

# APPROVED

WR-35  
Rev. 8/23/13

NAME: [Signature]

Page \_\_\_ of \_\_\_

DATE: 8/10/17

State of West Virginia

## Department of Environmental Protection - Office of Oil and Gas Well Operator's Report of Well Work

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JUL 17 2017

WV Department of  
Environmental Protection

API 47 - 017 - 06478 County Doddridge District Grant  
 Quad Smithburg 7.5' Pad Name Misery Pad Field/Pool Name -----  
 Farm name Denzil C. Spencer et al Well Number Rexal 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 4356850m Easting 521633m  
 Landing Point of Curve Northing 4356784.20m Easting 521198.50m  
 Bottom Hole Northing 4359418m Easting 520125m

Elevation (ft) 1001' 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 05/23/2014 Date drilling commenced 04/13/2015 Date drilling ceased 04/25/2016  
 Date completion activities began 08/19/2016 Date completion activities ceased 12/04/2016  
 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 475' Open mine(s) (Y/N) depths No  
 Salt water depth(s) ft 1477', 1511', 1675' Void(s) encountered (Y/N) depths No  
 Coal depth(s) ft 177', 257', 1542' Cavern(s) encountered (Y/N) depths No  
 Is coal being mined in area (Y/N) No

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

**09/15/2017**

API 47-017 - 06478 Farm name Denzil C. Spencer et al Well number Rexal 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"	53'	New	94#, J-55	N/A	Y
Surface	17-1/2"	13-3/8"	557'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2523'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16734'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7099'		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	150 sx	15.6	1.19	179	0'	8 Hrs.
Surface	Class A	663 sx	15.6	1.18	782	0'	8 Hrs.
Coal							
Intermediate 1	Class A	974 sx	15.6	1.18	1149	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1076 sx (Lead) 1574 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.21 (Lead), 1.83 (Tail)	4182	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16734' MD, 9740' TVD (BHL) & 6784' TVD (Deepest Point Drilled) Loggers TD (ft) 16699' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6346'

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Anne Unit 2H API #47-017-06374). Please reference the wireline logs submitted with Form WR-35 for Anne Unit 2H. 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 RECEIVED  
Surface - 1 above guide shoes, 1 above insert float, 1 every 4th joint to surface Office of Oil and Gas  
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 JUL 17 2017

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_ WV Department of Environmental Protection

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	8/19/2016	16468	16610	60	Marcellus
2	10/22/2016	16270	16437	60	Marcellus
3	10/23/2016	16072	16239	60	Marcellus
4	10/23/2016	15874	16041	60	Marcellus
5	10/23/2016	15676	15843	60	Marcellus
6	10/23/2016	15478	15645	60	Marcellus
7	10/24/2016	15279	15447	60	Marcellus
8	10/24/2016	15081	15248	60	Marcellus
9	10/24/2016	14883	15050	60	Marcellus
10	10/25/2016	14685	14852	60	Marcellus
11	10/25/2016	14487	14654	60	Marcellus
12	10/25/2016	14289	14456	60	Marcellus
13	10/25/2016	14091	14258	60	Marcellus
14	10/26/2016	13892	14060	60	Marcellus
15	10/26/2016	13694	13861	60	Marcellus
16	10/26/2016	13496	13663	60	Marcellus
17	10/26/2016	13298	13465	60	Marcellus
18	10/27/2016	13100	13267	60	Marcellus
19	10/27/2016	12902	13069	60	Marcellus
20	10/27/2016	12704	12871	60	Marcellus
21	10/28/2016	12506	12673	60	Marcellus
22	10/28/2016	12307	12475	60	Marcellus
23	10/28/2016	12109	12276	60	Marcellus
24	10/28/2016	11911	12078	60	Marcellus
25	10/29/2016	11713	11880	60	Marcellus
26	10/29/2016	11515	11682	60	Marcellus
27	10/29/2016	11317	11484	60	Marcellus
28	10/29/2016	11119	11286	60	Marcellus
29	10/29/2016	10920	11088	60	Marcellus
30	10/30/2016	10722	10889	60	Marcellus
31	10/30/2016	10524	10691	60	Marcellus
32	10/30/2016	10326	10493	60	Marcellus
33	10/30/2016	10128	10295	60	Marcellus
34	10/31/2016	9930	10097	60	Marcellus
35	10/31/2016	9732	9899	60	Marcellus
36	10/31/2016	9534	9701	60	Marcellus
37	10/31/2016	9335	9503	60	Marcellus
38	10/31/2016	9137	9304	60	Marcellus
39	11/1/2016	8939	9106	60	Marcellus
40	11/1/2016	8741	8908	60	Marcellus
41	11/1/2016	8543	8710	60	Marcellus
42	11/1/2016	8345	8512	60	Marcellus
43	11/2/2016	8147	8314	60	Marcellus
44	11/2/2016	7949	8116	60	Marcellus
45	11/2/2016	7750	7917	60	Marcellus
46	11/2/2016	7552	7719	60	Marcellus
47	11/2/2016	7354	7521	60	Marcellus
48	11/3/2016	7156	7323	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	10/22/2016	69.8	8165	0	5310	349050	8240	N/A
2	10/22/2016	70.5	7664	5981	5043	350810	8275	N/A
3	10/23/2016	75.6	7701	5937	5184	350540	9023	N/A
4	10/23/2016	74.1	7939	6078	5287	348900	8207	N/A
5	10/23/2016	70.9	7663	6038	5413	350100	8207	N/A
6	10/23/2016	71.7	7756	5905	4885	350820	8183	N/A
7	10/24/2016	71.8	7596	5873	5051	350280	8172	N/A
8	10/24/2016	71.3	7703	6347	5432	349050	8056	N/A
9	10/24/2016	78.1	8123	5824	5406	349050	8051	N/A
10	10/25/2016	76.0	7838	6042	5278	349680	9646	N/A
11	10/25/2016	75.9	8061	6209	5622	343150	7954	N/A
12	10/25/2016	76.8	8007	5744	5103	350250	8032	N/A
13	10/25/2016	78.0	7968	5905	5061	350390	8024	N/A
14	10/26/2016	78.0	8277	6003	4629	350540	9986	N/A
15	10/26/2016	79.0	7839	5844	5656	350200	8048	N/A
16	10/26/2016	78.6	7666	6071	5469	351450	8034	N/A
17	10/26/2016	79.0	7558	5793	5370	350840	7990	N/A
18	10/27/2016	78.0	7623	5986	5585	351160	7986	N/A
19	10/27/2016	80.6	7680	6165	5360	352120	7985	N/A
20	10/27/2016	78.0	7562	6074	5287	350720	9005	N/A
21	10/28/2016	74.0	7478	6390	5139	350510	7955	N/A
22	10/28/2016	79.8	7761	6045	4591	350400	7991	N/A
23	10/28/2016	79.7	7426	5638	5426	349600	7940	N/A
24	10/28/2016	79.0	7454	5979	5128	349600	8021	N/A
25	10/29/2016	78.0	7528	5934	4658	349560	8012	N/A
26	10/29/2016	79.0	7557	5946	5375	349420	8023	N/A
27	10/29/2016	78.6	7612	6237	5709	349400	8337	N/A
28	10/29/2016	79.3	7846	5908	5063	349180	8145	N/A
29	10/29/2016	78.0	7618	5866	4956	345350	8064	N/A
30	10/30/2016	79.0	7550	5577	4491	350350	7974	N/A
31	10/30/2016	78.0	7836	6021	3925	328050	8546	N/A
32	10/30/2016	79.7	7687	5670	5539	349700	8014	N/A
33	10/30/2016	79.0	7581	5812	5651	350270	7951	N/A
34	10/31/2016	79.0	7336	5608	4736	349580	7938	N/A
35	10/31/2016	79.0	7668	5748	5406	350270	8474	N/A
36	10/31/2016	79.9	7431	5508	4913	350460	7917	N/A
37	10/31/2016	74.2	7879	6673	5043	326630	8837	N/A
38	10/31/2016	80.0	7260	5955	4691	350640	7902	N/A
39	11/1/2016	80.0	7137	6011	5354	352960	7926	N/A
40	11/1/2016	79.9	7002	6254	5444	351380	6775	N/A
41	11/1/2016	76.3	7174	5734	5528	351220	7915	N/A
42	11/1/2016	80.0	7017	5945	5808	351310	6930	N/A
43	11/2/2016	79.0	7025	5816	5011	350560	6914	N/A
44	11/2/2016	78.7	6906	5712	4673	351240	6908	N/A
45	11/2/2016	79.6	7165	6134	5495	330320	6848	N/A
46	11/2/2016	80.1	6835	5841	5654	350690	6907	N/A
47	11/2/2016	78.0	7380	6204	5266	320370	7921	N/A
48	11/3/2016	79.0	6886	5900	4731	351780	6903	N/A
<b>AVG=</b>		<b>77.4</b>	<b>7,571</b>	<b>5,831</b>	<b>5,184</b>	<b>16,709,900</b>	<b>8,023</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
Fresh Water	475'	N/A	475'	N/A
Shale/ Siltstone	0	177	0	177
Shale/ Trace Coal	est. 177	207	est. 177	207
Shale/ Siltstone	est. 207	257	est. 207	257
Shale/ Trace Coal	est. 257	277	est. 257	277
Shale/ Sandstone	est. 277	657	est. 277	657
Limestone/ Siltstone	est. 657	967	est. 657	967
Sandstone	est. 967	987	est. 967	987
Shale/ Limestone/ Siltstone	est. 987	1117	est. 987	1117
Siltstone/ Sandstone	est. 1117	1177	est. 1117	1177
Shale/ Siltstone	est. 1177	1237	est. 1177	1237
Sandstone	est. 1237	1257	est. 1237	1257
Shale/ Siltstone	est. 1257	1397	est. 1257	1397
Sandstone/ Siltstone	est. 1397	1542	est. 1397	1542
Sandstone/ Coal	est. 1542	1602	est. 1542	1602
Siltstone/ Shale	est. 1602	1933	est. 1602	1938
Big Lime	1933	2045	1938	2050
Big Injun	2045	2487	2050	2492
Gantz Sand	2487	2611	2492	2616
Fifty Foot Sandstone	2611	2679	2616	2684
Gordon	2679	3025	2684	3030
Fifth Sandstone	3025	3067	3030	3072
Bayard	3067	3415	3072	3420
Warren	3415	3811	3420	3817
Speechley	3811	4523	3817	4547
Bradford	4523	4992	4547	5047
Benson	4992	5235	5047	5321
Alexander	5235	5427	5321	5535
Elk	5427	5998	5535	6163
Rhinestreet	5998	6335	6163	6550
Sycamore	6335	6512	6550	6757
Middlesex	6512	6643	6757	6948
Burkett	6643	6672	6948	6999
Tully	6672	6723	6999	7118
Marcellus	6723	NA	7118	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:	10/22/2016
Job End Date:	11/3/2016
State:	West Virginia
County:	Doddridge
API Number:	47-017-06478-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Rexal 2H
Latitude:	39.21387000
Longitude:	-80.44566500
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,783
Total Base Water Volume (gal):	16,770,782
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	89.11284	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	10.64620	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.12990	
			Hydrogen Chloride	7647-01-0	17.50000	0.03020	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.01646	
			Petroleum Distillates	64742-47-8	60.00000	0.01559	
			Suspending agent (solid)	14808-60-7	3.00000	0.00252	
			Surfactant	68439-51-0	3.00000	0.00099	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	2-Propenoic acid, polymer with 2-propenamide	9003-06-9	30.00000	0.01943	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01564	

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Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00420	
			Deionized Water	7732-18-5	28.00000	0.00240	
SI-1100s	U.S. Well Services, LLC	Scale Inhibitor					
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00149	
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	3.00000	0.00051	
			Phosphino carboxylic acid polymer	71050-62-9	3.00000	0.00049	
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	3.00000	0.00049	
AI-302	U.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Water	7732-18-5	95.00000	0.00029	
			2-Propyn-1-olcompound with methyloxirane	38172-91-7	15.00000	0.00005	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00030	

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.

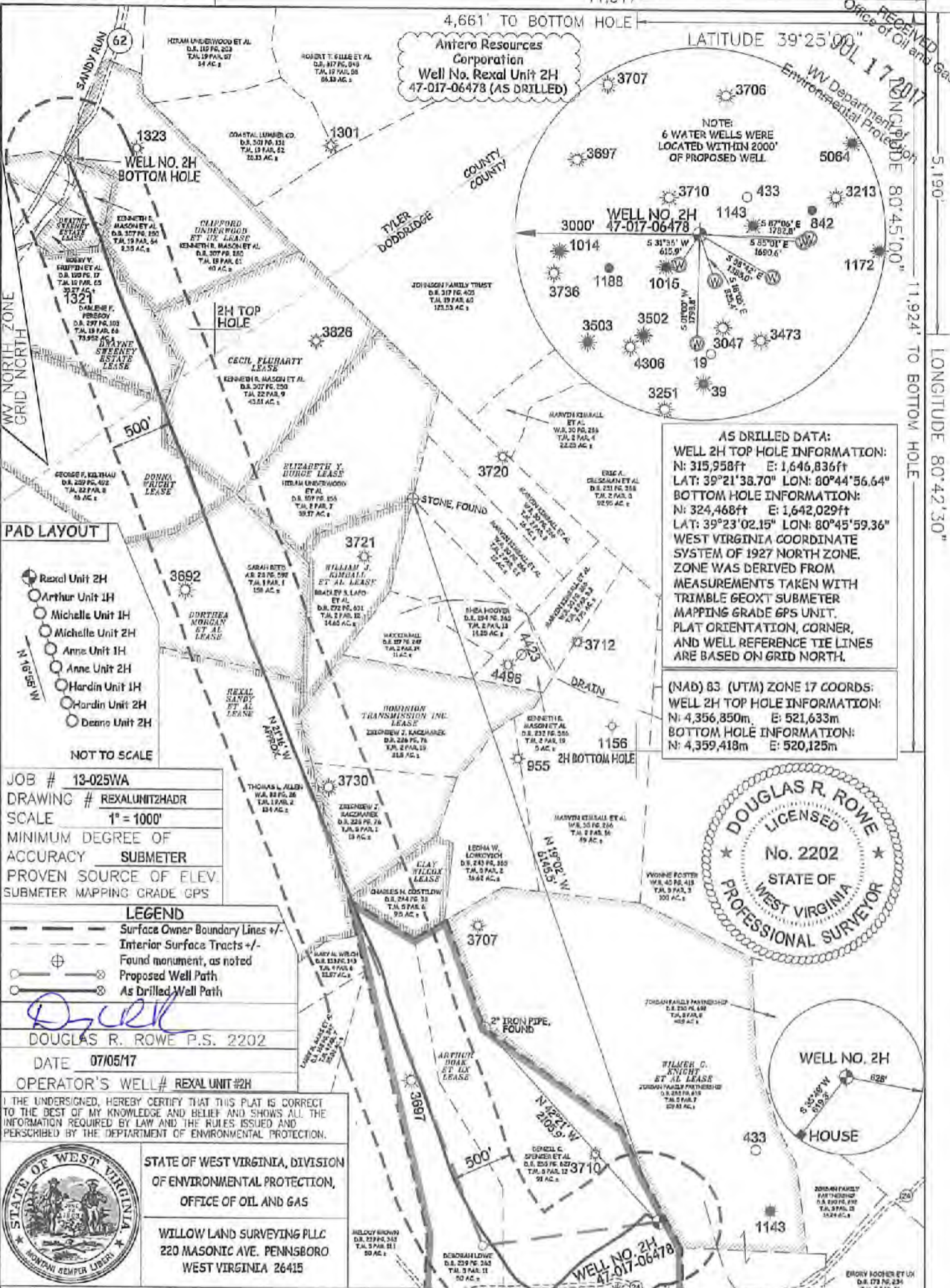
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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LATITUDE 39°22'30"

11,517'

LATITUDE 39°25'00"



Antero Resources Corporation  
Well No. Rexal Unit 2H  
47-017-06478 (AS DRILLED)

NOTE:  
6 WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF PROPOSED WELL

AS DRILLED DATA:  
WELL 2H TOP HOLE INFORMATION:  
N: 315,958ft E: 1,646,836ft  
LAT: 39°21'38.70" LON: 80°44'56.64"  
BOTTOM HOLE INFORMATION:  
N: 324,468ft E: 1,642,029ft  
LAT: 39°23'02.15" LON: 80°45'59.36"  
WEST VIRGINIA COORDINATE  
SYSTEM OF 1927 NORTH ZONE.  
ZONE WAS DERIVED FROM  
MEASUREMENTS TAKEN WITH  
TRIMBLE 660XT 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: 4,356,850m E: 521,633m  
BOTTOM HOLE INFORMATION:  
N: 4,359,418m E: 520,125m



**PAD LAYOUT**

- Rexal Unit 2H
- Arthur Unit 1H
- Michelle Unit 1H
- Michelle Unit 2H
- Anne Unit 1H
- Anne Unit 2H
- Hardin Unit 1H
- Hardin Unit 2H
- Deano Unit 2H

JOB # 13-025WA  
DRAWING # REXALUNITZHADR  
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

DOUGLAS R. ROWE P.S. 2202  
DATE 07/05/17  
OPERATOR'S WELL# REXAL UNIT #2H

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

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS STATE COUNTY PERMIT  
API WELL # 47 - 017 - 06478  
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL  
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X  
LOCATION: ELEVATION 1,020' - ORIG. 1,001' - PROP. WATERSHED MCELROY CREEK  
QUADRANGLE SMITHBURG 7.5 (TH) SHIRLEY 7.5 (BH) DISTRICT GRANT COUNTY DODDRIDGE  
SURFACE OWNER DENZIL C. SPENCER ET AL ACREAGE 91 ACRES +/-  
OIL & GAS ROYALTY OWNER ARTHUR DOAK ET UX; CLAY WILCOX; DOMINION TRANSMISSION INC.; REXAL SANDY ET AL;  
DORTHEA MORGAN ET AL; DONNA WRIGHT; CECIL FLUHARTY; DWAYNE SWEENEY ESTATE; CLIFFORD UNDER WOOD ET UX; DWAYNE SWEENEY ESTATE

LEASE ACREAGE 141 AC±; 18 AC±; 49.5 AC±; 134 AC±; 159 AC±; 46 AC±; 45.81 AC±; 32 AC±; 40 AC±; 19 ac±  
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE  
PLUG OFF OLD FORMATION PERFORME NEW FORMATION OTHER PHYSICAL CHANGE IN WELL  
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,740' TVD 16,734' MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA STAMPER  
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

- NOTE
- ONE OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HARBORING ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  - TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  - AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  - WAS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN THIS PLAT AND ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
  - WAS BE OF NO BEING RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

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COUNTY NAME PERMIT

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JUL 17 2017  
WV Department of Environmental Protection

5,190'  
11,924' TO BOTTOM HOLE  
LONGITUDE 80°42'30"





State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Discharge Monitoring Report  
Oil and Gas General Permit

Company Name: Antero Resources Corporation  
API No: 47-017-06478 County: Doddridge  
District: Grant Well No: Rexal Unit 2H  
Farm Name: Denzil C. Spencer, et al  
Discharge Date/s From:(MMDDYY) 12/08/16 To: (MMDDYY) 01/07/17  
Discharge Times. From: 0:00 To: 24:00  
Total Volume to be Disposed from this facility (gallons): 417,988

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: \_\_\_\_\_ (Include a topographical map of the Area.)  
(2) UIC: 382,340 Permit No. 3400923821, 3416729731, 4708509721, 3410523619, 3400923761, 3416729543, 3416729464, 3416729445, 3412123995  
(3) Offsite Disposal: 578 Site Location: Petta  
(4) Reuse: 35,070 Alternate Permit Number: \_\_\_\_\_  
(5) Centralized Facility: \_\_\_\_\_ Permit No. \_\_\_\_\_  
(6) Other method: \_\_\_\_\_ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: n/a Cl- mg/l n/a DO mg/l

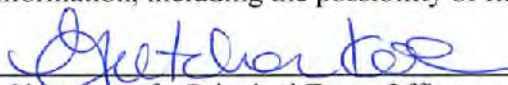
1. Do you have permission to use expedited treatment from the Director or his representative?  
(Y/N) n/a If yes, who? \_\_\_\_\_ and place a four (4) on line 7.  
If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4  
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a If yes, go to line 6  
If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: n/a No pit on site.

Name of Principal Exec. Officer: Gretchen Kohler

Title of Officer: Environmental & Regulatory Manager

Date Completed: 2/2/17

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

  
Signature of a Principal Exec. Officer or Authorized agent.

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Category 1  
Sampling Results

API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\*\*\* Al is only reported if the pH is above 9.0

Category 2  
Sampling Results

API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_

\*\* Include a description of your aeration technique.

\*\*\* Al is only reported if the pH is above 9.0

Date: \_\_\_\_\_

Aeration Code: \_\_\_\_\_

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Category 3  
Sampling Results  
API No : \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_ Date: \_\_\_\_\_  
 \*\* Include a description of your aeration technique. Aeration Code: \_\_\_\_\_  
 \*\*\* Al is only reported if the pH is above 9.0.

Category 4  
Sampling Results  
API No: \_\_\_\_\_

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/Bt
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

\* Can be 25,000 with inspector's approval,

(Inspector's signature): \_\_\_\_\_ Date: \_\_\_\_\_  
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