

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

API 47 - 017 - 06841 County Doddridge District West Union  
 Quad West Union 7.5' Pad Name Strickling Pad Field/Pool Name -----  
 Farm name John Paul Strickling, et al Well Number Tanus 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 4353672.467m Easting 518655.119m  
 Landing Point of Curve Northing 4353742.95m Easting 518638.43m  
 Bottom Hole Northing 4356424.794m Easting 517578.459m

Elevation (ft) 1065' 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 7/13/2017 Date drilling commenced 9/5/2017 Date drilling ceased 5/13/2018  
 Date completion activities began 8/6/2018 Date completion activities ceased 10/7/2018  
 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 None Identified Open mine(s) (Y/N) depths No  
 Salt water depth(s) ft None Identified 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 by:

WR-35  
Rev. 8/23/13

API 47-017 - 06841 Farm name John Paul Strickling, et al Well number Taunus Unit 2H

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"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	362'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2584'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16613'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6837'		4.7#, P-110		
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	284 sx	15.6	1.18	335	0'	8 Hrs.
Surface	Class A	318 sx	15.6	1.2	382	0'	8 Hrs.
Coal							
Intermediate 1	Class A	900 sx	15.6	1.18	1062	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	748 sx (Lead) 1544 sx (Tail)	14(Lead), 15.2 (Tail)	1.45 (Lead), 1.83 (Tail)	3910	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16627' MD, 6697' TVD (BHL), 6741' (Deepest Point Drilled) Loggers TD (ft) 16627' MD

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

Plug back procedure N/A

Kick off depth (ft) 5851'

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





WR-35  
Rev. 8/23/13

API 47- 017 - 06841 Farm name John Paul Strickling, et al Well number Taunus Unit 2H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6673' (TOP) TVD	6903' (TOP) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11161.98 mcfpd Oil 156.29 bpd NGL --- bpd Water 456.02 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP		BOTTOM		DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC  
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Nine Energy Service  
Address 125 Museum Rd City Washington State PA Zip 15301

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

Stimulating Company US Well Services  
Address 533 Industrial Park Road City Lane Jew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820  
Signature  Title Permitting Agent Date 2/1/2019

API 47-017-06841 Farm Name <u>John Paul Strickling, et al</u> Well Number <u>Taunus Unit 2H</u>					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	8/6/2018	16245.966	16416.411	48	Marcellus
2	8/7/2018	16043.832	16214.277	48	Marcellus
3	8/8/2018	15841.698	16012.143	48	Marcellus
4	8/8/2018	15639.564	15810.009	48	Marcellus
5	8/9/2018	15437.43	15607.875	48	Marcellus
6	8/9/2018	15235.296	15405.741	48	Marcellus
7	8/10/2018	15033.162	15203.607	48	Marcellus
8	8/10/2018	14831.028	15001.473	48	Marcellus
9	8/10/2018	14628.894	14799.339	48	Marcellus
10	8/11/2018	14426.76	14597.205	48	Marcellus
11	8/11/2018	14224.626	14395.071	48	Marcellus
12	8/12/2018	14022.492	14192.937	48	Marcellus
13	8/12/2018	13820.358	13990.803	48	Marcellus
14	8/12/2018	13618.224	13788.669	48	Marcellus
15	8/13/2018	13416.09	13586.535	48	Marcellus
16	8/13/2018	13213.956	13384.401	48	Marcellus
17	8/14/2018	13011.822	13182.267	48	Marcellus
18	8/15/2018	12809.688	12980.133	48	Marcellus
19	8/15/2018	12607.554	12777.999	48	Marcellus
20	8/16/2018	12405.42	12575.865	48	Marcellus
21	8/16/2018	12203.286	12373.731	48	Marcellus
22	8/17/2018	12001.152	12171.597	48	Marcellus
23	8/17/2018	11799.018	11969.463	48	Marcellus
24	8/17/2018	11596.884	11767.329	48	Marcellus
25	8/18/2018	11394.75	11565.195	48	Marcellus
26	8/18/2018	11192.616	11363.061	48	Marcellus
27	8/19/2018	10990.482	11160.927	48	Marcellus
28	8/19/2018	10788.348	10958.793	48	Marcellus
29	8/20/2018	10586.214	10756.659	48	Marcellus
30	8/20/2018	10384.08	10554.525	48	Marcellus
31	8/21/2018	10181.946	10352.391	48	Marcellus
32	8/21/2018	9979.812	10150.257	48	Marcellus
33	8/22/2018	9777.678	9948.123	48	Marcellus
34	8/22/2018	9575.544	9745.989	48	Marcellus
35	8/22/2018	9373.41	9543.855	48	Marcellus
36	8/23/2018	9171.276	9341.721	48	Marcellus
37	8/23/2018	8969.142	9139.587	48	Marcellus
38	8/24/2018	8767.008	8937.453	48	Marcellus
39	8/24/2018	8564.874	8735.319	48	Marcellus
40	8/24/2018	8362.74	8533.185	48	Marcellus
41	8/25/2018	8160.606	8331.051	48	Marcellus
42	8/25/2018	7958.472	8128.917	48	Marcellus
43	8/25/2018	7756.338	7926.783	48	Marcellus
44	8/26/2018	7554.204	7724.649	48	Marcellus
45	8/26/2018	7352.07	7522.515	48	Marcellus
46	8/27/2018	7149.936	7320.381	48	Marcellus
47	8/27/2018	6947.802	7118.247	48	Marcellus



API 47-017-06841 Farm Name John Paul Strickling, et al Well Number Taurus 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 (bbls)	Amount of Nitrogen/ other (units)
1	8/6/2018	74.2	7921.3	5920	5016	404900	8007	N/A
2	8/7/2018	79.3798	7871.412	6177	4736	406400	8346	N/A
3	8/8/2018	78.4841	7991.86	5926	3904	404400	7804	N/A
4	8/8/2018	76.7672	7974.816	5673	4827	405600	9261	N/A
5	8/9/2018	78.3914	8086.54	5617	5153	404400	7860	N/A
6	8/9/2018	79.1015	7812.834	5920	5118	404400	7885	N/A
7	8/10/2018	79.5278	7821.984	5758	4086	404900	7892	N/A
8	8/10/2018	78.0765	8113.565	5931	3989	404100	7889	N/A
9	8/10/2018	79.6303	8119.105	5921	3928	402300	7759	N/A
10	8/11/2018	79.4	8098.5	6055	3686	404290	7958	N/A
11	8/11/2018	78.9283	7656.375	5785	3750	405200	7810	N/A
12	8/12/2018	79.4644	7876.028	6129	3977	405080	7776	N/A
13	8/12/2018	78.8	7884.7	6220	4038	405970	7719	N/A
14	8/12/2018	80.2704	7969.563	6285	4048	403700	7763	N/A
15	8/13/2018	78.3	7856.3	6239	4132	405320	8421	N/A
16	8/13/2018	76.647	7610.074	5962	3751	405000	7770	N/A
17	8/14/2018	77.2	7992.9	6181	4192	403570	8883	N/A
18	8/15/2018	78.5	8057.4	6205	4381	404000	7831	N/A
19	8/15/2018	75.7277	8157.366	5941	5444	404800	9442	N/A
20	8/16/2018	76.7	8133.2	6322	3775	405370	7761	N/A
21	8/16/2018	77.6926	7904.503	6142	3518	403580	7908	N/A
22	8/17/2018	78.1922	7756.682	5924	3927	404400	7793	N/A
23	8/17/2018	79.3	7580.7	5982	3933	407110	7754	N/A
24	8/17/2018	78.7669	8167.482	6487	4895	405000	7786	N/A
25	8/18/2018	78.2	7972.2	6738	3892	404770	7688	N/A
26	8/18/2018	78.9687	7747.765	6063	3493	404350	7890	N/A
27	8/19/2018	80.2	7465.4	6108	3866	404580	7587	N/A
28	8/19/2018	78.1434	7520.794	6744	3990	403900	7838	N/A
29	8/20/2018	77.8939	7485.217	5863	4448	402900	8359	N/A
30	8/20/2018	78.3978	7839.891	7115	4545	394100	7072	N/A
31	8/21/2018	78.4328	7665.975	6554	3559	403720	7703	N/A
32	8/21/2018	78.6633	7505.634	6208	3495	405100	7672	N/A
33	8/22/2018	79.033	7516.864	6651	3572	405150	7757	N/A
34	8/22/2018	78.6128	7346.878	7182	3619	403200	7591	N/A
35	8/22/2018	79.1296	7368.721	6558	3635	403400	7673	N/A
36	8/23/2018	77.9193	7864.833	6307	3752	404400	7613	N/A
37	8/23/2018	78.1306	7849.224	7058	3920	404800	7606	N/A
38	8/24/2018	79.2647	7866.482	6341	4510	385750	7499	N/A
39	8/24/2018	79.0636	7424.276	7634	3840	403400	7652	N/A
40	8/24/2018	79.0098	7799.169	7905	3537	405000	7693	N/A
41	8/25/2018	79.5085	7320.049	8257	3616	442600	8128	N/A
42	8/25/2018	79.2137	7598.454	6532	3655	405400	7548	N/A
43	8/25/2018	79.6539	7393.251	6415	3419	404730	7613	N/A
44	8/26/2018	79.4873	7022.875	5899	3621	404600	7501	N/A
45	8/26/2018	78.8863	7216.239	6943	4563	393600	7614	N/A
46	8/27/2018	79.1806	6809.415	7507	4530	413500	7583	N/A
47	8/27/2018	80.8544	6527.256	5206	3873	403000	7434	N/A
	AVG=	79	7,714	6,351	4,067	19,019,740	369,392	TOTAL

API 47-017-06841 Farm Name John Paul Strickling, et al Well Number Taurus Unit 2H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Sandstone	0	187	0	187
Sandstone tr coal	187	267	187	267
Sandy shale	267	807	267	807
Calcareous Shale	807	1,187	807	1,187
Shale tr coal	1,187	1,207	1,187	1,207
Sandy Shale	1,207	1,527	1,207	1,527
Sandstone	1,527	1,567	1,527	1,567
Silty shale	1,567	1,667	1,567	1,667
Sandstone	1,667	1,787	1,667	1,787
Sandy shale	1,787	1,955	1,787	1,972
Big Lime	1,955	2,529	1,972	2,555
Fifty Foot Sandstone	2,529	2,724	2,555	2,753
Gordon	2,724	2,931	2,753	2,963
Fifth Sandstone	2,931	2,990	2,963	3,023
Bayard	2,990	3,807	3,023	3,843
Speechley	3,807	4,088	3,843	4,124
Balltown	4,088	4,593	4,124	4,629
Bradford	4,593	5,018	4,629	5,054
Benson	5,018	5,290	5,054	5,326
Alexander	5,290	6,285	5,326	6,337
Sycamore	6,285	6,459	6,337	6,540
Middlesex	6,459	6,600	6,540	6,754
Burkett	6,600	6,627	6,754	6,802
Tully	6,627	6,673	6,802	6,903
Marcellus	6,673	N/A	6,903	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.



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/7/2018
Job End Date:	8/27/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06841-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Taurus 2H
Latitude:	39.33218900
Longitude:	-80.78371900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,741
Total Base Water Volume (gal):	16,036,648
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract 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	87.37633	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	12.42564	
HCl Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.12369	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	Hydrogen Chloride	7647-01-0	17.50000	0.02876	
LGC-15	U.S. Well Services, LLC	Gelling Agents	2-Propenoic acid, polymer with 2-propanamide Hydrated light distillate (petroleum)	29003-06-9 64742-47-8	30.00000 30.00000	0.01560 0.01256	
	U.S. Well Services, LLC		Guar Gum	9000-30-0	50.00000	0.00447	
			Petroleum Distillates	64742-47-8	60.00000	0.00424	
			Suspending agent (solid)	14808-60-7	3.00000	0.00068	
			Surfactant	68439-51-0	3.00000	0.00027	



Product	Supplier	Chemical Name	Product Code	Concentration	MSDS No.
Bioclear 2000	J.S. Well Services, LLC	2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00399
		Deionized Water	7732-18-5	28.00000	0.00228
SI-1200s	J.S. Well Services, LLC	Proprietary Scale Inhibitor	Proprietary	10.00000	0.00129
AP One	J.S. Well Services, LLC	Ammonium Persulfate	7727-54-0	100.00000	0.00011
AI-303	J.S. Well Services, LLC	Ethylene glycol	107-21-1	40.00000	0.00004
		Cinnamaldehyde	104-55-2	20.00000	0.00002
		Formic acid	64-18-6	20.00000	0.00001
		Butyl cellosolve	111-76-2	20.00000	0.00001
		Polyether	60828-78-6	10.00000	0.00001
		Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00000

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)



9,543' to Top Hole

1,358' to Bottom Hole

BTM HOLE LATITUDE 39 - 22 - 30  
TOP HOLE LATITUDE 39 - 20 - 00

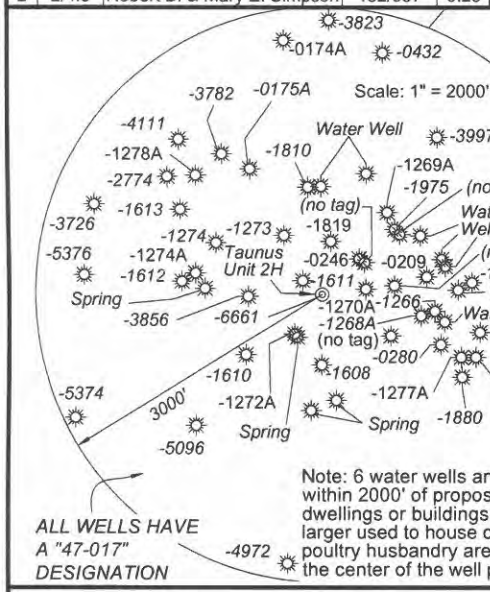
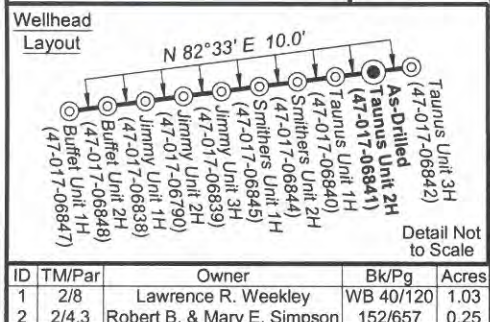
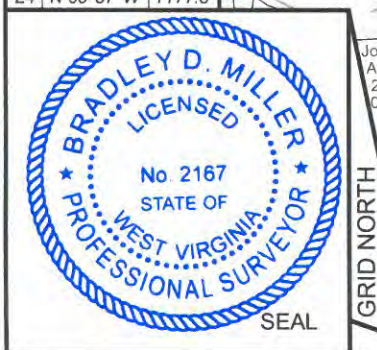
BTM HOLE LONGITUDE 80 - 47 - 30  
TOP HOLE LONGITUDE 80 - 45 - 00

282' to Top Hole

6,533' to Bottom Hole

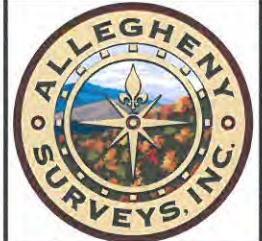
**Antero Resources**  
**Well No. Taurus Unit 2H**  
**As-Drilled Plat**  
**Antero Resources Corporation**

Bearing	Dist.
L1 N 88°26' E	786.8'
L2 S 84°42' W	431.2'
L3 S 56°05' E	262.7'
L4 N 68°57' W	1177.3'



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 prescribed by the Department of Environmental Protection.

*Bradley D. Miller*  
Bradley D. Miller, P.S. 2167



FILE NO: 43-30-WU-14  
DRAWING NO: Taurus 2H As-Drilled Plat  
SCALE: 1" = 1200'  
MINIMUM DEGREE OF ACCURACY: Submeter  
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

**STATE OF WEST VIRGINIA**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: December 27 2018  
OPERATOR'S WELL NO. Taurus Unit 2H  
API WELL NO  
47 - 017 - 06841  
STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
(IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION: As-Drilled 1,065' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union  
DISTRICT: West Union COUNTY: Doddridge  
SURFACE OWNER: John Paul Strickling, et al ACREAGE: 357.75 20.3; 84.25 38; 31; 36; 64  
ROYALTY OWNER: Joseph Freeman, et ux; W. F. Smith, et al; Freeman P. Smith, et ux LEASE NO: ACREAGE: 125; 368; 63.75; 600

PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 6,697' TVD 16,627' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System  
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road  
Denver, CO 80202 Charleston, WV 25313

**Notes:**  
**West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.**  
Well No. Taurus Unit 2H Top Hole coordinates are  
N: 305,694.21' Latitude: 39°19'55.88"  
E: 1,636,890.02' Longitude: 80°47'01.39"  
Bottom Hole coordinates are  
N: 314,785.05' Latitude: 39°21'25.24"  
E: 1,633,507.61' Longitude: 80°47'46.10"  
**UTM Zone 17, NAD 1983**  
Top Hole Coordinates Bottom Hole Coordinates  
N: 4,353,672.467m N: 4,356,424.794m  
E: 518,655.119m E: 517,578.459m  
Plat orientation and corner and well references are based upon the grid north meridian.  
Well location references are based upon the magnetic meridian.

**Leases**

A	Freeman P. Smith, et al Lease
B	Elwood T. Fox Lease
C	Madeline Williams, et al Lease
D	Madeline Williams, et al Lease
E	Lawrence R. Weekly Lease

(-o-) Denotes Location of Well on United States Topographical Maps

**Legend**

- Proposed gas well
- Found corner, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)
- Existing well, as noted

Top Hole Coordinates, As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

02/15/2019