

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

API 47 - 085 - 10216 County Ritchie District Union  
Quad Pullman 7.5' Pad Name Ireland North Pad Field/Pool Name ----  
Farm name Lynwood Ireland et al Well Number Karen 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 4335958m Easting 508713m  
Landing Point of Curve Northing 4335775.89m Easting 508486.42m  
Bottom Hole Northing 4332248m Easting 509712m

Elevation (ft) 945.5' 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 10/29/2018 Date drilling commenced 6/15/2017 Date drilling ceased 2/3/2019  
Date completion activities began 4/26/2019 Date completion activities ceased 8/18/2019  
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 92', 398', 429' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1509', 1749' 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

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Reviewed by:

DmH  
12-7-20

API 47- 085 - 10216 Farm name Lynwood Ireland et al Well number Karen 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"	110'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	486'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2658'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19215'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6694'		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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	234 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	545 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	915 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	169 sx (Lead) 2489 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)		~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 19270' MD, 6334' TVD (BHL), 6385' (Deepest Point Drilled)      Loggers TD (ft) 19270' MD  
 Deepest formation penetrated Marcellus      Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6000'

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

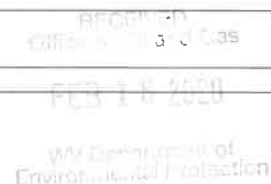
DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

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







**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	5/22/2019	19073	19127	60	Marcellus
2	5/23/2019	18871.562	19041.427	60	Marcellus
3	5/23/2019	18670.124	18839.989	60	Marcellus
4	5/24/2019	18468.686	18638.551	60	Marcellus
5	5/24/2019	18267.248	18437.113	60	Marcellus
6	5/25/2019	18065.81	18235.675	60	Marcellus
7	5/26/2019	17864.372	18034.237	60	Marcellus
8	5/26/2019	17662.934	17832.799	60	Marcellus
9	5/27/2019	17461.496	17631.361	60	Marcellus
10	5/27/2019	17260.058	17429.923	60	Marcellus
11	5/28/2019	17058.62	17228.485	60	Marcellus
12	5/29/2019	16857.182	17027.047	60	Marcellus
13	5/29/2019	16655.744	16825.609	60	Marcellus
14	5/30/2019	16454.306	16624.171	60	Marcellus
15	5/30/2019	16252.868	16422.733	60	Marcellus
16	5/31/2019	16051.43	16221.295	60	Marcellus
17	5/31/2019	15849.992	16019.857	60	Marcellus
18	6/1/2019	15648.554	15818.419	60	Marcellus
19	6/1/2019	15447.116	15616.981	60	Marcellus
20	6/2/2019	15245.678	15415.543	60	Marcellus
21	6/4/2019	15044.24	15214.105	60	Marcellus
22	6/4/2019	14842.802	15012.667	60	Marcellus
23	6/5/2019	14641.364	14811.229	60	Marcellus
24	6/6/2019	14439.926	14609.791	60	Marcellus
25	6/6/2019	14238.488	14408.353	60	Marcellus
26	6/8/2019	14037.05	14206.915	60	Marcellus
27	6/8/2019	13835.612	14005.477	60	Marcellus
28	6/9/2019	13634.174	13804.039	60	Marcellus
29	6/9/2019	13432.736	13602.601	60	Marcellus
30	6/9/2019	13231.298	13401.163	60	Marcellus
31	6/10/2019	13029.86	13199.725	60	Marcellus
32	6/10/2019	12828.422	12998.287	60	Marcellus
33	6/10/2019	12626.984	12796.849	60	Marcellus
34	6/10/2019	12425.546	12595.411	60	Marcellus
35	6/11/2019	12224.108	12393.973	60	Marcellus
36	6/11/2019	12022.67	12192.535	60	Marcellus
37	6/11/2019	11821.232	11991.097	60	Marcellus
38	6/12/2019	11619.794	11789.659	60	Marcellus
39	6/12/2019	11418.356	11588.221	60	Marcellus
40	6/12/2019	11216.918	11386.783	60	Marcellus
41	6/13/2019	11015.48	11185.345	60	Marcellus
42	6/13/2019	10814.042	10983.907	60	Marcellus
43	6/13/2019	10612.604	10782.469	60	Marcellus
44	6/14/2019	10411.166	10581.031	60	Marcellus
45	6/16/2019	10209.728	10379.593	60	Marcellus
46	6/17/2019	10008.29	10178.155	60	Marcellus
47	6/17/2019	9806.852	9976.717	60	Marcellus
48	6/17/2019	9605.414	9775.279	60	Marcellus
49	6/18/2019	9403.976	9573.841	60	Marcellus
50	6/18/2019	9202.538	9372.403	60	Marcellus
51	6/19/2019	9001.1	9170.965	60	Marcellus
52	6/19/2019	8799.662	8969.527	60	Marcellus
53	6/20/2019	8598.224	8768.089	60	Marcellus
54	6/20/2019	8396.786	8566.651	60	Marcellus
55	6/21/2019	8195.348	8365.213	60	Marcellus
56	6/21/2019	7993.91	8163.775	60	Marcellus
57	6/21/2019	7792.472	7962.337	60	Marcellus
58	6/21/2019	7591.034	7760.899	60	Marcellus
59	6/22/2019	7389.596	7559.461	60	Marcellus
60	6/23/2019	7188.158	7358.023	60	Marcellus
61	6/23/2019	6986.72	7156.585	60	Marcellus
62	6/24/2019	6785.282	6955.147	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	5/22/2019	68.5683	7582.621	5569	2292	173700	6123	N/A
2	5/23/2019	74.8884	7593.466	6079	2326	408640	9122	N/A
3	5/23/2019	75.0179	8071.166	6397	2603	408800	8940	N/A
4	5/24/2019	73.1479	7748.503	6690	2350	409100	8889	N/A
5	5/24/2019	71.9656	7830.359	6115	2879	412200	8880	N/A
6	5/25/2019	70.8013	7918.717	6423	3421	411860	9181	N/A
7	5/26/2019	69.5	8040	5704	2872	411820	11078	N/A
8	5/26/2019	76.2335	7909.607	6203	2610	415100	8691.571	N/A
9	5/27/2019	71.2913	7489.183	6310	2764	410580	9247	N/A
10	5/27/2019	76.3447	7914.474	6617	2752	412800	8724	N/A
11	5/28/2019	75.9459	7401.95	5734	2717	413000	8736	N/A
12	5/29/2019	74.2389	7519.871	5585	2711	411520	8678	N/A
13	5/29/2019	73.2827	7407.481	6271	2774	419140	8757	N/A
14	5/30/2019	76.0637	7590.918	3814	2871	411100	8723	N/A
15	5/30/2019	73.0692	7467.279	5658	2817	416160	8740	N/A
16	5/31/2019	65.6669	7965.593	5664	2826	417600	10238	N/A
17	5/31/2019	71.9143	7211.005	5640	2603	419720	8666	N/A
18	6/1/2019	73.0496	7610.148	3261	2688	417400	8673	N/A
19	6/1/2019	72.1376	7567.913	5779	2621	414900	8697	N/A
20	6/2/2019	66.3434	7566.567	8740	4635	406760	8310	N/A
21	6/4/2019	66.6178	7550.898	5744	4742	410800	8798.048	N/A
22	6/4/2019	47.6292	7883.273	6570	4801	182780	10716	N/A
23	6/5/2019	69.8001	7117.903	5705	2802	407820	9104	N/A
24	6/6/2019	66.1702	7321.952	6794	2729	411230	9126	N/A
25	6/6/2019	62.1955	7288.087	6047	2782	407430	8485	N/A
26	6/8/2019	64.7899	7351.46	7402	3054	402620	9049	N/A
27	6/8/2019	67.8215	7372.42	6259	2987	411220	8843	N/A
28	6/9/2019	67.257	7249.247	6390	3105	405500	9869	N/A
29	6/9/2019	67.0034	7065.962	6832	2881	408080	8840	N/A
30	6/9/2019	68.427	7091.998	7039	3101	411177	8802	N/A
31	6/10/2019	71.3779	7052.32	6343	3553	410111	8812	N/A
32	6/10/2019	66.7818	7047.098	6294	3069	406380	8619	N/A
33	6/10/2019	65.8131	7403.55	6582	3328	409064	8520	N/A
34	6/10/2019	72.4168	7087.692	5845	2939	409998	8763	N/A
35	6/11/2019	66.5262	7012.039	6504	3143	407360	8511	N/A
36	6/11/2019	66.2142	7154.693	5648	2977	407418	8526	N/A
37	6/11/2019	71.7245	7099.764	6840	3603	404775	8681	N/A
38	6/12/2019	68.0919	7176.978	6791	3474	402700	8558	N/A
39	6/12/2019	67.2781	7168.771	6242	3189	416000	9029	N/A
40	6/12/2019	72.3892	7137.147	6505	2863	405463	8752	N/A
41	6/13/2019	72.2463	6967.062	6314	3098	407100	8708	N/A
42	6/13/2019	70.5391	6725.737	6199	3166	411700	8490	N/A
43	6/13/2019	73.2172	7176.789	6177	3216	406441	8721	N/A
44	6/14/2019	72.3989	6984.9	6099	3288	404700	11739	N/A
45	6/16/2019	73.6635	7078.106	6862	3365	411716	8718	N/A
46	6/17/2019	71.047	6908.809	5969	3402	406100	8671	N/A
47	6/17/2019	70.0413	6970.336	5888	2766	407000	8701	N/A
48	6/17/2019	72.0434	7134.895	5945	2961	406791	8652	N/A
49	6/18/2019	69.6433	6988.854	6076	2641	411400	8667	N/A
50	6/18/2019	65.328	7148.052	3697	2789	407300	9703	N/A
51	6/19/2019	67.9491	7700.629	6035	4102	107500	6948	N/A
52	6/19/2019	73.8278	6800.359	5800	3073	406330	8559	N/A
53	6/20/2019	73.5554	6746.251	6031	3116	413100	8569	N/A
54	6/20/2019	73.1106	6687.137	6054	2862	412200	8634	N/A
55	6/21/2019	73.7249	6796.231	6047	3462	405880	8564	N/A
56	6/21/2019	72.9549	7109.471	6357	3242	409100	8615	N/A
57	6/21/2019	74.3704	6756.815	5791	3515	409490	8494	N/A
58	6/21/2019	73.346	6739.409	5964	3318	412880	8601	N/A
59	6/22/2019	74.0184	6724.06	6077	3259	411500	8639	N/A
60	6/23/2019	73.2614	6695.582	6073	4561	398100	8852	N/A
61	6/23/2019	73.7702	6689.82	5802	4726	393450	9588	N/A
62	6/24/2019	75.8579	6529.669	5836	3524	411701	8562	N/A
	<b>AVG.</b>	<b>70.0</b>	<b>7,399</b>	<b>6,184</b>	<b>3,053</b>	<b>18,001,483</b>	<b>401,873</b>	<b>TOTAL</b>

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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
Silty Sandstone	65	125	65	125
Sandstone	125	165	125	165
Silty sandstone tr coal	165	525	165	525
Shaly siltstone tr coal	525	685	525	685
Shaly siltstone	685	505	685	505
Silty Sandstone	505	985	505	985
Silty sandstone	985	825	985	825
Silty Sandstone	825	1,105	825	1,105
Siltstone	1,105	1,285	1,105	1,285
Siltstone tr coal	1,285	1,405	1,285	1,405
Sandstone tr coal	1,405	1,525	1,405	1,525
Shaly siltstone tr coal	1,525	1,705	1,525	1,705
Silty sandstone tr coal	1,705	1,879	1,705	1,895
Big Lime	1,894	2,398	1,865	2,399
Fifty Foot Sandstone	2,398	2,612	2,369	2,613
Gordon	2,612	2,887	2,583	2,888
Fifth Sandstone	2,887	2,966	2,858	2,968
Bayard	2,966	3,730	2,938	3,749
Speechley	3,730	3,893	3,719	3,922
Balltown	3,893	4,434	3,892	4,494
Bradford	4,434	4,816	4,464	4,901
Benson	4,816	5,058	4,871	5,157
Alexander	5,058	6,184	5,127	6,395
Sycamore	5,987	6,154	6,152	6,365
Middlesex	6,154	6,262	6,365	6,560
Burkett	6,262	6,298	6,560	6,660
Tully	6,298	6,316	6,660	6,735
Marcellus	6,316	NA	6,735	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.

# ANTERO RESOURCES CORPORATION

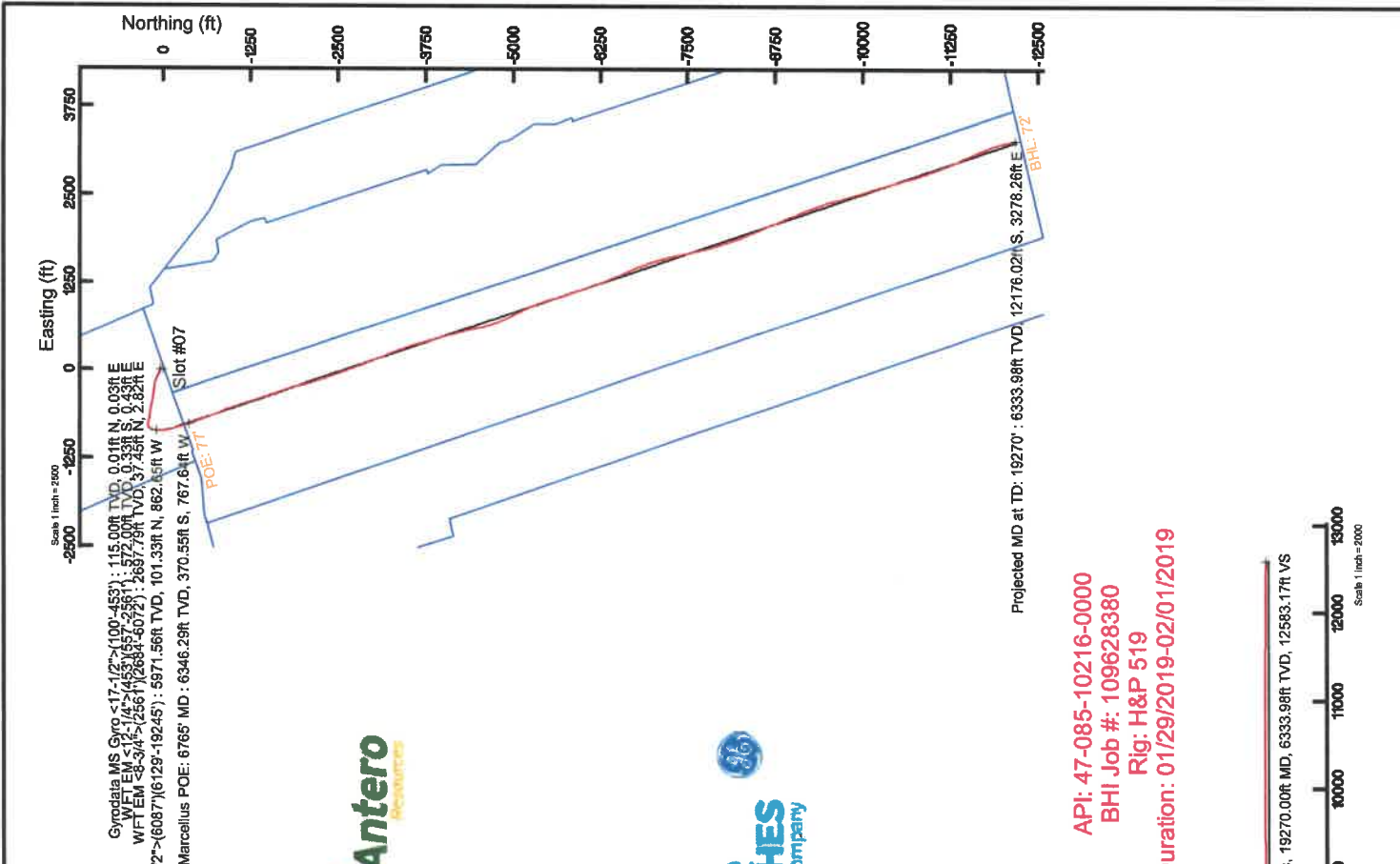
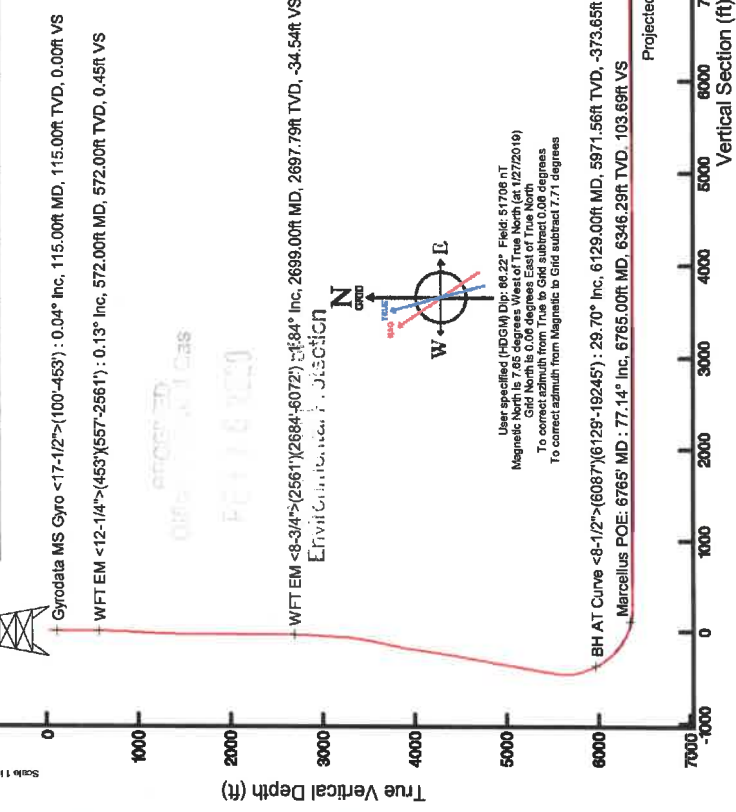
Location: Ritchie County, WV  
 Field: Ritchie  
 Facility: Ireland North Pad  
 Slot: Slot #07  
 Well: Karen Unit 3H  
 Wellbore: Karen Unit 3H PWB

Plot reference wellpath is Karen Unit 3H PWP Rev-A-0  
 True vertical depths are referenced to H&P 519 (RKB)  
 H&P 519 (RKB) to Mean Sea Level: 976.5 feet  
 Mean Sea Level to Ground level (At Slot Slot #07): -945.5 feet  
 Coordinates are in feet referenced to Slot

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Ireland North Pad	1668936.693	14224650.126	80°55'57.720"W
Slot	Local N (ft)	Local E (ft)	Longitude
Slot #07	-8.07	18.91	80°55'57.480"W
H&P 519 (RKB) to Ground level (At Slot Slot #07)	30R		
Mean Sea Level to Ground level (At Slot Slot #07)	-945.5R		
H&P 519 (RKB) to Mean Sea Level	976.5R		

Well Data			
Slot	Well	Wellbore	Wellpath
Slot #07	Karen Unit 3H	Karen Unit 3H AWB	Karen Unit 3H AWP Proj: 19270
Slot #07	Karen Unit 3H	Karen Unit 3H PWB	Karen Unit 3H PWP Rev-A-0

Well Profile Data									
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)	VS (ft)
Tie On	6087.00	27.200	191.500	5934.65	121.05	-859.17	5.80	-381.20	
Proj. To Bottom	6156.00	31.000	185.600	5997.51	86.37	-864.39	6.53	-380.05	
End of 3D Arc	6598.85	82.652	160.410	6297.55	-221.59	-808.56	8.20	-50.51	
POE	6737.73	74.947	161.226	6348.00	-342.65	-788.52	8.50	77.54	
Landing Pl.	6921.68	90.000	161.226	6373.00	-514.75	-707.99	8.50	259.42	
BHL	19255.80	90.000	161.226	6373.00	-12102.45	3261.49	0.00	12593.33	



Gyrodatta MS Gyro <17-1/2>(100-453) : 115.00ft TVD, 0.01ft N, 0.03ft E  
 WFT EM <12-1/4>(453)(557-2561) : 572.00ft TVD, 0.33ft S, 0.43ft E  
 WFT EM <8-3/4>(2561)(2684-6072) : 2697.79ft TVD, 37.49ft N, 2.82ft E  
 BH AT Curve <8-1/2>(6087)(6129-19245) : 5971.56ft TVD, 101.33ft N, 862.46ft W  
 Marcellus POE: 6765' MD : 6346.29ft TVD, 370.55ft S, 767.8ft W



API: 47-085-10216-0000  
 BHI Job #: 109628380  
 Rig: H&P 519  
 Duration: 01/29/2019-02/01/2019

User specified (H&P) Dip: 66.22° Field: 57706 nT  
 Magnetic North to True degrees: West (at 12/20/19)  
 To correct azimuth from True to Grid subtract 0.08 degrees  
 To correct azimuth from Magnetic to Grid subtract 7.71 degrees



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	5/22/2019
Job End Date	6/24/2019
State	West Virginia
County	Ritchie
API Number	47-085-10216-00-00
Operator Name	Antero Resources Corporation
Well Name and Number	Karen 3H
Latitude	39.17272200
Longitude	-80.89930000
Datum	NAD83
Federal Well	NO
Indian Well	NO
True Vertical Depth	6,385
Total Base Water Volume (gal)	23,702,802
Total Base Non Water Volume	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Carrier/Base Fluid	Water	7732-18-5	100.00000	88.55849	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	11.03607	
HCL Acid (12.6%-17.5%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.18513	
			Hydrogen Chloride	7647-01-0	17.50000	0.04304	
CGC-15	J.S. Well Services, LLC	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.05791	
			Petroleum Distillates	64742-47-8	60.00000	0.05484	
			Suspending agent (solid)	14808-60-7	3.00000	0.00886	
			Surfactant	68439-51-0	3.00000	0.00347	
WFR-405	J.S. Well Services, LLC	Friction Reducer	2-Propenoic acid, polymer with propenamide	29003-06-9	30.00000	0.01620	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01304	

SI-1200s	J.S. Well Services, LLC	Scale Inhibitor					
		Water	7732-18-5		98.00000		0.01229
		Sodium Chloride	7647-14-5		10.00000		0.00125
		Sodium Salt of Diethylenetriaminepenta (methylene phosphonic acid)	68155-78-2		10.00000		0.00125
Bioclear 2000	J.S. Well Services, LLC	Anti-Bacterial Agent					
		2,2-dibromo-3-nitropropionamide	10222-01-2		20.00000		0.00419
		Deionized Water	7732-18-5		28.00000		0.00239
AP One	J.S. Well Services, LLC	Gel Breakers					
		Ammonium Persulfate	7727-54-0		100.00000		0.00142
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors					
		Ethylene glycol	107-21-1		40.00000		0.00006
		Formic acid	64-18-6		20.00000		0.00002
		Cinnamaldehyde	104-55-2		20.00000		0.00002
		Butyl cellosolve	111-76-2		20.00000		0.00002
		Polyether	50828-78-6		10.00000		0.00001
		Acetophenone, thiourea, formaldehyde polymer	68527-49-1		5.00000		0.00001

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

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

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

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

RECEIVED  
Office of Oil and Gas

FEB 18 2020

UNITED STATES DEPARTMENT OF  
ENERGY - REGULATORY AFFAIRS DIVISION

LATITUDE 39°12'30"

6,890'

LATITUDE 39°10'00" 3,628' TO BOTTOM HOLE

LONGITUDE 80°52'30"

9,975' TO BOTTOM HOLE

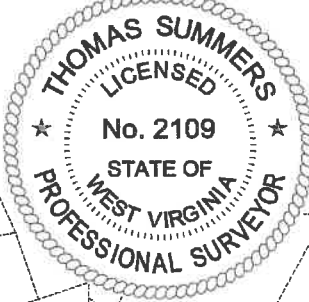
12,971'

LONGITUDE 80°52'30"

Antero Resources Corporation  
Well No. Karen Unit 3H  
47-085-10216

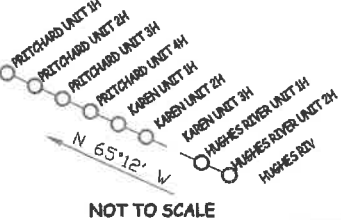
AS DRILLED DATA:  
WELL 3H TOP HOLE INFORMATION:  
N: 248,109ft E: 1,603,295ft  
LAT: 39°10'21.80" LON: 80°53'57.48"  
BOTTOM HOLE INFORMATION:  
N: 235,880ft E: 1,606,369ft  
LAT: 39°08'21.41" LON: 80°53'16.05"  
WEST VIRGINIA COORDINATE  
SYSTEM OF 1927 NORTH ZONE.  
ZONE WAS DERIVED FROM  
MEASUREMENTS 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: 4,335,958m E: 508,713m  
BOTTOM HOLE INFORMATION:  
N: 4,332,248m E: 509,712m



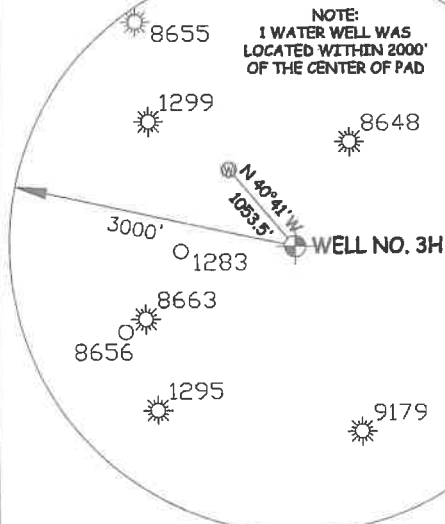
- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY
  3. AS 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.

**PAD LAYOUT**



NOT TO SCALE

NOTE:  
1 WATER WELL WAS  
LOCATED WITHIN 2000'  
OF THE CENTER OF PAD



JOB # 14-127WA  
DRAWING # KAREN3HAD  
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

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

**LEGEND**

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

THOMAS SUMMERS P.S. 2109

DATE 11/20/19  
OPERATOR'S WELL# KAREN UNIT #3H

API WELL # 47 - 085 - 10216  
STATE COUNTY PERMIT

WELL TYPE: OIL GAS  LIQUID INJECTION WASTE DISPOSAL  
(IF "GAS") PRODUCTION  STORAGE DEEP SHALLOW   
LOCATION: ELEVATION 945.5' AS BUILT WATERSHED SOUTH FORK HUGHES RIVER  
QUADRANGLE PULLMAN 7.5 DISTRICT UNION COUNTY RITCHIE  
SURFACE OWNER LYNWOOD IRELAND ET AL

OIL & GAS ROYALTY OWNER BELLE PRITCHARD; W. P. IRELAND ET UX;  
JOYCE E. WEBER; EARL E. FLESHER ET AL; EARL E. FLESHER; ELBERT SHEETS HEIRS;  
YVONNE JOYCE RIGGLEMAN; AI G. KELLEY

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 6,334' TVD 19,270' MD

WELL OPERATOR ANTERO RESOURCES CORP.  
ADDRESS 1615 WYNKOOP STREET  
DENVER, CO 80202

DESIGNATED AGENT DIANNA STAMPER  
ADDRESS CT CORPORATION SYSTEM  
5400 D BIG TYLER ROAD  
CHARLESTON, WV 25313