

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

API 47 - 095 - 02691 County Tyler District Ellsworth  
Quad Shirley & Porter Falls Pad Name Blizzard Field/Pool Name -----  
Farm name Roger D Blizzard & Ruth E Spencer Well Number Richmond 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 4372170m Easting 512867m  
Landing Point of Curve Northing 4372445.32m Easting 513058.27m  
Bottom Hole Northing 4376970m Easting 511503m

Elevation (ft) 1004' 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

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Date permit issued 3/20/2020 Date drilling commenced 5/31/2020 Date drilling ceased 7/13/2020  
Date completion activities began 9/25/2020 Date completion activities ceased 11/5/2020  
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 16' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1430', 1813' 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

APPROVED

Reviewed by: JMey 3/9/23

API 47-095 - 02691 Farm name Roger D Blizzard & Ruth E Spencer Well number Richmond 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"	80'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	510'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2638'	New	36#, K-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	22793'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6756'		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	204 sx	15.6	1.18	241	0'	8 Hrs.
Surface	Class A	567 sx	15.6	1.20	635	0'	8 Hrs.
Coal							
Intermediate 1	Class A	882 sx	15.6	1.19	1082	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	792 sx (Lead) 3544 sx (Tail)	13.5 (Lead), 15.2(Tail)	1.4 (Lead), 1.6 (Tail)	3003	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 22838' MD, 6410' TVD (BHL), 6518' (Deepest Point Drilled) Loggers TD (ft) 22838' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5870'

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

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

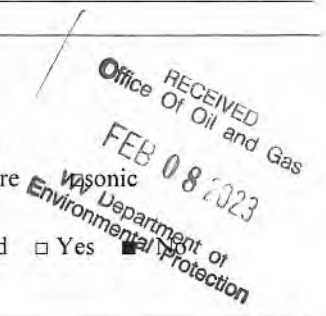
DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

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



*SMC*  
3/19/23

API 47-095 - 02691 Farm name Roger D Blizzard & Ruth E Spencer Well number Richmond 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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Please insert additional pages as applicable.

*Smiley  
3/19/13*

API 47- 095 - 02691 Farm name Roger D Blizzard & Ruth E Spencer Well number Richmond 2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6470' (TOP)	TVD	6828' (TOP) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 1199 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 16899 mcfpd Oil 650 bpd NGL --- bpd Water 1311 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 H & P Drilling  
Address 912 N Eagle Valley Rd City Howard State PA Zip 16841

Logging Company KLX Energy  
Address 1415 Louisiana St, Suite 2900 City Houston State TX Zip 77002

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

Stimulating Company Halliburton  
Address 3000 W. Sam Houston Pkwy City Houston State TX Zip 76114

Please insert additional pages as applicable.

Completed by Carly Marvel Telephone 303-357-7373  
Signature Carly Marvel Title Permitting Agent Date 2/6/2023

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

*Carly Marvel*  
3/9/23

**Exhibit 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/25/2020	22721.1	22678.8	60	Marcellus
2	9/25/2020	22640.06157	22474.3694	60	Marcellus
3	9/26/2020	22438.83102	22273.1389	60	Marcellus
4	9/26/2020	22237.60046	22071.9083	60	Marcellus
5	9/26/2020	22036.36991	21870.6778	60	Marcellus
6	9/27/2020	21835.13935	21669.4472	60	Marcellus
7	9/27/2020	21633.9088	21468.2167	60	Marcellus
8	9/28/2020	21432.67824	21266.9861	60	Marcellus
9	9/28/2020	21231.44769	21065.7556	60	Marcellus
10	9/28/2020	21030.21713	20864.525	60	Marcellus
11	9/28/2020	20828.98657	20663.2944	60	Marcellus
12	9/29/2020	20627.75602	20462.0639	60	Marcellus
13	9/29/2020	20426.52546	20260.8333	60	Marcellus
14	9/30/2020	20225.29491	20059.6028	60	Marcellus
15	9/30/2020	20024.06435	19858.3722	60	Marcellus
16	9/30/2020	19822.8338	19657.1417	60	Marcellus
17	10/1/2020	19621.60324	19455.9111	60	Marcellus
18	10/1/2020	19420.37269	19254.6806	60	Marcellus
19	10/2/2020	19219.14213	19053.45	60	Marcellus
20	10/2/2020	19017.91157	18852.2194	60	Marcellus
21	10/2/2020	18816.68102	18650.9889	60	Marcellus
22	10/3/2020	18615.45046	18449.7583	60	Marcellus
23	10/3/2020	18414.21991	18248.5278	60	Marcellus
24	10/4/2020	18212.98935	18047.2972	60	Marcellus
25	10/4/2020	18011.7588	17846.0667	60	Marcellus
26	10/4/2020	17810.52824	17644.8361	60	Marcellus
27	10/5/2020	17609.29769	17443.6056	60	Marcellus
28	10/5/2020	17408.06713	17242.375	60	Marcellus
29	10/5/2020	17206.83657	17041.1444	60	Marcellus
30	10/6/2020	17005.60602	16839.9139	60	Marcellus
31	10/6/2020	16804.37546	16638.6833	60	Marcellus
32	10/7/2020	16603.14491	16437.4528	60	Marcellus
33	10/7/2020	16401.91435	16236.2222	60	Marcellus
34	10/8/2020	16200.6838	16034.9917	60	Marcellus
35	10/8/2020	15999.45324	15833.7611	60	Marcellus
36	10/8/2020	15798.22269	15632.5306	60	Marcellus
37	10/9/2020	15596.99213	15431.3	60	Marcellus
38	10/9/2020	15395.76157	15230.0694	60	Marcellus
39	10/9/2020	15194.53102	15028.8389	60	Marcellus
40	10/10/2020	14993.30046	14827.6083	60	Marcellus
41	10/10/2020	14792.06991	14626.3778	60	Marcellus
42	10/11/2020	14590.83935	14425.1472	60	Marcellus
43	10/11/2020	14389.6088	14223.9167	60	Marcellus
44	10/11/2020	14188.37824	14022.6861	60	Marcellus
45	10/12/2020	13987.14769	13821.4556	60	Marcellus
46	10/12/2020	13785.91713	13620.225	60	Marcellus
47	10/12/2020	13584.68657	13418.9944	60	Marcellus
48	10/13/2020	13383.45602	13217.7639	60	Marcellus
49	10/13/2020	13182.22546	13016.5333	60	Marcellus
50	10/13/2020	12980.99491	12815.3028	60	Marcellus
51	10/13/2020	12779.76435	12614.0722	60	Marcellus
52	10/13/2020	12578.5338	12412.8417	60	Marcellus
53	10/14/2020	12377.30324	12211.6111	60	Marcellus
54	10/14/2020	12176.07269	12010.3806	60	Marcellus
55	10/14/2020	11974.84213	11809.15	60	Marcellus
56	10/14/2020	11773.61157	11607.9194	60	Marcellus
57	10/14/2020	11572.38102	11406.6889	60	Marcellus
58	10/15/2020	11371.15046	11205.4583	60	Marcellus
59	10/15/2020	11169.91991	11004.2278	60	Marcellus
60	10/15/2020	10968.68935	10802.9972	60	Marcellus
61	10/15/2020	10767.4588	10601.7667	60	Marcellus
62	10/15/2020	10566.22824	10400.5361	60	Marcellus
63	10/16/2020	10364.99769	10199.3056	60	Marcellus
64	10/16/2020	10163.76713	9998.075	60	Marcellus
65	10/16/2020	9962.536574	9796.84444	60	Marcellus
66	10/16/2020	9761.306019	9595.61389	60	Marcellus
67	10/16/2020	9560.075463	9394.38333	60	Marcellus
68	10/17/2020	9358.844907	9193.15278	60	Marcellus
69	10/17/2020	9157.614352	8991.92222	60	Marcellus
70	10/17/2020	8956.383796	8790.69167	60	Marcellus
71	10/17/2020	8755.153241	8589.46111	60	Marcellus
72	10/18/2020	8553.922685	8388.23056	60	Marcellus
73	10/18/2020	8352.69213	8187	60	Marcellus
74	10/18/2020	7503	7320	60	Marcellus
75	10/18/2020	7281	7098	60	Marcellus
76	10/18/2020	7059	6876	60	Marcellus

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DM

API 47-095-02691 Farm Name Roger D Blizzard & Ruth E Spencer Well Number Richmond 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	9/25/2020	80.33	10335	7161	3890	161000	4841.14286	N/A
2	9/25/2020	87.18	10514	6130	4212	382540	7492.7619	N/A
3	9/26/2020	86.28	9898	5813	4143	406380	7524.52381	N/A
4	9/26/2020	88.85	10011	7460	4225	402740	7332.07143	N/A
5	9/26/2020	83.67	9647	5682	4249	404790	7245.14286	N/A
6	9/27/2020	81.42	9773	5578	4090	406760	7262.5	N/A
7	9/27/2020	89.32	9996	7963	4151	403230	7322.92857	N/A
8	9/28/2020	79.83	8955.75	5415.52	4069.24	415710	7346.85714	N/A
9	9/28/2020	86.08	9405	5416	4278	404620	7346.85714	N/A
10	9/28/2020	95.98	10022	7662	4469	413010	7227.92857	N/A
11	9/28/2020	90.14	9722	5321	4172	410670	7337.5	N/A
12	9/29/2020	88.91	9428	5530	4455	419260	7322.28571	N/A
13	9/29/2020	92.08	10084	5742	4289	413940	7126.7381	N/A
14	9/30/2020	90.47	9892	5540	4456	416220	7132.16667	N/A
15	9/30/2020	89.62	10043	5387	4144	417160	6957.42857	N/A
16	9/30/2020	92.78	9695	4638	3954	411680	7131.97619	N/A
17	10/1/2020	91.69	10065	5376	4080	417240	6960.5	N/A
18	10/1/2020	96.2	9919	5365	3957	419020	7064.16667	N/A
19	10/2/2020	91.53	10037	4370	3793	417100	6869.66667	N/A
20	10/2/2020	92.45	10030	5361	4148	413920	7012.7381	N/A
21	10/2/2020	93.8	9810	8397	4197	416070	6977.40476	N/A
22	10/3/2020	91.73	10086	5739	4133	417000	7033.2381	N/A
23	10/3/2020	81.89	9935	10820	3728	417800	6820.88095	N/A
24	10/4/2020	92.2	9799	5163	3957	421390	7035.02381	N/A
25	10/4/2020	94.85	10007	10104	3960	414720	6893.95238	N/A
26	10/4/2020	91.62	9299	5293	4250	418320	7009.5	N/A
27	10/5/2020	94.75	9640	9392	4037	415830	6912.83333	N/A
28	10/5/2020	96.78	9537	4351	4180	418630	7052.0476	N/A
29	10/5/2020	95.22	9717	9639	3927	419890	6793.619	N/A
30	10/6/2020	99.06	9745	5081	3686	407540	6920.7381	N/A
31	10/6/2020	96.49	9638	9030	3616	414520	6948.2857	N/A
32	10/7/2020	95.66	9310	4205	4216	408090	6877.2381	N/A
33	10/7/2020	93.51	8731	4260	3767	410750	6998.3333	N/A
34	10/8/2020	94.97	9662	5315	3746	414640	6863.381	N/A
35	10/8/2020	96.55	9068	8982	3823	414860	7138.3571	N/A
36	10/8/2020	96.51	9060	4682	2966	414690	6918.8571	N/A
37	10/9/2020	95.64	8820	8966	3885	413560	6731.1905	N/A
38	10/9/2020	93.89	8908	5434	3621	413410	6889.6667	N/A
39	10/9/2020	95.79	8911	9898	3682	406460	6665.8571	N/A
40	10/10/2020	97.38	8940	5701	3951	412590	6928	N/A
41	10/10/2020	96.85	8864	9242	4038	422750	6718.2381	N/A
42	10/11/2020	95.96	8705	4420	3982	415340	6815.2619	N/A
43	10/11/2020	98.64	8975	8130	3848	417774	6702.5	N/A
44	10/11/2020	96.63	8832	5428	4189	411880	6838.9762	N/A
45	10/12/2020	92.63	8661	9190	4087	413280	6690.4286	N/A
46	10/12/2020	96.76	8951	6056	4433	412960	6856.619	N/A
47	10/12/2020	95.06	8963	10085	4053	415210	6739.9762	N/A
48	10/13/2020	95.88	8818	5826	4134	419280	6911.2619	N/A
49	10/13/2020	91.9	9023	10234	3763	419790	6837.0714	N/A
50	10/13/2020	97.12	8905	6063	3850	415480	6904.6429	N/A
51	10/13/2020	95.37	8875	8205	3993	416770	6979.6429	N/A
52	10/13/2020	95.41	8843	6262	4240	413370	6821.119	N/A
53	10/14/2020	93.24	8524	5496	4434	416930	7723.3571	N/A
54	10/14/2020	96.65	8691	6660	4111	420710	6859.119	N/A
55	10/14/2020	96.49	8841	8079	3815	415670	6653.0238	N/A
56	10/14/2020	95.09	8523	5747	4160	417420	6795.9762	N/A
57	10/14/2020	92.81	8911	8997	4043	408750	6659.3571	N/A
58	10/15/2020	97.03	8634	4884	4295	408670	6713.7619	N/A
59	10/15/2020	95.37	8963	8073	3940	407940	6718.381	N/A
60	10/15/2020	95.78	8607	4788	4010	409230	6780.619	N/A
61	10/15/2020	95.94	8096	8172	4227	406830	6641.2857	N/A
62	10/15/2020	96.55	8168	7631	4055	407740	6730.4524	N/A
63	10/16/2020	97.56	8191	7056	3761	408790	6651.1905	N/A
64	10/16/2020	97.06	8565	5679	4073	405660	6639.0952	N/A
65	10/16/2020	70.53	9246	9880	4468	409230	10583.595	N/A
66	10/16/2020	97.16	7989	5540	4033	413680	6730.9048	N/A
67	10/16/2020	95.03	8763	8903	3657	406050	6555.4524	N/A
68	10/17/2020	97.23	8026	6357	3808	411020	6755.5714	N/A
69	10/17/2020	96.66	8000	8275	4171	409270	6453.2381	N/A
70	10/17/2020	95.21	8174	5799	4426	409540	7357.4524	N/A
71	10/17/2020	97.49	8065	6096	4354	410990	6583.7857	N/A
72	10/18/2020	46.91	10325	6545	6918	20800	2884.3095	N/A
73	10/18/2020	95.89	7773	6581	3723	414540	6632.7857	N/A
74	10/18/2020	97.39	7821	5958	3363	453000	7667.9524	N/A
75	10/18/2020	97.42	7467	5619	3810	451820	7597.9286	N/A
76	10/18/2020	97.57	7428	4959	3806	451940	7682.3333	N/A
	AVG=	93	9,136	6,688	4,061	30,837,854	527,133	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
Shaley Sandstone	74	214	74	240
Sandy Shale	214	364	214	390
Shaley Sandstone	364	514	364	540
Limestone, Tr Shale	514	544	514	570
Sandstone	544	664	544	690
Limestone, Tr Coal	664	694	664	720
Shaley Sandstone, Tr Coal	694	784	694	810
Shale, Tr Sandstone	784	1,204	784	1,230
Sandy Shale, Limestone, Tr Coal	1,204	1,354	1,204	1,380
Sandy Shale	1,354	1,504	1,354	1,530
Sandstone, Tr Shale, Tr Coal	1,504	1,624	1,504	1,650
Sandy Shale	1,624	1,834	1,624	1,860
Shaly Sandstone, Tr coal	1,834	1,860	1,834	1,894
Big Lime	1,886	2,571	1,894	2,580
Fifty Foot Sandstone	2,571	2,690	2,580	2,698
Gordon	2,690	2,994	2,698	3,003
Fifth Sandstone	2,994	3,066	3,003	3,075
Bayard	3,066	3,850	3,075	3,880
Speechley	3,850	4,141	3,880	4,184
Balltown	4,141	4,504	4,184	4,558
Bradford	4,504	4,945	4,558	5,011
Benson	4,945	5,167	5,011	5,241
Alexander	5,167	6,327	5,241	6,495
Sycamore	6,184	6,301	6,315	6,495
Middlesex	6,301	6,394	6,469	6,652
Burkett	6,394	6,417	6,626	6,700
Tully	6,417	6,470	6,674	6,854
Marcellus	6,470	NA	6,828	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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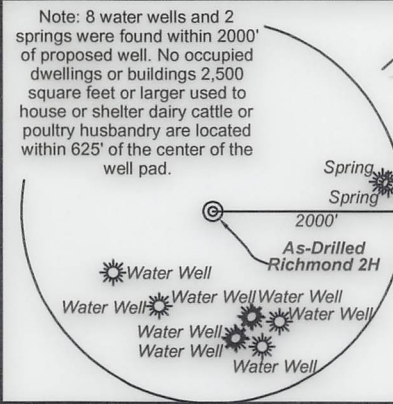
**Antero Resources**  
**Well No. Richmond 2H**  
 As-Drilled  
 Antero Resources Corporation



Richmond Unit 2H  
 POE Coordinates  
 West Virginia  
 Coordinate System  
 of 1927, North Zone  
 N: 367,542.29'  
 E: 1,619,631.56'  
 Latitude: 39°30'04.62"  
 Longitude: 80°50'52.82"  
 UTM Zone 17, NAD 1983  
 N: 4,372,426.828m  
 E: 513,082.848m

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



SEAL

Page 1 of 2

9,299' to Bottom Hole

4,851' to Top Hole

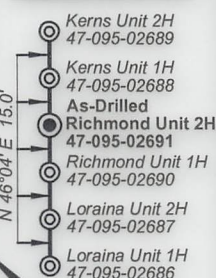
TOP HOLE LATITUDE 39 - 30 - 00  
 BTM HOLE LATITUDE 39 - 35 - 00

**Notes**  
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.  
 Well No. Richmond Unit 2H Top Hole coordinates are  
 N: 366,711.21' Longitude: 39°29'56.30"  
 E: 1,618,908.69' Longitude: 80°51'01.88"  
 Bottom Hole coordinates are  
 N: 382,536.37' Longitude: 39°32'32.07"  
 E: 1,614,694.93' Longitude: 80°51'58.70"  
 UTM Zone 17, NAD 1983  
 Top Hole Coordinates N: 4,372,169.952m E: 512,866.844m  
 Bottom Hole Coordinates N: 4,376,969.730m E: 511,502.772m  
 Plat orientation and corner and well references are based upon the grid north meridian.  
 Well location references are based upon the magnetic meridian.

LONGITUDE 80 - 50 - 00  
 375' to Top Hole

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

**Wellhead Layout (NTS)**



**Legend**

- As-Drilled gas well
- ⊗ Monument, as noted
- ⊙ Existing Well, as noted
- Creek or Drain
- Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)
- District Line

	Bearing	Dist.
L1	S 36°35' E	903.3'
L2	N 27°42' W	1,686.5'
L3	N 41°22' E	1,406.4'
L4	N 67°27' E	1,184.3'

FILE NO: 49-54-E-19  
 DRAWING NO: Richmond 2H As-Drilled  
 SCALE: 1" = 2000'  
 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 28 2020  
 OPERATOR'S WELL NO. Richmond 2H  
 API WELL NO  
 47 - 095 - 02691  
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1,004' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls

DISTRICT: Ellsworth

SURFACE OWNER: Roger D. Blizzard Nina & Phillip Whitefield; Patricia Ann Heintzman; BRC Appalachian Minerals I, LLC; & Ruth E. Spencer J&N Management Enterprises, LLC; Susan Ertel; Dennis M. Storde;

ROYALTY OWNER: Heritage Resources Marcellus Minerals, LLC; Roger D. Blizzard; Jerry R. Brown; LEASE NO:

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: 6,410' TVD

ESTIMATED DEPTH: 22,838' MD

WELL OPERATOR: Antero Resources Corporation  
 ADDRESS: 1615 Wynkoop Street  
 Denver, CO 80202

DESIGNATED AGENT: Dianna Stamper - CT Corporation System  
 ADDRESS: 5400 D Big Tyler Road  
 Charleston, WV 25313

14,967' to Bottom Hole





ID	TM/Par	Owner	Bk/Pg	Acres
1	15-33	Roger D. Blizzard, et al	340/170	102.62
2	15-32	William S. & Opal Marie Nash	335/188	78.58
3	15-30	Thomas C. Grinage, et al	458/73	124.08
4	15-31	Roger D. Blizzard, et al	342/782	25
5	15-38	Rodney A. & Candis L. Nash	351/701	85.48
6	15-30.1	Roger D. Blizzard, et al	343/427	101.38
7	15-12	Roger Matthes	319/22	61
8	15-11	Roger Matthes	318/137	115.47
9	15-7	Roger Matthes	319/22	41.72
10	15-6	James F. & Connie L. Billiter, et al	288/325	59.5
11	10-59	Goldie A. Mathews	115/485	10.08
12	10-58	Jeffery A. & Cheryl L. Ferrell	325/334	52
13	10-56	Mary K Neff	413/731	22.06
14	10-57	Charles E. & Laura L. Friend	334/836	84.39
15	10-60	J.S. & Goldie A. Mathews	129/58	17.67
16	10-46	Opal Carol Tallman	282/382	114
17	10-43	Kevin S. & Melinda S. Goff	431/799	100
18	10-42	Kevin S. & Melinda S. Goff	431/799	25.5
19	10-41	Kevin S. & Melinda S. Goff	431/799	2.66
20	10-36	Randy Lee & Mary Lou Michael	230/499	24.65
21	10-37.3	H.H. Snider	158/151	0.50
22	10-37	Sandra Fanti	425/827	1.31

ID	TM/Par	Owner	Bk/Pg	Acres
23	10-37.1	Wayne H. & Violet L. Mercer	226/473	5.05
24	10-37.2	Kenneth L. & Gladys L. Vancamp	431/194	1.36
25	10-39	Elk Fork Cemetery Association	143/308	0.32
26	10-15	Kevin S. Goff & Melinda S. Goff	423/695	18.50
27	10-15.9	Becky S. & Everett E. Neff, II	322/751	1.03
28	10-40	Avril Dewayne Matthews	421/565	1.43
29	10-14.1	Triad Energy Corp. of WV Inc.	329/604	1
30	10-14.3	Elk Fork Church	299/126	1.495
31	10-16	Ruby M. Watson	256/45	0.488
32	10-15.5	Ruby M. Watson	289/359	0.0292
33	10-15.7	Frank W., Jr. & Ruby M. Watson	317/383	5.226
34	10-15.4	Frank W., Jr. & Ruby M. Watson	343/309	0.65
35	10-15.8	Frank & Ruby Watson	427/47	5.229
36	10-17	Sandra K. Metz	342/153	0.89
37	10-18	Wendy S. Gustavich	331/365	1.9
38	10-15.6	Wayne H. & Violet Mercer	317/378	35.82
39	10-14	Kevin S. & Melinda S. Goff	597/808	97.065
40	10-3	Kevin S. & Melinda S. Goff	597/808	53.75
41	10-2	Patricia Ann Heintzman	W13/384	73.26
42	6-36	Dennis & Clista Heintzman	297/640	417.6
43	10-38	Elk Fork Cemetery Association	142/271	0.46
44	10-37	Sandra Fanti	425/827	1.31

**Detail (NTS)**



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C	Helen E. Boggs
D	Jerry R. Brown
E	B. Fred Hill Jr.
F	Roger D. Blizzard
G	Reita Jane Hall
H	Samuel Rogers
I	Linda Lou Moore
J	Dale E. Pipes
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L	David E. Bowyer
M	Joseph Shoemaker
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R	Allen Smith
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AE	Dennis M. Strode
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AG	Patricia Ann Heintzman
AH	Norma Smith
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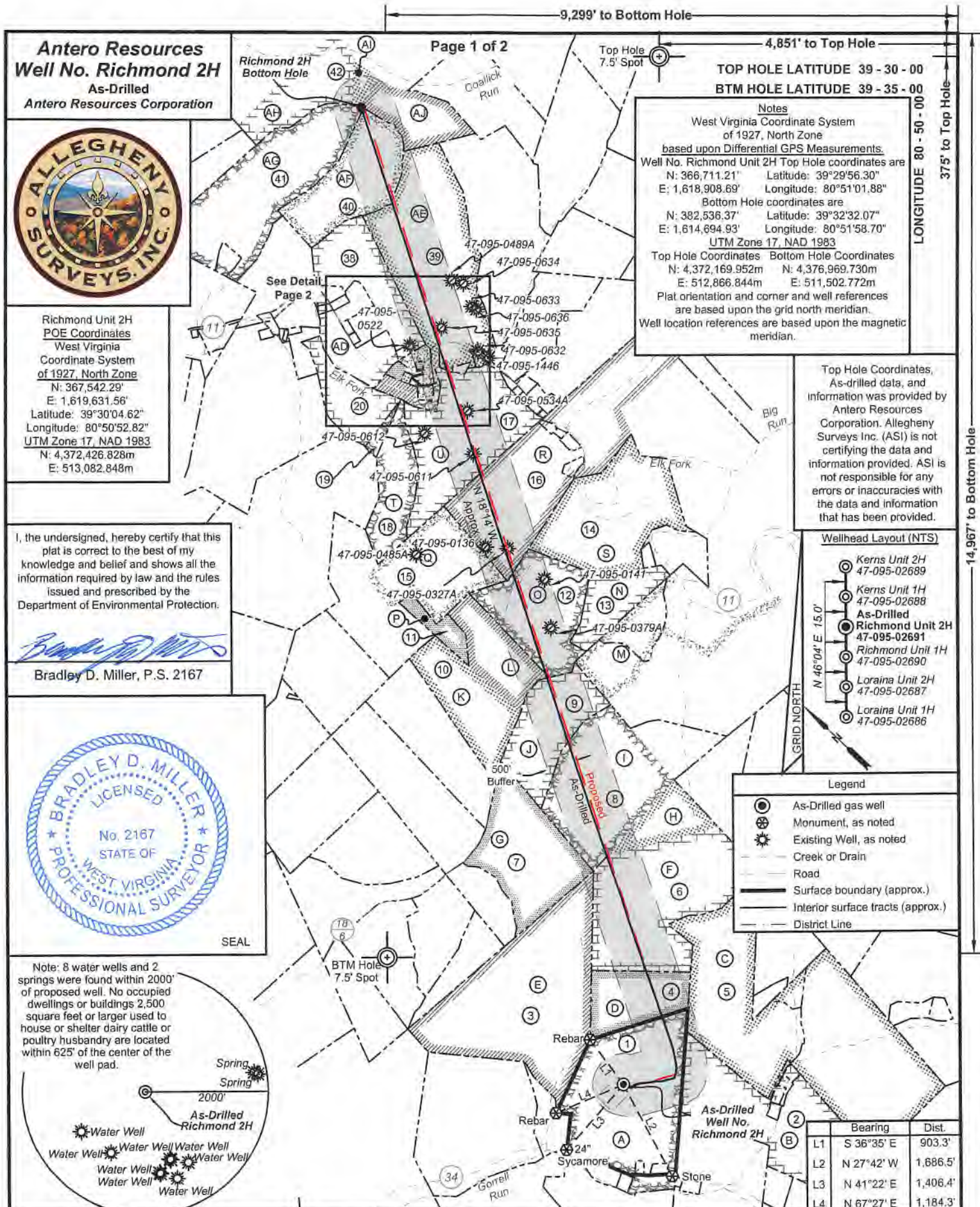
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**STATE OF WEST VIRGINIA**  
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 47 - 095 - 02691  
 STATE COUNTY PERMIT

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 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 6,410' TVD 22,838' 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



**Antero Resources**  
**Well No. Richmond 2H**  
 As-Drilled  
 Antero Resources Corporation

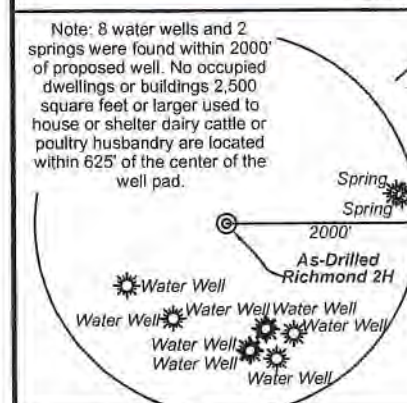


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 of 1927, North Zone  
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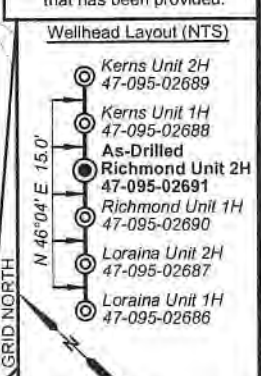
*Bradley D. Miller*

Bradley D. Miller, P.S. 2167



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- Legend**
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  - ⊗ Monument, as noted
  - ⊙ Existing Well, as noted
  - - - Creek or Drain
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  - Surface boundary (approx.)
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 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
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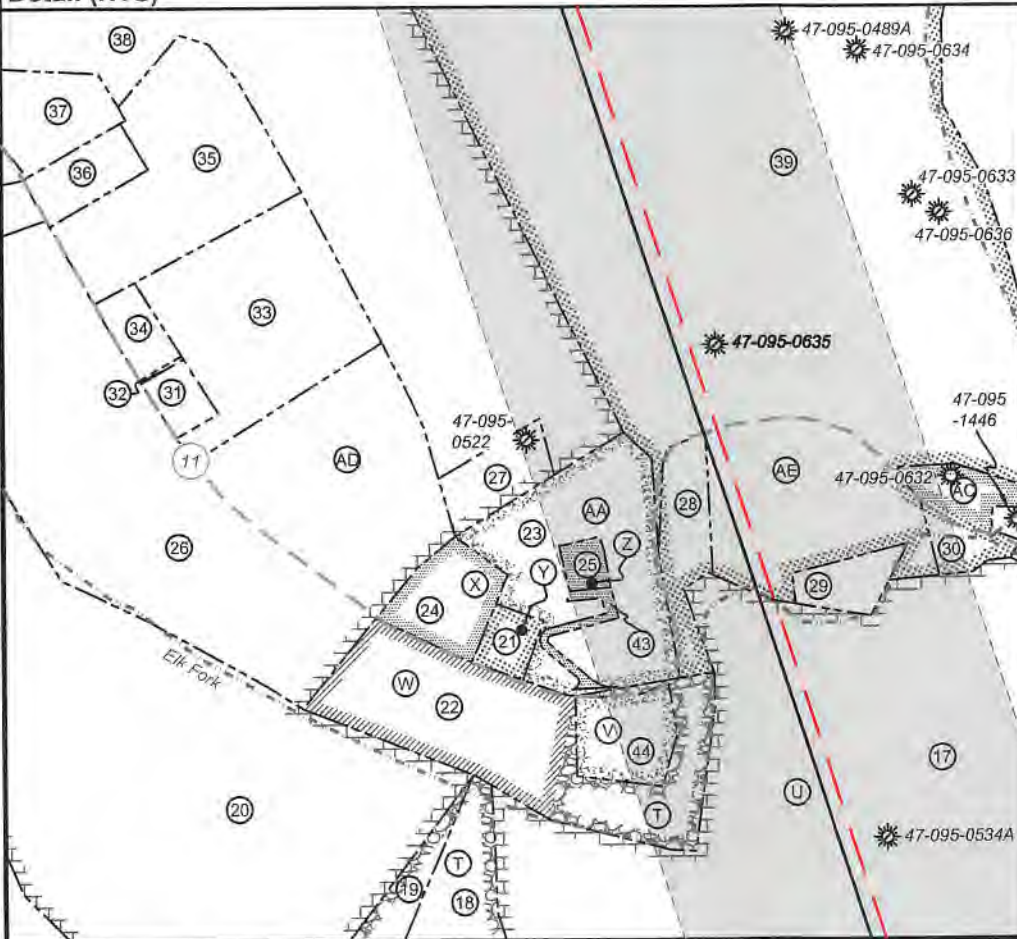
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 6,410' TVD

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

## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/25/2020
Job End Date:	10/18/2020
State:	West Virginia
County:	Tyler
API Number:	47-095-02691-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Richmond 2H
Latitude:	39.49897000
Longitude:	-80.85052000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,514
Total Base Water Volume (gal):	23,279,159
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
Produced Water	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	86.35523	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.13131	

DM

Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
HYDROCHLORIC ACID, 22 BAUME	Halliburton	Solvent					
				Listed Below			
Sand-Premium White-40/70	Halliburton	Proppant					
				Listed Below			
Excelerate LX-15	Halliburton	Friction Reducer					
				Listed Below			
OPTIFLO-II DELAYED RELEASE BREAKER	Halliburton	Breaker					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
HAI-501	Halliburton	Acid Corrosion Inhibitor					
				Listed Below			

Environmental Protection  
 Department  
 Office of Oil Spill Response  
 FEB 08 2003

FLUID Enviro-Syn HCR-7000-WL	Fluid Energy Group	Acid Replacement					
				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	13.45816	
			Complex Amine Compound	Proprietary	60.00000	0.03450	
			Hydrochloric acid	7647-01-0	30.00000	0.02656	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01725	
			Proprietary	Proprietary	20.00000	0.00547	
			Guar gum	9000-30-0	100.00000	0.00465	
			Surfactant	Proprietary	5.00000	0.00287	
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8	5.00000	0.00287	
			Proprietary	Proprietary	10.00000	0.00274	
			Glutaraldehyde	111-30-8	30.00000	0.00249	
			Ethoxylated alcohols	Proprietary	5.00000	0.00058	
			Organic chloride compound	Proprietary	1.00000	0.00057	
			Alkoxyated polyhydric alcohol	Proprietary	1.00000	0.00057	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00041	
			Methanol	67-56-1	100.00000	0.00025	
			Ammonium persulfate	7727-54-0	100.00000	0.00011	
			Ethanol	64-17-5	1.00000	0.00008	
			Mixture of dimer and trimer fatty acids of indefinite composition derived from tall oil	61790-12-3	30.00000	0.00005	
			Modified thiourea polymer	Proprietary	30.00000	0.00005	

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			Oxylated phenolic resin	Proprietary	30.00000	0.00003	
			Hexadecene	629-73-2	5.00000	0.00001	
			Propargyl alcohol	107-19-7	5.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Acrylamide	79-06-1	0.01000	0.00001	
			Nitrated acetate salt	Proprietary	0.01000	0.00001	
			Organic salt #2	Proprietary	0.01000	0.00001	
			Sodium hydroxide	1310-73-2	0.01000	0.00001	
			Organic salt #1	Proprietary	0.01000	0.00001	
			Formaldehyde	50-00-0	0.01000	0.00001	
			Sodium glycolate	2836-32-0	0.01000	0.00001	
			C.I. pigment Orange 5	3468-63-1	1.00000	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)

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