

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

API 47 - 017 - 06891 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 3H
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 4350948m Easting 523007m
Landing Point of Curve Northing 4351558.03m Easting 523476.03m
Bottom Hole Northing 4354500m Easting 522576m

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 10/9/2019 Date drilling ceased 11/10/2019
Date completion activities began 2/27/2020 Date completion activities ceased 4/9/2020
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 - 06891 Farm name George S. Wyckoff Well number Cortina Unit 3H

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"	554'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2665'	New	36#, H-40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19038'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6527'		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	885 sx	15.6	1.18	1047	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	798 sx (Lead) 3355sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)	2819	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 21100' MD, 7500' TVD (BHL), 7502' (Deepest Point Drilled) Loggers TD (ft) 21100' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6960'

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

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 - 06891 Farm name George S. Wyckoff Well number Cortina Unit 3H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE SEE ATTACHED EXHIBIT 1					

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								

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PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6952' (TOP) TVD	7441' (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 8633 mcfpd Oil 99 bpd NGL --- bpd Water 681 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**

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 Phillippi Pike City Clarksburg State WV Zip 26301

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Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223
Signature  Title Permitting Agent Date 7/21/20

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

API 47-017-06891 Farm Name George S. Wvckoff Well Number Cortina Unit 3H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/8/2020	18930.8	18886.7	60	Marcellus
2	1/8/2020	18848.987	18683.422	60	Marcellus
3	1/8/2020	18647.909	18482.344	60	Marcellus
4	1/9/2020	18446.831	18281.266	60	Marcellus
5	1/9/2020	18245.753	18080.188	60	Marcellus
6	1/9/2020	18044.675	17879.11	60	Marcellus
7	1/9/2020	17843.597	17678.032	60	Marcellus
8	1/10/2020	17642.519	17476.954	60	Marcellus
9	1/10/2020	17441.441	17275.876	60	Marcellus
10	1/10/2020	17240.363	17074.798	60	Marcellus
11	1/10/2020	17039.285	16873.72	60	Marcellus
12	1/11/2020	16838.207	16672.642	60	Marcellus
13	1/11/2020	16637.129	16471.564	60	Marcellus
14	1/12/2020	16436.051	16270.486	60	Marcellus
15	1/12/2020	16234.973	16069.408	60	Marcellus
16	1/12/2020	16033.895	15868.33	60	Marcellus
17	1/13/2020	15832.817	15667.252	60	Marcellus
18	1/13/2020	15631.739	15466.174	60	Marcellus
19	1/13/2020	15430.661	15265.096	60	Marcellus
20	1/14/2020	15229.583	15064.018	60	Marcellus
21	1/14/2020	15028.505	14862.94	60	Marcellus
22	1/14/2020	14827.427	14661.862	60	Marcellus
23	1/15/2020	14626.349	14460.784	60	Marcellus
24	1/15/2020	14425.271	14259.706	60	Marcellus
25	1/15/2020	14224.193	14058.628	60	Marcellus
26	1/16/2020	14023.115	13857.55	60	Marcellus
27	1/16/2020	13822.037	13656.472	60	Marcellus
28	1/17/2020	13620.959	13455.394	60	Marcellus
29	1/18/2020	13419.881	13254.316	60	Marcellus
30	1/18/2020	13218.803	13053.238	60	Marcellus
31	1/18/2020	13017.725	12852.16	60	Marcellus
32	1/19/2020	12816.647	12651.082	60	Marcellus
33	1/19/2020	12615.569	12450.004	60	Marcellus
34	1/20/2020	12414.491	12248.926	60	Marcellus
35	1/20/2020	12213.413	12047.848	60	Marcellus
36	1/21/2020	12012.335	11846.77	60	Marcellus
37	1/21/2020	11811.257	11645.692	60	Marcellus
38	1/22/2020	11610.179	11444.614	60	Marcellus
39	1/22/2020	11409.101	11243.536	60	Marcellus
40	1/23/2020	11208.023	11042.458	60	Marcellus
41	1/23/2020	11006.945	10841.38	60	Marcellus
42	1/28/2020	10805.867	10640.302	60	Marcellus
43	1/28/2020	10604.789	10439.224	60	Marcellus
44	1/28/2020	10403.711	10238.146	60	Marcellus
45	1/28/2020	10202.633	10037.068	60	Marcellus
46	1/28/2020	10001.555	9835.99	60	Marcellus
47	1/29/2020	9800.477	9634.912	60	Marcellus
48	1/29/2020	9599.399	9433.834	60	Marcellus
49	1/29/2020	9398.321	9232.756	60	Marcellus
50	1/29/2020	9197.243	9031.678	60	Marcellus
51	2/4/2020	8996.165	8830.6	60	Marcellus
52	2/5/2020	8795.087	8629.522	60	Marcellus
53	2/5/2020	8594.009	8428.444	60	Marcellus
54	2/5/2020	8392.931	8227.366	60	Marcellus
55	2/5/2020	8191.853	8026.288	60	Marcellus
56	2/5/2020	7990.775	7825.21	60	Marcellus
57	2/5/2020	7789.697	7624.132	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	1/8/2020	73.51	8390	3936	3675	170850	6142.214	N/A
2	1/8/2020	77.3	8517	6153	3777	400540	7442.143	N/A
3	1/8/2020	71.06	8534	6406	3008	401560	7432.071	N/A
4	1/9/2020	72.79	8491	5926	3620	408280	7415.143	N/A
5	1/9/2020	75.21	8509	5620	4399	401880	7320.905	N/A
6	1/9/2020	81.18	8730	6133	4329	403460	7344.286	N/A
7	1/9/2020	77.96	8806	5448	4149	399280	7176.119	N/A
8	1/10/2020	80.7	8641	5700	3646	407720	7454.381	N/A
9	1/10/2020	70.27	8681	5550	3520	406240	7194.524	N/A
10	1/10/2020	84.15	8784	5660	3902	409800	7446.095	N/A
11	1/10/2020	69.16	8676	5711	3706	411200	7396.071	N/A
12	1/11/2020	79.19	8524	5481	4133	409760	7389.905	N/A
13	1/11/2020	86.8	8395	5438	3773	412360	7500.357	N/A
14	1/12/2020	85.26	8458	5601	3609	406480	7244.143	N/A
15	1/12/2020	85.18	8135	5793	3654	411180	7404	N/A
16	1/12/2020	84.52	8112	4956	3470	402980	7223.048	N/A
17	1/13/2020	85.93	8275	5483	4031	416920	7391.69	N/A
18	1/13/2020	85.86	8443	5769	4032	399220	7313.952	N/A
19	1/13/2020	85.56	8420	5259	4061	402740	7254.5	N/A
20	1/14/2020	85.6	8303	5672	3699	413340	7211.833	N/A
21	1/14/2020	85.72	8099	5238	3967	401400	7157.786	N/A
22	1/14/2020	85.84	8035	5411	3882	417380	7441.476	N/A
23	1/15/2020	84.43	8451	5426	3963	412690	7093.548	N/A
24	1/15/2020	85.55	7903	5224	4030	411180	7027.857	N/A
25	1/15/2020	85.42	8081	5764	3755	411720	7333.5	N/A
26	1/16/2020	85.9	8017	5531	3839	409880	7192.262	N/A
27	1/16/2020	85.2	7912	5288	3929	405500	7209.738	N/A
28	1/17/2020	85.86	7957	4745	3924	410290	7117.786	N/A
29	1/18/2020	85.98	8157	5171	3590	401940	7150.905	N/A
30	1/18/2020	84.95	8342	5425	3526	408660	7143.548	N/A
31	1/18/2020	85.56	8270	5186	3482	406520	7134.333	N/A
32	1/19/2020	85.81	8262	5597	3750	403880	7069.905	N/A
33	1/19/2020	85.23	8156	5364	3349	402440	6971.143	N/A
34	1/20/2020	85.95	8495	5095	3620	406220	7149.333	N/A
35	1/20/2020	84.79	8211	5611	3833	404700	7111.619	N/A
36	1/21/2020	85.68	7750	5430	3816	404660	7416.643	N/A
37	1/21/2020	85.51	8108	5514	3780	406320	7009.238	N/A
38	1/22/2020	85.71	7986	5471	3751	412400	7140.786	N/A
39	1/22/2020	84.74	7925	5298	3813	407460	7119.452	N/A
40	1/23/2020	85.58	8311	5599	3903	410020	6968.262	N/A
41	1/23/2020	85.63	8002	5276	3641	405120	7003.762	N/A
42	1/28/2020	84.8	7469	6370	4105	403620	6962.667	N/A
43	1/28/2020	85.46	7527	5276	3696	396720	6935.286	N/A
44	1/28/2020	85.75	7683	5319	4060	398420	6947.429	N/A
45	1/28/2020	85.68	7521	5143	4051.78	402200	6977.714	N/A
46	1/28/2020	85.4	7713	5152	3609	413000	7040.524	N/A
47	1/29/2020	85.1	7951	5347	3876	404900	6903.214	N/A
48	1/29/2020	85.09	7931	5092	4023	406420	6900.31	N/A
49	1/29/2020	84.39	8011	4980	3800	395640	6851.095	N/A
50	1/29/2020	84.96	8112	5017	4091	402980	6919.429	N/A
51	2/4/2020	43.33	8982	6919	5354	9570	2004.786	N/A
52	2/5/2020	66	8245	5338	3992	405430	12666.69	N/A
53	2/5/2020	83.21	6501	5089	3752	409750	6965.69	N/A
54	2/5/2020	85.17	6583	5321	3930	412690	7049.452	N/A
55	2/5/2020	85.26	6833	5319	3693	402400	6900.524	N/A
56	2/5/2020	85.04	6616	5400	4391	403440	6831.095	N/A
57	2/5/2020	85.73	6740	5568	3429	401760	6896.167	N/A
	AVG=	82.7	8,299	5,472	3,789	16,456,170	295,660	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	2,149	2,120	2,203
Big Lime	2,149	2,757	2,178	2,859
Fifty Foot Sandstone	2,757	2,835	2,834	2,944
Gordon	2,835	3,117	2,919	3,250
Fifth Sandstone	3,117	3,311	3,225	3,458
Bayard	3,311	3,954	3,433	4,149
Speechley	3,954	4,249	4,124	4,466
Balltown	4,249	4,667	4,441	4,913
Bradford	4,667	5,166	4,888	5,454
Benson	5,166	5,452	5,429	5,763
Alexander	5,452	6,737	5,738	7,162
Sycamore	6,490	6,712	6,882	7,137
Middlesex	6,712	6,857	7,137	7,347
Burkett	6,857	6,886	7,347	7,400
Tully	6,886	6,957	7,400	7,577
Marcellus	6,957	NA	7,577	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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ANTERO RESOURCES CORPORATION

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

Slot: Slot #09
 Well: Cortina Unit 3H
 Wellbore: Cortina Unit 3H PWB

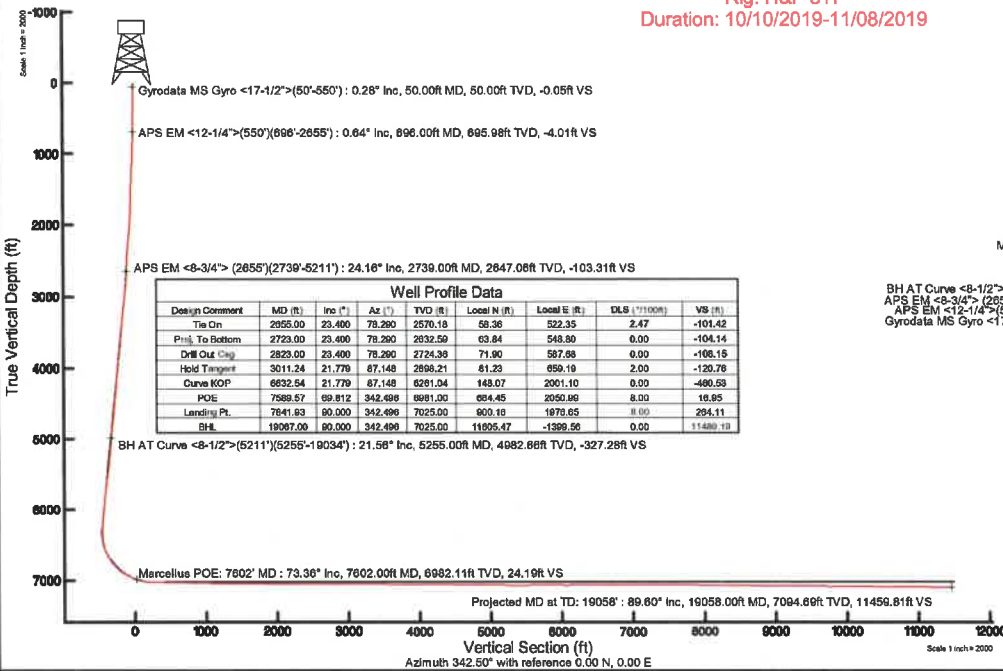


Plot reference wellbore is Cortina Unit 3H PWP Rev-B.0
 True vertical depths are referenced to H&P 317 (RKB)
 Measured depths are referenced to H&P 317 (RKB)
 H&P 317 (RKB) to Mean Sea Level: 1308.5 feet
 Mean Sea Level to Ground level (At Slot Slot #09) : -1283 feet
 Coordinates are in feet referenced to Slot

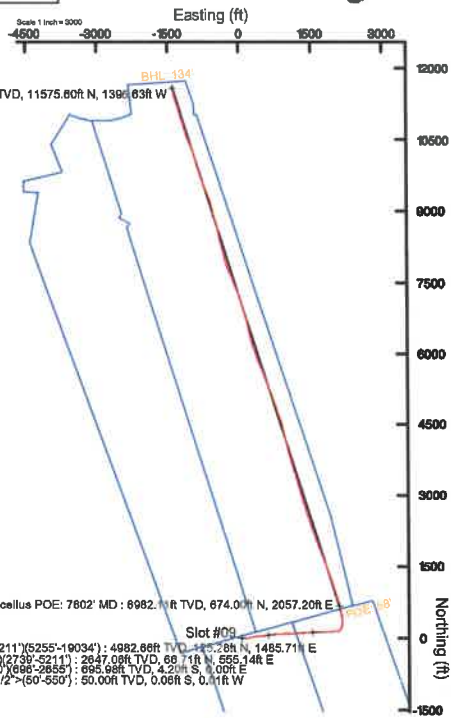
Grid System: NAD27 / UTM Zone 17 North, US feet
 North Reference: Grid north
 Scale: True distance
 Depths are in feet
 Created by: dafmet on 2019-11-12
 Database: W - MPL_EasternUS_Defn

Location Information					
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
George Scott Pad	1715804.893	14274033.226	39°18'27.250"N	80°44'00.549"W	
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Longitude
Slot #09	-13.41	48.15	1715852.820	14274019.820	39°18'27.116"N 80°43'59.839"W
H&P 317 (RKB) to Ground level (At Slot Slot #09)	25.6ft				
Mean Sea Level to Ground level (At Slot Slot #09)	-1283ft				
H&P 317 (RKB) to Mean Sea Level	1308.5ft				

Well Data			
Slot	Well	Wellbore	Wellbore
Slot #09	Cortina Unit 3H	Cortina Unit 3H AWD	Cortina Unit 3H AWP Proj: 19058'
Slot #09	Cortina Unit 3H	Cortina Unit 3H PWB	Cortina Unit 3H PWP Rev-B.0



Well Profile Data							
Design Comment	MD (ft)	Incl (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	VS (ft)
Tie On	2955.00	23.400	78.280	2570.18	56.36	522.35	-101.42
Prod. To Bottom	2723.00	23.400	78.280	2632.56	63.84	548.80	-104.14
Drill Out Clay	2823.00	23.400	78.280	2724.36	71.90	567.98	-108.15
Hold Tangent	3011.24	21.770	87.148	2698.21	81.23	659.19	-120.78
Curve ROP	6632.84	21.770	87.148	6281.04	143.07	2001.10	-486.59
POE	7688.57	69.812	342.498	6981.00	604.45	2050.80	-18.85
Landing Pt.	7841.83	80.000	342.498	7025.00	600.10	1870.65	294.11
BHL	18087.00	80.000	342.498	7025.00	11825.47	-1389.56	11480.10



North
 East
 West
 South

User specified (MGM) Dip: 88.37° Field: 51843 nT
 Magnetic North is 7.70 degrees West of True North (at 10/31/2019)
 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

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/8/2020
Job End Date:	2/5/2020
State:	West Virginia
County:	Doddridge
API Number:	47-017-06891-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Cortina 3H
Latitude:	39.30753000
Longitude:	-80.73331000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,094
Total Base Water Volume (gal):	17,985,507
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 Mixer	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	86.97747	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.17744	

MC B-8614	Halliburton	Biocide					
				Listed Below			
LD-2950	MultiChem	Friction Reducer					
				Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant					
				Listed Below			
Legend LD-2555	MultiChem	Additive					
				Listed Below			
Legend LD-2990	MultiChem	Friction Reducer					
				Listed Below			
FDP-S1296-17	Halliburton	Acid Corrosion Inhibitor					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
HYDROCHLORIC ACID, 22 BAUME	Halliburton	Solvent					
				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	12.81542	
			Hydrochloric acid	7647-01-0	30.00000	0.04215	
			Complex Amine Compound	Proprietary	60.00000	0.01630	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01422	
			Complex Amine Compound	Proprietary	60.00000	0.01214	
			Guar gum	9000-30-0	100.00000	0.00500	
			Glutaraldehyde	111-30-8	30.00000	0.00255	
			Polyethoxylated fatty amine salt	61791-26-2	30.00000	0.00158	
			Sobitan, mono-9- octadecenoate, (Z)	1338-43-8	5.00000	0.00136	
			Surfactant	Proprietary	5.00000	0.00136	
			Quaternary ammonium compounds, benzyl-C12- 16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00042	
			Methanol	67-56-1	100.00000	0.00034	
			Organic chloride compound	Proprietary	1.00000	0.00027	
			Alkoxyated polyhydric alcohol	Proprietary	1.00000	0.00027	
			Ethoxylated alcohols	Proprietary	1.00000	0.00027	
			Ethoxylated alcohols	Proprietary	1.00000	0.00020	
			Poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega- hydroxy-, branched	69011-36-5	1.00000	0.00020	
			Adipic acid	124-04-9	1.00000	0.00020	
			Ammonium persulfate	7727-54-0	100.00000	0.00019	

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			Ethanol	64-17-5	1.00000	0.00008	
			Mixture of dimer and trimer fatty acids of indefinite composition derived from tall oil	61790-12-3	30.00000	0.00008	
			Modified thiourea polymer	Proprietary	30.00000	0.00008	
			Oxylated phenolic resin	Proprietary	30.00000	0.00006	
			Organic salt #1	Proprietary	0.10000	0.00003	
			Acrylamide	79-06-1	0.10000	0.00003	
			Ethoxylated alcohols	Proprietary	5.00000	0.00001	
			Hexadecene	629-73-2	5.00000	0.00001	
			Propargyl alcohol	107-19-7	5.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Organic salt #2	Proprietary	0.01000	0.00000	
			Formaldehyde	50-00-0	0.01000	0.00000	
			Organic salt #3	Proprietary	0.01000	0.00000	
			Sodium glycollate	2836-32-0	0.01000	0.00000	
			Nitrated acetate salt	Proprietary	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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LATITUDE 39°20'00"

7,069'

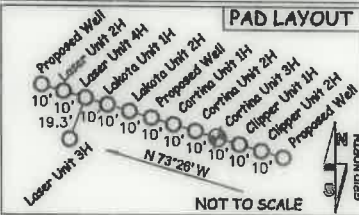
8,428' TO BOTTOM HOLE

LATITUDE 39°22'30"

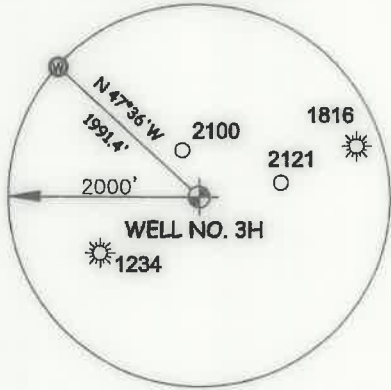
Antero Resources Corporation Well No. Cortina Unit 3H

AS DRILLED DATA:
WELL 3H TOP HOLE INFORMATION:
 N: 296,515ft E: 1,651,023ft
 LAT: 39°18'27.12" LON: 80°43'59.93"
BOTTOM HOLE INFORMATION:
 N: 308,112ft E: 1,649,820ft
 LAT: 39°20'21.56" LON: 80°44'17.28"
 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 3H TOP HOLE INFORMATION:
 N: 4,350,948m E: 523,007m
BOTTOM HOLE INFORMATION:
 N: 4,354,475m E: 522,582m



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



Grant District - Doddridge County
08-21 Samuel Hammett
West Union District - Doddridge County
05-04 Larry Williams
05-06 Kinney Cemetery
05-07 Diana Knight
05-7.1 Worthy Underwood Jr.
05-7.2
05-7.3 Lia Nicholson
05-7.4 Roger Baco
05-7.5 Diana Knight
05-08 Emeneo Sanchez
05-8.1 Charles Henderson
05-09 Lois Murphy
05-11 Larry Williams
05-12 Kelli Jeff
05-13 Phillip Williams
05-14 Lois Murphy
05-15 Jerry Chio
05-15.1 Red Oak Grove Church Trustees
05-16 Lorelei Phillips
05-17 Red Oak Grove Church Trustees
05-18 Steven Chippo
05-20 Steven Chippo
05-21 Steven Chippo
05-22 Diana Knight
08-03 Seth Evely
08-04 Lorelei Phillips
08-4.1 Lorelei Phillips
08-05 Lorelei Phillips
08-5.1 Antero Resources Corporation
08-06 Antero Resources Corporation
08-09 Kiever Family Trust
08-10 Diana Bonnell
08-11 Michael O'Brien
08-12 Antero Resources Corporation
08-13 Steven Chippo
08-14 Lia Daro
08-20 Michael O'Brien
08-21 John Davis
08-22 Michael O'Brien
08-23 Sheila Hought
08-23.1 Brian Daro
08-35 Michael O'Brien
08-35.1 Michael O'Brien
08-36 Paul Smith
08-36.1 George Wyckoff
08-51 Robert Holland
08-52 John Smith
12-11 John Smith
12-12 John Smith
12-13.1 George Wyckoff

LONGITUDE 80°42'30"

9,398'

12,995' TO BOTTOM HOLE

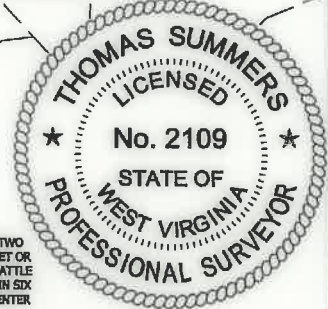
LONGITUDE 80°42'30"

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 # CORTINA3HAD
 SCALE 1" = 2000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

THOMAS SUMMERS P.S. 2109
 DATE 06/18/20
 OPERATOR'S WELL# CORTINA UNIT #3H

- 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 LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 ___ 017 ___ 06891
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW 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 V.B. CHAPMAN ET UX; FANNIE A. COULEHAN; LEASE ACREAGE 156 ACRES+; 234.94 ACRES+;
 JOHNSON B. SMITH ET UX; P.B. McCLAIN ET UX; JOHNSON WILLIAMS; 180 ACRES+; 200 ACRES+; 105.5 ACRES+;
 EDGAR DAVISSON ET UX; GEORGE BENTON WHITE; C. HOWARD KNIGHT ET AL 230 ACRES+; 75 ACRES+; 54 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 7,094' TVD 19,058' 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

COUNTY NAME PERMIT

LATITUDE 39°20'00"

7,069'

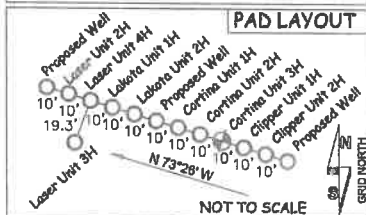
8,428' TO BOTTOM HOLE

LATITUDE 39°22'30"

Antero Resources Corporation Well No. Cortina Unit 3H

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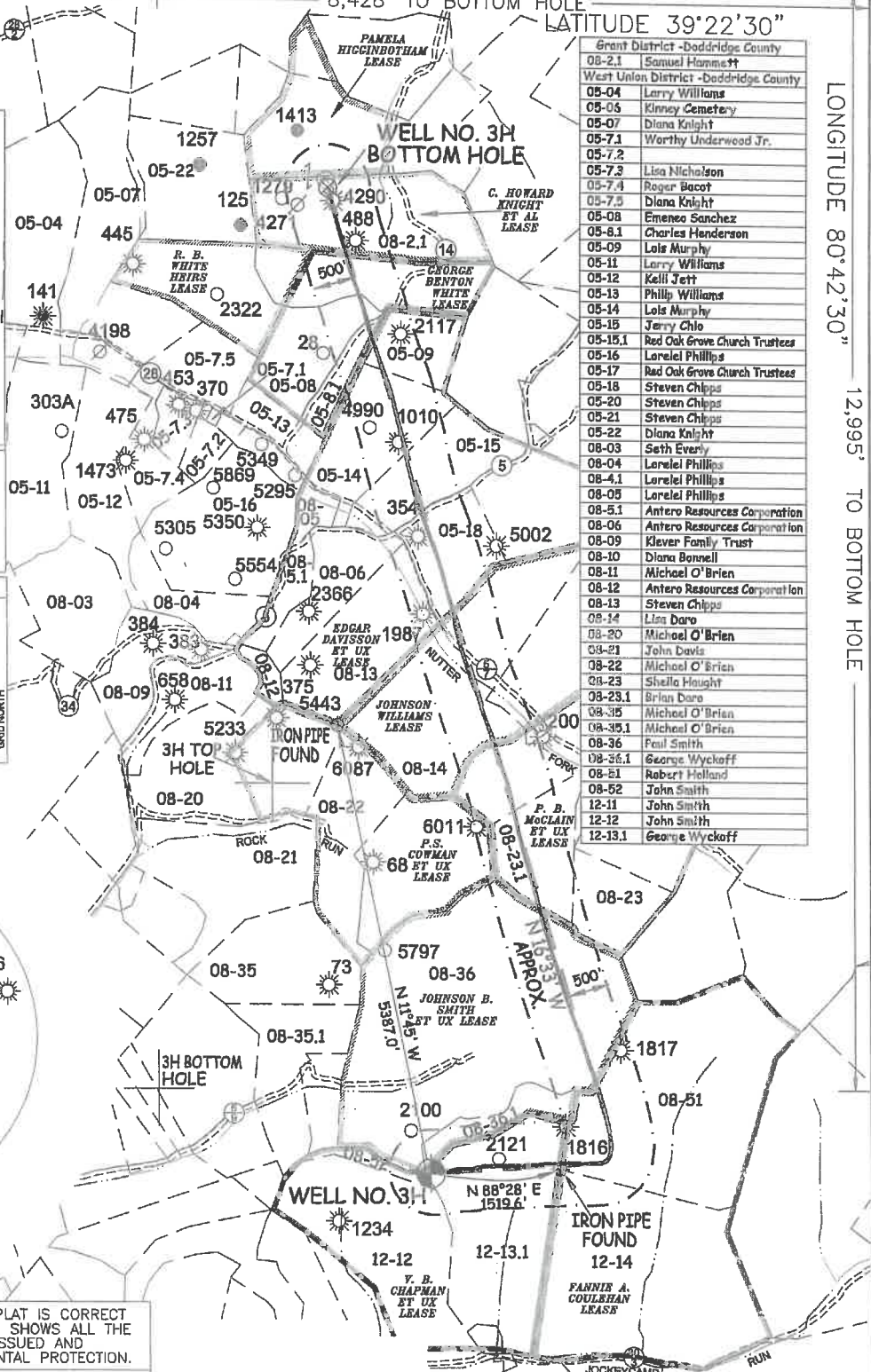
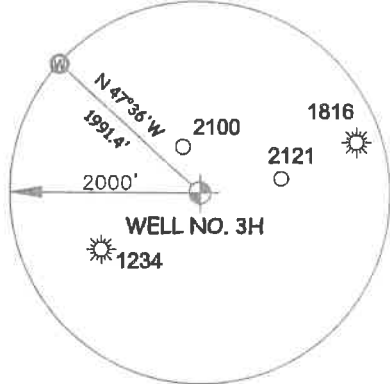


Table listing well numbers and names, including: Grant District - Doddridge County, West Union District - Doddridge County, and various individual well names like Larry Williams, Kinney Cemetery, Diana Knight, etc.

LONGITUDE 80°42'30"

12,995' TO BOTTOM HOLE

9,398'

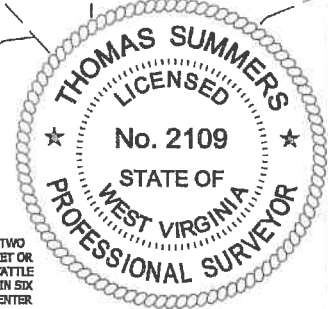
LONGITUDE 80°42'30"

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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



JOB # 18-033WA DRAWING # CORTINA3HAD 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 #3H

- 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 06891 (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+; 234.94 ACRES+; JOHNSON B. SMITH ET UX; P.B. McCLAIN ET UX; JOHNSON WILLIAMS; 180 ACRES+; 200 ACRES+; 105.5 ACRES+; EDGAR DAVISSON ET UX; GEORGE BENTON WHITE; C. HOWARD KNIGHT ET AL 230 ACRES+; 75 ACRES+; 64 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 7,094' TVD 19,058' 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