

WR-35  
Rev. 8/23/13

Reviewed

11/09/2018  
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State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

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WV Department of  
Environmental Protection

API 47 - 017 - 06761 County Doddridge District Central  
Quad West Union 7.5' Pad Name Long Run Pad Field/Pool Name -----  
Farm name Richard F. McCullough, et al Well Number Hugle 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 4350117m Easting 511746m  
Landing Point of Curve Northing 4349814.25m Easting 511658.33m  
Bottom Hole Northing 4347729m Easting 512344m

Elevation (ft) 1021' 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 11/30/2015 Date drilling commenced 12/16/2016 Date drilling ceased 3/29/2017  
Date completion activities began 6/17/2017 Date completion activities ceased 11/1/2017  
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 53' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 884' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:  
\_\_\_\_\_

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API 47-017 - 06761 Farm name Richard F. McCullough, et al Well number Hugle 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"	65'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	508'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2530'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15138'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6368'		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	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	597 sx	15.6	1.19	710	0'	8 Hrs.
Coal							
Intermediate 1	Class A	982 sx	15.6	1.18	1159	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	747 sx (Lead) 1219 sx (Tail)	13.50 (Lead), 15.20 (Tail)	1.56 (Lead), 1.83 (Tail)	3396	~500' Into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15138' MD, 6537' TVD (BHL), 6537' (Deepest Point Drilled) Loggers TD (ft) 15138' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

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Kick off depth (ft) 6005'

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

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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 - 06761 Farm name Richard F. McCullough, et al Well number Hugle Unit 1H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6435' (TOP)	TVD	6750' (TOP) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3100 psi Bottom Hole -- psi DURATION OF TEST -- hrs

OPEN FLOW Gas 11821 mcfpd Oil 53 bpd NGL -- bpd Water 15 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 <sub>2</sub> S, ETC)
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**\*PLEASE SEE ATTACHED EXHIBIT 3**

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					Environmental Protection

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC  
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Pro Oil & Gas Services LLC  
Address 3035 Lynnwood Drive City Hermitage State PA Zip 16148

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 Mallory Stanton Telephone 303-357-7182  
Signature \_\_\_\_\_ Title Permitting Supervisor Date 4/27/2018

API 47-017-06761 Farm Name <u>Richard F. McCullough et al</u> Well Number <u>Hugle Unit 1H</u>					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/11/2017	14866	15036	60	Marcellus
2	9/11/2017	14663	14834	60	Marcellus
3	9/11/2017	14461	14632	60	Marcellus
4	9/12/2017	14259	14429	60	Marcellus
5	9/12/2017	14056	14227	60	Marcellus
6	9/12/2017	13854	14024	60	Marcellus
7	9/13/2017	13651	13822	60	Marcellus
8	9/13/2017	13449	13620	60	Marcellus
9	9/14/2017	13247	13417	60	Marcellus
10	9/14/2017	13044	13215	60	Marcellus
11	9/14/2017	12842	13013	60	Marcellus
12	9/14/2017	12639	12810	60	Marcellus
13	9/14/2017	12437	12608	60	Marcellus
14	9/15/2017	12235	12405	60	Marcellus
15	9/15/2017	12032	12203	60	Marcellus
16	9/16/2017	11830	12001	60	Marcellus
17	9/16/2017	11628	11798	60	Marcellus
18	9/16/2017	11425	11596	60	Marcellus
19	9/17/2017	11223	11393	60	Marcellus
20	9/17/2017	11020	11191	60	Marcellus
21	9/17/2017	10818	10989	60	Marcellus
22	9/18/2017	10616	10786	60	Marcellus
23	9/18/2017	10413	10584	60	Marcellus
24	9/18/2017	10211	10382	60	Marcellus
25	9/19/2017	10009	10179	60	Marcellus
26	9/19/2017	9806	9977	60	Marcellus
27	9/19/2017	9604	9774	60	Marcellus
28	9/20/2017	9401	9572	60	Marcellus
29	9/20/2017	9199	9370	60	Marcellus
30	9/20/2017	8997	9167	60	Marcellus
31	9/21/2017	8794	8965	60	Marcellus
32	9/21/2017	8592	8763	60	Marcellus
33	9/21/2017	8389	8560	60	Marcellus
34	9/22/2017	8187	8358	60	Marcellus
35	9/22/2017	7985	8155	60	Marcellus
36	9/22/2017	7782	7953	60	Marcellus
37	9/23/2017	7580	7751	60	Marcellus
38	9/23/2017	7378	7548	60	Marcellus
39	9/23/2017	7175	7346	60	Marcellus
40	9/23/2017	6973	7143	60	Marcellus
41	9/24/2017	6770	6941	60	Marcellus

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## API 47-017-06761 Farm Name Richard F. McCullough et al Well Number Huggle Unit 1H

## 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	9/11/2017	78.2	7263	6740	4504	407950	8751	N/A
2	9/11/2017	76.7	7285	5637	4534	407550	8854	N/A
3	9/11/2017	73.9	7007	5439	4292	407750	8605	N/A
4	9/12/2017	74.2	7036	6038	4006	409000	8928	N/A
5	9/12/2017	74.5	7142	6209	4202	407150	8946	N/A
6	9/12/2017	77.8	7491	6082	3554	407600	10178	N/A
7	9/13/2017	78.6	7177	5986	3903	408000	8625	N/A
8	9/13/2017	72.7	7237	6260	3756	407900	8576	N/A
9	9/14/2017	73.4	7849	5836	4209	407900	11029	N/A
10	9/14/2017	74.6	7193	5980	4010	408700	8679	N/A
11	9/14/2017	75.7	6923	5837	3955	408500	8647	N/A
12	9/14/2017	78.3	7342	6068	4486	407850	8508	N/A
13	9/14/2017	78.2	7429	6079	5496	408250	8532	N/A
14	9/15/2017	73.8	7290	5981	4084	407600	8547	N/A
15	9/15/2017	76.5	7455	5619	3790	408650	8469	N/A
16	9/16/2017	77.3	7153	5747	4876	408500	8651	N/A
17	9/16/2017	77.2	7132	5685	4792	396100	8389	N/A
18	9/16/2017	76	7228	5390	4292	412950	10091	N/A
19	9/17/2017	79.2	7362	5465	5886	408450	8386	N/A
20	9/17/2017	76.7	7034	5694	3981	408600	8413	N/A
21	9/17/2017	78.2	6683	6380	4008	408850	8428	N/A
22	9/18/2017	74.2	7193	6147	4134	408050	8610	N/A
23	9/18/2017	78.1	6653	5687	5165	409000	8406	N/A
24	9/18/2017	77.3	6559	6407	3968	409750	8400	N/A
25	9/19/2017	77.7	6817	6122	3830	408550	8374	N/A
26	9/19/2017	79	6527	6514	4411	404400	8277	N/A
27	9/19/2017	77.5	6945	6067	4022	408650	8365	N/A
28	9/20/2017	76.1	6721	5468	4567	408800	8221	N/A
29	9/20/2017	78	6366	5476	3904	408350	8315	N/A
30	9/20/2017	77	6138	5834	3977	409950	8372	N/A
31	9/21/2017	78.7	6589	6656	4057	408500	8323	N/A
32	9/21/2017	79.1	6768	6175	4073	408450	8461	N/A
33	9/21/2017	64.4	6188	5220	4331	409450	10631	N/A
34	9/22/2017	78.4	6123	4962	4331	408350	8432	N/A
35	9/22/2017	75.4	6553	5316	5031	408800	8435	N/A
36	9/22/2017	77.5	6517	5061	3823	408750	8337	N/A
37	9/23/2017	70	7183	5211	5092	410700	10359	N/A
38	9/23/2017	76.5	6973	5975	4071	FALSE	9048	N/A
39	9/23/2017	78.7	7003	7447	5427	384300	9622	N/A
40	9/23/2017	79.5	6284	5225	4839	378370	8329	N/A
41	9/24/2017	79.2	5907	4952	3712	382990	8214	N/A
	AVG=	76.7	7,031	5,960	4,273	13,056,250	278,356	TOTAL

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API 47-017-06761 Farm Name Richard F. McCullough et al Well Number Hugel Unit 1H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	53'	N/A	N/A	N/A
Sandy siltstone	0	80	0	67
Silty sandstone	80	120	80	107
Sandy siltstone	120	400	120	387
Silty sandstone (tr coal)	400	600	400	587
Sandy shale	600	640	600	627
Silty limestone	640	720	640	707
Silty shale	720	800	720	787
Siltstone	800	880	800	867
Sandstone	880	960	880	947
Shaly sandstone	960	1,080	960	1,067
Silty sandstone (tr coal)	1,080	1,280	1,080	1,267
Silty shale	1,280	1,520	1,280	1,507
Sandy shale (tr coal)	1,520	1,690	1,520	1,677
Shaly sandstone	1,690	1,740	1,690	1,727
Silty shale	1,740	1,873	1,740	1,870
Big Lime	1,866	2,557	1,870	2,561
Fifty Foot Sandstone	2,556	2,640	2,561	2,664
Gordon	2,659	3,154	2,664	3,160
Fifth Sandstone	3,151	3,208	3,160	3,218
Bayard	3,208	3,687	3,218	3,738
Speechley	3,707	4,002	3,738	4,045
Baltown	4,004	4,488	4,045	4,554
Bradford	4,488	4,895	4,554	4,972
Benson	4,890	5,155	4,972	5,245
Alexander	5,153	5,765	5,245	5,852
Rhinstreet	5,740	6,099	5,852	6,196
Sycamore	6,096	6,261	6,220	6,384
Middlesex	6,255	6,383	6,408	6,576
Burkett	6,377	6,411	6,600	6,641
Tully	6,405	6,442	6,665	6,726
Marcellus	6,435	NA	6,750	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:	9/11/2017
Job End Date:	9/24/2017
State:	West Virginia
County:	Doddridge
API Number:	47-017-06761-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Hugle Unit 1H
Latitude:	39.30034700
Longitude:	-80.86377500
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,534
Total Base Water Volume (gal):	15,580,115
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	Supplied by Operator	Base Fluid					
			Water	7732-18-5	70.00000	88.19703	
DAP-103	CWS	Iron Control					
				Listed Below			



Hydrochloric Acid	CWS	Clean Perforations					
				Listed Below			
DWP-641	CWS	Friction Reducer					
				Listed Below			
Calbreak 5501	CWS	Breaker					
				Listed Below			
Sand (Proppant)	CWS	Propping Agent					
				Listed Below			
CI-9100G	CWS	Corrosion Inhibitor					
				Listed Below			
DWP-111	CWS	Gel Slurry					
				Listed Below			
SANIFRAC 8844	CWS	Biocide					
				Listed Below			
DAP-902	CWS	Scale Inhibitor					
				Listed Below			
Other Chemical (s)	Listed Above	See Trade Name (s) List					

				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	11.40843	
			Calcite	471-34-1	1.00000	0.08785	
			Hydrochloric acid	7647-01-0	37.00000	0.05402	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.04628	
			Guar gum	9000-30-0	60.00000	0.04628	
			Polymer	26100-47-0	45.00000	0.02811	
			Illite	12173-60-3	1.00000	0.02620	
			Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01874	
			Ammonium Persulfate	64742-47-8	100.00000	0.01191	
			Biotite	1302-27-8	0.10000	0.01140	
			Goethite	1310-14-1	0.10000	0.01140	
			Apatite	64476-38-6	0.10000	0.01140	
			Ammonium chloride	12125-02-9	11.00000	0.00687	
			Polyethylene glycol mixture	25322-68-3	54.50000	0.00617	
			2-Propenoic acid, homopolymer, sodium salt	9003-04-7	40.00000	0.00611	
			Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00386	
			Ilmenite	98072-94-7	0.10000	0.00262	
			Sorbitan monooleate	1338-43-8	4.00000	0.00250	
			Vinylidene chloride-methyl acrylate copolymer	69418-26-4	20.00000	0.00238	
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	20.00000	0.00226	
			Polyethylene glycol monooleate	9004-96-0	3.00000	0.00187	

			1,2-Propanediol	57-55-6	10.00000	0.00153	
			Sorbitol tetraoleate	61723-83-9	2.00000	0.00125	
			Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00116	
			Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00062	
			Citric acid	77-92-9	60.00000	0.00049	
			Sodium bromide	7647-15-6	4.00000	0.00045	
			Dibromoacetonitrile	3252-43-5	3.00000	0.00034	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00031	
			Acrylamide	79-06-1	0.10000	0.00006	
			Ethylene glycol	107-21-1	40.00000	0.00003	
			Diethylene glycol (mono) methyl ether	34590-94-8	20.00000	0.00002	
			Formic Acid	64-18-6	10.00000	0.00001	
			Tar bases, quinolone derivs	68513-87-1	1.00000	0.00001	
			Ethoxylated alcohols	Proprietary	10.00000	0.00001	Proprietary CAS
			Tar bases, quinolone derivs, benzyl chloride- quatenized	72480-70-7	10.00000	0.00001	
			Cinnamaldehyde	104-55-2	10.00000	0.00001	
			Isopropanol	67-63-0	5.00000	0.00001	
			Diethylene glycol	111-46-6	1.00000	0.00001	

\* 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)

LATITUDE 39°20'00"

8,664'

6,714' TO BOTTOM HOLE

LATITUDE 39°17'30"

LONGITUDE 80°50'00"

4,706' TO BOTTOM HOLE

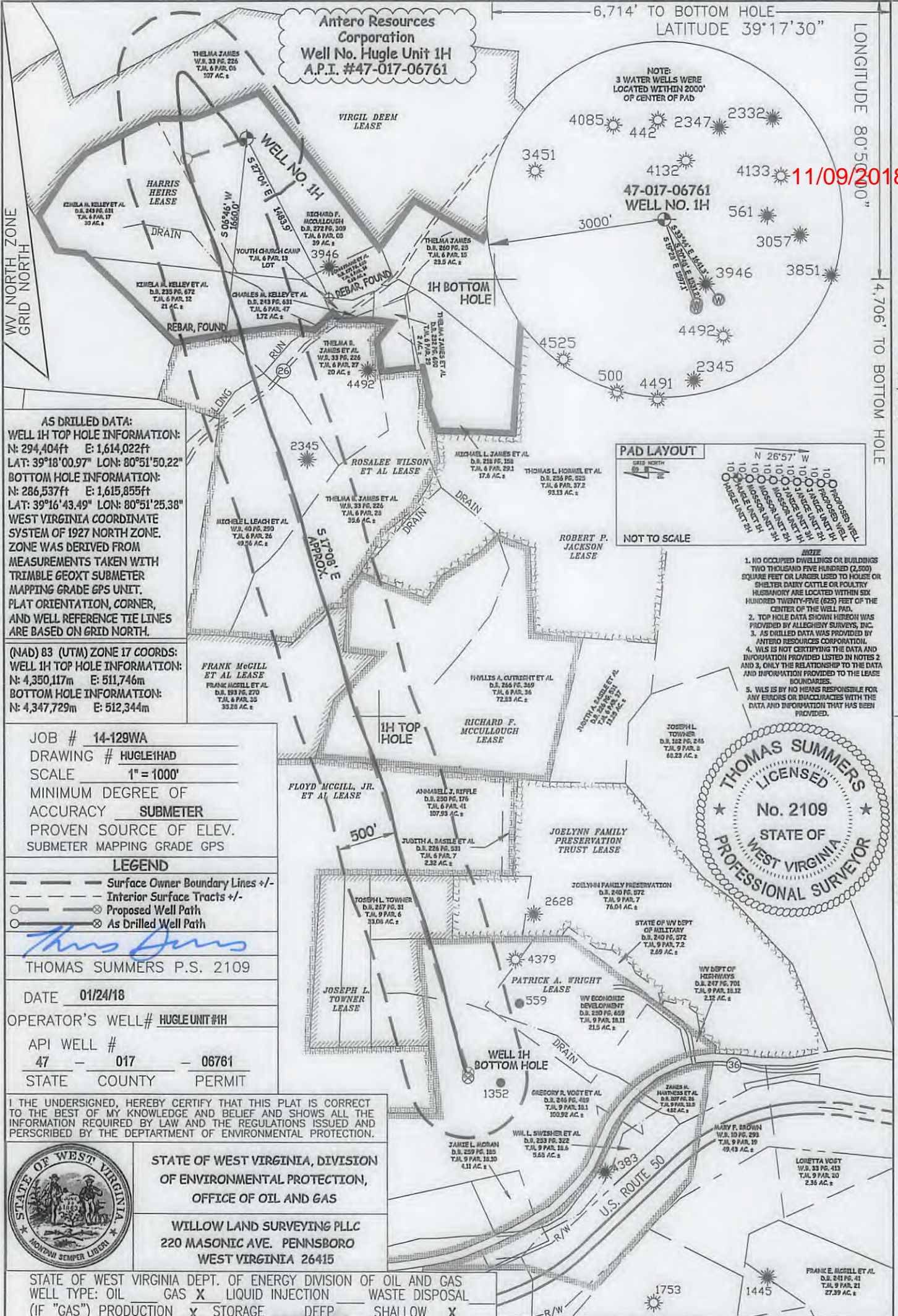
12,043'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Hugel Unit 1H  
A.P.I. #47-017-06761

NOTE:  
3 WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF CENTER OF PAD

11/09/2018



AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 294,404ft E: 1,614,022ft  
LAT: 39°18'00.97" LON: 80°51'50.22"  
BOTTOM HOLE INFORMATION:  
N: 286,537ft E: 1,615,855ft  
LAT: 39°16'43.49" LON: 80°51'25.38"  
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: 4,350,117m E: 511,746m  
BOTTOM HOLE INFORMATION:  
N: 4,347,729m E: 512,344m

JOB # 14-129WA  
DRAWING # HUGLE1HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF  
ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV.  
SUBMETER MAPPING GRADE GPS

LEGEND

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

THOMAS SUMMERS P.S. 2109

DATE 01/24/18

OPERATOR'S WELL# HUGLEUNIT#1H

API WELL #  
47 - 017 - 06761  
STATE COUNTY PERMIT

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 REGULATIONS 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

STATE OF WEST VIRGINIA DEPT. OF ENERGY DIVISION OF OIL AND GAS  
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL  
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X

LOCATION: ELEVATION 1,021' - AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE

SURFACE OWNER RICHARD F. MCCULLOUGH ACREAGE 39 ACRES +/-  
OIL & GAS ROYALTY OWNER HARRIS HEIRS; VIRGIL DEEM; ROSALEE WINLSON ET AL; LEASE ACREAGE 217 AC±; 107 AC±; 100 AC±;  
FRANK MCGILL ET AL; RICHARD F. MCCULLOUGH; FLOYD MCGILL, JR. ET AL; JOSEPH L. TOWNER; PATRICK A WRIGHT 106 AC±; 72.83 AC±; 107 AC±; 33 AC±; 222 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 6,537' TVD 15,138' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

LATITUDE 39°20'00"

8,664'

6,714' TO BOTTOM HOLE  
LATITUDE 39°17'30"

LONGITUDE 80°50'00"

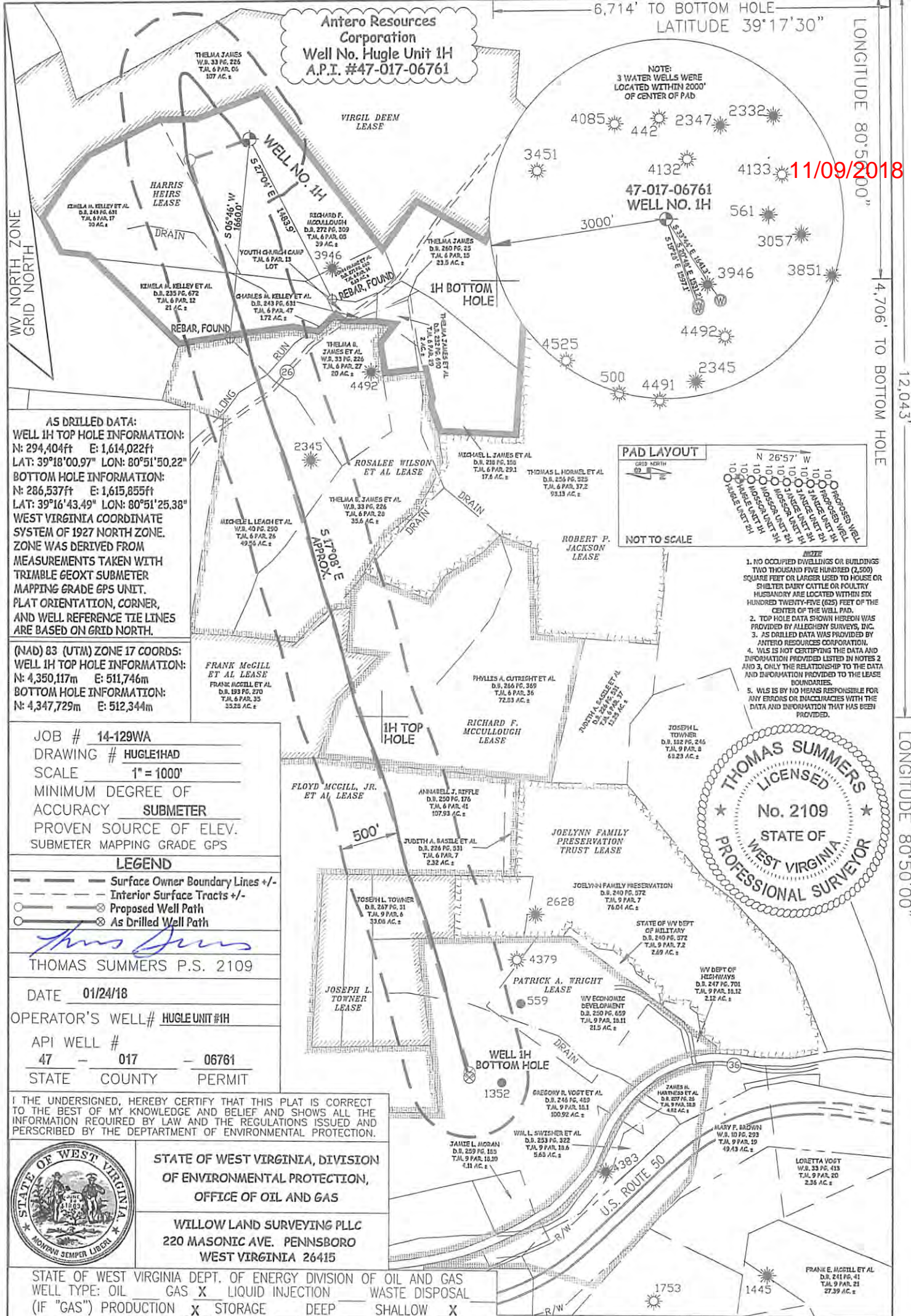
12,043'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Hugel Unit 1H  
A.P.I. #47-017-06761

NOTE:  
3 WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF CENTER OF PAD

11/09/2018



**AS DRILLED DATA:**  
**WELL 1H TOP HOLE INFORMATION:**  
 N: 294,404ft E: 1,614,022ft  
 LAT: 39°18'00.97" LON: 80°51'50.22"  
**BOTTOM HOLE INFORMATION:**  
 N: 286,537ft E: 1,615,855ft  
 LAT: 39°16'43.49" LON: 80°51'25.38"  
 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: 4,350,117m E: 511,746m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,347,729m E: 512,344m

JOB # 14-129WA  
 DRAWING # HUGLE1HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

**LEGEND**  
 - - - Surface Owner Boundary Lines +/-  
 - - - Interior Surface Tracts +/-  
 ○ Proposed Well Path  
 ⊗ As Drilled Well Path

*Thomas Summers*  
 THOMAS SUMMERS P.S. 2109

DATE 01/24/18  
 OPERATOR'S WELL # HUGLE UNIT #1H  
 API WELL # 47 - 017 - 06761  
 STATE COUNTY PERMIT

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 REGULATIONS 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

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 1,021' - AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE  
 SURFACE OWNER RICHARD F. McCULLOUGH ACREAGE 39 ACRES +/-  
 OIL & GAS ROYALTY OWNER HARRIS HEIRS; VIRGIL DEEM; ROSALEE WILSON ET AL; LEASE ACREAGE 217 AC±; 107 AC±; 100 AC±;  
FRANK McGILL ET AL; RICHARD F. MCCULLOUGH; FLOYD McGILL, JR. ET AL; JOSEPH L. TOWNER; PATRICK A WRIGHT 106 AC±; 72.83 AC±; 107 AC±; 33 AC±; 222 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  
 TARGET FORMATION MARCELLUS PLUG & ABANDON  CLEAN OUT & REPLUG   
 ESTIMATED DEPTH 6,537' TVD 15,138' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM  
DENVER, CO 80202 5400 D BIG TYLER ROAD  
 FORM WW-6 CHARLESTON, WV 25313

COUNTY NAME PERMIT

LATITUDE 39°20'00"

8,664'

6,714' TO BOTTOM HOLE

LATITUDE 39°17'30"

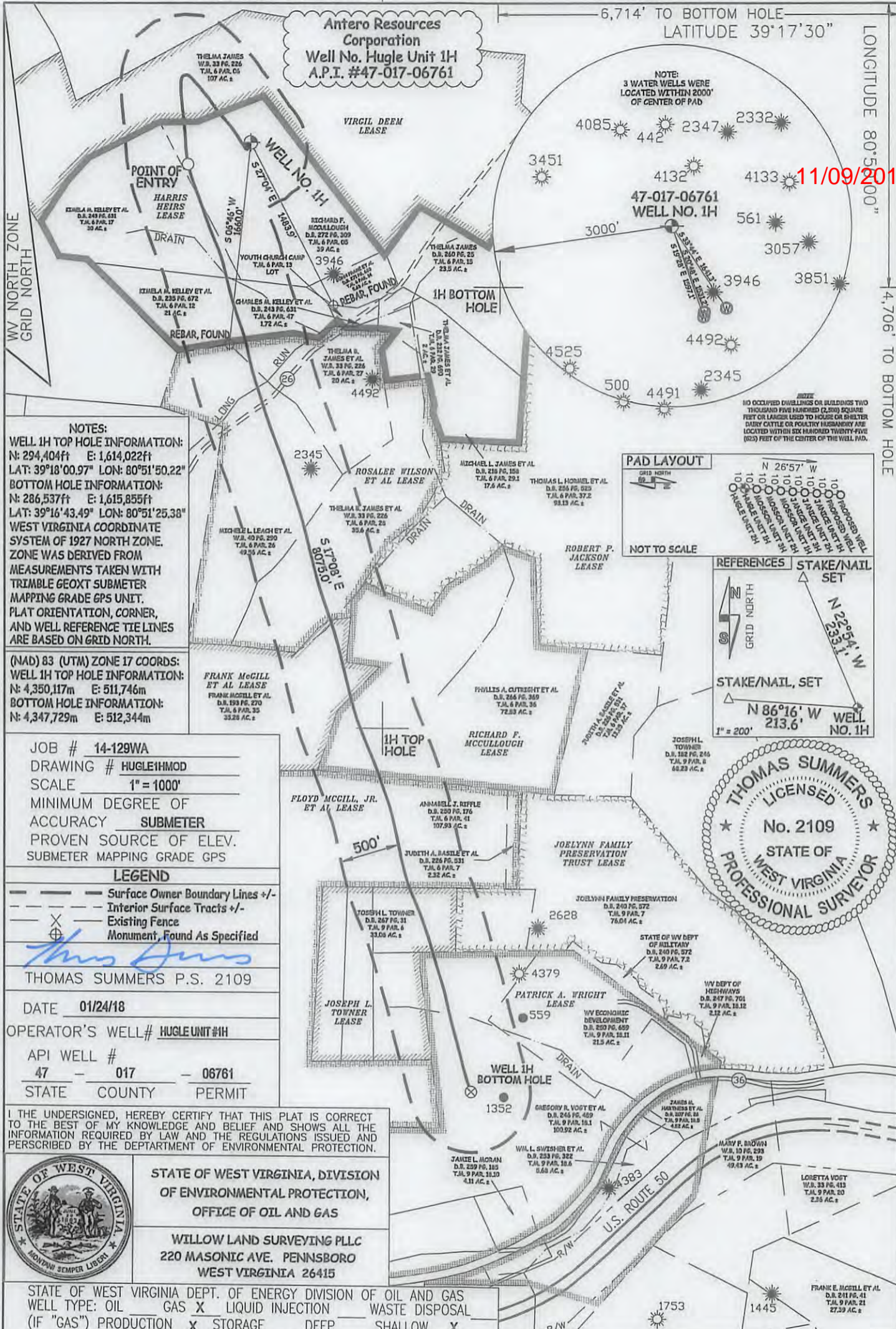
LONGITUDE 80°50'00"

4,706' TO BOTTOM HOLE

12,043'

LONGITUDE 80°50'00"

Antero Resources Corporation  
Well No. Huggle Unit 1H  
A.P.I. #47-017-06761



**NOTES:**  
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(NAD) 83 (UTM) ZONE 17 COORDS:  
 WELL 1H TOP HOLE INFORMATION:  
 N: 4,350,117m E: 511,746m  
 BOTTOM HOLE INFORMATION:  
 N: 4,347,729m E: 512,344m

JOB # 14-129WA  
 DRAWING # HUGLE1HMOD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

**LEGEND**  
 - - - Surface Owner Boundary Lines +/-  
 - - - Interior Surface Tracts +/-  
 X Existing Fence  
 ⊕ Monument, Found As Specified

THOMAS SUMMERS P.S. 2109

DATE 01/24/18

OPERATOR'S WELL# HUGLE UNIT #1H

API WELL # 47 - 017 - 06761

STATE COUNTY PERMIT

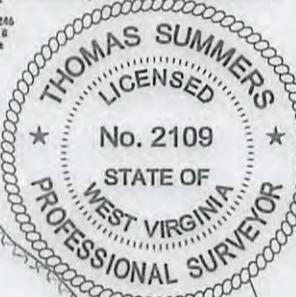
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 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

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 1,021' - AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE

SURFACE OWNER RICHARD F. McCULLOUGH ACREAGE 39 ACRES +/-  
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 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD POE PLUG & ABANDON CLEAN OUT & REPLUG  
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,537' TVD 15,138' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM  
 FORM WW-6 DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313



LATITUDE 39°20'00"

8,664'

6,714' TO BOTTOM HOLE

LATITUDE 39°17'30"

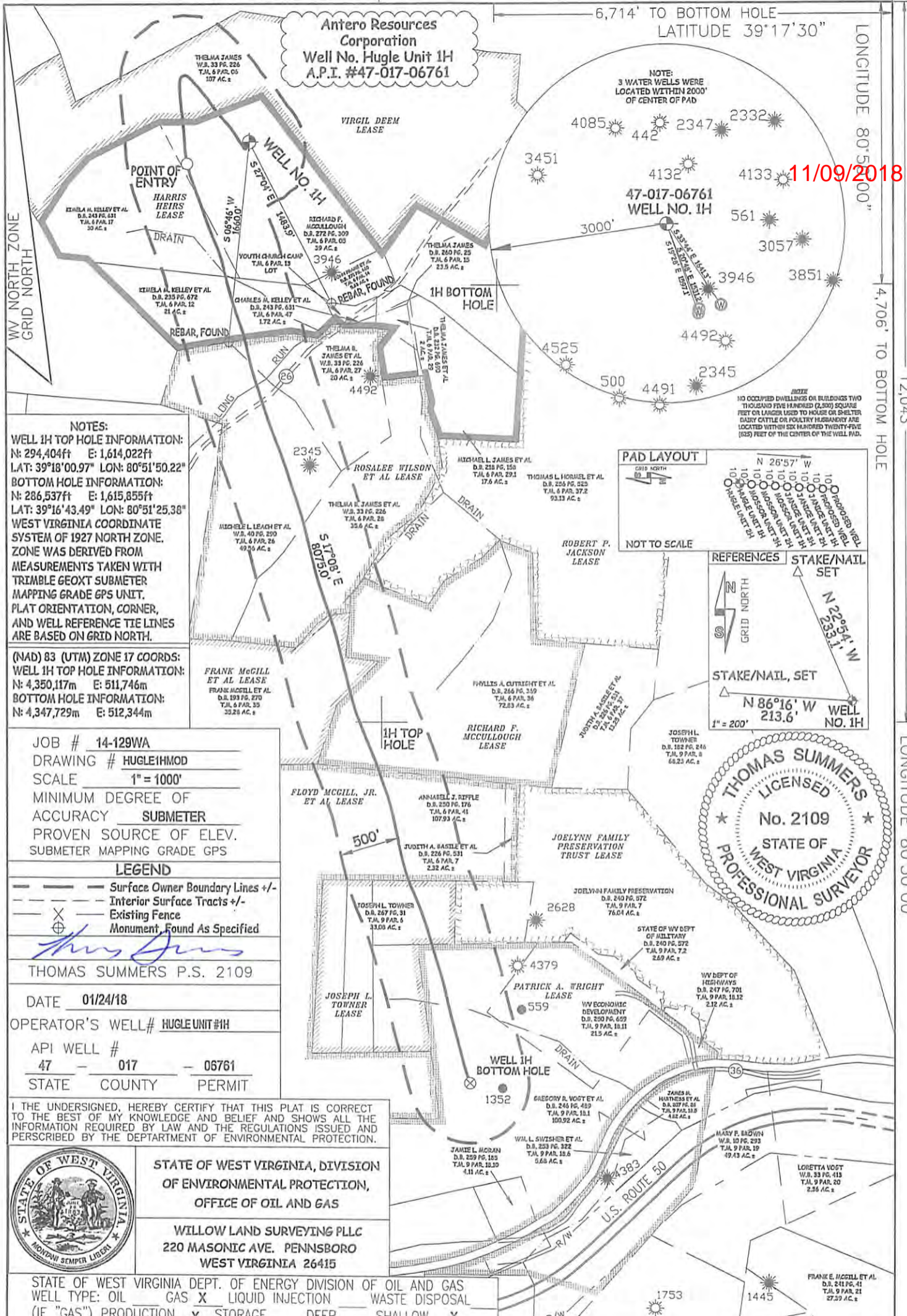
LONGITUDE 80°50'00"

4,706' TO BOTTOM HOLE

12.043'

LONGITUDE 80°50'00"

### Antero Resources Corporation Well No. Hugle Unit 1H A.P.I. #47-017-06761



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JOB # 14-129WA  
DRAWING # HUGLE1HMOD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

**LEGEND**  
Surface Owner Boundary Lines +/-  
Interior Surface Tracts +/-  
Existing Fence  
Monument, Found As Specified

THOMAS SUMMERS P.S. 2109

DATE 01/24/18

OPERATOR'S WELL# HUGLE UNIT #1H

API WELL # 47 - 017 - 06761  
STATE COUNTY PERMIT

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WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
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