

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

API 47 - 085 - 10017 County Ritchie District Union
Quad Pullman 7.5' Pad Name Yolanda Field/Pool Name ---
Farm name Williamson, Andrew, et al Well Number Allstate 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 4338478m Easting 510003m
Landing Point of Curve Northing 4338748.12m Easting 510092.39m
Bottom Hole Northing 4340217m Easting 509447m

Elevation (ft) 1144' 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 1/31/2013 Date drilling commenced 12/7/2013 Date drilling ceased 1/25/2014
Date completion activities began 4/1/2014 Date completion activities ceased 5/15/2014
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 112', 114' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1987', 1989' 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

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Reviewed by:

42. 5/27/15 ✓

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API 47-085 - 10017 Farm name Williamson, Andrew, et al Well number Allstate 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	28"	20"	40'	New	51# H-40	N/A	Y
Surface	17-1/2"	13-3/8"	357'	New	48# J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2538'	New	40# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	12355'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6762'		4.7# N-80	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	127 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	414 sx	15.6	1.18	248	0'	8 Hrs.
Coal							
Intermediate 1	Class A	734sx	15.6	1.18	795	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	901 sx (Lead), 928 sx (Tail)	Lead: 13.5, Tail: 15.2	Lead: 1.44, Tail: 1.80	2,363	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12355' MD, 6617' TVD (BHL) Loggers TD (ft) 12303' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) ^{6310'} _____

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Nicholson Unit 2H API# 47-085-09960). Please reference the wireline logs submitted with Form WR-35 for the Nicholson 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

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 Chemical + Radioactive

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API 47- 085 - 10017 Farm name Williamson, Andrew, et al Well number Allstate Unit 2H

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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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6,553' (TOP)</u> TVD	<u>6,831' (TOP)</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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 7288 mcfpd Oil 44 bpd NGL --- bpd Water 0 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	<u>0</u>		<u>0</u>		

SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling, LLC
Address 562 Spring Run Rd. City Pennsboro State WV Zip 26415

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

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

Stimulating Company U.S. Well Services
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permit Representative Date 1/8/2015

API 47-085-10017 Farm Name Williamson, Andrew, et al Well Number Allstate Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1-Apr-14	12,097	12,266	60	Marcellus
2	9-Apr-14	11,952	12,074	60	Marcellus
3	9-Apr-14	11,806	11,929	60	Marcellus
4	10-Apr-14	11,661	11,784	60	Marcellus
5	10-Apr-14	11,516	11,639	60	Marcellus
6	10-Apr-14	11,371	11,494	60	Marcellus
7	10-Apr-14	11,226	11,349	60	Marcellus
8	10-Apr-14	11,081	11,204	60	Marcellus
9	11-Apr-14	10,936	11,059	60	Marcellus
10	11-Apr-14	10,791	10,914	60	Marcellus
11	11-Apr-14	10,646	10,769	60	Marcellus
12	11-Apr-14	10,501	10,624	60	Marcellus
13	12-Apr-14	10,356	10,479	60	Marcellus
14	12-Apr-14	10,211	10,334	60	Marcellus
15	12-Apr-14	10,066	10,189	60	Marcellus
16	26-Apr-14	9,921	10,044	60	Marcellus
17	28-Apr-14	9,776	9,899	60	Marcellus
18	29-Apr-14	9,631	9,754	60	Marcellus
19	29-Apr-14	9,486	9,609	60	Marcellus
20	29-Apr-14	9,341	9,463	60	Marcellus
21	29-Apr-14	9,196	9,318	60	Marcellus
22	29-Apr-14	9,051	9,173	60	Marcellus
23	30-Apr-14	8,905	9,028	60	Marcellus
24	30-Apr-14	8,760	8,883	60	Marcellus
25	30-Apr-14	8,615	8,738	60	Marcellus
26	30-Apr-14	8,470	8,593	60	Marcellus
27	1-May-14	8,325	8,448	60	Marcellus
28	1-May-14	8,180	8,303	60	Marcellus
29	1-May-14	8,035	8,158	60	Marcellus
30	1-May-14	7,890	8,013	60	Marcellus
31	2-May-14	7,745	7,868	60	Marcellus
32	2-May-14	7,600	7,723	60	Marcellus
33	2-May-14	7,455	7,578	60	Marcellus
34	2-May-14	7,310	7,433	60	Marcellus
35	2-May-14	7,165	7,288	60	Marcellus
36	3-May-14	7,202	7,143	60	Marcellus
37	3-May-14	6,875	6,998	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	9-Apr-14	79.0	7,755	5,990	3,650	207,210	5,716	N/A
2	9-Apr-14	79.0	7,801	5,468	3,909	213,400	5,705	N/A
3	9-Apr-14	75.0	7,505	5,522	5,386	182,000	6,200	N/A
4	10-Apr-14	76.0	7,693	5,854	3,204	177,800	6,228	N/A
5	10-Apr-14	79.0	7,621	5,422	5,357	98,470	5,641	N/A
6	10-Apr-14	76.0	7,617	5,386	4,803	213,100	5,685	N/A
7	10-Apr-14	77.0	7,538	5,554	5,994	213,550	5,640	N/A
8	10-Apr-14	80.0	7,580	5,636	3,673	213,340	5,675	N/A
9	11-Apr-14	78.8	7,763	6,069	2,911	174,660	6,126	N/A
10	11-Apr-14	78.0	7,531	5,643	3,619	220,720	5,611	N/A
11	11-Apr-14	80.0	7,403	5,729	3,916	215,500	5,653	N/A
12	12-Apr-14	79.0	7,859	5,536	4,603	214,800	5,583	N/A
13	12-Apr-14	74.4	7,896	5,583	5,221	189,340	6,052	N/A
14	12-Apr-14	43.6	8,040	5,285	5,093	113,820	6,110	N/A
15	12-Apr-14	49.0	8,474	5,651	8,175	63,200	5,634	N/A
16	28-Apr-14	75.0	7,784	7,206	5,590	186,800	6,572	N/A
17	29-Apr-14	78.0	7,164	5,114	4,842	214,400	5,274	N/A
18	29-Apr-14	76.0	6,855	5,665	3,970	217,300	5,590	N/A
19	29-Apr-14	77.0	7,320	5,472	4,728	192,900	5,942	N/A
20	29-Apr-14	74.0	6,935	5,611	5,307	202,300	5,529	N/A
21	29-Apr-14	78.0	6,865	5,254	4,735	216,600	5,503	N/A
22	30-Apr-14	78.0	6,885	5,347	4,706	214,900	5,504	N/A
23	30-Apr-14	76.0	6,952	5,339	3,594	217,700	5,533	N/A
24	30-Apr-14	77.0	6,838	5,414	4,452	217,100	5,471	N/A
25	30-Apr-14	77.0	6,747	5,078	5,465	214,700	5,508	N/A
26	1-May-14	78.0	6,702	5,057	5,132	213,500	5,440	N/A
27	1-May-14	76.0	7,058	5,496	5,207	216,800	5,497	N/A
28	1-May-14	77.0	6,707	5,311	3,383	215,000	5,448	N/A
29	1-May-14	78.0	6,550	5,314	3,920	212,900	5,469	N/A
30	1-May-14	79.0	6,805	5,490	3,304	214,000	5,211	N/A
31	2-May-14	72.0	6,674	5,282	4,227	74,100	5,394	N/A
32	2-May-14	76.0	6,571	5,339	3,272	216,000	5,444	N/A
33	2-May-14	76.0	6,856	5,926	3,523	215,100	5,378	N/A
34	2-May-14	77.0	6,793	5,561	5,329	184,300	5,884	N/A
35	2-May-14	76.0	6,786	5,625	4,488	214,800	5,357	N/A
36	3-May-14	76.0	6,896	6,187	5,479	214,600	5,357	N/A
37	3-May-14	76.0	7,015	6,090	3,430	212,200	5,344	N/A
AVG=		75	7,239	5,581	4,530	7,208,910	208,908	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD) From Surface	BOTTOM DEPTH (TVD) From Surface	TOP DEPTH (MD) From Surface	BOTTOM DEPTH (MD) From Surface
Fresh Water	112'	N/A	112'	N/A
Fresh Water	114'	N/A	114'	N/A
Siltstone/Shale	0	216	0	216
Siltstone/Shale w/ trace coal	est. 216	236	est. 216	236
Siltstone/Shale	est. 236	616	est. 236	616
Siltstone and Coal	est. 616	636	est. 616	636
Siltstone/Limestone	est. 636	856	est. 636	856
Sandstone	est. 856	876	est. 856	876
Siltstone/Limestone	est. 876	1116	est. 876	1116
Sandstone and Coal	est. 1116	1156	est. 1116	1156
Siltstone/Shale	est. 1156	1656	est. 1156	1656
Sandstone	est. 1656	1756	est. 1656	1756
Siltstone/Shale w/ trace coal	est. 1756	1776	est. 1756	1776
Siltstone/Shale	est. 1776	2016	est. 1776	2016
Siltstone/Shale w/ trace coal	est. 2016	2120	est. 2016	2120
Big Lime	2120	2181	2120	2181
Big Injun	2181	2437	2181	2437
Gantz Sand	2437	2576	2437	2576
Fifty Foot Sandstone	2576	2682	2576	2682
Gordon	2682	3089	2682	3089
Fifth Sandstone	3089	3195	3089	3195
Bayard	3195	3517	3195	3517
Warren	3517	3956	3517	3956
Speechley	3956	4165	3956	4165
Baltown	4165	4639	4165	4639
Bradford	4639	5015	4639	5018
Benson	5015	5260	5018	5268
Alexander	5260	5463	5268	5477
Elk	5463	5875	5477	5914
Rhinestreet	5875	6225	5914	6302
Sycamore	6225	6390	6302	6509
Middlesex	6390	6,500	6509	6693
Burkett	6500	6531	6693	6765
Tully	6531	6553	6765	6831
Marcellus	6553	NA	6831	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 (Please reference Wireline Logs submitted for the Nicholson Unit 2H API# 47-085-09960). 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:	4/9/2014
Job End Date:	5/3/2014
State:	West Virginia
County:	Ritchie
API Number:	47-085-10017-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Allstate Unit 2H
Longitude:	-80.88433300
Latitude:	39.19541400
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,618
Total Base Water Volume (gal):	8,774,136
Total Base Non Water Volume:	366,383



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	WV Department Environmental Protection Ingredient Name	Chemical Abstract 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	90.71704	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	8.93692	
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.10619	
LGC-15	J.S. Well Services, LLC	Gelling Agents	Hydrogen Chloride	7641-01-1	18.00000	0.02537	
			Guar Gum	9000-30-0	50.00000	0.05549	
			Petroleum Distillates	64742-47-8	60.00000	0.05255	
			Suspending agent (solid)	14808-60-7	3.00000	0.00849	
			Surfactant	68439-51-0	3.00000	0.00333	
WFRA-405	J.S. Well Services, LLC	Friction Reducer	Anionic Polyacrylamide	Proprietary		0.02416	
			Water	7732-18-5	40.00000	0.02416	
			Petroleum Distillates	64742-47-8	22.00000	0.01945	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00302	

SI-1000	J.S. Well Services, LLC	Scale Inhibitor	Crystalline Salt	12125-02-9	5.00000	0.00302
			Anionic Copolymer	Proprietary		0.00420
			Ethylene Glycol	107-21-1	20.00000	0.00380
			Water	7732-18-5	30.00000	0.00317
K-BAC 1020	J.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropanamide	10222-01-2	20.00000	0.00448
			Deionized Water	7732-18-5	28.00000	0.00266
AP One	J.S. Well Services, LLC	Gel Breakers	Ammonium Persulfate	7727-54-0	100.00000	0.00196
AI-300	J.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene Glycol	107-21-1	31.00000	0.00028
			N,N-Dimethylformamide	68-12-2	15.00000	0.00009
			Cinnamaldehyde	104-55-2	5.00000	0.00008
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	13.00000	0.00007
			2-Butoxyethanol	111-76-2	7.00000	0.00007
			Water	7732-18-5	20.00000	0.00003
			Ethoxylated Nonylphenol	68412-54-4	5.00000	0.00002
			Triethyl Phosphate	78-40-0	3.00000	0.00001
			Isopropyl Alcohol	67-63-0	3.00000	0.00001

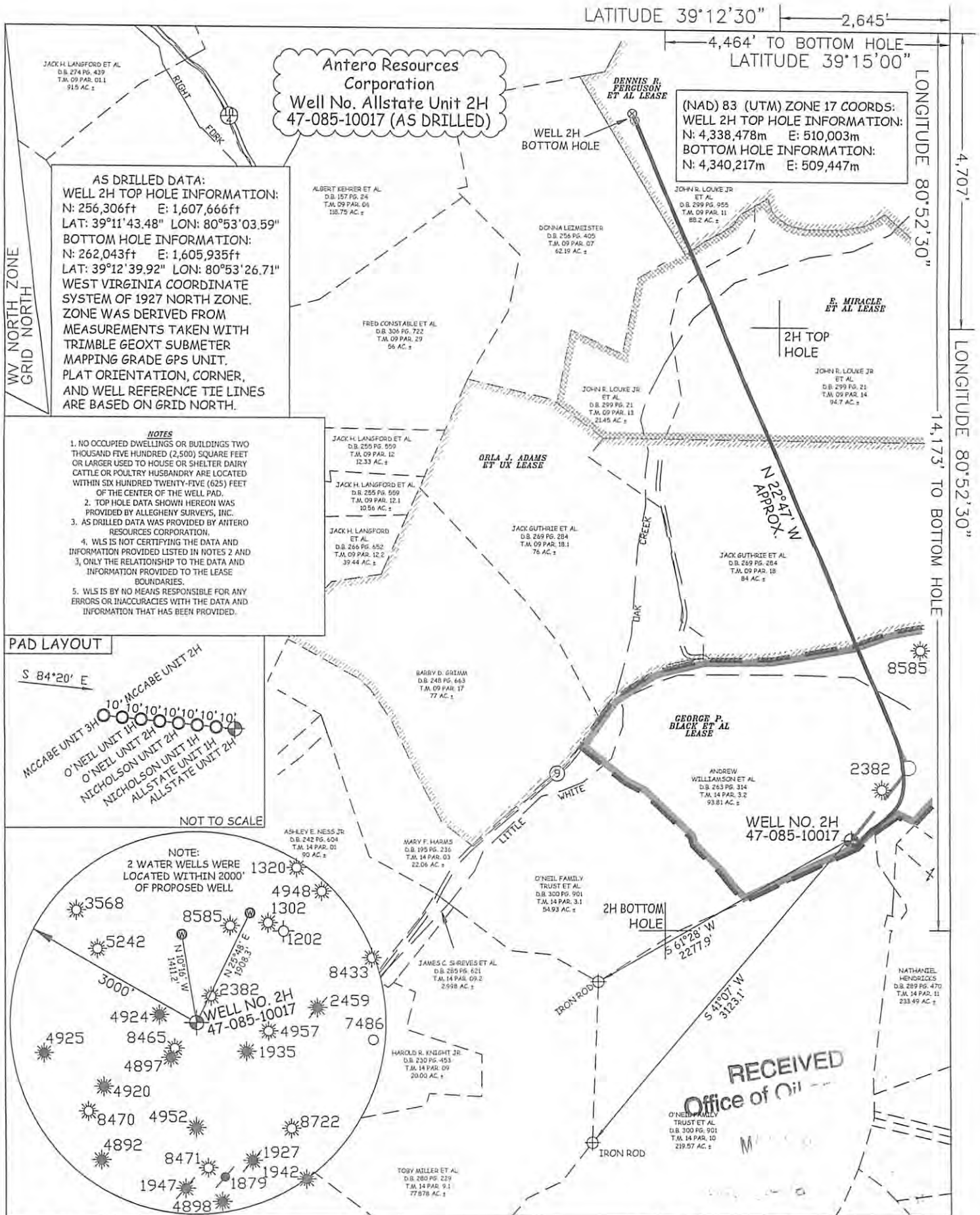
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* 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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JOB # 12-110WA
 DRAWING # ALLSTATE2HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

LEGEND
 - - - Surface Owner Boundary Lines +/-
 - - - Interior Surface Tracts +/-
 X Existing Fence
 ⊕ Found monument, as noted
 ⊙ Proposed Well Path
 ⊗ As Drilled Well Path

DATE 04/14/15
 OPERATOR'S WELL# ALLSTATE UNIT #2H
 API WELL # 47 - 085 - 10017

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,153' ORIGINAL - 1,144' AS-DRILLED WATERSHED SOUTH FORK HUGHES RIVER
 QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
 SURFACE OWNER ANDREW WILLIAMSON ET AL ACREAGE 93.81 ACRES +/-
 OIL & GAS ROYALTY OWNER GEORGE P. BLACK ET AL; ORLA J. ADAMS ET UX; E. MIRACLE ET AL; DENNIS R. FERGUSON ET AL LEASE ACREAGE 93 ACRES±; 314 ACRES±; 116 ACRES±; 88 ACRES±
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6.617' TVD 12,355' MD
 DIANNA STAMPER
 CT CORPORATION SYSTEM
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME RITCHIE
 PERMIT 06/05/2015