

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

API 47-085-10154 County Ritchie District Clay
Quad Pullman 7.5' Pad Name Mackay Pad Field/Pool Name ---
Farm name Jack D. Mackay et al Well Number Caldwell 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 4343235m Easting 508878m
Landing Point of Curve Northing 4343393.02m Easting 5088654.70m
Bottom Hole Northing 4346003m Easting 507643m

Elevation (ft) 1100' 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 9/26/2014 Date drilling commenced 4/24/2015 Date drilling ceased 12/5/2015
Date completion activities began 1/29/2016 Date completion activities ceased 9/4/2016
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 434' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 1966' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 301' Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) N

Reviewed by: _____

APPROVED

NAME: Michael Doff
DATE: 5/10/17

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Office of Oil and Gas
MAR 20 2017
No. _____
Department of
Environmental Protection
Reviewed by: _____
AX 05/26/2017
RBDMS 05/23/17

API 47-085 - 10154 Farm name Jack D. Mackay et al Well number Caldwell 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"	40'	New	94#, K-55	N/A	Y
Surface	17- 1/2"	13- 3/8"	516'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2522'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16250'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6658'		4.70#, 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	193 sx	15.6	1.20	38	0	8 Hrs.
Surface	Class A	658 sx	15.6	1.18	358	0	8 Hrs.
Coal							
Intermediate 1	Class A	1151 sx	15.6	1.18	790	0	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	877 sx (Lead) 1515 sx (Tail)	13.5 (Lead) 15.2 (Tail)	1.44 (Lead) 1.83 (Tail)	3260	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16250' MD, 6423' TVD (BHL); 6525' TVD (Deepest point drilled) Loggers TD (ft) 16199' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6160'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (McNabb Unit 1H API# 47-085-10196). Please reference the wireline logs submitted with Form WR-35 for the McNabb Unit 1H. A Cement Bond Log has been included with this submittal.

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 _____

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Environmental Protection

05/26/2017

API 47- 085 - 10154 Farm name Jack D. Mackay et al Well number Caldwell Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6506' (Top)</u> TVD	<u>6723' (Top)</u> MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 13238 mcfpd Oil 91 bpd NGL --- bpd Water 530 bpd GAS MEASURED BY Estimated Orifice Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
	<u>0</u>		<u>0</u>		

*** PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.


Drilling Contractor Precision Drilling Company, LP
Address 2640 Reach Road City Williamsport State PA Zip 17701

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company US Well Services
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Shelby Johnson Telephone (303) 357-7223
Signature  Title Permitting Agent Date 3/17/2017

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

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/29/2016	16033	16160	60	Marcellus
2	6/1/2016	15883	16010	60	Marcellus
3	6/1/2016	15733	15860	60	Marcellus
4	6/2/2016	15584	15710	60	Marcellus
5	6/2/2016	15434	15561	60	Marcellus
6	6/2/2016	15284	15411	60	Marcellus
7	6/3/2016	15134	15261	60	Marcellus
8	6/3/2016	14984	15111	60	Marcellus
9	6/4/2016	14834	14961	60	Marcellus
10	6/4/2016	14685	14811	60	Marcellus
11	6/4/2016	14535	14662	60	Marcellus
12	6/4/2016	14385	14512	60	Marcellus
13	6/4/2016	14235	14362	60	Marcellus
14	6/5/2016	14085	14212	60	Marcellus
15	6/5/2016	13935	14062	60	Marcellus
16	6/5/2016	13786	13912	60	Marcellus
17	6/6/2016	13636	13763	60	Marcellus
18	6/6/2016	13486	13613	60	Marcellus
19	6/6/2016	13336	13463	60	Marcellus
20	6/6/2016	13186	13313	60	Marcellus
21	6/7/2016	13036	13163	60	Marcellus
22	6/26/2016	12887	13013	60	Marcellus
23	6/27/2016	12737	12864	60	Marcellus
24	6/27/2016	12587	12714	60	Marcellus
25	6/27/2016	12437	12564	60	Marcellus
26	6/27/2016	12287	12414	60	Marcellus
27	6/27/2016	12137	12264	60	Marcellus
28	6/28/2016	11988	12114	60	Marcellus
29	6/28/2016	11838	11965	60	Marcellus
30	6/28/2016	11688	11815	60	Marcellus
31	6/28/2016	11538	11665	60	Marcellus
32	6/29/2016	11388	11515	60	Marcellus
33	6/29/2016	11238	11365	60	Marcellus
34	6/29/2016	11088	11215	60	Marcellus
35	6/29/2016	10939	11066	60	Marcellus
36	6/30/2016	10789	10916	60	Marcellus
37	6/30/2016	10639	10766	60	Marcellus
38	6/30/2016	10489	10616	60	Marcellus
39	6/30/2016	10339	10466	60	Marcellus
40	6/30/2016	10189	10316	60	Marcellus
41	7/1/2016	10040	10166	60	Marcellus
42	7/1/2016	9890	10017	60	Marcellus
43	7/1/2016	9740	9867	60	Marcellus
44	7/1/2016	9590	9717	60	Marcellus
45	7/2/2016	9440	9567	60	Marcellus
46	7/2/2016	9290	9417	60	Marcellus
47	7/3/2016	9141	9267	60	Marcellus
48	7/3/2016	8991	9118	60	Marcellus
49	7/3/2016	8841	8968	60	Marcellus
50	7/3/2016	8691	8818	60	Marcellus
51	7/3/2016	8541	8668	60	Marcellus
52	7/3/2016	8391	8518	60	Marcellus
53	7/4/2016	8242	8368	60	Marcellus
54	7/4/2016	8092	8219	60	Marcellus
55	7/4/2016	7942	8069	60	Marcellus
56	7/4/2016	7792	7919	60	Marcellus
57	7/4/2016	7642	7769	60	Marcellus
58	7/4/2016	7492	7619	60	Marcellus
59	7/5/2016	7343	7469	60	Marcellus
60	7/5/2016	7193	7320	60	Marcellus
61	7/5/2016	7043	7170	60	Marcellus
62	7/5/2016	6893	7020	60	Marcellus
63	7/5/2016	6743	6870	60	Marcellus

EXHIBIT 2									
API 47-085-10154 Farm Name Jack D. Mackay et al Well Number Caldwell Unit 1H									
Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)	
1	6/1/2016	68	7076	5695	4803	201420	7784	N/A	7784
2	6/1/2016	69	7064	6511	3710	234040	6527	N/A	6527
3	6/1/2016	71.9	7019	5953	3914	235060	6478	N/A	6478
4	6/2/2016	69.1	7036	6956	4511	234630	6550	N/A	6550
5	6/2/2016	68	6834	6550	4948	232762	7424	N/A	7424
6	6/2/2016	71	7044	6273	5001	234700	6512	N/A	6512
7	6/3/2016	71	7044	6425	4121	234988	6455	N/A	6455
8	6/3/2016	69.4	7089	6463	3883	235150	6430	N/A	6430
9	6/4/2016	72.2	7355	6106	3988	237321	6458	N/A	6458
10	6/4/2016	70	7151	6411	4473	235400	6462	N/A	6462
11	6/4/2016	71	6974	6611	4715	235380	6417	N/A	6417
12	6/4/2016	69.1	6991	6034	4053	235950	6388	N/A	6388
13	6/4/2016	74.2	7537	6206	4278	235650	6501	N/A	6501
14	6/5/2016	69	7014	5927	4586	234530	6367	N/A	6367
15	6/5/2016	70	7204	6708	4983	235610	6420	N/A	6420
16	6/5/2016	71.1	6961	5662	4588	235000	6354	N/A	6354
17	6/6/2016	71.4	6816	5422	4573	234640	6350	N/A	6350
18	6/6/2016	71	6801	5959	5093	234640	6361	N/A	6361
19	6/6/2016	70	6992	5912	3951	235720	6376	N/A	6376
20	6/6/2016	59	7041	6051	4952	189730	7158	N/A	7158
21	6/7/2016	69.6	7434	6425	5256	173760	7537	N/A	7537
22	6/26/2016	71	7485	7186	5143	215650	6844	N/A	6844
23	6/27/2016	67	7141	6249	4817	235390	7176	N/A	7176
24	6/27/2016	68.6	7159	5849	4640	235400	6306	N/A	6306
25	6/27/2016	71.1	7094	6122	4399	234770	6247	N/A	6247
26	6/27/2016	70	7142	5816	4972	235000	6242	N/A	6242
27	6/27/2016	70	6901	5695	5246	234850	6258	N/A	6258
28	6/28/2016	71.6	6990	6308	5260	234830	6196	N/A	6196
29	6/28/2016	70.8	6777	6270	4639	235220	6216	N/A	6216
30	6/28/2016	71.4	6865	5658	5254	235140	6192	N/A	6192
31	6/28/2016	71	6944	6825	4562	234810	7074	N/A	7074
32	6/29/2016	70	6865	6344	5129	234690	6204	N/A	6204
33	6/29/2016	72.9	6908	5556	5314	234960	6159	N/A	6159
34	6/29/2016	71.7	7108	6710	5463	234390	6154	N/A	6154
35	6/29/2016	71	7011	5664	5415	234450	6139	N/A	6139
36	6/30/2016	71	6847	5567	5170	234580	6131	N/A	6131
37	6/30/2016	70.1	6949	6399	4568	236170	6158	N/A	6158
38	6/30/2016	71.7	6891	5926	4863	236060	6153	N/A	6153
39	6/30/2016	73.3	7053	5988	5361	234650	6189	N/A	6189
40	6/30/2016	73	6929	5793	5200	234670	6115	N/A	6115
41	7/1/2016	73	6933	5780	5175	228250	6036	N/A	6036
42	7/1/2016	72	6875	6141	5596	237110	6125	N/A	6125
43	7/1/2016	71.5	6903	5758	5363	236850	6094	N/A	6094
44	7/1/2016	71	6906	5819	4597	235070	6114	N/A	6114
45	7/2/2016	71	6886	5612	5088	233030	6087	N/A	6087
46	7/2/2016	71.4	6677	5748	4954	236580	6073	N/A	6073
47	7/3/2016	74	7131	5669	4812	235850	6779	N/A	6779
48	7/3/2016	72	6717	5894	4031	236600	6032	N/A	6032
49	7/3/2016	71.7	7026	5804	4565	236690	6044	N/A	6044
50	7/3/2016	72.7	6607	5854	4947	236880	6047	N/A	6047
51	7/3/2016	72.9	6896	5966	4857	237400	6045	N/A	6045
52	7/3/2016	72	6932	6421	4367	235950	5991	N/A	5991
53	7/4/2016	72	6863	6190	4054	232200	5918	N/A	5918
54	7/4/2016	72	6903	6252	3969	234550	5965	N/A	5965
55	7/4/2016	71	6832	5592	3884	234600	5956	N/A	5956
56	7/4/2016	69	6527	5643	4125	235200	5959	N/A	5959
57	7/4/2016	72.7	6853	5964	4404	199700	5921	N/A	5921
58	7/4/2016	73	6554	5519	4829	234250	6079	N/A	6079
59	7/5/2016	73	6347	5870	5245	234250	5907	N/A	5907
60	7/5/2016	72.7	6667	6107	4552	233250	5899	N/A	5899
61	7/5/2016	69.7	6729	5637	5004	234600	5903	N/A	5903
62	7/5/2016	72.6	6623	5493	5110	234200	5879	N/A	5879
63	7/5/2016	66.5	7004	6982	4575	212200	7129	N/A	7129
AVG=									
70.8									
6,950									
6,052									
4,729									
14,587,021									
399,444									
TOTAL									

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	434'	N/A	434'	N/A
Shale	0	201	0	201
Sandstone	est. 201	281	est. 201	281
Siltstone	est. 281	301	est. 281	301
Coal "Washington Coal"	est. 301	361	est. 301	361
Sandstone	est. 361	581	est. 361	581
Shale	est. 581	1,241	est. 581	1,241
Sandstone	est. 1241	1,321	est. 1241	1,321
Siltstone/ sandstone	est. 1321	1,401	est. 1321	1,401
Sandstone	est. 1401	1,721	est. 1401	1,721
Shale	est. 1721	1,821	est. 1721	1,821
Siltstone	est. 1821	1,981	est. 1821	1,981
Limestone	est. 1981	2,098	est. 1981	2,101
Big Lime	2,098	2,982	2,101	2,985
Fifty Foot Sandstone	2,982	2,827	2,985	2,830
Gordon	2,827	2,982	2,830	2,985
Fifth Sandstone	2,982	3,110	2,985	3,113
Bayard	3,110	3,934	3,113	3,938
Speechley	3,934	4,197	3,938	4,200
Baltown	4,197	4,642	4,200	4,645
Bradford	4,642	5,031	4,645	5,035
Benson	5,031	5,280	5,035	5,284
Alexander	5,280	6,189	5,284	6,216
Sycamore	6,189	6,347	6,216	6,410
Middlesex	6,347	6,454	6,410	6,587
Burkett	6,454	6,484	6,587	6,656
Tully	6,484	6,506	6,656	6,723
Marcellus	6,506	NA	6,723	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.

Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	6/1/2016
Job End Date:	7/15/2016
State:	West Virginia
County:	Ritchie
API Number:	47-085-10154-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Caldwell 1H
Latitude:	39.23837500
Longitude:	-80.89712800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,525
Total Base Water Volume (gal):	17,483,540
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	Base Fluid	Water	7732-18-5	100.00000	90.52198	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	9.05577	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.16067	
			Hydrogen Chloride	7647-01-0	18.00000	0.03838	
LGC-15	U.S. Well Services	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.05886	
			Petroleum Distillates	64742-47-8	60.00000	0.05574	
			Suspending agent (solid)	14808-60-7	3.00000	0.00900	
			Surfactant	68439-51-0	3.00000	0.00353	
WFRA-405	U.S. Well Services	Friction Reducer	Water	7732-18-5	60.00000	0.03548	
			2-Propenoic acid, polymer with 2-propenamide	9003-06-9	30.00000	0.01774	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01428	

			Ethoxylated alcohol blend	68002-97-1	4.00000	0.00237
SI-1100s	U.S. Well Services	Scale Inhibitor				
			Water	7732-18-5	80.00000	0.01026
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00151
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00130
			Hexamethylene triamine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00083
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00083
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033
BIOCLEAR 2000	U.S. Well Services	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	30.00000	0.00644
			Deionized Water	7732-18-5	28.00000	0.00245
AP One	U.S. Well Services	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00183
AI-302	U.S. Well Services	Acid Corrosion Inhibitors				
			Water	7732-18-5	95.00000	0.00035
			2-Propyn-1-ol compound with methyloxirane	38172-91-7	15.00000	0.00006

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)

LATITUDE 39°15'00"

6,316'

10,358' TO BOTTOM HOLE

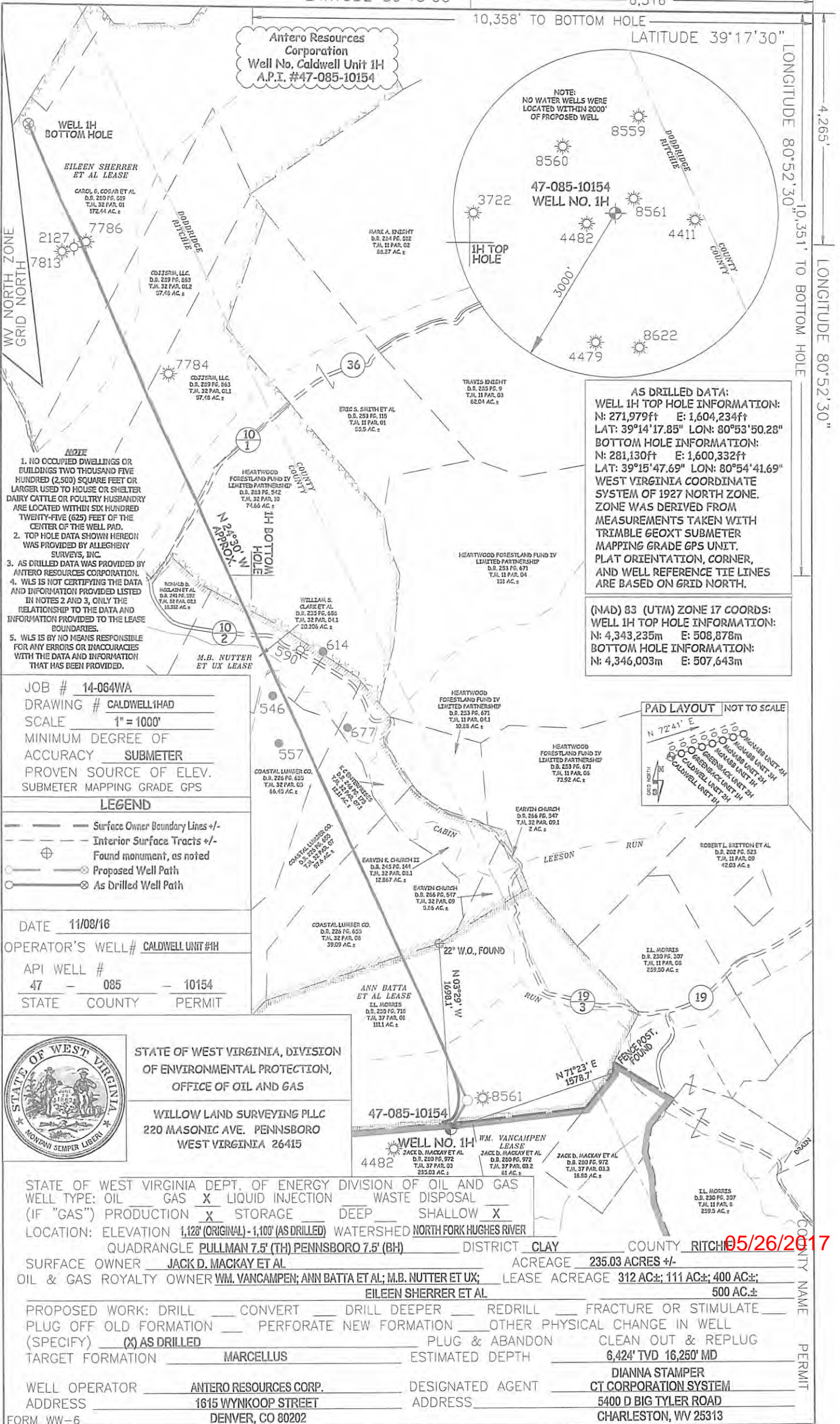
LATITUDE 39°17'30"

LONGITUDE 80°52'30"

4,265'

10,351' TO BOTTOM HOLE

LONGITUDE 80°52'30"



AS DRILLED DATA:

WELL 1H TOP HOLE INFORMATION:
 N: 271,979ft E: 1,604,234ft
 LAT: 39°15'17.85" LON: 80°53'50.28"

BOTTOM HOLE INFORMATION:
 N: 281,130ft E: 1,600,332ft
 LAT: 39°15'47.69" LON: 80°54'41.69"

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: 4,343,235m E: 508,878m

BOTTOM HOLE INFORMATION:
 N: 4,346,003m E: 507,643m

- 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 FOULTRY 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 ALLEGHENY SURVEYS, INC.
 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.

JOB # 14-064WA
 DRAWING # CALDWELL1HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 11/08/16
 OPERATOR'S WELL# CALDWELL UNIT #1H
 API WELL # 47 - 085 - 10154
 STATE COUNTY PERMIT



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,128' (ORIGINAL) - 1,100' (AS DRILLED) WATERSHED NORTH FORK HUGHES RIVER
 QUADRANGLE PULLMAN 7.5' (TH) PENNSBORO 7.5' (BH) DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER JACK D. MACKAY ET AL ACREAGE 235.03 ACRES +/-
 OIL & GAS ROYALTY OWNER WM. VANCAMPEN; ANN BATTA ET AL; M.B. NUTTER ET UX; LEASE ACREAGE 312 AC±; 111 AC±; 400 AC±;
 EILEEN SHERRER ET AL 500 AC±

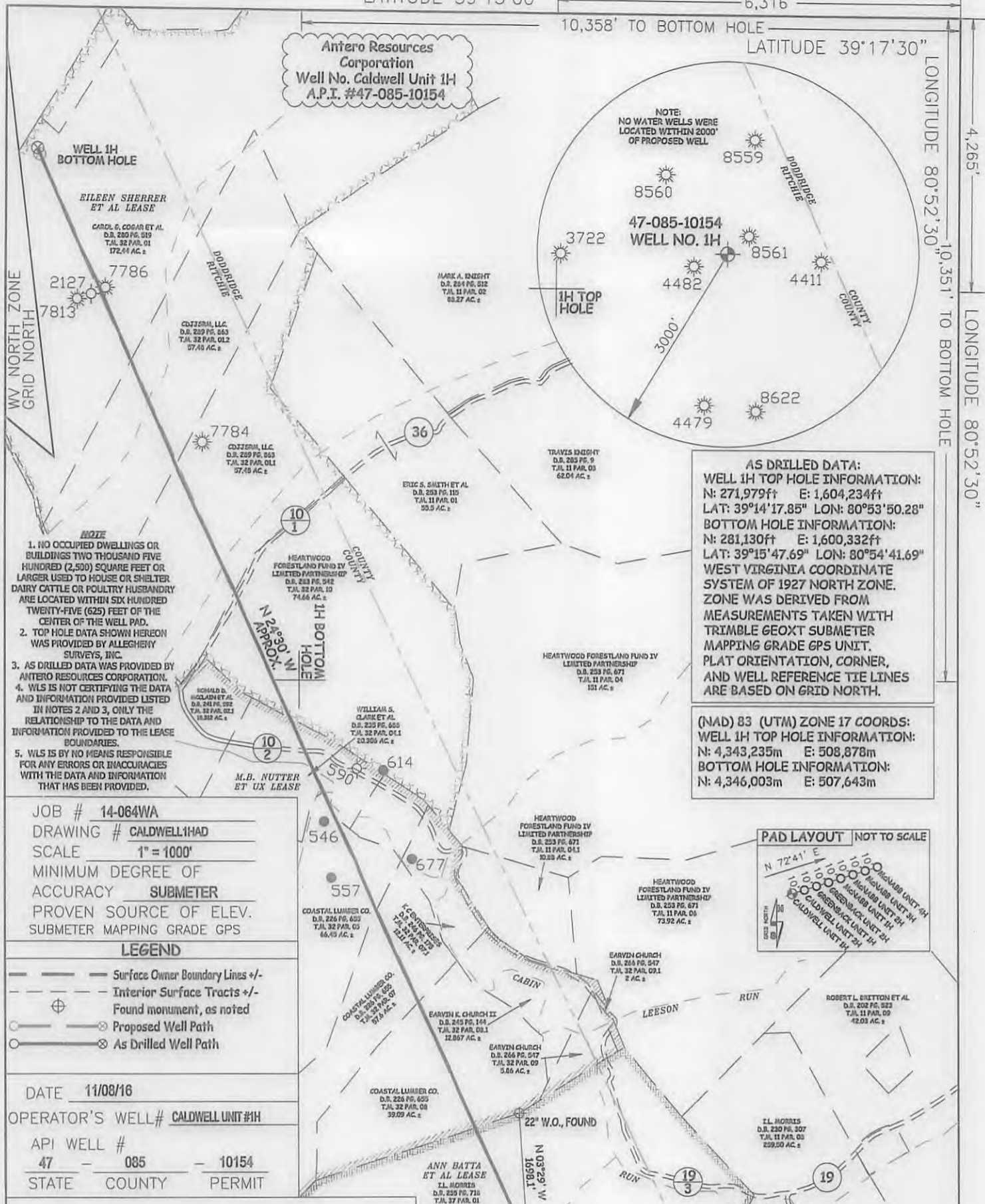
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,424' TVD 16,250' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313

05/26/2017

LATITUDE 39°15'00" 6,316'
 10,358' TO BOTTOM HOLE
 LATITUDE 39°17'30" 4,265'
 LONGITUDE 80°52'30" 10,351' TO BOTTOM HOLE
 LONGITUDE 80°52'30"

Antero Resources Corporation
 Well No. Caldwell Unit 1H
 A.P.I. #47-085-10154



AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
 N: 271,979ft E: 1,604,234ft
 LAT: 39°14'17.85" LON: 80°53'50.28"
BOTTOM HOLE INFORMATION:
 N: 281,130ft E: 1,600,332ft
 LAT: 39°15'47.69" LON: 80°54'41.69"
 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.

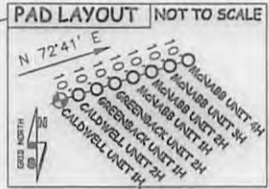
(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
 N: 4,343,235m E: 508,878m
BOTTOM HOLE INFORMATION:
 N: 4,346,003m E: 507,643m

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