

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

RECEIVED

FEB 12 2016

WV GEOLOGICAL SURVEY
MORGANTOWN, WV

API 47 - 085 - 10139 County Ritchie District Union
Quad Pullman 7.5' Pad Name John Richards Pad Field/Pool Name ----
Farm name Richards, John Wayne Well Number Stalnaker Unit 3H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop St. 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 4339585m Easting 506952m
Landing Point of Curve Northing 4339741.33m Easting 506746.34m
Bottom Hole Northing 4341079m Easting 506502m

Elevation (ft) 1025' 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 8/11/2014 Date drilling commenced 12/10/2014 Date drilling ceased 2/1/2015
Date completion activities began 9/4/2015 Date completion activities ceased 11/27/2015
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 42', 52', 172' 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 - 10139

Farm name Richards, John Wayne

Well number Stalnaker Unit 3H

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	30"	20"	40'	New	94# K-55	N/A	Y
Surface	17- 1/2"	13- 3/8"	418'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2519'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	11929'	New	23# P-110	N/A	Y
Tubing		2-3/8"	6500'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details Sidetrack @ 6730'

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	150 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	490 sx	15.6	1.18	290	0'	8 Hrs.
Coal							
Intermediate 1	Class A	980 sx	15.6	1.00	789	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	859 sx (Lead) 906 sx (Tail)	14.5 Lead 15.2 Tail	1.44 Lead 1.80 Tail	2270	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 11929' MD, 6385' TVD (BHL), 6411' (Deepest Point Drilled)

Loggers TD (ft) 11882'

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5655'

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 _____

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Duckworth Unit 3H API #47-085-10103). Please reference the wireline logs submitted with Form WR-35 for Duckworth Unit 3H. A Cement Bond Log has been included with this submittal.

API 47- 085 - 10139 Farm name Richards, John Wayne Well number Stalnaker Unit 3H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6352' (TOP) TVD	6569' (TOP) MD

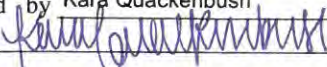
Please insert additional pages as applicable.

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 12166 mcfpd Oil 21 bpd NGL --- bpd Water --- 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)
	0		0		
*PLEASE 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 US 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  Title Permit Representative Date 1/26/2016

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	4-Sep-15	11,666	11,836	60	Marcellus
2	17-Oct-15	11,464	11,634	60	Marcellus
3	17-Oct-15	11,261	11,432	60	Marcellus
4	17-Oct-15	11,059	11,230	60	Marcellus
5	18-Oct-15	10,857	11,028	60	Marcellus
6	18-Oct-15	10,655	10,825	60	Marcellus
7	18-Oct-15	10,453	10,623	60	Marcellus
8	19-Oct-15	10,251	10,421	60	Marcellus
9	19-Oct-15	10,049	10,219	60	Marcellus
10	20-Oct-15	9,846	10,017	60	Marcellus
11	20-Oct-15	9,644	9,815	60	Marcellus
12	20-Oct-15	9,442	9,613	60	Marcellus
13	21-Oct-15	9,240	9,410	60	Marcellus
14	21-Oct-15	9,038	9,208	60	Marcellus
15	21-Oct-15	8,836	9,006	60	Marcellus
16	22-Oct-15	8,634	8,804	60	Marcellus
17	22-Oct-15	8,431	8,602	60	Marcellus
18	22-Oct-15	8,229	8,400	60	Marcellus
19	22-Oct-15	8,027	8,198	60	Marcellus
20	22-Oct-15	7,825	7,995	60	Marcellus
21	23-Oct-15	7,623	7,793	60	Marcellus
22	23-Oct-15	7,421	7,591	60	Marcellus
23	23-Oct-15	7,219	7,389	60	Marcellus
24	23-Oct-15	7,016	7,187	60	Marcellus
25	23-Oct-15	6,814	6,985	60	Marcellus
26	24-Oct-15	6,612	6,783	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	17-Oct-15	68.2	7,539	6,203	5,141	213,421	6,665	N/A
2	17-Oct-15	74.2	7,125	6,128	4,887	247,368	6,513	N/A
3	17-Oct-15	66.0	7,102	6,260	4,708	195,880	6,661	N/A
4	17-Oct-15	68.0	7,222	5,664	4,720	151,380	5,717	N/A
5	18-Oct-15	73.2	7,224	5,942	5,169	254,970	6,527	N/A
6	18-Oct-15	68.0	6,911	6,209	3,648	257,510	6,513	N/A
7	18-Oct-15	66.0	7,262	5,523	4,356	199,710	6,307	N/A
8	19-Oct-15	73.0	6,975	5,559	4,548	221,440	6,625	N/A
9	19-Oct-15	73.0	6,949	5,947	4,931	168,460	4,416	N/A
10	20-Oct-15	69.0	6,745	6,190	4,592	245,330	6,355	N/A
11	20-Oct-15	68.0	7,134	6,260	3,626	223,030	7,015	N/A
12	20-Oct-15	72.0	7,080	5,947	4,735	237,770	6,813	N/A
13	21-Oct-15	72.0	6,641	6,079	4,047	258,580	6,597	N/A
14	21-Oct-15	69.0	6,600	6,285	3,280	256,810	6,405	N/A
15	21-Oct-15	70.0	6,667	6,153	3,672	257,300	6,475	N/A
16	22-Oct-15	71.0	6,688	6,046	4,529	253,830	6,314	N/A
17	22-Oct-15	73.0	6,645	5,879	5,377	256,160	6,346	N/A
18	22-Oct-15	73.0	6,757	5,882	5,042	235,180	6,186	N/A
19	22-Oct-15	68.0	6,851	6,147	5,298	246,360	6,254	N/A
20	22-Oct-15	72.0	6,872	6,076	5,607	257,330	6,320	N/A
21	23-Oct-15	70.0	6,765	5,879	5,074	257,740	6,408	N/A
22	23-Oct-15	72.0	6,461	6,063	5,331	255,960	6,286	N/A
23	23-Oct-15	73.0	6,344	6,239	5,228	258,050	6,316	N/A
24	23-Oct-15	68.0	6,305	5,986	5,151	249,920	6,822	N/A
25	23-Oct-15	72.0	6,443	6,421	4,942	257,110	6,277	N/A
26	24-Oct-15	71.0	6,295	6,043	3,493	256,300	6,422	N/A
AVG=		70.5	6,831	6,039	4,659	6,172,899	165,555	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	42'	N/A	42'	N/A
Fresh Water	52'	N/A	52'	N/A
Fresh Water	172'	N/A	172'	N/A
Sandstone	0	97	0	97
Shale/ Sandstone	est. 97	417	est. 97	417
Sandstone	est. 417	657	est. 417	657
Shale	est. 657	697	est. 657	697
Sandstone	est. 697	737	est. 697	737
Shale	est. 737	817	est. 737	817
Sandy Shale	est. 817	1317	est. 817	1317
Sandstone	est. 1317	1357	est. 1317	1357
Shale	est. 1357	1417	est. 1357	1417
Sandstone/ Shale	est. 1417	1497	est. 1417	1497
Sandstone	est. 1497	1577	est. 1497	1577
Shale/ Coal	est. 1577	1637	est. 1577	1637
Sandstone/ Trace Coal	est. 1637	1817	est. 1637	1817
Shale	est. 1817	1945	est. 1817	1945
Big Lime	est. 1945	2009	est. 1945	2009
Big Injun	est. 2009	2263	est. 2009	2263
Gantz Sand	est. 2263	2426	est. 2263	2426
Fifty Foot Sandstone	est. 2426	2640	est. 2426	2640
Gordon	est. 2640	2924	est. 2640	2924
Fifth Sandstone	est. 2924	3028	est. 2924	3028
Bayard	est. 3028	3405	est. 3028	3405
Warren	est. 3405	3801	est. 3405	3801
Speechley	est. 3801	3929	est. 3801	3929
Baltown	est. 3929	4493	est. 3929	4493
Bradford	est. 4493	4857	est. 4493	4857
Benson	est. 4857	5098	est. 4857	5098
Alexander	est. 5098	5299	est. 5098	5299
Elk	est. 5299	5698	est. 5299	5698
Rhinestreet	est. 5698	6040	est. 5698	6085
Sycamore	6040	6197	6085	6273
Middlesex	6197	6305	6273	6444
Burkett	6305	6332	6444	6507
Tully	6332	6352	6507	6569
Marcellus	6352	NA	6569	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:	10/17/2015
Job End Date:	10/24/2015
State:	West Virginia
County:	Ritchie
API Number:	47-085-10139-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Stalnakar 3H
Longitude:	-80.91948100
Latitude:	39.20550300
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,411
Total Base Water Volume (gal):	7,146,048
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	Base Fluid	Water	7732-18-5	100.00000	90.16706	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	9.33910	
HCl Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.18199	
LGC-15	J.S. Well Services	Gelling Agents	Hydrogen Chloride	7647-01-0	18.00000	0.04347	
			Guar Gum	9000-30-0	50.00000	0.07925	
			Petroleum Distillates	64742-47-8	60.00000	0.07506	
			Suspending agent (solid)	14808-60-7	3.00000	0.01212	
			Surfactant	68439-51-0	3.00000	0.00476	
WFRA-405	J.S. Well Services	Friction Reducer	Water	7732-18-5	40.00000	0.02729	
			2-Propanoic acid, polymer with 2-propanamide	9003-06-9	30.00000	0.02729	
			Petroleum Distillates	64742-47-8	20.00000	0.01098	
SI-1100	J.S. Well Services	Scale Inhibitor	Ethoxylated alcohol blend	68002-97-1	4.00000	0.00341	

			Water	7732-18-5	80.00000	0.01023
			Ethylene Glycol	107-21-1	25.00000	0.00361
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00151
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00129
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00083
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00083
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033
K-BAC 1020	J.S. Well Services	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropanamide	10222-01-2	20.00000	0.00440
			Deionized Water	7732-18-5	28.00000	0.00251
AP One	J.S. Well Services	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00232
AI-301	J.S. Well Services	Acid Corrosion Inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00014
			Methenamine	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)

LATITUDE 39°12'30" 845'

2,320' TO BOTTOM HOLE

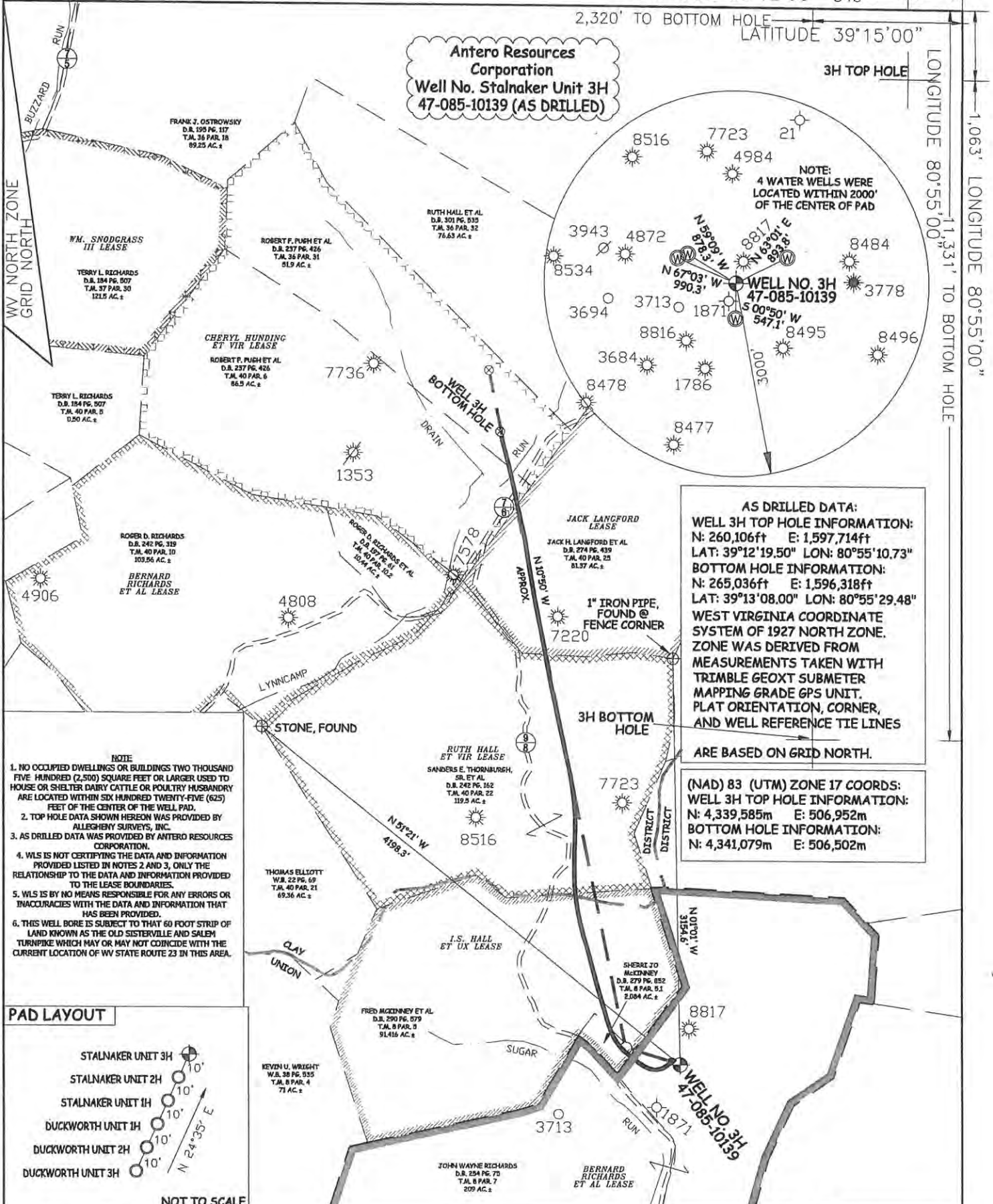
LATITUDE 39°15'00"

3H TOP HOLE

LONGITUDE 80°55'00"

1.063' LONGITUDE 80°55'00"

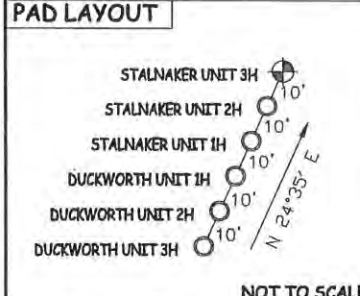
Antero Resources Corporation
Well No. Stalaker Unit 3H
47-085-10139 (AS DRILLED)



AS DRILLED DATA:
WELL 3H TOP HOLE INFORMATION:
N: 260,106ft E: 1,597,714ft
LAT: 39°12'19.50" LON: 80°55'10.73"
BOTTOM HOLE INFORMATION:
N: 265,036ft E: 1,596,318ft
LAT: 39°13'08.00" LON: 80°55'29.48"
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 3H TOP HOLE INFORMATION:
N: 4,339,585m E: 506,952m
BOTTOM HOLE INFORMATION:
N: 4,341,079m E: 506,502m

- 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 ALLEGHENY SURVEYS, INC.
 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.
 6. THIS WELL BORE IS SUBJECT TO THAT 60 FOOT STRIP OF LAND KNOWN AS THE OLD SISTERVILLE AND SALEM TURNPIKE WHICH MAY OR MAY NOT COINCIDE WITH THE CURRENT LOCATION OF WV STATE ROUTE 23 IN THIS AREA.



JOB # **14-039 WA**
DRAWING # **STALAKER3HAD**
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

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 1,035' ORIGINAL - 1,025' AS-DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
SURFACE OWNER JOHN WAYNE RICHARDS ACREAGE 209 ACRES +/-
OIL & GAS ROYALTY OWNER BERNARD RICHARDS ET AL; I.S. HALL ET UX; RUTH HALL ET VIR; JACK LANGFORD; CHERYL HUNDING ET VIR LEASE ACREAGE 214 AC.±; 100 AC.±; 120 AC.±; 448.5 AC.±; 143 AC.±
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 6,389' TVD 11,447' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME PERMIT