

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

API 47 - 095 - 02350 County Tyler District Meade  
Quad Pennsboro 7.5' Pad Name Terry Snider Pad Field/Pool Name -----  
Farm name Terry L. Snider Well Number Markle Unit 2H  
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 4357635m Easting 503096m  
Landing Point of Curve Northing 4357452.93m Easting 502933.02m  
Bottom Hole Northing 4354868m Easting 503963m

Elevation (ft) 1146.5' 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 5/6/2016 Date drilling commenced 5/11/2016 Date drilling ceased 10/5/2016  
Date completion activities began 10/1/2017 Date completion activities ceased 4/17/2018  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths No  
Salt water depth(s) ft N/A 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

Reviewed

Reviewed by:  
Job  
9/12/2018

API 47- 095 - 02350 Farm name Terry L. Snider Well number Markle Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/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"	516'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2507'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15979'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6459'		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	600 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	975 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	790 sx (Lead) 1327 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3774	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15979' MD, 6444' TVD (BHL), 6437' (Deepest Point Drilled) Loggers TD (ft) 15979' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5641'

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

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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

API 47- 095 - 02350

Farm name Terry L. Snider

Well number Markle Unit 2H

**PERFORATION RECORD**

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

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)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

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API 47- 095 - 02350 Farm name Terry L. Snider Well number Markle Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6407' (TOP)</u> TVD	<u>6650' (TOP)</u> 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      Oil      NGL      Water      GAS MEASURED BY

9873 mcfpd   135 bpd   --- bpd   445 bpd    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, H<sub>2</sub>S, ETC)</u>
	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	
	<u>NAME</u>	<u>TVD</u>	<u>MD</u>	<u>MD</u>	

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC

Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Kodiak Services Int'l

Address 2219 Sawdust Road, Unit 1604-1605 City The Woodlands State TX Zip 77380

Cementing Company BJ Services


Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company Baker Hughes

Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223

Signature  Title Permitting Agent Date 8/20/2018

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

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API 47-095-02350 Farm Name Terry L. Snider Well Number Markle Unit 2H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/22/2018	15706	15875	60	Marcellus
2	2/23/2018	15505	15674	60	Marcellus
3	2/23/2018	15304	15473	60	Marcellus
4	2/24/2018	15103	15273	60	Marcellus
5	2/24/2018	14902	15072	60	Marcellus
6	2/25/2018	14702	14871	60	Marcellus
7	2/25/2018	14501	14670	60	Marcellus
8	2/26/2018	14300	14469	60	Marcellus
9	2/26/2018	14099	14269	60	Marcellus
10	2/27/2018	13899	14068	60	Marcellus
11	2/28/2018	13698	13867	60	Marcellus
12	2/28/2018	13497	13666	60	Marcellus
13	3/1/2018	13296	13465	60	Marcellus
14	3/1/2018	13095	13265	60	Marcellus
15	3/2/2018	12895	13064	60	Marcellus
16	3/3/2018	12694	12863	60	Marcellus
17	3/3/2018	12493	12662	60	Marcellus
18	3/4/2018	12292	12461	60	Marcellus
19	3/4/2018	12091	12261	60	Marcellus
20	3/5/2018	11891	12060	60	Marcellus
21	3/5/2018	11690	11859	60	Marcellus
22	3/6/2018	11489	11658	60	Marcellus
23	3/6/2018	11288	11457	60	Marcellus
24	3/6/2018	11087	11257	60	Marcellus
25	3/7/2018	10887	11056	60	Marcellus
26	3/7/2018	10686	10855	60	Marcellus
27	3/10/2018	10485	10654	60	Marcellus
28	3/10/2018	10284	10454	60	Marcellus
29	3/11/2018	10083	10253	60	Marcellus
30	3/11/2018	9883	10052	60	Marcellus
31	3/12/2018	9682	9851	60	Marcellus
32	3/12/2018	9481	9650	60	Marcellus
33	3/13/2018	9280	9450	60	Marcellus
34	3/13/2018	9079	9249	60	Marcellus
35	3/14/2018	8879	9048	60	Marcellus
36	3/14/2018	8678	8847	60	Marcellus
37	3/15/2018	8477	8646	60	Marcellus
38	3/16/2018	8276	8446	60	Marcellus
39	3/17/2018	8075	8245	60	Marcellus
40	3/17/2018	7875	8044	60	Marcellus
41	3/18/2018	7674	7843	60	Marcellus
42	3/18/2018	7473	7642	60	Marcellus
43	3/19/2018	7272	7442	60	Marcellus
44	3/19/2018	7071	7241	60	Marcellus
45	3/20/2018	6871	7040	60	Marcellus
46	3/20/2018	6670	6839	60	Marcellus

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API 47-095-02350 Farm Name Terry L. Snider Well Number Markle Unit 2H

**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 (bbbls)	Amount of Nitrogen/ other (units)
1	2/22/2018	74.5	7428	5191	3982	16601	9326	N/A
2	2/23/2018	72.7	7329	5602	3988	16919	10645	N/A
3	2/23/2018	71.3	7448	5768	4359	17575	10924	N/A
4	2/24/2018	73.6	7617	5923	3792	17332	9409	N/A
5	2/24/2018	74.1	7449	5735	4080	17264	9303	N/A
6	2/25/2018	75.9	7605	6462	4217	18284	9742	N/A
7	2/25/2018	73.6	7407	5904	4121	17432	9113	N/A
8	2/26/2018	73.4	7278	6352	4160	17790	9336	N/A
9	2/26/2018	74.1	7269	5470	4403	17142	9347	N/A
10	2/27/2018	71.8	7259	5206	4764	17229	9367	N/A
11	2/28/2018	69.74	7258	5471	4792	17521	9217	N/A
12	2/28/2018	71.73	7234	5638	4518	17390	8905	N/A
13	3/1/2018	75	7530	5624	4498	17652	9548	N/A
14	3/1/2018	69.5	7224	5534	4565	17323	9105	N/A
15	3/2/2018	74.6	7655	5638	4312	17605	10835	N/A
16	3/3/2018	69.2	6755	5599	3880	16234	8972	N/A
17	3/3/2018	74.4	7055	5783	4732	17570	9263	N/A
18	3/4/2018	73.9	7160	5932	3848	16940	9101	N/A
19	3/4/2018	72.9	6972	5748	3920	16640	9249	N/A
20	3/5/2018	75	7071	5546	3955	16572	9286	N/A
21	3/5/2018	74.8	7112	5580	4030	16722	9101	N/A
22	3/6/2018	77.9	7348	5493	3763	16604	9193	N/A
23	3/6/2018	74.4	7026	6134	3902	17062	9205	N/A
24	3/6/2018	76	7072	5780	3997	16849	9054	N/A
25	3/7/2018	75	7016	5809	3944	16769	9343	N/A
26	3/7/2018	70.5	6726	5384	4218	16328	8986	N/A
27	3/10/2018	75.2	6821	5158	3844	15823	9019	N/A
28	3/10/2018	75.1	6859	5549	3885	16293	9205	N/A
29	3/11/2018	75.3	6939	5538	3999	16476	9245	N/A
30	3/11/2018	75.1	6808	5320	3871	15999	9600	N/A
31	3/12/2018	74	6936	5276	3487	15699	9176	N/A
32	3/12/2018	74.3	6871	5407	3692	15970	9390	N/A
33	3/13/2018	73.7	6714	5407	3985	16106	9522	N/A
34	3/13/2018	75.6	6496	5166	3962	15624	9317	N/A
35	3/14/2018	74.3	6578	5531	3921	16030	9104	N/A
36	3/14/2018	77.3	6588	5133	3963	15684	8952	N/A
37	3/15/2018	75.2	6476	5177	3619	15272	8862	N/A
38	3/16/2018	75	6560	5206	3900	15666	8955	N/A
39	3/17/2018	78.7	6504	5239	3857	15600	9177	N/A
40	3/17/2018	73.3	6554	5415	5145	17114	9118	N/A
41	3/18/2018	77.4	6844	5985	5156	17985	10403	N/A
42	3/18/2018	75.4	6590	5450	3863	15903	9499	N/A
43	3/19/2018	74	6814	5601	3703	16118	9251	N/A
44	3/19/2018	73.4	6627	6627	3807	17061	9263	N/A
45	3/20/2018	77.4	6938	5811	4285	17034	9128	N/A
46	3/20/2018	76.5	6462	5520	3981	15963	9196	N/A
	AVG=	74.3	7,006	5,605	4,103	168,769	430,257	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	0	N/A	0	N/A
Silty Sandstone	260	N/A	260	N/A
Shale w/trace Coal	560	N/A	560	N/A
Silty Sandstone	740	N/A	740	N/A
Limey Shale	880	N/A	880	N/A
Silty Shale w/trace Coal	1,080	N/A	1,080	N/A
Silty Sandstone	1,240	N/A	1,240	N/A
Silty Shale w/trace Coal	1,380	N/A	1,380	N/A
Silty Sandstone	1,520	N/A	1,520	N/A
Sandstone w/trace Coal	1,600	N/A	1,600	N/A
Silty Sandstone	1,680	N/A	1,680	N/A
shale w/trace Coal	1,740	N/A	1,740	N/A
Silty Sandstone	1,840	N/A	1,840	N/A
Big Lime	2,046	N/A	2,047	N/A
Big Injun	2,151	N/A	2,152	N/A
Gantz Sand	2,556	N/A	2,557	N/A
Fifty Foot Sandstone	2,854	N/A	2,855	N/A
Gordon	2,938	N/A	2,939	N/A
Fifth Sandstone	3,203	N/A	3,208	N/A
Bayard	3,292	N/A	3,297	N/A
Warren	3,681	N/A	3,692	N/A
Speechley	414	N/A	4,031	N/A
Balltown	4,298	N/A	4,320	N/A
Bradford	4,674	N/A	4,702	N/A
Benson	5,076	N/A	5,112	N/A
Alexander	5,307	N/A	5,345	N/A
Rhinestreet	5,852	N/A	5,903	N/A
Sycamore	6,188	N/A	6,278	N/A
Middlesex	6,280	N/A	6,407	N/A
Burkett	6,374	N/A	6,570	N/A
Tully	6,399	N/A	6,627	N/A
Marcellus	6,407	N/A	6,650	N/A

\*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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LATITUDE 39°22'30" 1,665'

10,611' TO BOTTOM HOLE  
LATITUDE 39°22'30"

LONGITUDE 80°55'00"

2,514'

LONGITUDE 80°57'30"

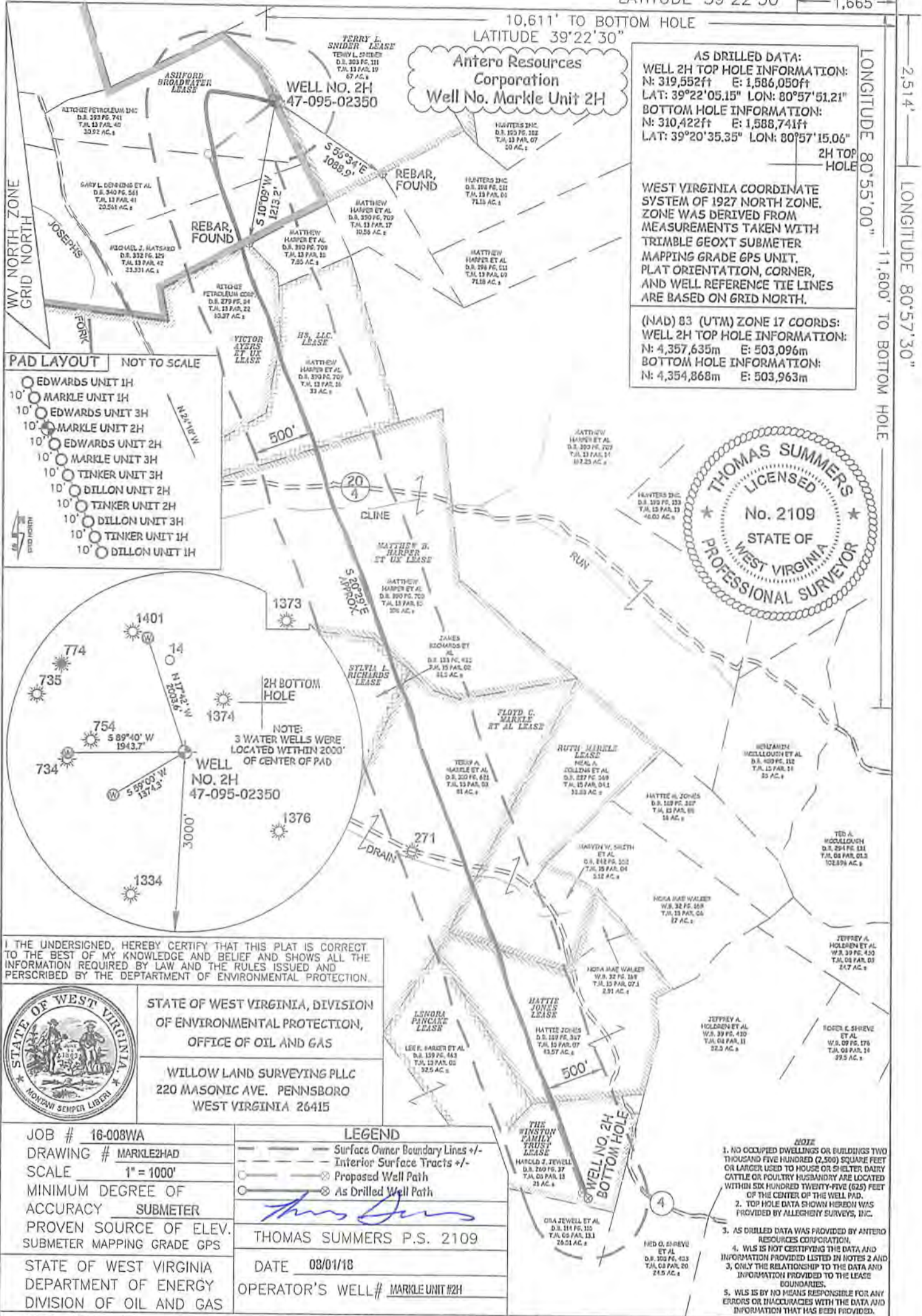
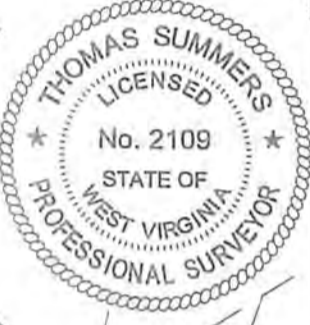
11,600' TO BOTTOM HOLE

Antero Resources Corporation  
Well No. Markle Unit 2H

AS DRILLED DATA:  
WELL 2H TOP HOLE INFORMATION:  
N: 319,552ft E: 1,586,050ft  
LAT: 39°22'05.15" LON: 80°57'51.21"  
BOTTOM HOLE INFORMATION:  
N: 310,422ft E: 1,588,741ft  
LAT: 39°20'35.35" LON: 80°57'15.06"

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 2H TOP HOLE INFORMATION:  
N: 4,357,635m E: 503,096m  
BOTTOM HOLE INFORMATION:  
N: 4,354,868m E: 503,963m



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 # 16-008WA  
DRAWING # MARKLE2HAD  
SCALE 1" = 1000'  
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 08/01/18  
OPERATOR'S WELL # MARKLE UNIT #2H

- 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 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.

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL 47 095 02350  
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X  
LOCATION: ELEVATION 1,146.5' AS-BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK STATE COUNTY PERMIT  
QUADRANGLE PENNSBORO 7.5 DISTRICT MEADE COUNTY TYLER  
SURFACE OWNER RITCHIE PETROLEUM INC. ACREAGE 30.92 ACRES +/-  
OIL & GAS ROYALTY OWNER ASHFORD BROADWATER; TERRY L. SNIDER; VICTOR AYERS ET UX; LEASE ACREAGE 583.712 ACRES; 67 ACRES; 97 ACRES;  
H3, LLC; MATTHEW B. HARPER ET UX; SYLVIA L. RICHARDS; FLOYD C. MARKLE ET AL; RUTH MARKLE; HATTIE JONES; THE WINSTON FAMILY TRUST 33 AC; 100 ACRES; 81.5 ACRES; 81 ACRES; 4 ACRES; 43.57 ACRES; 21 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 6,444' TVD 15,979' MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313



FORM WV-6  
 ADDRESS 1615 WYNKOP STREET  
 DENVER CO 80202  
 ANTERO RESOURCES CORP.  
 DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 5400 D BIG TYLER ROAD  
 CHARLESTON, WV 26313

WELL TYPE: OIL  
 GAS X LIQUID INJECTION  
 WASTE DISPOSAL  
 SHALLOW X DEEP  
 STATE COUNTY PERMIT  
 47 095 02350

WELL OPERATOR  
 TARGET FORMATION  
 (SPECIFY) AS DRILLED  
 PLUG OFF OLD FORMATION  
 CONVERT DRILL DEEPER  
 REDRILL FRACTURE OR STIMULATE  
 CLEAN OUT & REPLUG  
 ESTIMATED DEPTH  
 6,444 TVD 15,979 MD  
 COUNTY NAME  
 COUNTY TYLER

PROPOSED WORK: DRILL  
 SURFACE OWNER  
 RITCHEE PETROLEUM INC.  
 QUADRANGLE PENNSBORO 7.5  
 DISTRICT MEADE  
 COUNTY TYLER

STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY  
 DIVISION OF OIL AND GAS  
 OPERATOR'S WELL# MARLE UNIT 2H  
 DATE 08/01/18  
 THOMAS SUMMERS P.S. 2109

JOB # 16-008WA  
 DRAWING # MARLE2HAD  
 SCALE 1" = 100'  
 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  
 WILLLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO  
 WEST VIRGINIA 26415

WELL TYPE: OIL  
 GAS X LIQUID INJECTION  
 WASTE DISPOSAL  
 SHALLOW X DEEP  
 STATE COUNTY PERMIT  
 47 095 02350

PROPOSED WORK: DRILL  
 SURFACE OWNER  
 RITCHEE PETROLEUM INC.  
 QUADRANGLE PENNSBORO 7.5  
 DISTRICT MEADE  
 COUNTY TYLER

STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY  
 DIVISION OF OIL AND GAS  
 OPERATOR'S WELL# MARLE UNIT 2H  
 DATE 08/01/18  
 THOMAS SUMMERS P.S. 2109

JOB # 16-008WA  
 DRAWING # MARLE2HAD  
 SCALE 1" = 100'  
 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  
 WILLLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO  
 WEST VIRGINIA 26415

WELL TYPE: OIL  
 GAS X LIQUID INJECTION  
 WASTE DISPOSAL  
 SHALLOW X DEEP  
 STATE COUNTY PERMIT  
 47 095 02350

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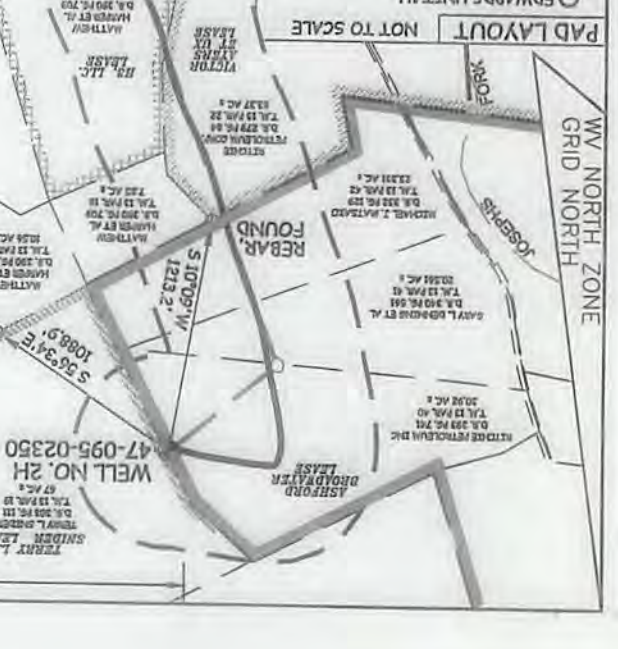
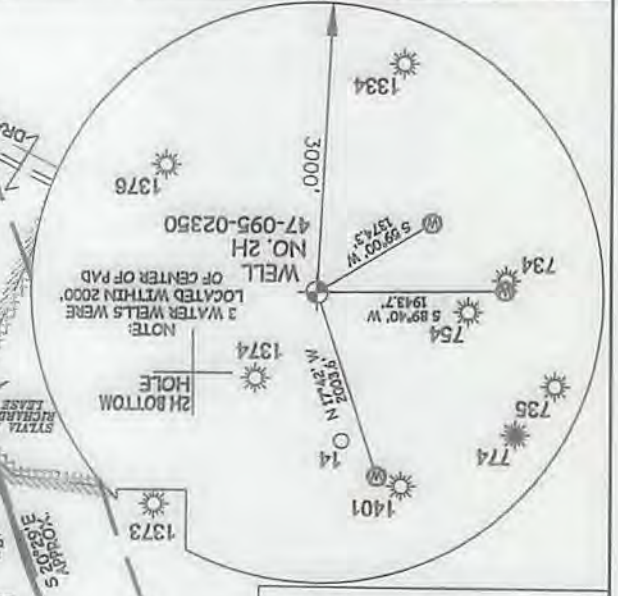
WELL TYPE: OIL  
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PROPOSED WORK: DRILL  
 SURFACE OWNER  
 RITCHEE PETROLEUM INC.  
 QUADRANGLE PENNSBORO 7.5  
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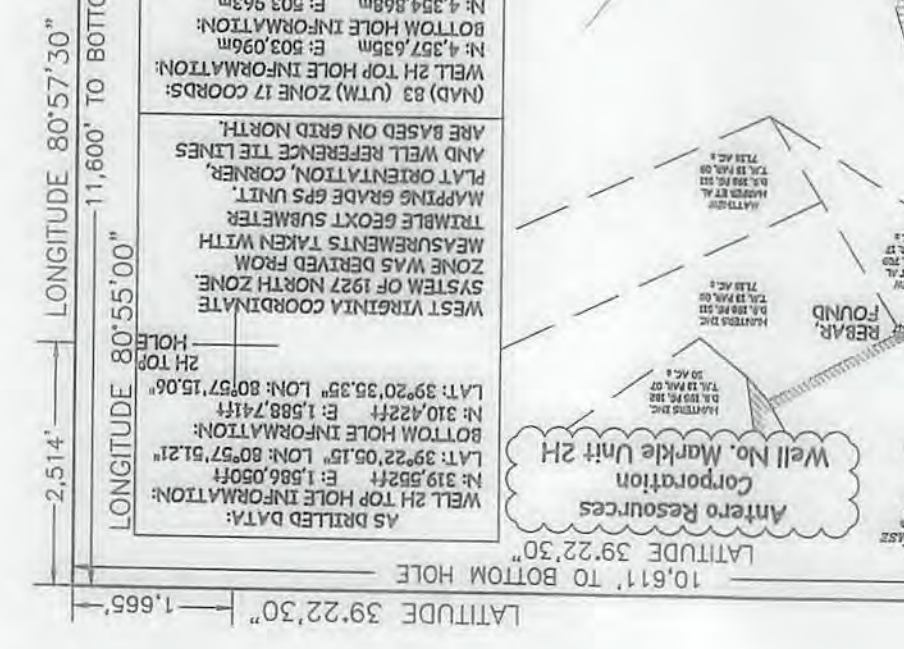
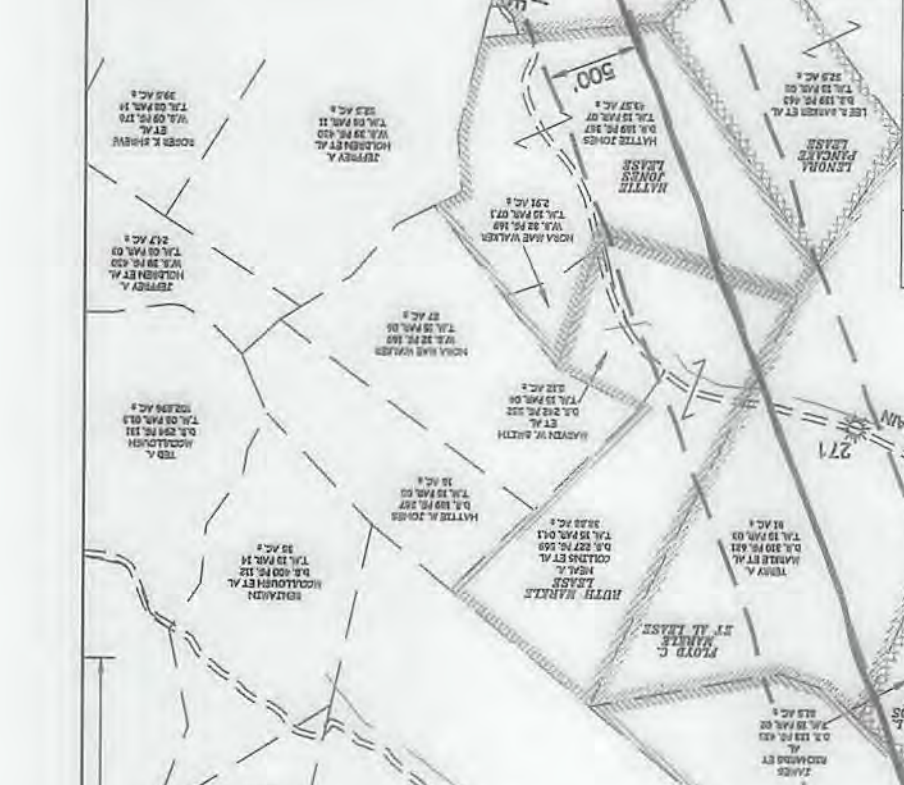
STATE OF WEST VIRGINIA  
 DEPARTMENT OF ENERGY  
 DIVISION OF OIL AND GAS  
 OPERATOR'S WELL# MARLE UNIT 2H  
 DATE 08/01/18  
 THOMAS SUMMERS P.S. 2109



THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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.



1. NO COURED DWELLERS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2500) SQUARE FEET OR LARGER USED TO HOUSE OR SHEDD 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 ALLEGHENY SURVEYS, INC.  
 3. AS OBTAINED DATA WAS PROVIDED BY ANTIPOD RESOURCES CORPORATION.  
 4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP LISTED IN NOTES 2 AND 3. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR IMPACTS WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.



AS DRILLED DATA:  
 WELL 2H TOP HOLE INFORMATION:  
 N: 319.5524 E: 1566.0504  
 LAT: 39°22'05.15" LONG: 80°57'51.21"  
 BOTTOM HOLE INFORMATION:  
 N: 310.4224 E: 1588.7414  
 LAT: 39°20'35.35" LONG: 80°57'15.06"

## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/27/2018
Job End Date:	3/27/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02350-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Markle 2H
Latitude:	39.36809722
Longitude:	-80.96422500
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,657
Total Base Water Volume (gal):	18,597,948
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	89.00486	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.31460	

WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
LD-2900	Multi-Chem	Friction Reducer					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
SAND-COMMON WHITE-100 MESH, SSA-2	Halliburton	Proppant					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
SAND-PREMIUM WHITE-30/50	Halliburton	Proppant					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
SAND-PREMIUM WHITE-40/70	Halliburton	Proppant					
				Listed Below			

HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SCALECHEK LP-70	Halliburton	Scale Inhibitor					
				Listed Below			
HYDROCHLORIC ACID	Halliburton	Solvent					
				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	10.65519	
			Hydrochloric acid	7647-01-0	15.00000	0.03973	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01716	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01234	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01234	
			Guar gum	9000-30-0	100.00000	0.00995	
			Ethylene glycol	107-21-1	60.00000	0.00858	
			Acrylamide, sodium acrylate polymer	25987-30-8	30.00000	0.00461	
			Glutaraldehyde	111-30-8	30.00000	0.00263	
			Telmer	Proprietary	10.00000	0.00143	
			Sobitan, mono-9-octadecenoate, (Z)	1338-43-8	5.00000	0.00077	
			Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	5.00000	0.00077	
			Sodium persulfate	7775-27-1	100.00000	0.00077	

			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00044	
			Sodium polyacrylate	9003-04-7	1.00000	0.00014	
			Methanol	67-56-1	60.00000	0.00013	
			Ethanol	64-17-5	1.00000	0.00009	
			Fatty acids, tall oil	Proprietary	30.00000	0.00006	
			Modified thiourea polymer	Proprietary	30.00000	0.00006	
			Ethoxylated alcohols	Proprietary	30.00000	0.00006	
			Olefins	Proprietary	5.00000	0.00002	
			Propargyl alcohol	107-19-7	10.00000	0.00002	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Acrylic acid	79-10-7	0.01000	0.00000	
			Sodium sulfate	7757-82-6	0.10000	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)