



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

August 9, 2019

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells:

- Waco Unit 1H (API # 47-085-10354)—Bison Pad
- Waco Unit 2H (API # 47-085-10356)—Bison Pad
- Waldo Unit 1H (API # 47-085-10353)—Bison Pad
- Waldo Unit 2H (API # 47-085-10355)—Bison Pad

If you have any questions please feel free to contact me at (303) 357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", written in a cursive style.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

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

API 47-085-10354 County Ritchie District Clay
Quad Pennsboro 7.5' Pad Name Bison Pad Field/Pool Name -----
Farm name Donald L. Costilow Well Number Waco 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 4349551m Easting 508530m
Landing Point of Curve Northing 4349402m Easting 508433m
Bottom Hole Northing 4346397m Easting 509441m

Elevation (ft) 1221' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 9/14/2015 Date drilling commenced 6/29/2017 Date drilling ceased 11/12/2018
Date completion activities began 3/15/2019 Date completion activities ceased 4/23/2019
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: _____

API 47-085 - 10354 Farm name Donald L. Costilow Well number Waco 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"	110'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	556.5'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2560'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17641.5'	New	23#, HCP-110	N/A	Y
Tubing		2-3/8"	6495'		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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	241	0'	8 Hrs.
Surface	Class A	529 sx	15.6	1.20	635	0'	8 Hrs.
Coal							
Intermediate 1	Class A	910 sx	15.6	1.19	1083	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	792 sx (Lead) 1258sx (Tail)	14.5 (Lead), 15.2(Tail)	1.4 (Lead), 1.6 (Tail)	3118	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 14138' MD, 6603' TVD (BHL), 6612' (Deepest Point Drilled) Loggers TD (ft) 14138' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6200'

** This is a subsequent Well. Antero only runs wireline logs on one well on a multi-well pad (Bill Unit 3H API#47-085-10257). A Cement Bond Log has been included with this submittal.

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

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Conductor - 0
 Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
 Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface
 Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

API 47- 085 - 10354 Farm name Donald L. Costilow Well number Waco Unit 1H

PRODUCING FORMATION(S)	DEPTHS		
<u>Marcellus</u>	<u>6556' (TOP)</u>	<u>TVD</u>	<u>7464' (TOP)</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas 10033.04 mcfpd Oil 57.53 bpd NGL --- bpd Water 390.17 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ 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 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company KLX Energy Services
Address 6072 W Veterans Memorial Hwy City Bridgeport State WV Zip 26330

Cementing Company Schlumberger Oilfield Services
Address 300 Schlumberger Dr City Sugarland State TX Zip 77478

Stimulating Company CalFrac Well Services
Address 171 17th Street, Suite 1445 City Denver State CO Zip 80202

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-6820
Signature  Title Permitting Agent Date 8/1/2019

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

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	3/15/2019	17544.6		60	Marcellus
2	3/16/2019	17462.7	17298.2	60	Marcellus
3	3/16/2019	17262.9	17098.4	60	Marcellus
4	3/16/2019	17063.1	16898.6	60	Marcellus
5	3/17/2019	16863.3	16698.8	60	Marcellus
6	3/17/2019	16663.5	16499	60	Marcellus
7	3/17/2019	16463.7	16299.2	60	Marcellus
8	3/18/2019	16263.9	16099.4	60	Marcellus
9	3/19/2019	16064.1	15899.6	60	Marcellus
10	3/19/2019	15864.3	15699.8	60	Marcellus
11	3/20/2019	15664.5	15500	60	Marcellus
12	3/20/2019	15464.7	15300.2	60	Marcellus
13	3/20/2019	15264.9	15100.4	60	Marcellus
14	3/21/2019	15065.1	14900.6	60	Marcellus
15	3/21/2019	14865.3	14700.8	60	Marcellus
16	3/22/2019	14665.5	14501	60	Marcellus
17	3/22/2019	14465.7	14301.2	60	Marcellus
18	3/22/2019	14265.9	14101.4	60	Marcellus
19	3/23/2019	14066.1	13901.6	60	Marcellus
20	3/23/2019	13866.3	13701.8	60	Marcellus
21	3/24/2019	13666.5	13502	60	Marcellus
22	3/24/2019	13466.7	13302.2	60	Marcellus
23	3/24/2019	13266.9	13102.4	60	Marcellus
24	3/24/2019	13067.1	12902.6	60	Marcellus
25	3/25/2019	12867.3	12702.8	60	Marcellus
26	3/25/2019	12667.5	12503	60	Marcellus
27	3/25/2019	12467.7	12303.2	60	Marcellus
28	3/26/2019	12267.9	12103.4	60	Marcellus
29	3/26/2019	12068.1	11903.6	60	Marcellus
30	3/26/2019	11868.3	11703.8	60	Marcellus
31	3/26/2019	11668.5	11504	60	Marcellus
32	3/27/2019	11468.7	11304.2	60	Marcellus
33	3/27/2019	11268.9	11104.4	60	Marcellus
34	3/27/2019	11069.1	10904.6	60	Marcellus
35	3/28/2019	10869.3	10704.8	60	Marcellus
36	3/28/2019	10669.5	10505	60	Marcellus
37	3/28/2019	10469.7	10305.2	60	Marcellus
38	3/28/2019	10269.9	10105.4	60	Marcellus
39	3/29/2019	10070.1	9905.6	60	Marcellus
40	3/29/2019	9870.3	9705.8	60	Marcellus
41	3/29/2019	9670.5	9506	60	Marcellus
42	3/29/2019	9470.7	9306.2	60	Marcellus
43	3/30/2019	9270.9	9106.4	60	Marcellus
44	3/30/2019	9071.1	8906.6	60	Marcellus
45	3/31/2019	8871.3	8706.8	60	Marcellus
46	3/31/2019	8671.5	8507	60	Marcellus
47	3/31/2019	8471.7	8307.2	60	Marcellus
48	3/31/2019	8271.9	8107.4	60	Marcellus
49	4/1/2019	8072.1	7907.6	60	Marcellus
50	4/1/2019	7872.3	7707.8	60	Marcellus
51	4/1/2019	7672.5	7508	60	Marcellus
52	4/1/2019	7472.7	7308.2	60	Marcellus
53	4/1/2019	7272.9	7108.4	60	Marcellus
54	4/2/2019	7073.1	6908.6	60	Marcellus

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	3/15/2019	74.11579	7709.925	5338	4394	172650	5238	N/A
2	3/16/2019	79.13507	8078.604	4936	4495	403930	9059	N/A
3	3/16/2019	73.36493	7893.733	4960	4739	404750	8929	N/A
4	3/16/2019	75.65787	8082.569	4495	4433	403500	8899	N/A
5	3/17/2019	69.97978	7517.3	4994	4931	403350	10500	N/A
6	3/17/2019	75.49628	7776.176	5000	4088	404200	8913	N/A
7	3/17/2019	75.89353	8104.858	5207	4150	337200	9826	N/A
8	3/18/2019	72.96028	7814.697	5335	4395	403650	8943	N/A
9	3/19/2019	74.55914	7775.245	5020	4498	404000	8241	N/A
10	3/19/2019	78.90506	8059.103	5452	3792	403850	8896	N/A
11	3/20/2019	70.93022	8049.824	5362	3576	404150	9691	N/A
12	3/20/2019	71.95741	8252.432	5488	3541	404050	8719	N/A
13	3/20/2019	76.49459	8221.457	5790	3988	403200	8883	N/A
14	3/21/2019	78.20909	7935.33	5142	4024	406600	8734	N/A
15	3/21/2019	79.33722	7903.043	5305	4020	405950	8731	N/A
16	3/22/2019	79.10883	8082.406	5463	3784	403800	8854	N/A
17	3/22/2019	78.92846	8042.435	5594	3653	406700	8767	N/A
18	3/22/2019	80.62725	8170.703	5422	4298	409450	8828	N/A
19	3/23/2019	75.94723	7954.437	5911	3774	404650	9679	N/A
20	3/23/2019	74.845	7517.491	5309	4097	403250	8684	N/A
21	3/24/2019	74.90471	7968.839	5780	3758	403750	9619	N/A
22	3/24/2019	77.49975	7706.656	5137	3456	405150	8750	N/A
23	3/24/2019	78.65508	7875.732	5112	3643	404250	8705	N/A
24	3/24/2019	71.3747	7976.567	5253	4530	403550	8772	N/A
25	3/25/2019	76.15862	7568.574	5381	3982	405850	8672	N/A
26	3/25/2019	78.42849	7728.081	5401	3551	404300	8729	N/A
27	3/25/2019	77.67339	7841.903	5692	3320	405950	8949	N/A
28	3/26/2019	78.82139	7588.28	5672	3928	403000	8755	N/A
29	3/26/2019	80.29679	7621.528	5588	3765	402950	8767	N/A
30	3/26/2019	81.54494	7714.843	5280	4486	404300	8478	N/A
31	3/26/2019	77.37362	7680.026	5800	4411	407050	9759	N/A
32	3/27/2019	82.30403	7859.747	6386	3761	404950	8788	N/A
33	3/27/2019	81.09154	7783.951	5411	3986	404850	8672	N/A
34	3/27/2019	83.3092	7897.51	5369	3510	405700	8719	N/A
35	3/28/2019	77.02036	7749.619	5403	3423	403950	9773	N/A
36	3/28/2019	84.65471	7567.4	5459	4122	404950	8618	N/A
37	3/28/2019	86.22276	7516.918	4602	3625	403500	8722	N/A
38	3/28/2019	87.62979	7605.891	5854	4090	403290	8810	N/A
39	3/29/2019	87.55835	7509.921	5528	4075	405000	8563	N/A
40	3/29/2019	86.697	7589.686	6055	3429	405050	8577	N/A
41	3/29/2019	88.47192	7799.744	5337	3509	404400	8627	N/A
42	3/29/2019	89.51128	7641.121	5813	3492	403800	8618	N/A
43	3/30/2019	88.42522	7328.485	5181	3575	404900	8504	N/A
44	3/30/2019	83.72902	7774.964	5643	3471	403450	8584	N/A
45	3/31/2019	87.47462	7580.041	4441	4376	404200	8590	N/A
46	3/31/2019	88.58684	7748.105	4840	4009	404650	8441	N/A
47	3/31/2019	88.60304	7217.091	4832	3593	406300	8486	N/A
48	3/31/2019	85.36524	7100.407	5546	3736	404050	8521	N/A
49	4/1/2019	88.43906	7219.577	5632	3506	404550	8505	N/A
50	4/1/2019	88.12515	7208.35	4269	3698	405300	8452	N/A
51	4/1/2019	89.21875	7331.488	3413	4122	408650	8489	N/A
52	4/1/2019	90.02398	6948.922	5374	4086	406700	9601	N/A
53	4/1/2019	89.142	6841.595	5292	3735	407150	8427	N/A
54	4/2/2019	87.545	6940.04	5561	3272	402480	8782	N/A
	AVG=	77	7,874	5,376	4,038	13,052,780	292,429	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Silty Sandstone	0	190	0	190
Sandy siltstone	190	290	190	290
Sandstone	290	600	290	600
Silty Sandstone	600	870	600	870
limey siltstone	870	945	870	945
silty sandstone, tr. coal	945	1,095	945	1,095
silty sandstone	1,095	1,490	1,095	1,490
silty shale	1,490	1,620	1,490	1,620
sandstone, tr coal	1,620	1,630	1,620	1,630
silty sandstone	1,630	1,670	1,630	1,670
sandstone	1,670	1,745	1,670	1,745
sandy shale	1,745	1,770	1,745	1,770
shaly sand	1,770	2,011	1,770	2,011
Big Lime	2,026	2,907	2,026	2,908
Fifty Foot Sandstone	2,907	3,023	2,908	3,025
Gordon	3,023	3,187	3,025	3,190
Fifth Sandstone	3,187	3,442	3,190	3,450
Bayard	3,442	3,940	3,450	3,959
Speechley	3,940	4,185	3,959	4,210
Balltown	4,185	4,742	4,210	4,780
Bradford	4,742	5,113	4,780	5,158
Benson	5,113	5,347	5,158	5,397
Alexander	5,347	6,387	5,397	6,498
Sycamore	6,250	6,357	6,333	6,468
Middlesex	6,357	6,466	6,468	6,665
Burkett	6,466	6,501	6,665	6,757
Tully	6,501	6,528	6,757	6,857
Marcellus	6,528	NA	6,857	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/15/2019
Job End Date:	4/2/2019
State:	West Virginia
County:	Ritchie
API Number:	47-085-10354-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Waco Unit 1H
Latitude:	39.29520800
Longitude:	-80.90125300
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,623
Total Base Water Volume (gal):	20,592,278
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	100.00000	88.58486	
SaniFrac 8844	CWS	Biocide					
				Listed Below			

					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	11.11292
					Calcite	471-34-1	1.00000	0.07719
					Hydrochloric acid	7647-01-0	37.00000	0.05217
					Illite	12173-60-3	1.00000	0.03392
					Polymer	26100-47-0	45.00000	0.02630
					Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01753
					Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.01702
					Guar gum	9000-30-0	60.00000	0.01702
					Apatite	64476-38-6	0.10000	0.01111
					Goethite	1310-14-1	0.10000	0.01111
					Biotite	1302-27-8	0.10000	0.01111
					Ammonium chloride	12125-02-9	11.00000	0.00643
					Polyethylene glycol mixture	25322-68-3	54.50000	0.00574
					Ilmenite	98072-94-7	0.10000	0.00339
					Sorbitol monooleate	1338-43-8	4.00000	0.00234
					2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	20.00000	0.00211
					Polyethylene glycol monooleate	9004-96-0	3.00000	0.00175
					Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00142
					Sorbitol tetraoleate	61723-83-9	2.00000	0.00117
					Ammonium Persulfate	7727-54-0	100.00000	0.00062
					Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00058
					Citric acid	77-92-9	60.00000	0.00047

					37251-67-5	1.50000	0.00043	
				Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether				
				Sodium bromide	7647-15-6	4.00000	0.00042	
				Dibromoacetonitrile	3252-43-5	3.00000	0.00032	
				Alkyloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00029	
				Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00012	
				Acrylamide	79-06-1	0.10000	0.00006	
				Ethylene Glycol	107-21-1	40.00000	0.00003	
				Formic acid	64-18-6	10.00000	0.00001	
				Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00001	
				Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
				Tar bases, quinolone derivs, benzyl chloride-quatzenized	72480-70-7	10.00000	0.00001	
				Isopropyl alcohol	67-63-0	5.00000	0.00001	
				Cinnamaldehyde	104-55-2	10.00000	0.00001	
				Glycol	57-55-6			Proprietary Additive Concentration
				Organic Acid Salts	9003-04-7			Proprietary Additive Concentration

* 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)

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: 47-085-10354 County: Ritchie
District: Clay Well No: Waco Unit 1H
Farm Name: Antero Resources Corporation
Discharge Date/s From:(MMDDYY) 05/06/19 To: (MMDDYY) 06/05/19
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 593,873
Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 104,515 Permit No. 3416729731, 3400923821
(3) Offsite Disposal: _____ Site Location: _____
(4) Reuse: 489,359 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: Senior Environmental and Regulatory Manager

Date Completed: 7/12/19

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.

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): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

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

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/Bl
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

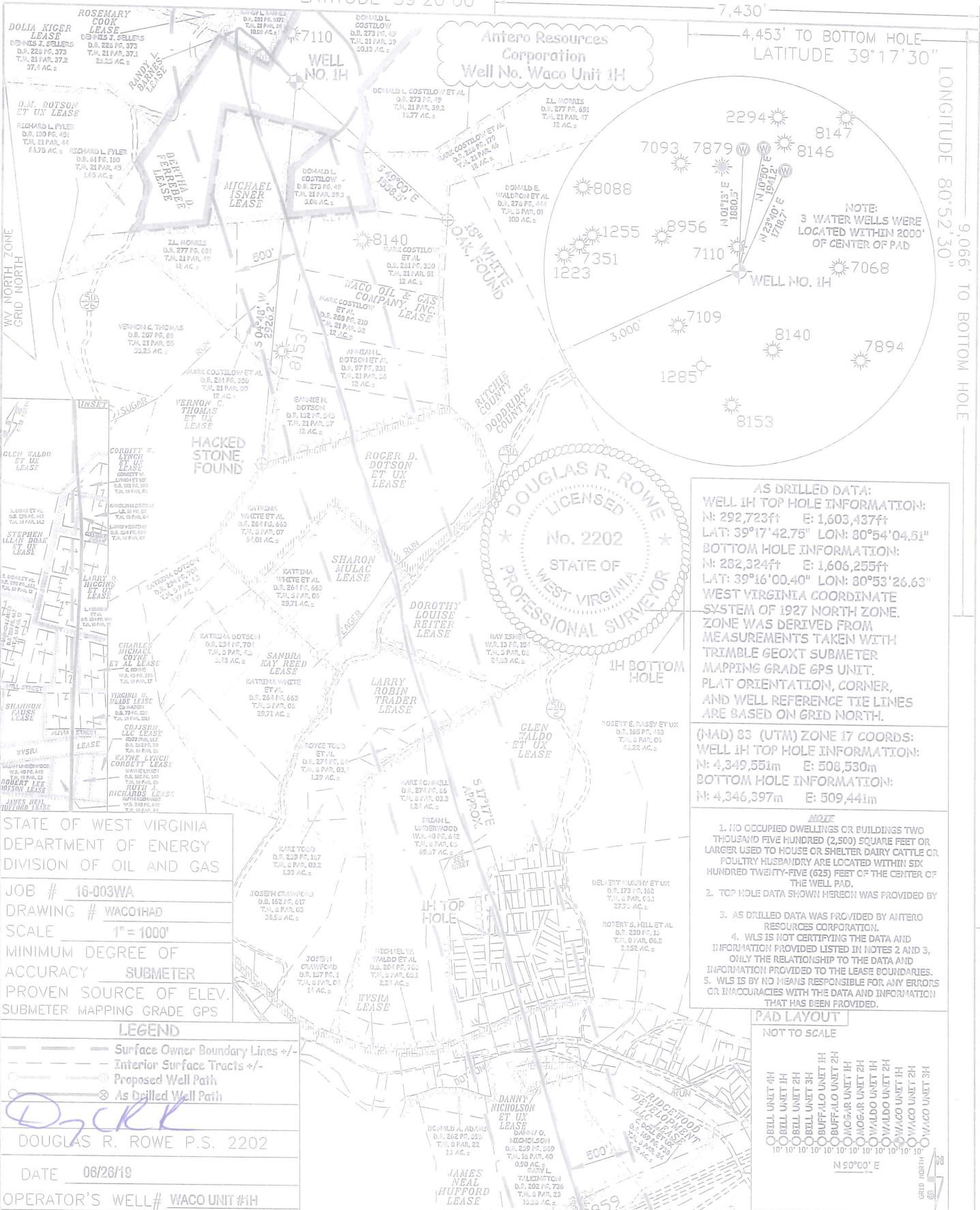
* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

LATITUDE 39°20'00"

7,430'



Antero Resources Corporation
Well No. Waco Unit 1H

DOUGLAS R. ROWE
LICENSED
No. 2202
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

AS DRILLED DATA:
WELL 1H TOP HOLE INFORMATION:
N: 292,723ft E: 1,603,437ft
LAT: 39°17'42.75" LON: 80°54'04.51"
BOTTOM HOLE INFORMATION:
N: 282,324ft E: 1,606,255ft
LAT: 39°16'00.40" LON: 80°53'26.63"
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: 4,349,551m E: 508,530m
BOTTOM HOLE INFORMATION:
N: 4,346,397m E: 509,441m

- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR 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
 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.



STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

JOB # 16-003WA
DRAWING # WACO1HAD
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

DOUGLAS R. ROWE P.S. 2202
DATE 06/26/19
OPERATOR'S WELL # WACO UNIT 1H

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

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION ___ STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,221' AS-BUILT WATERSHED NORTH FORK HUGHES RIVER
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY (TH) CENTRAL (BH) COUNTY RITCHIE (TH) DODDRIDGE (BH)

SURFACE OWNER DONALD L. COSTILOW ACREAGE 50.13 ACRES +/-
OIL & GAS ROYALTY OWNER BERTHA D. FERREBEE; RANDY L. BARNES; MICHAEL ISNER; WACO OIL & GAS CO. INC.; LEASE ACREAGE 67 AC±; 10.75 AC±; 98.3 AC±;
ROGER D. DOTSON ET UX; SHARON MULAC; DOROTHY LOUISE REITER; LARRY ROBIN TRADER; GLEN WALDO ET UX; 40 AC±; 25 AC±; 24.5 AC±; 25.83 AC±; 72.11 AC±;
CORBITT W. LYNCH ET UX; LARRY O. HIGGINS ET UX; CHARLES MICHAEL COYNE ET AL; VIRGINIA M. MEADE; WYRSA; RUTH A. RICHARDS; 10.09 AC±; 2.95 AC±; 0.4 AC±; 4.05 AC±; 301.19 AC±; 0.38 AC±;
JAMES NEAL HUFFORD; DANNY NICHOLSON ET UX; JUDY DOLL; VIRGINIA M. MEADE; G.W. HILL ET UX 46.7 AC±; 1.73 AC±; 40 AC±; 4.23 AC±; 47 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 ___
WELL OPERATOR ANTERO RESOURCES CORP. ESTIMATED DEPTH 6,623' TVD 17,681' MD
ADDRESS 1615 WYNKOOP STREET DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
FORM WW-6 DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

47	API WELL #	085	10354
	STATE	COUNTY	PERMIT

COUNTY NAME PERMIT