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

WV Department of
Environmental Protection

API 47-085-10161 County Ritchie District Clay
Quad Pennsboro 7.5' Pad Name Kelly Pad Field/Pool Name -----
Farm name Eddy D. Waggoner et al Well Number Duchene 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 4351663m Easting 503224m
Landing Point of Curve Northing 4352027.71m Easting 503358.28m
Bottom Hole Northing 4354322m Easting 502431m

Elevation (ft) 1127' 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 12/05/2014 Date drilling commenced 8/11/2016 Date drilling ceased 11/13/2016
Date completion activities began 05/16/2017 Date completion activities ceased 9/21/2017
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 337' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1099' 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: _____

Reviewed

Michael Daff 9/5/18

09/07/2018

API 47-085 - 10161 Farm name Eddy D. Waggoner et al Well number Duchene Unit 1H

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade w/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---------------------------|---------------|-------------|--------|-------------|------------|-----------------|---|
| Conductor | 24" | 20" | 53' | New | 94#, H-40 | N/A | Y |
| Surface | 17-1/2" | 13-3/8" | 504' | New | 48#, H-40 | N/A | Y |
| Coal | | | | | | | |
| Intermediate 1 | 12-1/4" | 9-5/8" | 2565' | New | 36#, K-55 | N/A | Y |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8-3/4"/8-1/2" | 5-1/2" | 15596' | New | 23#, P-110 | N/A | Y |
| Tubing | | 2-3/8" | 6598' | | 4.7#, N-80 | | |
| 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 | 102 sx | 15.6 | 1.18 | 120 | 0' | 8 Hrs. |
| Surface | Class A | 715 sx | 15.6 | 1.19 | 851 | 0' | 8 Hrs. |
| Coal | | | | | | | |
| Intermediate 1 | Class A | 985 sx | 15.6 | 1.18 | 1162 | 0' | 8 Hrs. |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | Class H | 691 sx (Lead) 1411 sx (Tail) | 13.5 (Lead), 15.2 (Tail) | 1.65 (Lead), 1.83 (Tail) | 3722 | -500' into Intermediate Casing | 8 Hrs. |
| Tubing | | | | | | | |

Drillers TD (ft) 15596' MD, 8387' TVD (BHL), 6429' (Depth) (Top of Hole) Loggers TD (ft) 15596' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

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Kick off depth (ft) 8076'

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 - 10161 Farm name Eddy D. Waggoner et al Well number Duchene Unit 1H

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---------------------------------------|------------------|------------------------|----------------------|------------------------|--------------|
| *PLEASE SEE ATTACHED EXHIBIT 1 | | | | | |
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Please insert additional pages as applicable.

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STIMULATION INFORMATION PER STAGE
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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) |
|---------------------------------------|-------------------|---------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
| *PLEASE SEE ATTACHED EXHIBIT 2 | | | | | | | | |
| | | | | | | | | |
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Please insert additional pages as applicable.

API 47- 085 - 10161 Farm name Eddy D. Waggoner et al Well number Duchene Unit 1H

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u> | |
|-------------------------------|------------------------|-----------------------|
| <u>Marcellus</u> | <u>6380' (TOP)</u> TVD | <u>6860' (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 8968 mcfpd Oil --- bpd NGL --- bpd Water 1158 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**

| | | | | | |
|--|--|--|--|--|--|
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Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP
Address 2640 Reach Road City Williamsport State PA Zip 17701

Logging Company Pro Oilfield Services LLC
Address 3141 Pulaski Rd City New Castle State PA Zip 16105

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

Stimulating Company FTS International
Address 1432 Route 519 City Eighty Four State PA Zip 15330

Please insert additional pages as applicable.

Completed by Mallory Stanton Telephone 303-357-7182
Signature Mallory Stanton Title Permitting Supervisor Date 05/09/2018

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

09/07/2018

API 47-085-10161 Farm Name Eddy D. Waggoner et al Well Number Duchene Unit 1H

EXHIBIT 1

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
|-----------|------------------|------------------------|----------------------|------------------------|------------|
| 1 | 5/16/2017 | 15326 | 15495 | 48 | Marcellus |
| 2 | 6/24/2017 | 15126 | 15295 | 48 | Marcellus |
| 3 | 6/25/2017 | 14925 | 15094 | 48 | Marcellus |
| 4 | 6/26/2017 | 14725 | 14894 | 48 | Marcellus |
| 5 | 6/27/2017 | 14524 | 14693 | 48 | Marcellus |
| 6 | 6/28/2017 | 14324 | 14493 | 48 | Marcellus |
| 7 | 7/18/2017 | 14123 | 14292 | 48 | Marcellus |
| 8 | 7/18/2017 | 13923 | 14092 | 48 | Marcellus |
| 9 | 7/22/2017 | 13722 | 13892 | 48 | Marcellus |
| 10 | 7/23/2017 | 13522 | 13691 | 48 | Marcellus |
| 11 | 7/23/2017 | 13322 | 13491 | 48 | Marcellus |
| 12 | 7/24/2017 | 13121 | 13290 | 48 | Marcellus |
| 13 | 7/24/2017 | 12921 | 13090 | 48 | Marcellus |
| 14 | 7/25/2017 | 12720 | 12889 | 48 | Marcellus |
| 15 | 7/25/2017 | 12520 | 12689 | 48 | Marcellus |
| 16 | 7/26/2017 | 12319 | 12488 | 48 | Marcellus |
| 17 | 7/27/2017 | 12119 | 12288 | 48 | Marcellus |
| 18 | 7/27/2017 | 11919 | 12088 | 48 | Marcellus |
| 19 | 7/28/2017 | 11718 | 11887 | 48 | Marcellus |
| 20 | 7/29/2017 | 11518 | 11687 | 48 | Marcellus |
| 21 | 7/30/2017 | 11317 | 11486 | 48 | Marcellus |
| 22 | 7/31/2017 | 11117 | 11286 | 48 | Marcellus |
| 23 | 7/31/2017 | 10916 | 11085 | 48 | Marcellus |
| 24 | 8/1/2017 | 10716 | 10885 | 48 | Marcellus |
| 25 | 8/3/2017 | 10516 | 10685 | 48 | Marcellus |
| 26 | 8/4/2017 | 10315 | 10484 | 48 | Marcellus |
| 27 | 8/4/2017 | 10115 | 10284 | 48 | Marcellus |
| 28 | 8/5/2017 | 9914 | 10083 | 48 | Marcellus |
| 29 | 8/6/2017 | 9714 | 9883 | 48 | Marcellus |
| 30 | 8/7/2017 | 9513 | 9682 | 48 | Marcellus |
| 31 | 8/7/2017 | 9313 | 9482 | 48 | Marcellus |
| 32 | 8/8/2017 | 9112 | 9281 | 48 | Marcellus |
| 33 | 8/9/2017 | 8912 | 9081 | 48 | Marcellus |
| 34 | 8/10/2017 | 8712 | 8881 | 48 | Marcellus |
| 35 | 8/10/2017 | 8511 | 8680 | 48 | Marcellus |
| 36 | 8/11/2017 | 8311 | 8480 | 48 | Marcellus |
| 37 | 8/11/2017 | 8110 | 8279 | 48 | Marcellus |
| 38 | 8/11/2017 | 7910 | 8079 | 48 | Marcellus |
| 39 | 8/12/2017 | 7709 | 7878 | 48 | Marcellus |
| 40 | 8/12/2017 | 7509 | 7678 | 48 | Marcellus |
| 41 | 8/13/2017 | 7309 | 7478 | 48 | Marcellus |
| 42 | 8/13/2017 | 7108 | 7277 | 48 | Marcellus |
| 43 | 8/13/2017 | 6908 | 7077 | 48 | Marcellus |
| 44 | 8/14/2017 | 6707 | 6876 | 48 | 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 | 5/16/2017 | 71 | 7388 | 5495 | 7656 | 504099 | 8754 | N/A |
| 2 | 6/24/2017 | 79 | 7432 | 5816 | 4233 | 517483 | 8826 | N/A |
| 3 | 6/25/2017 | 80 | 7472 | 5668 | 3199 | 510584 | 10947 | N/A |
| 4 | 6/26/2017 | 79 | 7340 | 6595 | 3420 | 512905 | 9105 | N/A |
| 5 | 6/27/2017 | 80 | 7472 | 5546 | 3839 | 510459 | 8518 | N/A |
| 6 | 6/28/2017 | 75 | 7845 | 5713 | 9291 | 449842 | 9921 | N/A |
| 7 | 7/18/2017 | 76 | 7317 | 5457 | 3848 | 532959 | 8462 | N/A |
| 8 | 7/18/2017 | 66 | 7546 | 5318 | 4941 | 405634 | 8116 | N/A |
| 9 | 7/22/2017 | 69 | 7421 | 5671 | 5863 | 480011 | 8627 | N/A |
| 10 | 7/23/2017 | 79 | 8593 | 5779 | 7340 | 509136 | 8433 | N/A |
| 11 | 7/23/2017 | 73 | 7088 | 5675 | 3898 | 510911 | 8632 | N/A |
| 12 | 7/24/2017 | 76 | 7022 | 5711 | 4086 | 511960 | 9705 | N/A |
| 13 | 7/24/2017 | 80 | 7237 | 6356 | 3991 | 514292 | 8524 | N/A |
| 14 | 7/25/2017 | 77 | 7230 | 6109 | 4161 | 509933 | 8413 | N/A |
| 15 | 7/25/2017 | 80 | 7039 | 5858 | 4246 | 510281 | 8326 | N/A |
| 16 | 7/26/2017 | 78 | 7116 | 5596 | 4122 | 514585 | 8391 | N/A |
| 17 | 7/27/2017 | 72 | 7479 | 5721 | 4354 | 510596 | 11794 | N/A |
| 18 | 7/27/2017 | 80 | 7364 | 5729 | 4952 | 456566 | 8482 | N/A |
| 19 | 7/28/2017 | 78 | 7257 | 5584 | 3750 | 513022 | 8375 | N/A |
| 20 | 7/29/2017 | 73 | 6758 | 5486 | 3862 | 511111 | 8480 | N/A |
| 21 | 7/30/2017 | 76 | 6987 | 5507 | 4975 | 477972 | 8443 | N/A |
| 22 | 7/31/2017 | 80 | 7179 | 5689 | 3882 | 515331 | 8371 | N/A |
| 23 | 7/31/2017 | 80 | 6971 | 5241 | 3790 | 511728 | 8343 | N/A |
| 24 | 8/1/2017 | 81 | 6941 | 5631 | 4351 | 509819 | 8375 | N/A |
| 25 | 8/3/2017 | 75 | 6858 | 5942 | 4268 | 511855 | 10434 | N/A |
| 26 | 8/4/2017 | 80 | 7179 | 5689 | 3882 | 515331 | 8078 | N/A |
| 27 | 8/4/2017 | 72 | 7063 | 5348 | 3960 | 503424 | 8290 | N/A |
| 28 | 8/5/2017 | 78 | 7212 | 5427 | 4185 | 510144 | 8614 | N/A |
| 29 | 8/6/2017 | 79 | 7479 | 5899 | 3834 | 512184 | 8334 | N/A |
| 30 | 8/7/2017 | 75 | 6586 | 5288 | 4150 | 508799 | 8448 | N/A |
| 31 | 8/7/2017 | 76 | 6322 | 5649 | 4155 | 507529 | 9072 | N/A |
| 32 | 8/8/2017 | 77 | 6679 | 6693 | 4280 | 507110 | 8375 | N/A |
| 33 | 8/9/2017 | 62 | 6710 | 6332 | 4531 | 509819 | 8298 | N/A |
| 34 | 8/10/2017 | 78 | 6838 | 6639 | 4173 | 510418 | 7909 | N/A |
| 35 | 8/10/2017 | 75 | 6469 | 6651 | 4178 | 506858 | 13291 | N/A |
| 36 | 8/11/2017 | 73 | 7014 | 6241 | 4565 | 482560 | 9797 | N/A |
| 37 | 8/11/2017 | 70 | 7014 | 5564 | 3980 | 514008 | 8318 | N/A |
| 38 | 8/11/2017 | 78 | 7222 | 5925 | 3961 | 513884 | 8120 | N/A |
| 39 | 8/12/2017 | 69 | 7021 | 5887 | 3971 | 427558 | 8252 | N/A |
| 40 | 8/12/2017 | 69 | 6171 | 5785 | 3912 | 513924 | 8210 | N/A |
| 41 | 8/13/2017 | 75 | 6802 | 6206 | 4277 | 516549 | 9341 | N/A |
| 42 | 8/13/2017 | 76 | 6556 | 6227 | 4018 | 510868 | 8045 | N/A |
| 43 | 8/13/2017 | 78 | 6540 | 5920 | 4287 | 514753 | 10846 | N/A |
| 44 | 8/14/2017 | 77 | 6471 | 6564 | 4179 | 512517 | 8210 | N/A |
| | AVG= | 75.7 | 7,084 | 5,837 | 4,427 | 22,121,311 | 390,645 | TOTAL |

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| LITHOLOGY/ FORMATION | TOP DEPTH (TVD) | BOTTOM DEPTH (TVD) | TOP DEPTH (MD) | BOTTOM DEPTH (MD) |
|----------------------|-----------------|--------------------|----------------|-------------------|
| | From Surface | From Surface | From Surface | From Surface |
| Fresh Water | 337' | N/A | 337' | N/A |
| Sandstone | 0 | 221 | 0 | 221 |
| siltstone | est. 221 | 241 | est. 221 | 241 |
| shale | est. 241 | 381 | est. 241 | 381 |
| Coal | est. 381 | 401 | est. 381 | 401 |
| Sandstone | est. 401 | 441 | est. 401 | 441 |
| Limestone | est. 441 | 561 | est. 441 | 561 |
| Sandstone | est. 561 | 621 | est. 561 | 621 |
| Sandstone | est. 621 | 761 | est. 621 | 761 |
| Sandstone | est. 761 | 941 | est. 761 | 941 |
| Limestone | est. 941 | 1,978 | est. 941 | 2,019 |
| Big Lime | 1,978 | 2,492 | 1,979 | 2,493 |
| Gantz | 2,492 | 2,864 | 2,493 | 2,865 |
| Fifty Foot Sandstone | 2,864 | 2,961 | 2,865 | 2,962 |
| Gordon | 2,961 | 3,327 | 2,962 | 3,329 |
| Fifth Sandstone | 3,327 | 3,399 | 3,329 | 3,402 |
| Bayard | 3,399 | 3,939 | 3,402 | 3,955 |
| Speechley | 3,939 | 4,194 | 3,955 | 4,221 |
| Baltown | 4,194 | 4,589 | 4,221 | 4,631 |
| Bradford | 4,589 | 4,975 | 4,631 | 5,031 |
| Benson | 4,975 | 5,214 | 5,031 | 5,280 |
| Alexander | 5,214 | 5,511 | 5,280 | 5,587 |
| Elk | 5,511 | 5,793 | 5,587 | 5,882 |
| Rhinestreet | 5,793 | 6,134 | 5,882 | 6,254 |
| Sycamore | 6,134 | 6,228 | 6,254 | 6,376 |
| Middlesex | 6,228 | 6,334 | 6,376 | 6,550 |
| Burkett | 6,334 | 6,361 | 6,550 | 6,616 |
| Tully | 6,361 | 6,380 | 6,616 | 6,680 |
| Marcellus | 6,380 | NA | 6,680 | 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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Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|--------------------------------|------------------------------|
| Job Start Date: | 6/23/2017 |
| Job End Date: | 8/14/2017 |
| State: | West Virginia |
| County: | Ritchie |
| API Number: | 47-085-10161-00-00 |
| Operator Name: | Antero Resources Corporation |
| Well Name and Number: | Duchene 1H |
| Latitude: | 39.31435800 |
| Longitude: | -80.96260300 |
| Datum: | NAD27 |
| Federal Well: | NO |
| Indian Well: | NO |
| True Vertical Depth: | 6,400 |
| Total Base Water Volume (gal): | 19,721,016 |
| Total Base Non Water Volume: | 66,474 |



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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 | 87.89929 | |
| Other Chemical (s) | Listed Above | See Trade Name (s) List | | | | | |
| | | | Water | 7732-18-5 | 30.00000 | 0.00347 | |

| | | | | | | | |
|---------------|------|--------------------------|-------|--------------|----------|---------|--|
| | | | Water | 7732-18-5 | 60.00000 | 0.04606 | |
| | | | Water | 7732-18-5 | 97.00000 | 0.01457 | |
| | | | Water | 7732-18-5 | 85.00000 | 0.13620 | |
| | | | Water | 7732-18-5 | 30.00000 | 0.00009 | |
| 30/50 White | FTSI | Proppant | | | | | |
| | | | | Listed Below | | | |
| 100 Mesh Sand | FTSI | Proppant | | | | | |
| | | | | Listed Below | | | |
| HVG-1 4.0 | FTSI | Water gelling agent | | | | | |
| | | | | Listed Below | | | |
| CI-150 | FTSI | Acid Corrosion Inhibitor | | | | | |
| | | | | Listed Below | | | |
| 40/70 White | FTSI | Proppant | | | | | |
| | | | | Listed Below | | | |
| CS-750 SI | FTSI | Scale Inhibitor | | | | | |
| | | | | Listed Below | | | |
| FRW-900 | FTSI | Friction Reducer | | | | | |

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|-----------------|------|---------|--|--------------|--|--|--|
| | | | | Listed Below | | | |
| K-BAC-1020 | FTSI | Biocide | | | | | |
| | | | | Listed Below | | | |
| LTB-1 | FTSI | Breaker | | | | | |
| | | | | Listed Below | | | |
| 10.1%-15.0% HCL | FTSI | Acid | | | | | |
| | | | | Listed Below | | | |

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Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.

| | | | | | | | |
|--|--|--|--|-------------|-----------|---------|--|
| | | | Silica, Quartz | 14808-60-7 | 100.00000 | 5.36468 | |
| | | | Silica, Quartz | 14808-60-7 | 100.00000 | 3.39179 | |
| | | | Silica, Quartz | 14808-60-7 | 100.00000 | 3.01872 | |
| | | | Hydrotreated Light Distillate | 64742-47-8 | 40.00000 | 0.03071 | |
| | | | Anionic polymer | Proprietary | 40.00000 | 0.03071 | |
| | | | Guar gum | 9000-30-0 | 55.00000 | 0.02600 | |
| | | | Petroleum Distillate | 64742-47-8 | 55.00000 | 0.02600 | |
| | | | Raffinates, Sorption Process | 64741-85-1 | 55.00000 | 0.02600 | |
| | | | Hydrogen Chloride | 7647-01-0 | 15.00000 | 0.02404 | |
| | | | 2-Propenoic acid, polymer with 2 propenamide | 9003-06-9 | 30.00000 | 0.02303 | |
| | | | Ammonium Persulfate | 7727-54-0 | 84.00000 | 0.01206 | |
| | | | Glycerol | 56-81-5 | 10.00000 | 0.00768 | |
| | | | Polyethylene glycol | 25322-68-3 | 50.00000 | 0.00579 | |
| | | | Ethoxylated Alcohols | Proprietary | 5.00000 | 0.00384 | |
| | | | Alcohols, C10-C16, ethoxylated | 68002-97-1 | 5.00000 | 0.00384 | |

| | | | | | | | |
|--|--|--|-------------------------------------|-------------|----------|---------|--|
| | | | Sodium chloride (NaCl) | 7647-14-5 | 5.00000 | 0.00384 | |
| | | | Sorbitan, mono-(9Z)-9-octadecenoate | 1338-43-8 | 5.00000 | 0.00384 | |
| | | | Cured acrylic resin | 25085-19-2 | 22.00000 | 0.00316 | |
| | | | 2,2-Dibromo-3-nitrilopropionamide | 10222-01-2 | 21.00000 | 0.00243 | |
| | | | Suspending Agent | 1302-78-9 | 5.00000 | 0.00236 | |
| | | | Quartz | 14808-60-7 | 4.00000 | 0.00189 | |
| | | | Proprietary Scale Inhibitor | Proprietary | 10.00000 | 0.00150 | |
| | | | Isotridecanol, ethoxylated | 9043-30-5 | 2.00000 | 0.00095 | |
| | | | Isopropanol | 67-63-0 | 60.00000 | 0.00017 | |
| | | | Ethoxylated fatty alcohol | Proprietary | 30.00000 | 0.00009 | |
| | | | Fatty amino compound salt | Proprietary | 30.00000 | 0.00009 | |
| | | | Talc | 14807-96-6 | 0.60000 | 0.00009 | |
| | | | Ethoxylated Alcohol | Proprietary | 10.00000 | 0.00003 | |
| | | | Aromatic aldehyde | Proprietary | 8.00000 | 0.00002 | |
| | | | Alkoxyated fatty amine | Proprietary | 5.00000 | 0.00001 | |
| | | | Methanol | 67-56-1 | 0.10000 | 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)

RECEIVED Gas
Office of Oil and Gas
MAY 10 2018
WV 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

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.

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT

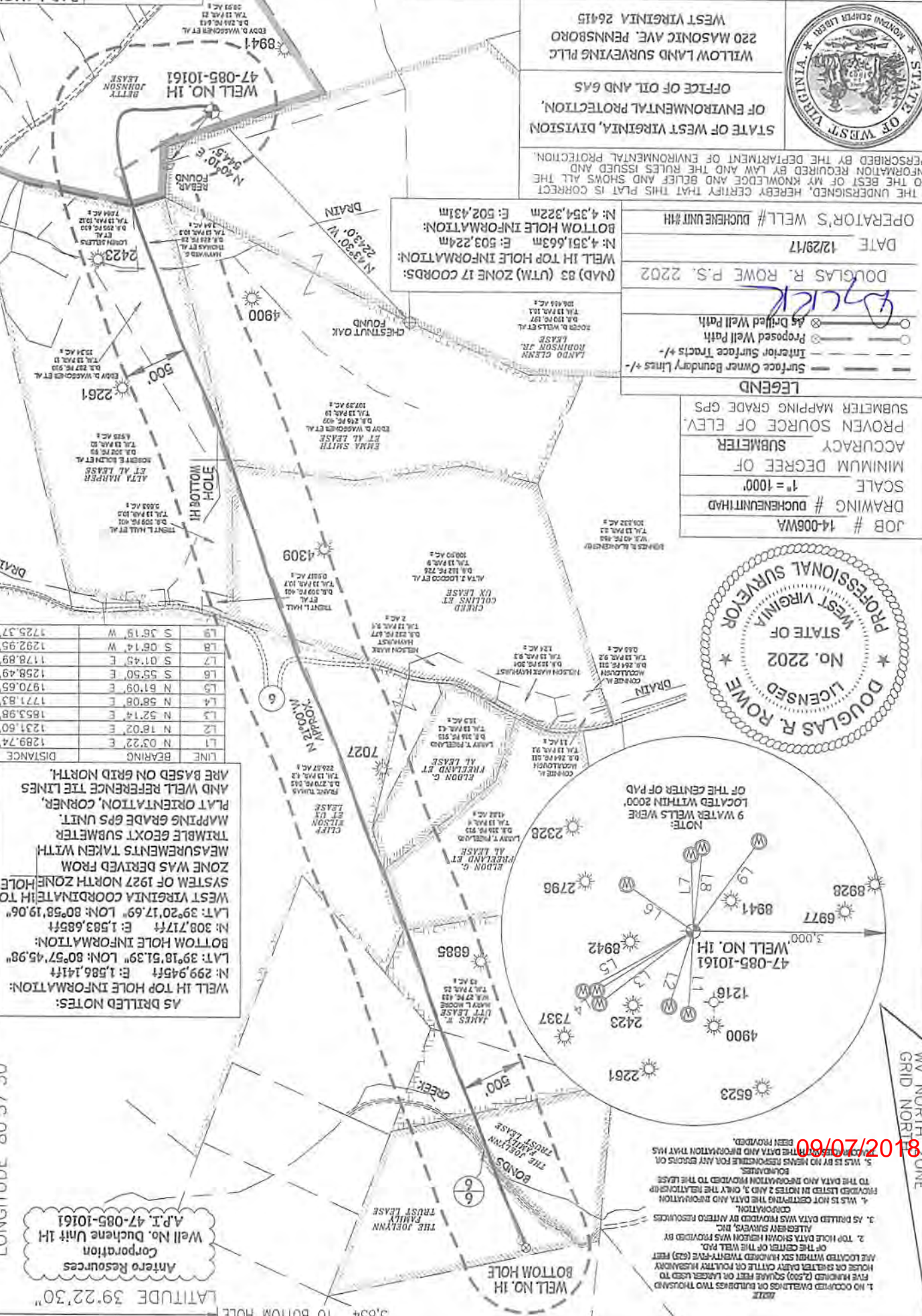
JOB # 14-006WA
DRAWING # DUCHEUNEUNITHAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER
LEGEND

DATE 12/29/17
OPERATOR'S WELL # DUCHEUNEUNIT #11
WELL I# TOP HOLE INFORMATION:
N: 4,351,663m E: 502,224m
N: 4,354,322m E: 502,431m
BOTTOM HOLE INFORMATION:

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

STATE OF WEST VIRGINIA
DIVISION OF ENERGY
DEPARTMENT OF OIL AND GAS
WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
LOCATION: ELEVATION 1,127 AS DRILLED
QUADRANGLE PENNSBORO 75
SURFACE OWNER EDDY D. WAGGONER ET AL
ACREAGE 59.93 ACRES +/-
WATERSHED NORTH FORK HUGHES RIVER
DISTRICT CLAY
WELL I# TOP HOLE INFORMATION:
N: 4,351,663m E: 502,224m
N: 4,354,322m E: 502,431m
BOTTOM HOLE INFORMATION:

LEASE ACREAGE 130 AC±; 112 AC±; 104 AC±; 413 AC±; 38 AC±; 56.5 AC±; 16 AC±; 22 AC±
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP.
DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA STAMPER
ADDRESS 1615 WYNNKOOP STREET DENVER, CO 80202
FORM W-6



| LINE | BEARING | DISTANCE |
|------|------------|----------|
| L1 | N 03°22' E | 1289.74 |
| L2 | N 16°02' E | 1231.60 |
| L3 | N 52°14' E | 1853.98 |
| L4 | N 58°08' E | 1771.83 |
| L5 | N 61°09' E | 1970.65 |
| L6 | S 01°43' E | 1258.49 |
| L7 | S 01°43' E | 1178.89 |
| L8 | S 06°14' W | 1292.95 |
| L9 | S 36°19' W | 1725.37 |

AS DRILLED NOTES:
WELL I# TOP HOLE INFORMATION:
N: 299,945ft E: 1,586,141ft
LAT: 39°18'51.39" LON: 80°57'45.98"
WELL I# TOP HOLE INFORMATION:
N: 308,717ft E: 1,583,685ft
LAT: 39°20'17.69" LON: 80°58'19.06"
WEST VIRGINIA COORDINATE I# TOP HOLE SYSTEM OF 1927 NORTH ZONE HOLE ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIANGLE GEOXT SUBMETER MAPPING GRADE EPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

Antero Resources Corporation
Well No. Duchene Unit 1H
A.P.I. 47-085-10161

LATITUDE 39°20'00" LONGITUDE 80°57'30" LONGITUDE 80°57'30" LONGITUDE 80°57'30"

6.941' 13.387' TO BOTTOM HOLE 3.854' TO BOTTOM HOLE 1.256'

LATITUDE 39°20'00" 1,256'

LATITUDE 39°22'30"

LONGITUDE 80°57'30"

6,941'

13,387' TO BOTTOM HOLE

LONGITUDE 80°57'30"

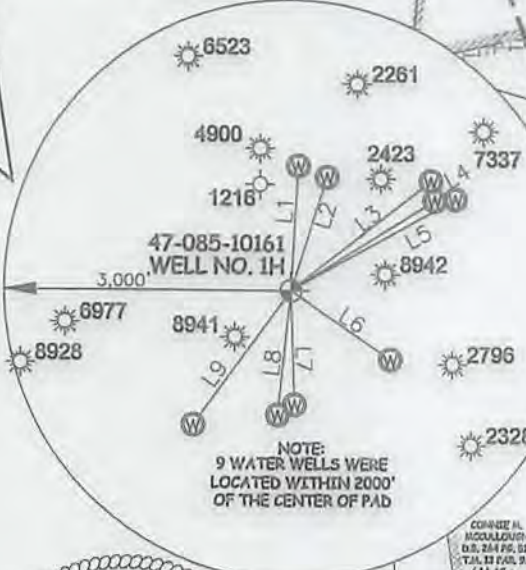
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY IN ANY MANNER ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, 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 DISCREPANCIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

WV NORTH ZONE GRID NORTH

WELL NO. 1H
BOTTOM HOLE

3,854' TO BOTTOM HOLE

Antero Resources Corporation
Well No. Duchene Unit 1H
A.P.I. 47-085-10161



AS DRILLED NOTES:

WELL 1H TOP HOLE INFORMATION:
 N: 299,945ft E: 1,586,141ft
 LAT: 39°18'51.39" LON: 80°57'45.98"

BOTTOM HOLE INFORMATION:
 N: 308,717ft E: 1,583,685ft
 LAT: 39°20'17.69" LON: 80°58'19.06"

WEST VIRGINIA COORDINATE 1H TOP SYSTEM OF 1927 NORTH ZONE HOLE 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.

| LINE | BEARING | DISTANCE |
|------|------------|----------|
| L1 | N 03°22' E | 1289.74' |
| L2 | N 18°02' E | 1231.60' |
| L3 | N 52°14' E | 1853.98' |
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| L6 | S 55°50' E | 1258.49' |
| L7 | S 01°45' E | 1178.89' |
| L8 | S 06°14' W | 1292.95' |
| L9 | S 36°19' W | 1725.37' |



JOB # 14-006WA
 DRAWING # DUCHENEUNIT1HAD
 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 12/29/17
 OPERATOR'S WELL # DUCHENE UNIT #1H

(NAD) 83 (UTM) ZONE 17 COORDS:
 WELL 1H TOP HOLE INFORMATION:
 N: 4,351,663m E: 503,224m
 BOTTOM HOLE INFORMATION:
 N: 4,354,322m E: 502,431m

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.

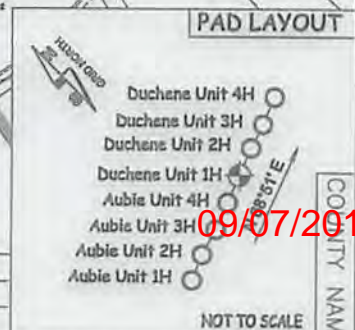


STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

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

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 API WELL # 47-085-10161
 STATE COUNTY PERMIT
 WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X
 LOCATION: ELEVATION 1,127' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER
 QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER EDDY D. WAGGONER ET AL ACREAGE 59.93 ACRES +/-
 OIL & GAS ROYALTY OWNER BETTY JOHNSON; ALTA HARPER ET AL; CREED COLLINS ET UX; CLIFF WILSON ET UX; ELDON G. FREELAND ET AL; JAMES W. UTT; THE JOELYNN FAMILY TRUST; THE JOELYNN FAMILY TRUST

LEASE ACREAGE 130 AC±; 112 AC±; 104 AC±; 413 AC±; 38 AC±; 56.5 AC±; 16 AC±; 22 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 ESTIMATED DEPTH 6,387' TVD 15,596' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313



COUNTY NAME PERMIT