcellus
22	1/19/2020	17175.2	17009.7	60	Marcellus
23	1/19/2020	16974.2	16808.7	60	Marcellus
24	1/19/2020	16773.2	16607.7	60	Marcellus
25	1/20/2020	16572.2	16406.7	60	Marcellus
26	1/20/2020	16371.2	16205.7	60	Marcellus
27	1/21/2020	16170.2	16004.7	60	Marcellus
28	1/21/2020	15969.2	15803.7	60	Marcellus
29	1/22/2020	15768.2	15602.7	60	Marcellus
30	1/22/2020	15567.2	15401.7	60	Marcellus
31	1/23/2020	15366.2	15200.7	60	Marcellus
32	1/23/2020	15165.2	14999.7	60	Marcellus
33	1/23/2020	14964.2	14798.7	60	Marcellus
34	1/24/2020	14763.2	14597.7	60	Marcellus
35	1/24/2020	14562.2	14396.7	60	Marcellus
36	1/24/2020	14361.2	14195.7	60	Marcellus
37	1/24/2020	14160.2	13994.7	60	Marcellus
38	1/24/2020	13959.2	13793.7	60	Marcellus
39	1/25/2020	13758.2	13592.7	60	Marcellus
40	1/25/2020	13557.2	13391.7	60	Marcellus
41	1/25/2020	13356.2	13190.7	60	Marcellus
42	1/25/2020	13155.2	12989.7	60	Marcellus
43	1/26/2020	12954.2	12788.7	60	Marcellus
44	1/26/2020	12753.2	12587.7	60	Marcellus
45	1/26/2020	12552.2	12386.7	60	Marcellus
46	1/26/2020	12351.2	12185.7	60	Marcellus
47	1/26/2020	12150.2	11984.7	60	Marcellus
48	1/27/2020	11949.2	11783.7	60	Marcellus
49	1/27/2020	11748.2	11582.7	60	Marcellus
50	1/27/2020	11547.2	11381.7	60	Marcellus
51	1/27/2020	11346.2	11180.7	60	Marcellus
52	1/28/2020	11145.2	10979.7	60	Marcellus
53	1/29/2020	10944.2	10778.7	60	Marcellus
54	1/30/2020	10743.2	10577.7	60	Marcellus
55	1/30/2020	10542.2	10376.7	60	Marcellus
56	1/30/2020	10341.2	10175.7	60	Marcellus
57	1/30/2020	10140.2	9974.7	60	Marcellus
58	1/30/2020	9939.2	9773.7	60	Marcellus
59	1/30/2020	9738.2	9572.7	60	Marcellus
60	1/31/2020	9537.2	9371.7	60	Marcellus
61	1/31/2020	9336.2	9170.7	60	Marcellus
62	1/31/2020	9135.2	8969.7	60	Marcellus
63	1/31/2020	8934.2	8768.7	60	Marcellus
64	1/31/2020	8733.2	8567.7	60	Marcellus
65	1/31/2020	8532.2	8366.7	60	Marcellus
66	1/31/2020	8331.2	8165.7	60	Marcellus
67	1/31/2020	8130.2	7964.7	60	Marcellus
68	2/1/2020	7929.2	7763.7	60	Marcellus
69	2/1/2020	7728.2	7562.7	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	1/10/2020	74.1	8518	6238	3978	169315	5051	N/A
2	1/11/2020	82.24	8676	5319	4829	406260	7597.7	N/A
3	1/11/2020	90.2	8470	5985	4770	403320	7533.3	N/A
4	1/11/2020	91.1	8605	5501	4770	403760	7420.8	N/A
5	1/12/2020	88.34	8287	5681	4789	409120	7595.6	N/A
6	1/12/2020	93.28	8645	5587	5003	403120	7411.5	N/A
7	1/12/2020	74.73	8649	5856	4019	414740	7699.5	N/A
8	1/13/2020	92.06	8681	8385	4704	403740	7366.7	N/A
9	1/13/2020	92.8	8802	5999	5098	404580	7411	N/A
10	1/14/2020	89.62	8757	5380	4781	407880	7265.4	N/A
11	1/14/2020	94.3	8709	5796	4814	402420	7599.7	N/A
12	1/14/2020	88.71	8671	5650	4732	403660	7327.4	N/A
13	1/15/2020	93.94	8726	5666	4553	410500	7284.1	N/A
14	1/15/2020	95.58	8609	5669	4585	410900	7431.6	N/A
15	1/15/2020	85.75	8381	5467	4192	407300	7300.6	N/A
16	1/16/2020	95.28	8674	5128	4342	412040	7463.6	N/A
17	1/16/2020	94.98	8578	5208	4366	410880	7399.9	N/A
18	1/17/2020	94.74	8565	5954	4023	409640	7382	N/A
19	1/17/2020	90.24	8436	5229	4599	406810	7427	N/A
20	1/18/2020	92.72	8372	5721	4444	405000	7298	N/A
21	1/18/2020	95.16	8561	4360	4582	406000	7405	N/A
22	1/19/2020	93.07	8280	5496	4425	411660	7428	N/A
23	1/19/2020	94.43	8543	5677	4501	403360	7226	N/A
24	1/19/2020	90.47	8708	5475	4358	404700	8356	N/A
25	1/20/2020	92.68	8509	5587	4513	405740	7160	N/A
26	1/20/2020	95.8	8442	3599	4692	424200	7793	N/A
27	1/21/2020	94.92	8542	5302	4462	407480	7270.5	N/A
28	1/21/2020	95.25	8542	5579	3979	416480	7394.9	N/A
29	1/22/2020	93.2	8374	5114	4509	406720	7276	N/A
30	1/22/2020	94.35	8611	5564	4514	398920	7141.7	N/A
31	1/23/2020	93.56	8324	5466	4602	414620	7277.7	N/A
32	1/23/2020	90.09	8563	5744	4316	405440	7209.6	N/A
33	1/23/2020	90.18	8578	5432	4033	404440	7089.6	N/A
34	1/24/2020	93.14	8519	5552	4068	408880	7132.4	N/A
35	1/24/2020	91.32	8448	5600	4545	409600	7234	N/A
36	1/24/2020	93.97	8476	5725	4176	414240	7262.5	N/A
37	1/24/2020	95.25	8588	5393	4379	406360	7086	N/A
38	1/24/2020	93.56	8573	5461	4476	409360	7034.3	N/A
39	1/25/2020	95.84	8547	6634	4285	409120	7085.5	N/A
40	1/25/2020	94.17	8502	5516	4408	409380	7183.7	N/A
41	1/25/2020	94.56	8465	5107	4416	410680	7091.8	N/A
42	1/25/2020	95.5	8490	5220	4033.33	408400	6963	N/A
43	1/26/2020	95.53	8435	5869	4153	408080	7059.4	N/A
44	1/26/2020	95.44	8370	5773	4431	410140	7022.1	N/A
45	1/26/2020	93.83	8415	5001	4361	399460	6967.7	N/A
46	1/26/2020	93.34	8355	5505	4841	400780	7078.3	N/A
47	1/26/2020	94.66	8284	6842	4653	406200	7058.3	N/A
48	1/27/2020	95.66	8478	5393	4239	399820	6838.8	N/A
49	1/27/2020	94.55	8299	5981	4437	401980	7108.8	N/A
50	1/27/2020	94.24	8153	5193	3992	402700	7014.8	N/A
51	1/27/2020	95.67	8267	5635	4411	407420	6970.8	N/A
52	1/28/2020	95.62	8439	5439	3055	400400	6855.5	N/A
53	1/29/2020	92.52	8433	5737	4028	404440	7036.5	N/A
54	1/30/2020	97	8596	5984	4195	408060	6973.3	N/A
55	1/30/2020	94.68	8297	5283	4213	412060	7079.4	N/A
56	1/30/2020	96.07	8392	5582	4644	409240	7006.9	N/A
57	1/30/2020	95	8220	5591	4505	406180	6905.3	N/A
58	1/30/2020	95.33	8159	5209	3864	408260	6926.7	N/A
59	1/30/2020	95.48	8579	5251	3901	398280	6846.1	N/A
60	1/31/2020	93.7	8469	5095	4478	406680	6795	N/A
61	1/31/2020	95.11	8366	5150	3880	406380	6897.2	N/A
62	1/31/2020	94.78	8346	5136	3776	402100	6852.8	N/A
63	1/31/2020	95.3	8314	5591	3754	404260	6832.6	N/A
64	1/31/2020	95.14	8302	5283	3750	407640	6875.3	N/A
65	1/31/2020	95.54	8081	4473	3566	404420	6851	N/A
66	1/31/2020	95.34	8514	5607	4036.85	400570	6761.7	N/A
67	1/31/2020	96.01	8410	5487	3857	401740	6771.1	N/A
68	2/1/2020	95.27	8465	5537	3620	398460	6727.1	N/A
69	2/1/2020	95.71	8264	5661	3556	403500	6761.2	N/A
	AVG=	91.7	8,549	5,581	4,479	16,492,365	299,405	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	2,123	2,120	2,129
Big Lime	2,123	2,760	2,104	2,766
Fifty Foot Sandstone	2,760	2,832	2,741	2,839
Gordon	2,832	3,117	2,814	3,126
Fifth Sandstone	3,117	3,319	3,101	3,333
Bayard	3,319	3,959	3,308	4,025
Speechley	3,959	4,257	4,000	4,351
Balltown	4,257	4,673	4,326	4,818
Bradford	4,673	5,160	4,793	5,355
Benson	5,160	5,458	5,330	5,674
Alexander	5,458	6,734	5,649	7,095
Sycamore	6,491	6,709	6,807	7,070
Middlesex	6,709	6,852	7,070	7,288
Burkett	6,852	6,881	7,288	7,346
Tully	6,881	6,947	7,346	7,516
Marcellus	6,947	NA	7,516	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:	2/1/2020
Job End Date:	2/17/2020
State:	West Virginia
County:	Doddridge
API Number:	47-017-06889-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Cortina 1H
Latitude:	39.30755000
Longitude:	-80.73338000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,107
Total Base Water Volume (gal):	17,363,416
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	86.64413	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.16762	

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

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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	13.16309	
			Hydrochloric acid	7647-01-0	30.00000	0.04031	
			Complex Amine Compound	Proprietary	60.00000	0.01438	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01251	
			Complex Amine Compound	Proprietary	60.00000	0.01064	
			Guar gum	9000-30-0	100.00000	0.00360	
			Glutaraldehyde	111-30-8	30.00000	0.00247	
			Polyethoxylated fatty amine salt	61791-26-2	30.00000	0.00137	
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8	5.00000	0.00120	
			Surfactant	Proprietary	5.00000	0.00120	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00041	
			Methanol	67-56-1	100.00000	0.00032	
			Organic chloride compound	Proprietary	1.00000	0.00024	
			Alkoxylated polyhydric alcohol	Proprietary	1.00000	0.00024	
			Ethoxylated alcohols	Proprietary	1.00000	0.00024	
			Poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, branched	69011-36-5	1.00000	0.00018	
			Ethoxylated alcohols	Proprietary	1.00000	0.00018	
			Adipic acid	124-04-9	1.00000	0.00018	
			Ammonium persulfate	7727-54-0	100.00000	0.00009	

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			Ethanol	64-17-5	1.00000	0.00008	
			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	
			Ethoxylated alcohols	Proprietary	5.00000	0.00001	
			Propargyl alcohol	107-19-7	5.00000	0.00001	
			Hexadecene	629-73-2	5.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Formaldehyde	50-00-0	0.01000	0.00000	
			Organic salt #2	Proprietary	0.01000	0.00000	
			Nitrated acetate salt	Proprietary	0.01000	0.00000	
			Organic salt #3	Proprietary	0.01000	0.00000	
			Sodium glycollate	2836-32-0	0.01000	0.00000	
			Sodium hydroxide	1310-73-2	0.01000	0.00000	
			C.I. pigment Orange 5	3468-63-1	1.00000	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)

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 Environmental Protection



ANTERO RESOURCES CORPORATION

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

Slot: Slot #07
 Well: Cortina Unit 1H
 Wellbore: Cortina Unit 1H PWB



API: 47-017-06889-0000
 BHI Job #: 110067414B
 Rig: H&P 317
 Duration: 10/08/2019-11/16/2019

Scale 1 inch = 2600
 Easting (ft)
 -5000 -3750 -2500 -1250 0 1250 2500

Projected MD at TD: 18397' : 7110.69ft TVD, 10840.36ft N, 2894.12ft W

Plot reference wellpath is Cortina Unit 1H 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: 1306.6 feet	Coordinates are in feet referenced to Slot
Mean Sea Level to Ground level (At Slot: Slot #07): -1283 feet	Depths are in feet
Offset wellpath MDs are referenced to each well's default MD datum	Created by: dslatun on 2019-11-24; Database: WA_MPL_EasternUS_Defn

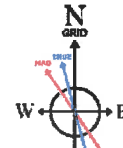
Gyrodota MS Gyro <17-1/2">(50'-480') : 0.24° Inc, 50.00ft MD, 50.00ft TVD, -0.02ft VS
 APS EM <12-1/4">(480')(609'-2575') : 0.38° Inc, 609.00ft MD, 608.98ft TVD, -2.61ft VS

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 #07	-8.11	28.87	1715833.550	14274025.120
H&P 317 (RKB) to Ground level (At Slot: Slot #07)			25.5ft	
Mean Sea Level to Ground level (At Slot: Slot #07)			-1283ft	
H&P 317 (RKB) to Mean Sea Level			1308.5ft	

APS EM <8-3/4">(2575')(2639'-6722') : 1.95° Inc, 2639.00ft MD, 2638.64ft TVD, -16.36ft VS

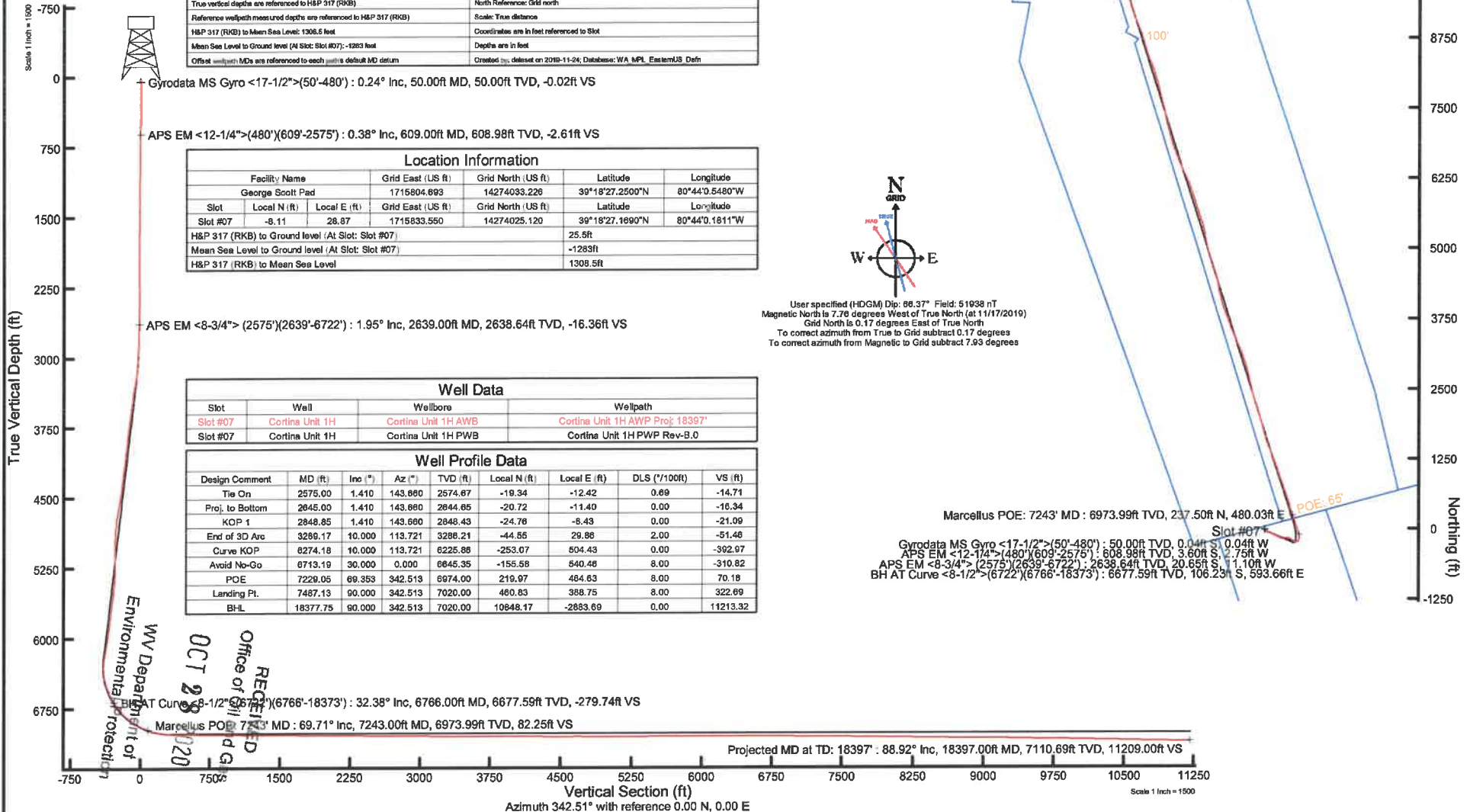
Well Data			
Slot	Well	Wellbore	Wellpath
Slot #07	Cortina Unit 1H	Cortina Unit 1H AWP	Cortina Unit 1H AWP Proj: 18397'
Slot #07	Cortina Unit 1H	Cortina Unit 1H PWB	Cortina Unit 1H PWP Rev-B.0

Well Profile Data								
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	2575.00	1.410	143.860	2574.67	-19.34	-12.42	0.69	-14.71
Proj. to Bottom	2645.00	1.410	143.860	2644.65	-20.72	-11.40	0.00	-16.34
KOP 1	2848.85	1.410	143.860	2848.43	-24.78	-8.43	0.00	-21.09
End of 3D Arc	3289.17	10.000	113.721	3286.21	-44.55	29.86	2.00	-51.46
Curve KOP	6274.18	10.000	113.721	6226.88	-253.07	504.43	0.00	-392.97
Avoid No-Go	6713.19	30.000	0.000	6645.35	-155.58	840.46	8.00	-310.82
PDE	7229.05	69.353	342.513	6974.00	219.97	484.63	8.00	70.18
Landing Pt.	7487.13	90.000	342.513	7020.00	460.63	388.75	8.00	322.69
BHL	18377.75	80.000	342.513	7020.00	10848.17	-2883.69	0.00	11213.32



User specified (HDGM) Dip: 88.37° Field: 51098 nT
 Magnetic North is 7.78 degrees West of True North (at 11/17/2019)
 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

Marcellus POE: 7243' MD : 6973.99ft TVD, 237.50ft N, 480.03ft E
 Gyrodota MS Gyro <17-1/2">(50'-480') : 50.00ft TVD, 0.04ft S, 0.04ft W
 APS EM <12-1/4">(480')(609'-2575') : 608.98ft TVD, 3.60ft S, 2.75ft W
 APS EM <8-3/4">(2575')(2639'-6722') : 2638.64ft TVD, 20.65ft S, 11.10ft W
 BH AT Curve <8-1/2">(6722')(6766'-18373') : 6677.59ft TVD, 106.23ft S, 593.66ft E



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AT Curve <8-1/2">(6722')(6766'-18373') : 32.38° Inc, 6766.00ft MD, 6677.59ft TVD, -279.74ft VS
 Marcellus POE: 7243' MD : 69.71° Inc, 7243.00ft MD, 6973.99ft TVD, 82.25ft VS

Projected MD at TD: 18397' : 88.92° Inc, 18397.00ft MD, 7110.69ft TVD, 11209.00ft VS

Vertical Section (ft)
 Azimuth 342.51° with reference 0.00 N, 0.00 E

Scale 1 inch = 1500

LATITUDE 39°20'00"

7,088'

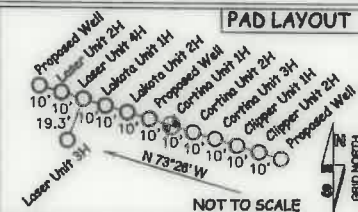
9,947' TO BOTTOM HOLE

LATITUDE 39°22'30"

Antero Resources Corporation Well No. Cortina Unit 1H

AS DRILLED DATA: WELL 1H TOP HOLE INFORMATION: N: 296,521ft E: 1,651,004ft LAT: 39°18'27.17" LON: 80°44'00.18" BOTTOM HOLE INFORMATION: N: 307,407ft E: 1,648,291ft LAT: 39°20'14.40" LON: 80°44'36.61" 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 1H TOP HOLE INFORMATION: N: 4,350,950m E: 523,002m BOTTOM HOLE INFORMATION: N: 4,354,252m E: 522,120m



1 WATER WELL WAS LOCATED WITHIN 2000' OF CENTER OF PAD

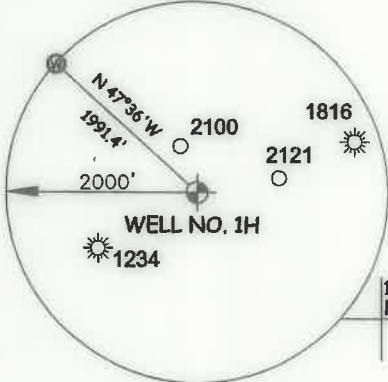


Table listing landowners and lease information for various parcels. Includes names like Samuel Hammett, Larry Williams, Kinney Cemetery, Diana Knight, Worthy Underwood Jr., Lisa Nicholson, Roger Kocot, Diana Knight, Emereo Sanchez, Charles Henderson, Lois Murphy, Larry Williams, Kelli Jeff, Philip Williams, Lois Murphy, Jerry Chio, Red Oak Grove Church Trustees, Lorelei Phillips, Red Oak Grove Church Trustees, Steven Chipp, Steven Chipp, Diana Knight, Seth Every, Lorelei Phillips, Lorelei Phillips, Antero Resources Corporation, Antero Resources Corporation, Kiever Family Trust, Diana Bonnell, Michael O'Brien, Antero Resources Corporation, Steven Chipp, Lisa Dara, Michael O'Brien, John Davis, Michael O'Brien, Sheila Hought, Brian Daro, Michael O'Brien, Michael O'Brien, Paul Smith, George Wyckoff, Robert Halkard, John Smith, John Smith, John Smith, George Wyckoff.

LONGITUDE 80°42'30"

9,393'

13,720' TO BOTTOM HOLE

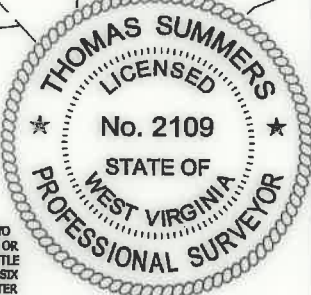
LONGITUDE 80°42'30"

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 # 18-033WA DRAWING # CORTINA1HAD 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 THOMAS SUMMERS P.S. 2109 DATE 06/18/20 OPERATOR'S WELL# CORTINA UNIT #1H

- 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 06889 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 1283' 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 +/- LEASE ACREAGE 156 ACRES +/- 180 ACRES +/- OIL & GAS ROYALTY OWNER V.B. CHAPMAN ET UX; JOHNSON B. SMITH ET UX; P.S. COWMAN ET UX; JOHNSON WILLIAMS; EDGAR DAVISSON ET UX; 105.93 ACRES +/- 105.5 ACRES +/- 230 ACRES +/- LORELEI PHILLIPS ET AL.; GORE CORP.; MARIE K. COX ET AL.; R. B. WHITE HEIRS 72 ACRES +/- 11.25 ACRES +/- 97 ACRES +/- 53 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 7,110' TVD 18,397' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

LATITUDE 39°20'00"

7,088'

9,947' TO BOTTOM HOLE

LATITUDE 39°22'30"

LONGITUDE 80°42'30"

9,393'

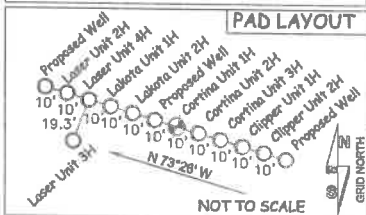
13,720' TO BOTTOM HOLE

LONGITUDE 80°42'30"

Antero Resources Corporation Well No. Cortina Unit 1H

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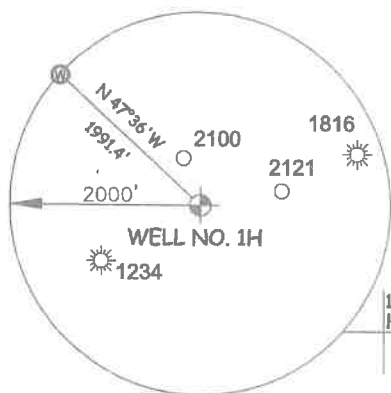


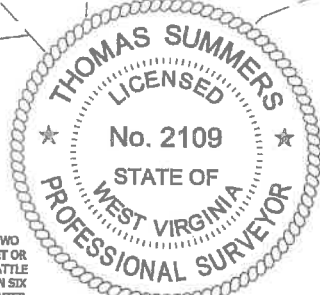
Table listing lease information including Grant District, Lease Number, Lease Name, and Lease Holder. Includes entries for Grant District - Doddridge County, West Union District - Doddridge County, and various individual leaseholders like Lisa Nicholson, Roger Bacon, etc.

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 # 18-033WA DRAWING # CORTINA1HAD 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 Thomas Summers, P.S. 2109. DATE 06/18/20 OPERATOR'S WELL# CORTINA 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 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 - 06889 (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 +/- LEASE ACREAGE 156 ACRES +/- 180 ACRES +/- OIL & GAS ROYALTY OWNER V.B. CHAPMAN ET UX; JOHNSON B. SMITH ET UX; P.S. COWMAN ET UX; JOHNSON WILLIAMS; EDGAR DAVISSON ET UX; LORELEI PHILLIPS ET AL; GORE CORP.; MARIE K. COX ET AL; R. B. WHITE HEIRS 105.93 ACRES +/- 105.5 ACRES +/- 230 ACRES +/- 72 ACRES +/- 11.25 ACRES +/- 97 ACRES +/- 53 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 7,110' TVD 18,397' 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