

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

API 47 - 017 - 06387 County Doddridge District Greenbrier
Quad Salem Pad Name Leonard Pad Field/Pool Name _____
Farm name Davidson, Walter & Leonard Well Number Fuego 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 4,346,305.422m Easting 534,825.289m
Landing Point of Curve Northing 4,346,660.72m Easting 535,293.20m
Bottom Hole Northing 4,345,342.458m Easting 536,283.577m

Elevation (ft) 1320' 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 10/29/2013 Date drilling commenced 2/13/2014 Date drilling ceased 7/4/2014
Date completion activities began 7/25/2014 Date completion activities ceased 2/16/2015
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 113', 212' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1302', 1911' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 517', 1077', 2013' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
AL 5/27/15
WS 6/5/15
06/05/2015

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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"	40'	New	106.50#/J-55	N/A	Y
Surface	17-1/2"	13-3/8"	360'	New	48#/H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2488'	New	36#/J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	13,542'	New	20#/P-110	N/A	Y
Tubing		2-3/8"	7989'	New	4.7#/N-80	N/A	N/A
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	196 sx	15.6	1.18	38 Cu. Ft.	0'	8 Hrs.
Surface	Class A	429 sx	15.6	1.18	250 Cu. Ft.	0'	8 Hrs.
Coal							
Intermediate 1	Class A	937 sx	15.6	1.18	779 Cu. Ft.	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	1288 sx (Lead), 901 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.86 (Tail)	2647 Cu. Ft.	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 13,587' MD, 7435' TVD (BHL); 7506' TVD (Deepest Point Drilled) Loggers TD (ft) 13,538' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 7387'

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

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Rikk Unit 1H API# 47-017-06228). Please reference the wireline logs submitted with Form WR-35 for the Rikk Unit 1H. A Cement Bond Log has been included with this submittal.

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

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

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
			SEE ATTACHED EXHIBIT 1		

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)
			SEE ATTACHED EXHIBIT 2					

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Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS	
<u>Marcellus</u>	<u>7433' (Top)</u> TVD	<u>7963' (Top)</u> 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 6725 mcfpd Oil _____ bpd NGL _____ bpd Water _____ 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	
	<u>0</u>		<u>0</u>		
					SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carlton Drive City Eight Four State PA Zip 15330

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Nabors Completion & Production Services, Co. (bought Superior)
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company US Well Services
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Natalie Komp Telephone 303-357-6820
Signature *Natalie Komp* Title Permitting Agent Date 5/6/2015

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

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EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	25-Jul-14	13289'	13454'	60	Marcellus
2	27-Dec-14	13094'	13259'	60	Marcellus
3	27-Dec-14	12898'	13063'	60	Marcellus
4	27-Dec-14	12702'	12867'	60	Marcellus
5	28-Dec-14	12507'	12672'	60	Marcellus
6	28-Dec-14	12311'	12476'	60	Marcellus
7	28-Dec-14	12115'	12280'	60	Marcellus
8	29-Dec-14	11919'	12085'	60	Marcellus
9	29-Dec-14	11724'	11889'	60	Marcellus
10	29-Dec-14	11528'	11693'	60	Marcellus
11	30-Dec-14	11332'	11498'	60	Marcellus
12	30-Dec-14	11137'	11302'	60	Marcellus
13	30-Dec-14	10941'	11106'	60	Marcellus
14	30-Dec-14	10745'	10910'	60	Marcellus
15	31-Dec-14	10550'	10715'	60	Marcellus
16	31-Dec-14	10354'	10519'	60	Marcellus
17	31-Dec-14	10158'	10323'	60	Marcellus
18	1-Jan-15	9963'	10128'	60	Marcellus
19	1-Jan-15	9767'	9932'	60	Marcellus
20	1-Jan-15	9571'	9736'	60	Marcellus
21	2-Jan-15	9376'	9541'	60	Marcellus
22	2-Jan-15	9180'	9345'	60	Marcellus
23	2-Jan-15	8984'	9149'	60	Marcellus
24	2-Jan-15	8788'	8954'	60	Marcellus
25	3-Jan-15	8593'	8758'	60	Marcellus
26	3-Jan-15	8397'	8562'	60	Marcellus
27	3-Jan-15	8201'	8366'	60	Marcellus
28	3-Jan-15	8006'	8171'	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	26-Dec-14	63.0	6,989	N/A	5,142	237,210	6,665	N/A
2	27-Dec-14	63.6	6,958	5,865	5,836	229,570	6,385	N/A
3	27-Dec-14	64.7	7,119	6,469	5,716	236,800	6,396	N/A
4	27-Dec-14	65.5	7,012	6,370	6,166	233,310	6,370	N/A
5	28-Dec-14	66.7	6,970	6,119	5,296	236,570	6,474	N/A
6	28-Dec-14	69.4	7,173	6,330	5,083	236,900	6,359	N/A
7	28-Dec-14	67.2	7,214	6,419	5,715	232,670	6,284	N/A
8	29-Dec-14	67.1	7,002	6,090	6,068	234,350	6,319	N/A
9	29-Dec-14	66.3	6,966	6,003	5,620	235,890	6,268	N/A
10	29-Dec-14	66.2	6,921	6,081	5,608	237,270	6,271	N/A
11	30-Dec-14	68.0	6,895	6,319	5,367	239,080	6,291	N/A
12	30-Dec-14	68.1	6,802	6,183	5,323	236,710	6,241	N/A
13	30-Dec-14	68.4	6,851	6,157	4,956	235,860	6,342	N/A
14	30-Dec-14	67.0	6,695	5,927	7,183	240,140	6,339	N/A
15	31-Dec-15	68.3	6,899	6,379	4,910	237,470	6,195	N/A
16	31-Dec-15	66.2	6,945	6,603	4,968	237,750	6,185	N/A
17	31-Dec-14	67.0	7,055	6,656	5,178	239,680	6,593	N/A
18	1-Jan-15	64.7	7,296	6,869	5,589	221,580	6,653	N/A
19	1-Jan-15	67.1	7,056	6,361	5,141	237,840	6,134	N/A
20	1-Jan-15	67.0	6,941	6,184	5,120	213,020	6,277	N/A
21	2-Jan-15	50.0	7,957	6,153	5,629	131,750	6,688	N/A
22	2-Jan-15	67.9	6,679	6,207	4,722	239,740	6,076	N/A
23	2-Jan-15	67.3	6,955	6,702	5,164	238,720	6,013	N/A
24	2-Jan-15	67.0	6,710	6,274	4,976	239,020	5,999	N/A
25	3-Jan-15	65.0	7,012	6,933	5,521	221,920	6,539	N/A
26	3-Jan-15	68.0	6,917	6,882	5,390	239,940	6,007	N/A
27	3-Jan-15	63.4	6,988	6,776	5,663	182,980	5,890	N/A
28	3-Jan-15	68.0	6,559	6,964	5,063	240,090	5,928	N/A
	AVG=	66.0	6,983	6,381	5,433	6,423,830	176,181	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
Fresh Water	113	NA	113	NA
Fresh Water	212	NA	212	NA
Siltstone	0	217	0	217
Sand	217	457	217	457
Siltstone	457	497	457	497
Sandstone	497	517	497	517
Coal	517	657	517	657
Siltstone	657	697	657	697
Sandstone	697	857	697	857
Siltstone	857	927	857	927
Limestone	927	1,057	927	1,057
Sandstone/Silt	1,057	1,077	1,057	1,077
Coal	1,077	1,477	1,077	1,477
Limestone/Silt	1,477	1,577	1,477	1,577
Siltstone	1,577	1,737	1,577	1,737
Sandstone/Limestone	1,737	2,004	1,737	2,004
Sandstone/Silt	2,004	2,013	2,004	2,013
Coal	2,013	2,317	2,013	2,317
Sandstone/Silt	2,317	2,394	2,317	2,394
Big Lime	2,394	2,512	2,394	2,512
Big Injun	2,512	2,837	2,512	2,838
Gantz Sand	2,837	2,966	2,838	2,967
Fifty Foot Sandstone	2,966	3,129	2,967	3,133
Gordon	3,129	3,397	3,133	3,410
Fifth Sandstone	3,397	3,470	3,410	3,487
Bayard	3,470	3,743	3,487	3,780
Warren	3,743	3,978	3,780	4,038
Speechley	3,978	4,293	4,038	4,375
Baltown	4,293	4,755	4,375	4,886
Bradford	4,755	5,356	4,886	5,553
Benson	5,356	5,630	5,553	5,851
Alexander	5,630	5,832	5,851	6,072
Elk	5,832	6,390	6,072	6,697
Rhinestreet	6,390	6,915	6,697	7,291
Sycamore	6,915	7,134	7,291	7,539
Middlesex	7,134	7,270	7,539	7,705
Burkett	7,270	7,302	7,705	7,748
Tully	7,302	7,433	7,748	7,963
Marcellus	7,433	NA	7,963	NA

*Please note Antero determines shallow formation tops based on mud and/or wireline 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:	12/26/2014
Job End Date:	1/3/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06387-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Fuego Unit 2H
Longitude:	-80.59631400
Latitude:	39.26538600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,506
Total Base Water Volume (gal):	7,399,602
Total Base Non Water Volume:	323,309



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Base Fluid	Water	7732-18-5	100.00000	90.27447	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	9.39690	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.09331	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Hydrogen Chloride	7641-01-1	18.00000	0.02229	
			Guar Gum	9000-30-0	50.00000	0.04601	
			Petroleum Distillates	64742-47-8	60.00000	0.04358	
			Suspending agent (solid)	14808-60-7	3.00000	0.00704	
			Surfactant	68439-51-0	3.00000	0.00276	
WFRA-405	U.S. Well Services, Office of Oil and Gas	Friction Reducer	Anionic Polyacrylamide	Proprietary		0.02585	
			Water	7732-18-5	40.00000	0.02585	
			Petroleum Distillates	64742-47-8	22.00000	0.02081	
			Crystalline Salt	12125-02-9	5.00000	0.00323	

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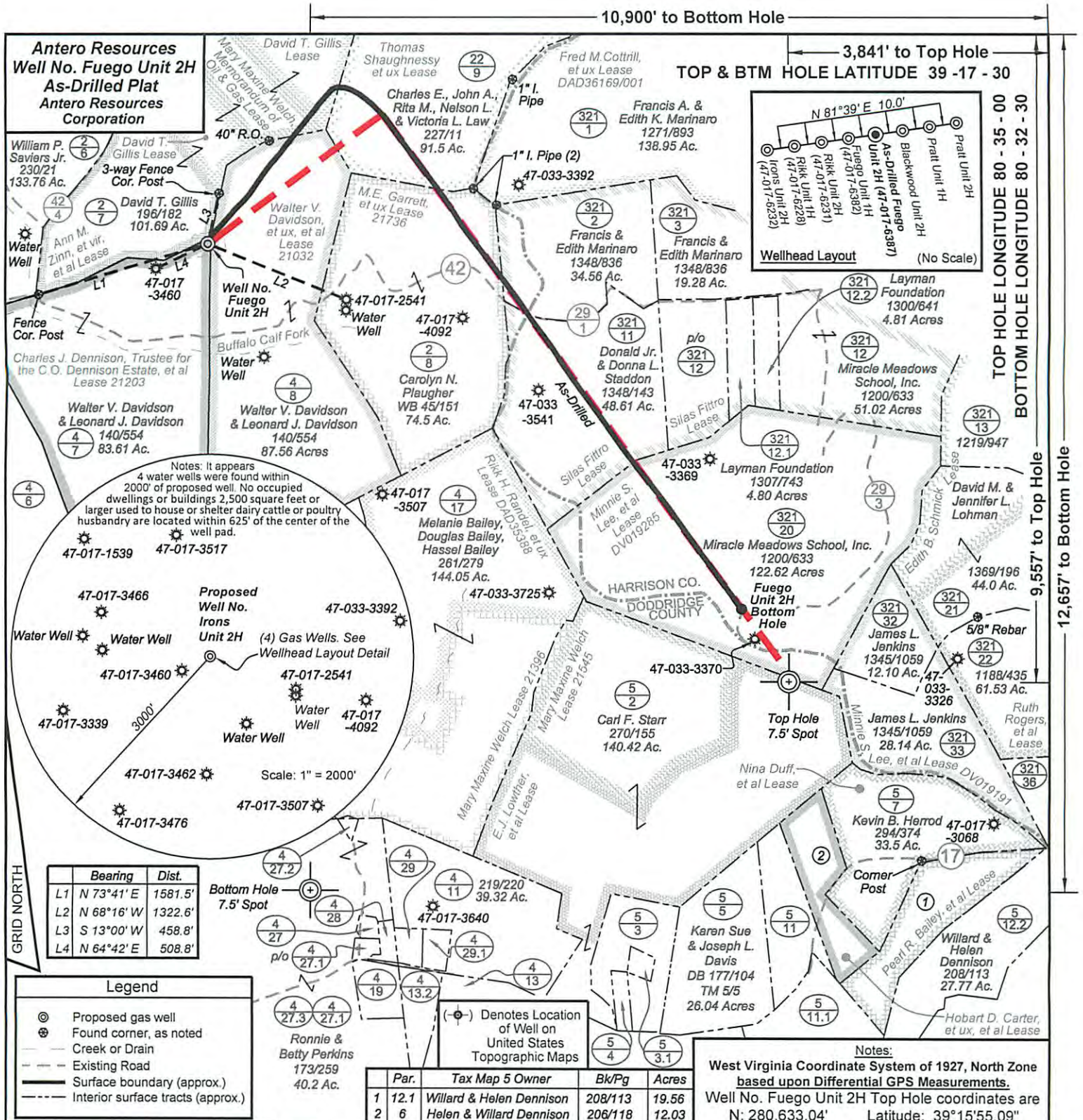
SI-1100	U.S. Well Services	Scale Inhibitor	Ethoxylated alcohol blend	Proprietary	5.00000	0.00323
			Di Water	7732-18-5	80.00000	0.01069
			Ethylene Glycol	107-21-1	40.00000	0.00604
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	10.00000	0.00180
			2-Phosphonobutane 1,2,4 tricarboxylic salt	37971-36-1	10.00000	0.00172
			hexamethylenediamine tetra (methylene phosphonic acid)	38820-59-6	10.00000	0.00167
			Copolymer of Maleic and Acrylic acid	26677-99-6	10.00000	0.00158
			bis (hexamethylene) tramine penta (methylene phosphonic acid) - phosphate acid	40623-75-4	10.00000	0.00154
			Acrylic polymer	52255-49-9	5.00000	0.00067
X-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitriopropionamide	10222-01-2	20.00000	0.00440
			Deionized Water	7732-18-5	28.00000	0.00251
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00170
AI-301	U.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00014
			Methanamine	100-97-0	20.00000	0.00011
			Hydrogen Chloride	7647-01-0	10.00000	0.00005
			Polyethylene polyamine	68603-67-8	10.00000	0.00004
			Coco amine	61791-14-8	5.00000	0.00002

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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Top Hole coordinates verified by survey grade GPS. 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.

Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Fuego Unit 2H Top Hole coordinates are
N: 280,633.04' Latitude: 39°15'55.09"
E: 1,689,549.20' Longitude: 80°35'47.36"
Bottom Hole coordinates are
N: 277,393.21' Latitude: 39°15'23.63"
E: 1,694,281.90' Longitude: 80°34'46.70"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,346,305.422m N: 4,345,342.458m
E: 534,825.289m E: 536,283.577m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

FILE NO: 190-30-G-13
DRAWING NO: Fuego 2H Well Plat As-Drilled
SCALE: 1" = 1200'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Bridgeport, WV

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

DATE: February 26 20 15
OPERATOR'S WELL NO. Fuego Unit 2H
API WELL NO
47 - 017 - 06387
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: 1320' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: Salem
DISTRICT: Greenbrier COUNTY: Doddridge
SURFACE OWNER: Mary Maxine Welch, Memorandum of Oil & Gas; Walter V. Davidson & Leonard J. Davidson; M.E. Garrett, et ux; Minnie S. Lee, et al; Thomas Shaughnessy, et ux; Silas Fittro 21032 ACREAGE: 83.61 59.23; 176; 96
ROYALTY OWNER: Charles J. Dennison, Trustee for the C.O. Dennison Estate, et al LEASE NO: 21736; DV019285; 21203 ACREAGE: 84; 87; 74.5; 130
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 DEPTH: 7,435' TVD; 15,587' 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

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