WR-35
Rev. 8/23/13

APPROVED
NAME: [illegible]
DATE: 5/25/16

Page ___ of ___

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

API 47 - 017 - 06372 County Doddridge District Grant
Quad Smithburg 7.5' Pad Name RJ Smith Field/Pool Name ---
Farm name Smith, Robert J. Well Number Gibson Unit 2H
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 4357402m Easting 523021m
Landing Point of Curve Northing 4357502.17m Easting 522925.96m
Bottom Hole Northing 4360043m Easting 521904m

Elevation (ft) 998' 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 11/4/2013 Date drilling commenced 2/22/2015 Date drilling ceased 6/9/2015
Date completion activities began 11/5/2015 Date completion activities ceased 1/22/2016
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 181', 237' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 804', 1267', 1350', 1431' 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:

AK 07/29/2016

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API 47- 017 - 06372 Farm name Smith, Robert J. Well number Gibson 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 | 30" | 20" | 40' | New | 94# J-55 | N/A | Y |
| Surface | 17- 1/2" | 13- 3/8" | 484' | New | 48# H-40 | N/A | Y |
| Coal | | | | | | | |
| Intermediate 1 | 12-1/4" | 9-5/8" | 2563' | New | 36# J-55 | N/A | Y |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8-3/4" & 8-1/2" | 5-1/2" | 16190' | New | 23# P-110 | N/A | Y |
| Tubing | | 2-3/8" | 6754' | | 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 | 193 sx | 15.6 | 1.18 | 38 | 0' | 8 Hrs. |
| Surface | Class A | 590 sx | 15.6 | 1.18 | 336 | 0' | 8 Hrs. |
| Coal | | | | | | | |
| Intermediate 1 | Class A | 940 sx | 15.6 | 1.18 | 803 | 0' | 8 Hrs. |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | Class H | 1110 sx (Lead) 1457 sx (Tail) | 14.2 Lead 14.8 Tail | 1.24 Lead 1.81 Tail | 3236 | ~500' into Intermediate Casing | 8 Hrs. |
| Tubing | | | | | | | |

Drillers TD (ft) 16190' MD, 6822' TVD (BHL), 6884' (Deepest Point Drilled) Loggers TD (ft) 16190'

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6286'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Duff Unit 2H API #47-017-06247). Please reference the wireline logs submitted with Form WR-35 for Duff 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 ☐ 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 aboce 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



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API 47- 017 - 06372 Farm name Smith, Robert J. Well number Gibson Unit 2H

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
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*PLEASE 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) |
|---|---|---|---|---|---|---|---|---|
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*PLEASE SEE ATTACHED EXHIBIT 2

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API 47- 017 - 06372 Farm name Smith, Robert J. Well number Gibson Unit 2H

| PRODUCING FORMATION(S) | DEPTHS | | |
|---|---|---|---|
| Marcellus | 6817' (TOP) TVD | 6917' (TOP) MD | |
| | | | |
| | | | |
| | | | |

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown ■ Open Flow OIL TEST ■ Flow □ Pump

SHUT-IN PRESSURE Surface 3550 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 8920 mcfpd Oil 25 bpd NGL --- bpd Water 4 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, $H_2S$, ETC) |
|---|---|---|---|---|---|
| | 0 | | 0 | | |
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*PLEASE SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company LP
Address 2640 Reach Rd. City Williamsport State PA Zip 17701

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

Cementing Company Allied Gas & Oil Services, LLC
Address 1036 East Main St. City Bridgeport State WV Zip 26330

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permit Representative Date 3/17/2016

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

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Environmental Protection

07/29/2016

| API 47-017-06372 Farm Name Smith, Robert J. Well Number Gibson Unit 2H | | | | | |
|---|---|---|---|---|---|
| **EXHIBIT 1** | | | | | |
| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
| 1 | 5-Nov-15 | 15,930 | 16,098 | 60 | Marcellus |
| 2 | 3-Dec-15 | 15,730 | 15,898 | 60 | Marcellus |
| 3 | 4-Dec-15 | 15,531 | 15,699 | 60 | Marcellus |
| 4 | 4-Dec-15 | 15,331 | 15,500 | 60 | Marcellus |
| 5 | 4-Dec-15 | 15,132 | 15,300 | 60 | Marcellus |
| 6 | 4-Dec-15 | 14,933 | 15,101 | 60 | Marcellus |
| 7 | 5-Dec-15 | 14,733 | 14,901 | 60 | Marcellus |
| 8 | 5-Dec-15 | 14,534 | 14,702 | 60 | Marcellus |
| 9 | 5-Dec-15 | 14,334 | 14,502 | 60 | Marcellus |
| 10 | 5-Dec-15 | 14,135 | 14,303 | 60 | Marcellus |
| 11 | 6-Dec-15 | 13,935 | 14,104 | 60 | Marcellus |
| 12 | 6-Dec-15 | 13,736 | 13,904 | 60 | Marcellus |
| 13 | 6-Dec-15 | 13,536 | 13,705 | 60 | Marcellus |
| 14 | 6-Dec-15 | 13,337 | 13,505 | 60 | Marcellus |
| 15 | 6-Dec-15 | 13,138 | 13,306 | 60 | Marcellus |
| 16 | 7-Dec-15 | 12,938 | 13,106 | 60 | Marcellus |
| 17 | 7-Dec-15 | 12,739 | 12,907 | 60 | Marcellus |
| 18 | 7-Dec-15 | 12,539 | 12,707 | 60 | Marcellus |
| 19 | 7-Dec-15 | 12,340 | 12,508 | 60 | Marcellus |
| 20 | 7-Dec-15 | 12,140 | 12,309 | 60 | Marcellus |
| 21 | 8-Dec-15 | 11,941 | 12,109 | 60 | Marcellus |
| 22 | 21-Dec-15 | 11,741 | 11,910 | 60 | Marcellus |
| 23 | 21-Dec-15 | 11,542 | 11,710 | 60 | Marcellus |
| 24 | 21-Dec-15 | 11,343 | 11,511 | 60 | Marcellus |
| 25 | 21-Dec-15 | 11,143 | 11,311 | 60 | Marcellus |
| 26 | 22-Dec-15 | 10,944 | 11,112 | 60 | Marcellus |
| 27 | 22-Dec-15 | 10,744 | 10,912 | 60 | Marcellus |
| 28 | 22-Dec-15 | 10,545 | 10,713 | 60 | Marcellus |
| 29 | 22-Dec-15 | 10,345 | 10,514 | 60 | Marcellus |
| 30 | 23-Dec-15 | 10,146 | 10,314 | 60 | Marcellus |
| 31 | 23-Dec-15 | 9,947 | 10,115 | 60 | Marcellus |
| 32 | 23-Dec-15 | 9,747 | 9,915 | 60 | Marcellus |
| 33 | 23-Dec-15 | 9,548 | 9,716 | 60 | Marcellus |
| 34 | 23-Dec-15 | 9,348 | 9,516 | 60 | Marcellus |
| 35 | 23-Dec-15 | 9,149 | 9,317 | 60 | Marcellus |
| 36 | 24-Dec-15 | 8,949 | 9,118 | 60 | Marcellus |
| 37 | 26-Dec-15 | 8,750 | 8,918 | 60 | Marcellus |
| 38 | 26-Dec-15 | 8,550 | 8,719 | 60 | Marcellus |
| 39 | 26-Dec-15 | 8,351 | 8,519 | 60 | Marcellus |
| 40 | 27-Dec-15 | 8,152 | 8,320 | 60 | Marcellus |
| 41 | 27-Dec-15 | 7,952 | 8,120 | 60 | Marcellus |
| 42 | 27-Dec-15 | 7,753 | 7,921 | 60 | Marcellus |
| 43 | 27-Dec-15 | 7,553 | 7,721 | 60 | Marcellus |
| 44 | 27-Dec-15 | 7,354 | 7,522 | 60 | Marcellus |
| 45 | 28-Dec-15 | 7,154 | 7,323 | 60 | Marcellus |
| 46 | 28-Dec-15 | 6,955 | 7,123 | 60 | Marcellus |

API 47-017-06372 Farm Name Smith, Robert J. Well Number Gibson 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 | 3-Dec-15 | 67.9 | 7,222 | 5,651 | 5,335 | 249,982 | 6,650 | N/A |
| 2 | 3-Dec-15 | 69.4 | 6,959 | 5,198 | 5,202 | 258,021 | 6,573 | N/A |
| 3 | 4-Dec-15 | 70.4 | 7,214 | 5,836 | 4,931 | 254,469 | 6,590 | N/A |
| 4 | 4-Dec-15 | 74.0 | 7,448 | 6,018 | 5,296 | 252,612 | 6,483 | N/A |
| 5 | 4-Dec-15 | 74.0 | 7,331 | 6,289 | 5,327 | 215,119 | 7,079 | N/A |
| 6 | 4-Dec-15 | 71.3 | 7,167 | 6,036 | 5,323 | 256,328 | 6,497 | N/A |
| 7 | 5-Dec-15 | 72.3 | 7,241 | 5,747 | 5,258 | 253,289 | 6,438 | N/A |
| 8 | 5-Dec-15 | 78.0 | 6,794 | 5,894 | 5,330 | 247,215 | 6,383 | N/A |
| 9 | 5-Dec-15 | 73.7 | 7,455 | 5,827 | 5,364 | 197,986 | 7,002 | N/A |
| 10 | 5-Dec-15 | 75.2 | 7,255 | 5,602 | 5,495 | 252,643 | 6,308 | N/A |
| 11 | 6-Dec-15 | 73.1 | 7,263 | 5,598 | 5,313 | 253,429 | 6,320 | N/A |
| 12 | 6-Dec-15 | 76.0 | 7,722 | 5,520 | 5,373 | 251,076 | 6,405 | N/A |
| 13 | 6-Dec-15 | 74.3 | 7,743 | 5,564 | 5,143 | 147,622 | 7,011 | N/A |
| 14 | 6-Dec-15 | 72.8 | 7,306 | 6,594 | 5,390 | 250,715 | 6,438 | N/A |
| 15 | 6-Dec-15 | 72.8 | 7,099 | 5,542 | 4,766 | 252,644 | 6,312 | N/A |
| 16 | 7-Dec-15 | 72.7 | 6,950 | 5,523 | 5,349 | 251,461 | 6,248 | N/A |
| 17 | 7-Dec-15 | 73.2 | 7,132 | 5,702 | 5,388 | 250,902 | 6,252 | N/A |
| 18 | 7-Dec-15 | 74.3 | 7,013 | 5,795 | 5,452 | 251,990 | 6,284 | N/A |
| 19 | 7-Dec-15 | 73.7 | 6,924 | 5,592 | 5,160 | 251,875 | 6,261 | N/A |
| 20 | 7-Dec-15 | 72.0 | 6,883 | 5,489 | 4,442 | 249,361 | 6,210 | N/A |
| 21 | 8-Dec-15 | 75.0 | 7,114 | 5,573 | 5,241 | 250,582 | 6,212 | N/A |
| 22 | 21-Dec-15 | 68.4 | 6,686 | 5,597 | 5,251 | 250,840 | 6,343 | N/A |
| 23 | 21-Dec-15 | 71.2 | 6,727 | 5,408 | 5,464 | 251,471 | 6,311 | N/A |
| 24 | 21-Dec-15 | 70.6 | 6,945 | 5,512 | 5,057 | 222,107 | 6,174 | N/A |
| 25 | 21-Dec-15 | 69.0 | 6,803 | 5,479 | 5,122 | 250,385 | 6,411 | N/A |
| 26 | 22-Dec-15 | 69.5 | 6,755 | 5,326 | 5,709 | 252,230 | 6,282 | N/A |
| 27 | 22-Dec-15 | 69.8 | 6,607 | 5,230 | 4,788 | 252,045 | 6,255 | N/A |
| 28 | 22-Dec-15 | 70.5 | 6,714 | 15 | 4,847 | 251,449 | 6,203 | N/A |
| 29 | 22-Dec-15 | 69.2 | 6,963 | 5,581 | 5,225 | 209,072 | 5,868 | N/A |
| 30 | 23-Dec-15 | 69.7 | 6,783 | 5,526 | 4,506 | 250,562 | 6,315 | N/A |
| 31 | 23-Dec-15 | 69.1 | 6,718 | 6,140 | 5,040 | 254,270 | 6,255 | N/A |
| 32 | 23-Dec-15 | 70.6 | 6,472 | 5,494 | 5,576 | 250,830 | 6,146 | N/A |
| 33 | 23-Dec-15 | 70.2 | 6,608 | 5,421 | 5,890 | 251,992 | 6,112 | N/A |
| 34 | 23-Dec-15 | 70.8 | 6,311 | 5,705 | 5,050 | 251,281 | 6,164 | N/A |
| 35 | 23-Dec-15 | 69.8 | 6,462 | 5,956 | 5,323 | 256,720 | 6,271 | N/A |
| 36 | 24-Dec-15 | 69.6 | 6,653 | 5,954 | 4,843 | 253,233 | 6,163 | N/A |
| 37 | 26-Dec-15 | 70.4 | 6,734 | 5,692 | 5,123 | 199,316 | 6,610 | N/A |
| 38 | 26-Dec-15 | 69.7 | 6,638 | 5,836 | 5,318 | 253,185 | 6,199 | N/A |
| 39 | 26-Dec-15 | 68.1 | 6,652 | 6,701 | 5,287 | 252,681 | 6,068 | N/A |
| 40 | 27-Dec-15 | 69.9 | 6,774 | 6,134 | 4,802 | 177,921 | 5,725 | N/A |
| 41 | 27-Dec-15 | 70.2 | 6,912 | 5,881 | 5,279 | 252,239 | 6,262 | N/A |
| 42 | 27-Dec-15 | 69.9 | 6,606 | 6,430 | 5,122 | 251,974 | 6,114 | N/A |
| 43 | 27-Dec-15 | 70.2 | 6,672 | 6,871 | 5,069 | 252,482 | 6,199 | N/A |
| 44 | 27-Dec-15 | 73.4 | 7,000 | 5,579 | 5,175 | 226,292 | 6,450 | N/A |
| 45 | 28-Dec-15 | 69.9 | 6,671 | 5,898 | 5,507 | 153,724 | 6,315 | N/A |
| 46 | 28-Dec-15 | 71.0 | 6,220 | 7,036 | 5,149 | 253,299 | 5,984 | N/A |
| AVG= | | **71.5** | **6,920** | **5,674** | **5,204** | **11,080,921** | **291,155** | TOTAL |

| API 47-017-06372 Farm Name Smith, Robert J. Well Number Gibson Unit 2H | | | | |
|---|---|---|---|---|
| **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 | 181' | N/A | 181' | N/A |
| Fresh Water | 237' | N/A | 237' | N/A |
| Siltstone | 0 | 427 | 0 | 427 |
| Sandstone | est. 427 | 597 | est. 427 | 597 |
| Dolostone/Sandstone/Siltstone | est. 597 | 637 | est. 597 | 637 |
| Sandstone and Siltstone w/trace coal | est. 637 | 697 | est. 637 | 697 |
| Siltstone | est. 697 | 877 | est. 697 | 877 |
| Shale | est. 877 | 1027 | est. 877 | 1027 |
| Sandstone | est. 1027 | 1107 | est. 1027 | 1107 |
| Sandstone w/trace coal | est. 1107 | 1197 | est. 1107 | 1197 |
| Sandstone | est. 1197 | 1527 | est. 1197 | 1527 |
| Siltstone | est. 1527 | 1587 | est. 1527 | 1587 |
| Sandstone | est. 1587 | 1647 | est. 1587 | 1647 |
| Shale | est. 1647 | 1707 | est. 1647 | 1707 |
| Sandstone | est. 1707 | 1737 | est. 1707 | 1737 |
| Shale | est. 1737 | 1867 | est. 1737 | 1867 |
| Siltstone | est. 1867 | 2007 | est. 1867 | 2009 |
| Big Lime | 2007 | 2112 | 2009 | 2114 |
| Big Injun | 2112 | 2570 | 2114 | 2572 |
| Gantz Sand | 2570 | 2706 | 2572 | 2708 |
| Fifty Foot Sandstone | 2706 | 2781 | 2708 | 2783 |
| Gordon | 2781 | 3142 | 2783 | 3144 |
| Fifth Sandstone | 3142 | 3154 | 3144 | 3156 |
| Bayard | 3154 | 3502 | 3156 | 3504 |
| Warren | 3502 | 3889 | 3504 | 3891 |
| Speechley | 3889 | 4605 | 3891 | 4607 |
| Bradford | 4605 | 5084 | 4607 | 5086 |
| Benson | 5084 | 5351 | 5086 | 5353 |
| Alexander | 5351 | 5549 | 5353 | 5551 |
| Elk | 5549 | 6054 | 5551 | 6056 |
| Rhinestreet | 6054 | 6416 | 6056 | 6422 |
| Sycamore | 6416 | 6601 | 6422 | 6619 |
| Middlesex | 6601 | 6735 | 6619 | 6784 |
| Burkett | 6735 | 6764 | 6784 | 6824 |
| Tully | 6764 | 6817 | 6824 | 6917 |
| Marcellus | 6817 | NA | 6917 | 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.

Antero
Doddridge County WV
R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola
Gibson Unit 2H
Original Hole
Plan 3

8:52, June 05 2015

NAD 1927 (NADCON CONUS)
Universal Transverse Mercator (US Survey Feet)
Zone 17N (84 W to 78 W)

Azimuths to Grid North
True North: -0.17°
Magnetic North: -8.70°

Magnetic Field
Strength: 52179.0snT
Dip Angle: 66.86°
Date: 1/19/2015
Model: BGGM2014

John F. Marshall (724) 812-1467 jmarshall@crescentdirectional.com

SURFACE DETAILS — Ground Level: 998.0 — KB Elevation @ 1016.0usft (Precision 522)

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Slot |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 14295193.16 | 1715896.55 | 39° 21' 56.466 N | 80° 43' 58.583 W | |

TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| PBHL Gibson Unit 2H | 6797.0 | 8706.8 | -3695.5 | 14303899.98 | 1712201.08 | 39° 23' 22.660 N | 80° 44' 45.341 W |
| LP Gibson Unit 2H | 6878.0 | 330.0 | -311.0 | 14295523.16 | 1715585.55 | 39° 21' 59.738 N | 80° 44' 2.532 W |

PLAN SECTIONS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 7375.0 | 90.89 | 345.67 | 6875.2 | 498.7 | -375.4 | 0.00 | 0.00 | 603.0 |
| 2 | 7430.0 | 90.50 | 343.70 | 6874.6 | 551.7 | -389.9 | 3.65 | -101.19 | 657.6 |
| 3 | 7686.7 | 90.50 | 336.00 | 6872.3 | 792.5 | -478.3 | 3.00 | -89.97 | 913.9 |
| 4 | 8186.7 | 90.50 | 336.00 | 6867.9 | 1249.3 | -681.7 | 0.00 | 0.00 | 1413.7 |
| 5 | 8253.5 | 90.50 | 338.00 | 6867.4 | 1310.7 | -707.8 | 3.00 | 89.99 | 1480.4 |
| 6 | 16230.5 | 90.50 | 338.00 | 6797.7 | 8706.8 | -3695.5 | 0.00 | 0.00 | 9457.2 |





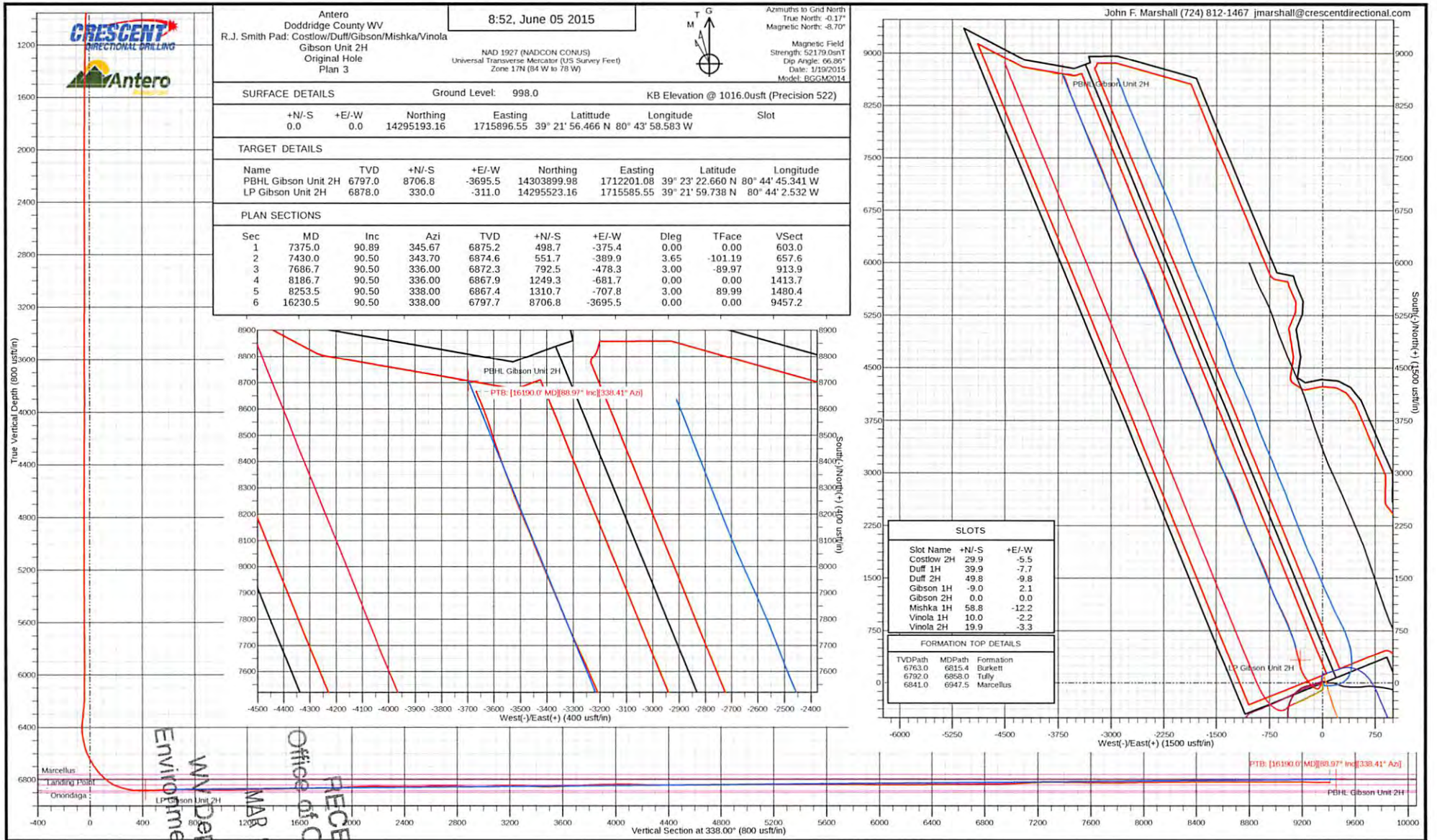


SLOTS

| Slot Name | +N/-S | +E/-W |
|---|---|---|
| Costlow 2H | 29.9 | -5.5 |
| Duff 1H | 39.9 | -7.7 |
| Duff 2H | 49.8 | -9.8 |
| Gibson 1H | -9.0 | 2.1 |
| Gibson 2H | 0.0 | 0.0 |
| Mishka 1H | 58.8 | -12.2 |
| Vinola 1H | 10.0 | -2.2 |
| Vinola 2H | 19.9 | -3.3 |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---|---|---|
| 6763.0 | 6815.4 | Burkett |
| 6792.0 | 6858.0 | Tully |
| 6841.0 | 6947.5 | Marcellus |



# Antero

**Doddridge County WV**
**R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola**
**Gibson Unit 2H**

**Original Hole**

**Design: Surveys**

# Standard Survey Report

**05 June, 2015**

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

| **Project** | Doddridge County WV, McClellan District | | |
|---|---|---|---|
| **Map System:** | Universal Transverse Mercator (US Survey Feet) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | Zone 17N (84 W to 78 W) | | |

| **Site** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 14,295,223.06 usft | **Latitude:** | 39° 21' 56.762 N |
| **From:** | Map | **Easting:** | 1,715,891.05 usft | **Longitude:** | 80° 43' 58.652 W |
| **Position Uncertainty:** | 0.0 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.17 ° |

| **Well** | Gibson Unit 2H, Marcellus | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 14,295,193.16 usft | **Latitude:** | 39° 21' 56.466 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 1,715,896.55 usft | **Longitude:** | 80° 43' 58.583 W |
| **Position Uncertainty** | | 2.0 usft | **Wellhead Elevation:** | 1,009.0 usft | **Ground Level:** | 998.0 usft |

| **Wellbore** | Original Hole | | | |
|---|---|---|---|---|
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | User Defined | 1/19/2015 | -8.53 | 66.86 | 52,179 |

| **Design** | Surveys | | | | |
|---|---|---|---|---|---|
| **Audit Notes:** | | | | | |
| **Version:** | 1.0 | **Phase:** | ACTUAL | **Tie On Depth:** | 0.0 |

| **Vertical Section:** | **Depth From (TVD) (usft)** | **+N/-S (usft)** | **+E/-W (usft)** | **Direction (°)** |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 338.00 |

**Survey Program** **Date** 6/5/2015

| **From (usft)** | **To (usft)** | **Survey (Wellbore)** | **Tool Name** | **Description** |
|---|---|---|---|---|
| 105.0 | 6,035.5 | Gyro (Original Hole) | EMS | EMS - Standard |
| 6,070.0 | 16,190.0 | Crescent MWD (Original Hole) | MWD | MWD - Standard |

**Survey**

| **Measured Depth (usft)** | **Inclination (°)** | **Azimuth (°)** | **Vertical Depth (usft)** | **+N/-S (usft)** | **+E/-W (usft)** | **Vertical Section (usft)** | **Dogleg Rate (°/100usft)** | **Build Rate (°/100usft)** | **Turn Rate (°/100usft)** |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 105.0 | 0.23 | 326.93 | 105.0 | 0.2 | -0.1 | 0.2 | 0.22 | 0.22 | 0.00 |
| 130.0 | 0.31 | 337.19 | 130.0 | 0.3 | -0.2 | 0.3 | 0.37 | 0.32 | 41.04 |
| 155.0 | 0.27 | 321.42 | 155.0 | 0.4 | -0.2 | 0.4 | 0.36 | -0.16 | -63.08 |
| 180.0 | 0.30 | 316.44 | 180.0 | 0.5 | -0.3 | 0.6 | 0.16 | 0.12 | -19.92 |
| 205.0 | 0.26 | 314.49 | 205.0 | 0.6 | -0.4 | 0.7 | 0.16 | -0.16 | -7.80 |
| 230.0 | 0.17 | 307.90 | 230.0 | 0.6 | -0.5 | 0.8 | 0.37 | -0.36 | -26.36 |
| 255.0 | 0.23 | 338.69 | 255.0 | 0.7 | -0.5 | 0.8 | 0.48 | 0.24 | 123.16 |
| 280.0 | 0.23 | 330.73 | 280.0 | 0.8 | -0.6 | 0.9 | 0.13 | 0.00 | -31.84 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 305.0 | 0.08 | 256.72 | 305.0 | 0.8 | -0.6 | 1.0 | 0.89 | -0.60 | -296.04 |
| 330.0 | 0.20 | 249.98 | 330.0 | 0.8 | -0.7 | 1.0 | 0.48 | 0.48 | -26.96 |
| 355.0 | 0.03 | 263.16 | 355.0 | 0.8 | -0.7 | 1.0 | 0.68 | -0.68 | 52.72 |
| 380.0 | 0.12 | 220.72 | 380.0 | 0.8 | -0.7 | 1.0 | 0.40 | 0.36 | -169.76 |
| 405.0 | 0.28 | 217.39 | 405.0 | 0.7 | -0.8 | 1.0 | 0.64 | 0.64 | -13.32 |
| 430.0 | 0.71 | 219.36 | 430.0 | 0.5 | -0.9 | 0.8 | 1.72 | 1.72 | 7.88 |
| 455.0 | 0.81 | 222.83 | 455.0 | 0.3 | -1.1 | 0.7 | 0.44 | 0.40 | 13.88 |
| 480.0 | 1.07 | 221.51 | 480.0 | 0.0 | -1.4 | 0.5 | 1.04 | 1.04 | -5.28 |
| 505.0 | 1.47 | 214.95 | 505.0 | -0.5 | -1.8 | 0.2 | 1.70 | 1.60 | -26.24 |
| 530.0 | 2.22 | 212.37 | 530.0 | -1.1 | -2.2 | -0.2 | 3.02 | 3.00 | -10.32 |
| 555.0 | 3.07 | 208.71 | 554.9 | -2.1 | -2.8 | -0.9 | 3.46 | 3.40 | -14.64 |
| 580.0 | 3.57 | 208.98 | 579.9 | -3.4 | -3.5 | -1.8 | 2.00 | 2.00 | 1.08 |
| 605.0 | 3.69 | 206.91 | 604.9 | -4.8 | -4.2 | -2.9 | 0.71 | 0.48 | -8.28 |
| 630.0 | 4.19 | 208.65 | 629.8 | -6.3 | -5.0 | -4.0 | 2.06 | 2.00 | 6.96 |
| 655.0 | 5.01 | 208.52 | 654.7 | -8.1 | -6.0 | -5.2 | 3.28 | 3.28 | -0.52 |
| 680.0 | 5.22 | 209.18 | 679.6 | -10.0 | -7.1 | -6.6 | 0.87 | 0.84 | 2.64 |
| 705.0 | 5.62 | 208.39 | 704.5 | -12.1 | -8.2 | -8.1 | 1.63 | 1.60 | -3.16 |
| 730.0 | 5.69 | 208.51 | 729.4 | -14.3 | -9.4 | -9.7 | 0.28 | 0.28 | 0.48 |
| 755.0 | 5.80 | 208.13 | 754.3 | -16.5 | -10.5 | -11.3 | 0.47 | 0.44 | -1.52 |
| 780.0 | 5.82 | 209.04 | 779.1 | -18.7 | -11.8 | -12.9 | 0.38 | 0.08 | 3.64 |
| 805.0 | 5.88 | 208.76 | 804.0 | -20.9 | -13.0 | -14.5 | 0.27 | 0.24 | -1.12 |
| 830.0 | 5.94 | 208.54 | 828.9 | -23.2 | -14.2 | -16.2 | 0.26 | 0.24 | -0.88 |
| 855.0 | 5.94 | 209.28 | 853.7 | -25.4 | -15.5 | -17.8 | 0.31 | 0.00 | 2.96 |
| 880.0 | 5.64 | 209.74 | 878.6 | -27.6 | -16.7 | -19.4 | 1.21 | -1.20 | 1.84 |
| 905.0 | 4.98 | 209.81 | 903.5 | -29.6 | -17.9 | -20.8 | 2.64 | -2.64 | 0.28 |
| 930.0 | 4.79 | 209.48 | 928.4 | -31.5 | -18.9 | -22.1 | 0.77 | -0.76 | -1.32 |
| 955.0 | 4.51 | 208.64 | 953.3 | -33.3 | -19.9 | -23.4 | 1.15 | -1.12 | -3.36 |
| 980.0 | 4.28 | 208.74 | 978.2 | -34.9 | -20.8 | -24.6 | 0.92 | -0.92 | 0.40 |
| 1,005.0 | 3.85 | 208.70 | 1,003.2 | -36.5 | -21.7 | -25.7 | 1.72 | -1.72 | -0.16 |
| 1,030.0 | 3.56 | 209.11 | 1,028.1 | -37.9 | -22.5 | -26.7 | 1.16 | -1.16 | 1.64 |
| 1,055.0 | 3.25 | 209.99 | 1,053.1 | -39.2 | -23.2 | -27.7 | 1.26 | -1.24 | 3.52 |
| 1,080.0 | 2.97 | 209.35 | 1,078.0 | -40.4 | -23.9 | -28.5 | 1.13 | -1.12 | -2.56 |
| 1,105.0 | 3.01 | 210.28 | 1,103.0 | -41.5 | -24.5 | -29.3 | 0.25 | 0.16 | 3.72 |
| 1,130.0 | 2.73 | 211.63 | 1,128.0 | -42.6 | -25.2 | -30.1 | 1.15 | -1.12 | 5.40 |
| 1,155.0 | 2.53 | 213.10 | 1,153.0 | -43.6 | -25.8 | -30.7 | 0.84 | -0.80 | 5.88 |
| 1,180.0 | 2.19 | 214.76 | 1,177.9 | -44.4 | -26.3 | -31.3 | 1.39 | -1.36 | 6.64 |
| 1,205.0 | 1.91 | 216.93 | 1,202.9 | -45.1 | -26.9 | -31.8 | 1.16 | -1.12 | 8.68 |
| 1,230.0 | 1.75 | 216.45 | 1,227.9 | -45.8 | -27.3 | -32.2 | 0.64 | -0.64 | -7.92 |
| 1,255.0 | 1.68 | 217.60 | 1,252.9 | -46.4 | -27.8 | -32.6 | 0.31 | -0.28 | 4.60 |
| 1,280.0 | 1.37 | 211.75 | 1,277.9 | -46.9 | -28.2 | -32.9 | 1.39 | -1.24 | -23.40 |
| 1,305.0 | 1.23 | 211.86 | 1,302.9 | -47.4 | -28.5 | -33.3 | 0.56 | -0.56 | 0.44 |
| 1,330.0 | 1.17 | 211.97 | 1,327.9 | -47.8 | -28.7 | -33.6 | 0.24 | -0.24 | 0.44 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 1,355.0 | 1.05 | 208.52 | 1,352.9 | -48.3 | -29.0 | -33.9 | 0.55 | -0.48 | -13.80 |
| 1,380.0 | 0.99 | 208.31 | 1,377.9 | -48.6 | -29.2 | -34.2 | 0.24 | -0.24 | -0.84 |
| 1,405.0 | 0.90 | 206.20 | 1,402.9 | -49.0 | -29.4 | -34.4 | 0.39 | -0.36 | -8.44 |
| 1,430.0 | 0.79 | 206.87 | 1,427.9 | -49.3 | -29.6 | -34.7 | 0.44 | -0.44 | 2.68 |
| 1,455.0 | 0.65 | 204.55 | 1,452.9 | -49.6 | -29.7 | -34.9 | 0.57 | -0.56 | -9.28 |
| 1,480.0 | 0.53 | 214.67 | 1,477.9 | -49.9 | -29.8 | -35.1 | 0.63 | -0.48 | 40.48 |
| 1,505.0 | 0.60 | 202.83 | 1,502.9 | -50.1 | -29.9 | -35.2 | 0.54 | 0.28 | -47.36 |
| 1,530.0 | 0.57 | 208.87 | 1,527.9 | -50.3 | -30.0 | -35.4 | 0.27 | -0.12 | 24.16 |
| 1,555.0 | 0.43 | 216.15 | 1,552.9 | -50.5 | -30.2 | -35.5 | 0.61 | -0.56 | 29.12 |
| 1,580.0 | 0.50 | 207.80 | 1,577.9 | -50.7 | -30.3 | -35.6 | 0.39 | 0.28 | -33.40 |
| 1,605.0 | 0.42 | 205.25 | 1,602.9 | -50.8 | -30.4 | -35.8 | 0.33 | -0.32 | -10.20 |
| 1,630.0 | 0.47 | 196.67 | 1,627.8 | -51.0 | -30.4 | -35.9 | 0.33 | 0.20 | -34.32 |
| 1,655.0 | 0.43 | 190.07 | 1,652.8 | -51.2 | -30.5 | -36.1 | 0.26 | -0.16 | -26.40 |
| 1,680.0 | 0.49 | 193.63 | 1,677.8 | -51.4 | -30.5 | -36.2 | 0.27 | 0.24 | 14.24 |
| 1,705.0 | 0.47 | 194.36 | 1,702.8 | -51.6 | -30.6 | -36.4 | 0.08 | -0.08 | 2.92 |
| 1,730.0 | 0.44 | 181.16 | 1,727.8 | -51.8 | -30.6 | -36.6 | 0.44 | -0.12 | -52.80 |
| 1,755.0 | 0.46 | 195.01 | 1,752.8 | -52.0 | -30.6 | -36.7 | 0.44 | 0.08 | 55.40 |
| 1,780.0 | 0.45 | 189.45 | 1,777.8 | -52.2 | -30.7 | -36.9 | 0.18 | -0.04 | -22.24 |
| 1,805.0 | 0.38 | 179.71 | 1,802.8 | -52.4 | -30.7 | -37.1 | 0.40 | -0.28 | -38.96 |
| 1,830.0 | 0.30 | 189.72 | 1,827.8 | -52.5 | -30.7 | -37.2 | 0.40 | -0.32 | 40.04 |
| 1,855.0 | 0.36 | 202.63 | 1,852.8 | -52.7 | -30.7 | -37.3 | 0.38 | 0.24 | 51.64 |
| 1,880.0 | 0.20 | 200.27 | 1,877.8 | -52.8 | -30.8 | -37.4 | 0.64 | -0.64 | -9.44 |
| 1,905.0 | 0.21 | 210.23 | 1,902.8 | -52.8 | -30.8 | -37.5 | 0.15 | 0.04 | 39.84 |
| 1,930.0 | 0.13 | 205.41 | 1,927.8 | -52.9 | -30.8 | -37.5 | 0.32 | -0.32 | -19.28 |
| 1,955.0 | 0.17 | 249.02 | 1,952.8 | -52.9 | -30.9 | -37.5 | 0.47 | 0.16 | 174.44 |
| 1,980.0 | 0.08 | 226.16 | 1,977.8 | -53.0 | -30.9 | -37.5 | 0.40 | -0.36 | -91.44 |
| 2,005.0 | 0.08 | 247.10 | 2,002.8 | -53.0 | -31.0 | -37.5 | 0.12 | 0.00 | 83.76 |
| 2,030.0 | 0.07 | 326.33 | 2,027.8 | -53.0 | -31.0 | -37.5 | 0.38 | -0.04 | 316.92 |
| 2,055.0 | 0.07 | 162.85 | 2,052.8 | -53.0 | -31.0 | -37.5 | 0.55 | 0.00 | -653.92 |
| 2,080.0 | 0.12 | 246.15 | 2,077.8 | -53.0 | -31.0 | -37.5 | 0.53 | 0.20 | 333.20 |
| 2,105.0 | 0.07 | 206.10 | 2,102.8 | -53.0 | -31.0 | -37.5 | 0.32 | -0.20 | [illegible] |
| 2,130.0 | 0.22 | 200.53 | 2,127.8 | -53.1 | -31.1 | -37.6 | 0.60 | 0.60 | -22.28 |
| 2,155.0 | 0.21 | 224.16 | 2,152.8 | -53.2 | -31.1 | -37.6 | 0.35 | -0.04 | 94.52 |
| 2,180.0 | 0.12 | 251.96 | 2,177.8 | -53.2 | -31.2 | -37.7 | 0.47 | -0.36 | 111.20 |
| 2,205.0 | 0.14 | 270.37 | 2,202.8 | -53.2 | -31.2 | -37.6 | 0.18 | 0.08 | 73.64 |
| 2,230.0 | 0.15 | 288.18 | 2,227.8 | -53.2 | -31.3 | -37.6 | 0.18 | 0.04 | 71.24 |
| 2,255.0 | 0.15 | 316.59 | 2,252.8 | -53.2 | -31.3 | -37.6 | 0.29 | 0.00 | 113.64 |
| 2,280.0 | 0.04 | 328.27 | 2,277.8 | -53.1 | -31.4 | -37.5 | 0.44 | -0.44 | 46.72 |
| 2,305.0 | 0.15 | 256.70 | 2,302.8 | -53.1 | -31.4 | -37.5 | 0.57 | 0.44 | -286.28 |
| 2,330.0 | 0.11 | 289.49 | 2,327.8 | -53.1 | -31.5 | -37.5 | 0.33 | -0.16 | 131.16 |
| 2,355.0 | 0.15 | 282.61 | 2,352.8 | -53.1 | -31.5 | -37.5 | 0.17 | 0.16 | -27.52 |
| 2,380.0 | 0.09 | 128.51 | 2,377.8 | -53.1 | -31.5 | -37.5 | 0.94 | -0.24 | -616.40 |
| 2,405.0 | 0.07 | 331.95 | 2,402.8 | -53.1 | -31.5 | -37.5 | 0.63 | -0.08 | -626.24 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 2,430.0 | 0.15 | 295.94 | 2,427.8 | -53.1 | -31.6 | -37.4 | 0.41 | 0.32 | -144.04 |
| 2,455.0 | 0.06 | 292.13 | 2,452.8 | -53.1 | -31.6 | -37.4 | 0.36 | -0.36 | -15.24 |
| 2,480.0 | 0.10 | 328.76 | 2,477.8 | -53.1 | -31.6 | -37.4 | 0.25 | 0.16 | 146.52 |
| 2,505.0 | 0.13 | 269.76 | 2,502.8 | -53.0 | -31.7 | -37.3 | 0.46 | 0.12 | -235.91 |
| 2,530.0 | 0.14 | 248.69 | 2,527.8 | -53.1 | -31.7 | -37.3 | 0.20 | 0.04 | -84.28 |
| 2,555.0 | 0.17 | 233.67 | 2,552.8 | -53.1 | -31.8 | -37.3 | 0.20 | 0.12 | -60.08 |
| 2,580.0 | 0.18 | 218.24 | 2,577.8 | -53.1 | -31.8 | -37.3 | 0.19 | 0.04 | -61.72 |
| 2,605.0 | 0.14 | 194.13 | 2,602.8 | -53.2 | -31.9 | -37.4 | 0.31 | -0.16 | -96.44 |
| 2,630.0 | 0.13 | 172.09 | 2,627.8 | -53.3 | -31.9 | -37.4 | 0.21 | -0.04 | -88.16 |
| 2,655.0 | 0.16 | 193.66 | 2,652.8 | -53.3 | -31.9 | -37.5 | 0.25 | 0.12 | 86.28 |
| 2,680.0 | 0.15 | 234.59 | 2,677.8 | -53.4 | -31.9 | -37.5 | 0.44 | -0.04 | 163.72 |
| 2,705.0 | 0.14 | 205.31 | 2,702.8 | -53.4 | -32.0 | -37.6 | 0.30 | -0.04 | -117.12 |
| 2,730.0 | 0.19 | 201.01 | 2,727.8 | -53.5 | -32.0 | -37.6 | 0.21 | 0.20 | -17.20 |
| 2,755.0 | 0.18 | 208.41 | 2,752.8 | -53.6 | -32.0 | -37.7 | 0.10 | -0.04 | 29.60 |
| 2,780.0 | 0.22 | 214.65 | 2,777.8 | -53.6 | -32.1 | -37.7 | 0.18 | 0.16 | 24.96 |
| 2,805.0 | 0.18 | 207.62 | 2,802.8 | -53.7 | -32.1 | -37.8 | 0.19 | -0.16 | -28.12 |
| 2,830.0 | 0.18 | 194.47 | 2,827.8 | -53.8 | -32.1 | -37.8 | 0.16 | 0.00 | -52.60 |
| 2,855.0 | 0.14 | 188.48 | 2,852.8 | -53.9 | -32.1 | -37.9 | 0.17 | -0.16 | -23.96 |
| 2,880.0 | 0.13 | 180.56 | 2,877.8 | -53.9 | -32.2 | -37.9 | 0.08 | -0.04 | -31.68 |
| 2,905.0 | 0.05 | 183.28 | 2,902.8 | -54.0 | -32.2 | -38.0 | 0.32 | -0.32 | 10.88 |
| 2,930.0 | 0.06 | 252.94 | 2,927.8 | -54.0 | -32.2 | -38.0 | 0.25 | 0.04 | 278.64 |
| 2,955.0 | 0.05 | 248.78 | 2,952.8 | -54.0 | -32.2 | -38.0 | 0.04 | -0.04 | -16.64 |
| 2,980.0 | 0.11 | 254.03 | 2,977.8 | -54.0 | -32.2 | -38.0 | 0.24 | 0.24 | 21.00 |
| 3,005.0 | 0.14 | 249.26 | 3,002.8 | -54.0 | -32.3 | -38.0 | 0.13 | 0.12 | -19.08 |
| 3,030.0 | 0.11 | 236.50 | 3,027.8 | -54.0 | -32.3 | -38.0 | 0.16 | -0.12 | -51.04 |
| 3,055.0 | 0.14 | 266.29 | 3,052.8 | -54.0 | -32.4 | -38.0 | 0.28 | 0.12 | 119.16 |
| 3,080.0 | 0.15 | 233.66 | 3,077.8 | -54.1 | -32.4 | -38.0 | 0.33 | 0.04 | -130.52 |
| 3,105.0 | 0.10 | 231.59 | 3,102.8 | -54.1 | -32.5 | -38.0 | 0.20 | -0.20 | -8.28 |
| 3,130.0 | 0.12 | 228.39 | 3,127.8 | -54.1 | -32.5 | -38.0 | 0.08 | 0.08 | -12.80 |
| 3,155.0 | 0.14 | 262.71 | 3,152.8 | -54.1 | -32.6 | -38.0 | 0.32 | 0.08 | 137.28 |
| 3,180.0 | 0.15 | 216.12 | 3,177.8 | -54.2 | -32.6 | -38.0 | 0.46 | 0.04 | -186.36 |
| 3,205.0 | 0.13 | 181.15 | 3,202.8 | -54.2 | -32.6 | -38.1 | 0.35 | -0.08 | -139.88 |
| 3,230.0 | 0.17 | 207.63 | 3,227.8 | -54.3 | -32.6 | -38.1 | 0.32 | 0.16 | 105.92 |
| 3,255.0 | 0.20 | 210.41 | 3,252.8 | -54.4 | -32.7 | -38.2 | 0.13 | 0.12 | 11.12 |
| 3,280.0 | 0.19 | 220.56 | 3,277.8 | -54.4 | -32.7 | -38.2 | 0.14 | -0.04 | 40.60 |
| 3,305.0 | 0.21 | 206.59 | 3,302.8 | -54.5 | -32.8 | -38.3 | 0.21 | 0.08 | -55.88 |
| 3,330.0 | 0.18 | 235.09 | 3,327.8 | -54.6 | -32.8 | -38.3 | 0.40 | -0.12 | 114.00 |
| 3,355.0 | 0.20 | 207.38 | 3,352.8 | -54.6 | -32.9 | -38.3 | 0.37 | 0.08 | -110.84 |
| 3,380.0 | 0.25 | 217.19 | 3,377.8 | -54.7 | -32.9 | -38.4 | 0.25 | 0.20 | 39.24 |
| 3,405.0 | 0.24 | 209.69 | 3,402.8 | -54.8 | -33.0 | -38.4 | 0.13 | -0.04 | -30.00 |
| 3,430.0 | 0.22 | 224.63 | 3,427.8 | -54.9 | -33.1 | -38.5 | 0.25 | -0.08 | 59.76 |
| 3,455.0 | 0.33 | 213.89 | 3,452.8 | -55.0 | -33.1 | -38.6 | 0.48 | 0.44 | -42.96 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 3,480.0 | 0.24 | 196.18 | 3,477.8 | -55.1 | -33.2 | -38.6 | 0.50 | -0.36 | -70.84 |
| 3,505.0 | 0.27 | 203.29 | 3,502.8 | -55.2 | -33.2 | -38.7 | 0.17 | 0.12 | 28.44 |
| 3,530.0 | 0.20 | 211.80 | 3,527.8 | -55.3 | -33.3 | -38.8 | 0.31 | -0.28 | 34.04 |
| 3,555.0 | 0.17 | 211.30 | 3,552.8 | -55.3 | -33.3 | -38.8 | 0.12 | -0.12 | -2.00 |
| 3,580.0 | 0.19 | 235.21 | 3,577.8 | -55.4 | -33.4 | -38.9 | 0.31 | 0.08 | 95.64 |
| 3,605.0 | 0.21 | 210.22 | 3,602.8 | -55.5 | -33.4 | -38.9 | 0.35 | 0.08 | -99.96 |
| 3,630.0 | 0.21 | 204.11 | 3,627.8 | -55.5 | -33.5 | -39.0 | 0.09 | 0.00 | -24.44 |
| 3,655.0 | 0.21 | 211.93 | 3,652.8 | -55.6 | -33.5 | -39.0 | 0.11 | 0.00 | 31.28 |
| 3,680.0 | 0.27 | 223.05 | 3,677.8 | -55.7 | -33.6 | -39.1 | 0.30 | 0.24 | 44.48 |
| 3,705.0 | 0.21 | 216.75 | 3,702.8 | -55.8 | -33.6 | -39.1 | 0.26 | -0.24 | -25.20 |
| 3,730.0 | 0.28 | 235.71 | 3,727.8 | -55.9 | -33.7 | -39.2 | 0.42 | 0.28 | 75.84 |
| 3,755.0 | 0.30 | 233.46 | 3,752.8 | -55.9 | -33.8 | -39.2 | 0.09 | 0.08 | -9.00 |
| 3,780.0 | 0.26 | 231.91 | 3,777.8 | -56.0 | -33.9 | -39.2 | 0.16 | -0.16 | -6.20 |
| 3,805.0 | 0.38 | 225.85 | 3,802.8 | -56.1 | -34.0 | -39.3 | 0.50 | 0.48 | -24.24 |
| 3,830.0 | 0.30 | 221.61 | 3,827.8 | -56.2 | -34.1 | -39.3 | 0.34 | -0.32 | -16.96 |
| 3,855.0 | 0.20 | 217.94 | 3,852.8 | -56.3 | -34.2 | -39.4 | 0.40 | -0.40 | -14.68 |
| 3,880.0 | 0.30 | 220.92 | 3,877.8 | -56.4 | -34.3 | -39.4 | 0.40 | 0.40 | 11.92 |
| 3,905.0 | 0.28 | 209.17 | 3,902.8 | -56.5 | -34.3 | -39.5 | 0.25 | -0.08 | -47.00 |
| 3,930.0 | 0.30 | 211.24 | 3,927.8 | -56.6 | -34.4 | -39.6 | 0.09 | 0.08 | 8.28 |
| 3,955.0 | 0.29 | 209.71 | 3,952.8 | -56.7 | -34.5 | -39.7 | 0.05 | -0.04 | -6.12 |
| 3,980.0 | 0.26 | 200.49 | 3,977.8 | -56.8 | -34.5 | -39.7 | 0.21 | -0.12 | -36.88 |
| 4,005.0 | 0.30 | 193.65 | 4,002.8 | -56.9 | -34.6 | -39.8 | 0.21 | 0.16 | -27.36 |
| 4,030.0 | 0.29 | 195.54 | 4,027.8 | -57.0 | -34.6 | -39.9 | 0.06 | -0.04 | 7.56 |
| 4,055.0 | 0.29 | 197.34 | 4,052.8 | -57.2 | -34.6 | -40.0 | 0.04 | 0.00 | 7.20 |
| 4,080.0 | 0.30 | 194.52 | 4,077.8 | -57.3 | -34.7 | -40.1 | 0.07 | 0.04 | -11.28 |
| 4,105.0 | 0.27 | 206.87 | 4,102.8 | -57.4 | -34.7 | -40.2 | 0.27 | -0.12 | 49.40 |
| 4,130.0 | 0.31 | 184.67 | 4,127.8 | -57.5 | -34.7 | -40.3 | 0.47 | 0.16 | -88.80 |
| 4,155.0 | 0.30 | 192.36 | 4,152.8 | -57.7 | -34.8 | -40.4 | 0.17 | -0.04 | 30.76 |
| 4,180.0 | 0.27 | 200.92 | 4,177.8 | -57.8 | -34.8 | -40.5 | 0.21 | -0.12 | 34.24 |
| 4,205.0 | 0.31 | 189.65 | 4,202.8 | -57.9 | -34.8 | -40.6 | 0.28 | 0.16 | -45.08 |
| 4,230.0 | 0.32 | 194.41 | 4,227.8 | -58.0 | -34.8 | -40.8 | 0.11 | 0.04 | 19.04 |
| 4,255.0 | 0.24 | 201.65 | 4,252.8 | -58.2 | -34.9 | -40.8 | 0.35 | -0.32 | 28.96 |
| 4,280.0 | 0.24 | 239.34 | 4,277.8 | -58.2 | -35.0 | -40.9 | 0.62 | 0.00 | 150.76 |
| 4,305.0 | 0.26 | 197.36 | 4,302.8 | -58.3 | -35.0 | -40.9 | 0.72 | 0.08 | -147.92 |
| 4,330.0 | 0.23 | 204.76 | 4,327.8 | -58.4 | -35.1 | -41.0 | 0.17 | -0.12 | 29.60 |
| 4,355.0 | 0.23 | 190.28 | 4,352.8 | -58.5 | -35.1 | -41.1 | 0.23 | 0.00 | -57.92 |
| 4,380.0 | 0.26 | 185.21 | 4,377.8 | -58.6 | -35.1 | -41.2 | 0.15 | 0.12 | -20.28 |
| 4,405.0 | 0.25 | 167.28 | 4,402.8 | -58.7 | -35.1 | -41.3 | 0.32 | -0.04 | -71.72 |
| 4,430.0 | 0.22 | 165.39 | 4,427.8 | -58.8 | -35.1 | -41.4 | 0.12 | -0.12 | -7.56 |
| 4,455.0 | 0.20 | 151.25 | 4,452.8 | -58.9 | -35.0 | -41.5 | 0.22 | -0.08 | -56.56 |
| 4,480.0 | 0.19 | 134.59 | 4,477.8 | -59.0 | -35.0 | -41.6 | 0.23 | -0.04 | -66.64 |
| 4,505.0 | 0.15 | 131.12 | 4,502.8 | -59.0 | -34.9 | -41.6 | 0.17 | -0.16 | -13.88 |
| 4,530.0 | 0.14 | 119.00 | 4,527.8 | -59.1 | -34.9 | -41.7 | 0.13 | -0.04 | -48.48 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 4,555.0 | 0.12 | 76.18 | 4,552.8 | -59.1 | -34.8 | -41.7 | 0.39 | -0.08 | -171.28 |
| 4,580.0 | 0.07 | 128.04 | 4,577.8 | -59.1 | -34.8 | -41.7 | 0.38 | -0.20 | 207.44 |
| 4,605.0 | 0.02 | 137.46 | 4,602.8 | -59.1 | -34.8 | -41.8 | 0.20 | -0.20 | 37.68 |
| 4,630.0 | 0.10 | 238.13 | 4,627.8 | -59.1 | -34.8 | -41.8 | 0.42 | 0.32 | 402.68 |
| 4,655.0 | 0.09 | 242.43 | 4,652.8 | -59.1 | -34.8 | -41.8 | 0.05 | -0.04 | 17.20 |
| 4,680.0 | 0.07 | 266.43 | 4,677.8 | -59.1 | -34.9 | -41.8 | 0.15 | -0.08 | 96.00 |
| 4,705.0 | 0.08 | 207.21 | 4,702.8 | -59.1 | -34.9 | -41.8 | 0.30 | 0.04 | -236.88 |
| 4,730.0 | 0.18 | 199.23 | 4,727.8 | -59.2 | -34.9 | -41.8 | 0.41 | 0.40 | -31.92 |
| 4,755.0 | 0.20 | 214.85 | 4,752.8 | -59.3 | -34.9 | -41.9 | 0.22 | 0.08 | 62.48 |
| 4,780.0 | 0.11 | 208.98 | 4,777.8 | -59.3 | -35.0 | -41.9 | 0.37 | -0.36 | -23.48 |
| 4,805.0 | 0.15 | 162.26 | 4,802.8 | -59.4 | -35.0 | -42.0 | 0.44 | 0.16 | -186.88 |
| 4,830.0 | 0.14 | 185.85 | 4,827.8 | -59.4 | -35.0 | -42.0 | 0.24 | -0.04 | 94.36 |
| 4,855.0 | 0.18 | 158.41 | 4,852.8 | -59.5 | -35.0 | -42.1 | 0.34 | 0.16 | -109.76 |
| 4,880.0 | 0.18 | 120.12 | 4,877.8 | -59.6 | -34.9 | -42.1 | 0.47 | 0.00 | -153.16 |
| 4,905.0 | 0.14 | 138.11 | 4,902.8 | -59.6 | -34.9 | -42.2 | 0.25 | -0.16 | 71.96 |
| 4,930.0 | 0.14 | 145.94 | 4,927.8 | -59.7 | -34.8 | -42.3 | 0.08 | 0.00 | 31.32 |
| 4,955.0 | 0.15 | 79.05 | 4,952.8 | -59.7 | -34.8 | -42.3 | 0.64 | 0.04 | -267.56 |
| 4,980.0 | 0.11 | 74.77 | 4,977.8 | -59.7 | -34.7 | -42.3 | 0.16 | -0.16 | -17.12 |
| 5,005.0 | 0.16 | 42.01 | 5,002.8 | -59.6 | -34.7 | -42.3 | 0.36 | 0.20 | -131.04 |
| 5,030.0 | 0.07 | 44.52 | 5,027.8 | -59.6 | -34.6 | -42.3 | 0.36 | -0.36 | 10.04 |
| 5,055.0 | 0.15 | 47.70 | 5,052.8 | -59.6 | -34.6 | -42.3 | 0.32 | 0.32 | 12.72 |
| 5,080.0 | 0.12 | 18.82 | 5,077.8 | -59.5 | -34.6 | -42.2 | 0.29 | -0.12 | -115.52 |
| 5,105.0 | 0.16 | 20.34 | 5,102.8 | -59.5 | -34.5 | -42.2 | 0.16 | 0.16 | 6.08 |
| 5,130.0 | 0.16 | 23.47 | 5,127.8 | -59.4 | -34.5 | -42.1 | 0.03 | 0.00 | 12.52 |
| 5,155.0 | 0.19 | 21.11 | 5,152.8 | -59.3 | -34.5 | -42.1 | 0.12 | 0.12 | -9.44 |
| 5,180.0 | 0.12 | 23.23 | 5,177.8 | -59.3 | -34.5 | -42.0 | 0.28 | -0.28 | 8.48 |
| 5,205.0 | 0.23 | 0.82 | 5,202.8 | -59.2 | -34.5 | -42.0 | 0.51 | 0.44 | -89.64 |
| 5,230.0 | 0.22 | 17.65 | 5,227.8 | -59.1 | -34.4 | -41.9 | 0.27 | -0.04 | 67.32 |
| 5,255.0 | 0.27 | 359.13 | 5,252.8 | -59.0 | -34.4 | -41.8 | 0.37 | 0.20 | -74.08 |
| 5,280.0 | 0.31 | 347.74 | 5,277.8 | -58.9 | -34.4 | -41.7 | 0.28 | 0.16 | -45.56 |
| 5,305.0 | 0.35 | 342.04 | 5,302.8 | -58.7 | -34.5 | -41.5 | 0.21 | 0.16 | -22.80 |
| 5,330.0 | 0.28 | 323.19 | 5,327.8 | -58.6 | -34.5 | -41.4 | 0.50 | -0.28 | -75.48 |
| 5,355.0 | 0.45 | 329.27 | 5,352.8 | -58.5 | -34.6 | -41.2 | 0.70 | 0.68 | 24.32 |
| 5,380.0 | 0.38 | 330.12 | 5,377.8 | -58.3 | -34.7 | -41.1 | 0.28 | -0.28 | 3.36 |
| 5,405.0 | 0.36 | 325.77 | 5,402.8 | -58.2 | -34.8 | -40.9 | 0.14 | -0.08 | -17.40 |
| 5,430.0 | 0.26 | 313.07 | 5,427.8 | -58.1 | -34.9 | -40.8 | 0.48 | -0.40 | -50.80 |
| 5,455.0 | 0.40 | 339.04 | 5,452.8 | -57.9 | -35.0 | -40.6 | 0.81 | 0.56 | 103.88 |
| 5,480.0 | 0.32 | 340.96 | 5,477.8 | -57.8 | -35.0 | -40.5 | 0.32 | -0.32 | 7.68 |
| 5,505.0 | 0.32 | 331.77 | 5,502.8 | -57.7 | -35.1 | -40.3 | 0.21 | 0.00 | -36.76 |
| 5,530.0 | 0.32 | 325.92 | 5,527.8 | -57.6 | -35.1 | -40.2 | 0.13 | 0.00 | -23.41 |
| 5,555.0 | 0.40 | 337.89 | 5,552.8 | -57.4 | -35.2 | -40.0 | 0.44 | 0.32 | 47.88 |
| 5,580.0 | 0.47 | 345.73 | 5,577.8 | -57.2 | -35.3 | -39.9 | 0.37 | 0.28 | 31.36 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 5,605.0 | 0.40 | 353.15 | 5,602.8 | -57.0 | -35.3 | -39.7 | 0.36 | -0.28 | 29.68 |
| 5,630.0 | 0.38 | 358.33 | 5,627.8 | -56.9 | -35.3 | -39.5 | 0.16 | -0.08 | 20.72 |
| 5,655.0 | 0.17 | 25.65 | 5,652.8 | -56.8 | -35.3 | -39.4 | 0.97 | -0.84 | 109.28 |
| 5,680.0 | 0.14 | 5.03 | 5,677.8 | -56.7 | -35.3 | -39.3 | 0.25 | -0.12 | -82.48 |
| 5,705.0 | 0.24 | 347.02 | 5,702.8 | -56.6 | -35.3 | -39.3 | 0.46 | 0.40 | -72.04 |
| 5,730.0 | 0.20 | 347.14 | 5,727.8 | -56.5 | -35.3 | -39.2 | 0.16 | -0.16 | 0.48 |
| 5,755.0 | 0.14 | 2.47 | 5,752.8 | -56.4 | -35.3 | -39.1 | 0.30 | -0.24 | 61.32 |
| 5,780.0 | 0.18 | 4.46 | 5,777.8 | -56.4 | -35.3 | -39.0 | 0.16 | 0.16 | 7.96 |
| 5,805.0 | 0.04 | 30.44 | 5,802.8 | -56.3 | -35.3 | -39.0 | 0.58 | -0.56 | 103.92 |
| 5,830.0 | 0.12 | 345.03 | 5,827.8 | -56.3 | -35.3 | -39.0 | 0.38 | 0.32 | -181.64 |
| 5,855.0 | 0.13 | 194.40 | 5,852.8 | -56.3 | -35.3 | -39.0 | 0.97 | 0.04 | -602.52 |
| 5,880.0 | 0.26 | 297.55 | 5,877.8 | -56.3 | -35.4 | -38.9 | 1.26 | 0.52 | 412.60 |
| 5,905.0 | 0.09 | 264.51 | 5,902.8 | -56.3 | -35.5 | -38.9 | 0.76 | -0.68 | -132.16 |
| 5,930.0 | 0.07 | 19.69 | 5,927.8 | -56.3 | -35.5 | -38.9 | 0.54 | -0.08 | 460.72 |
| 5,955.0 | 0.25 | 190.58 | 5,952.8 | -56.3 | -35.5 | -38.9 | 1.28 | 0.72 | 683.56 |
| 5,980.0 | 0.24 | 188.90 | 5,977.8 | -56.4 | -35.5 | -39.0 | 0.05 | -0.04 | -6.72 |
| 6,005.0 | 0.10 | 173.83 | 6,002.8 | -56.5 | -35.5 | -39.1 | 0.58 | -0.56 | -60.28 |
| 6,030.0 | 0.17 | 155.54 | 6,027.8 | -56.5 | -35.5 | -39.1 | 0.33 | 0.28 | -73.16 |
| 6,035.5 | 0.05 | 172.47 | 6,033.3 | -56.5 | -35.5 | -39.1 | 2.23 | -2.18 | 307.26 |
| 6,070.0 | 0.18 | 270.79 | 6,067.8 | -56.6 | -35.5 | -39.1 | 0.56 | 0.38 | 285.05 |
| 6,163.0 | 1.34 | 197.32 | 6,160.8 | -57.6 | -36.0 | -39.9 | 1.40 | 1.25 | -79.00 |
| 6,193.0 | 3.47 | 192.68 | 6,190.8 | -58.8 | -36.3 | -40.9 | 7.12 | 7.10 | -15.47 |
| 6,224.0 | 5.67 | 198.67 | 6,221.7 | -61.2 | -37.0 | -42.9 | 7.25 | 7.10 | 19.32 |
| 6,255.0 | 7.40 | 201.91 | 6,252.5 | -64.5 | -38.2 | -45.5 | 5.70 | 5.58 | 10.45 |
| 6,286.0 | 9.93 | 205.71 | 6,283.1 | -68.8 | -40.1 | -48.7 | 8.36 | 8.16 | 12.26 |
| 6,317.0 | 12.24 | 206.49 | 6,313.5 | -74.1 | -42.8 | -52.7 | 7.47 | 7.45 | 2.52 |
| 6,348.0 | 12.33 | 216.45 | 6,343.8 | -79.7 | -46.2 | -56.6 | 6.83 | 0.29 | 32.13 |
| 6,379.0 | 11.57 | 235.56 | 6,374.2 | -84.1 | -50.7 | -59.0 | 12.94 | -2.45 | 61.65 |
| 6,409.0 | 12.41 | 249.99 | 6,403.5 | -86.9 | -56.2 | -59.5 | 10.35 | 2.80 | 48.10 |
| 6,440.0 | 13.22 | 261.60 | 6,433.8 | -88.6 | -62.9 | -58.6 | 8.69 | 2.61 | 37.45 |
| 6,471.0 | 14.93 | 272.98 | 6,463.8 | -88.9 | -70.4 | -56.1 | 10.47 | 5.52 | 36.71 |
| 6,502.0 | 16.76 | 284.68 | 6,493.7 | -87.6 | -78.7 | -51.7 | 11.85 | 5.90 | 37.74 |
| 6,533.0 | 18.25 | 291.68 | 6,523.2 | -84.6 | -87.5 | -45.7 | 8.31 | 4.81 | 22.58 |
| 6,564.0 | 20.99 | 297.07 | 6,552.4 | -80.3 | -97.0 | -38.1 | 10.58 | 8.84 | 17.39 |
| 6,594.0 | 23.89 | 300.59 | 6,580.2 | -74.8 | -107.0 | -29.2 | 10.65 | 9.67 | 11.73 |
| 6,625.0 | 26.65 | 304.99 | 6,608.2 | -67.6 | -118.1 | -18.4 | 10.76 | 8.90 | 14.19 |
| 6,656.0 | 29.53 | 310.61 | 6,635.5 | -58.6 | -129.6 | -5.8 | 12.61 | 9.29 | 18.13 |
| 6,687.0 | 31.82 | 313.49 | 6,662.2 | -48.0 | -141.3 | 8.4 | 8.78 | 7.39 | 9.29 |
| 6,718.0 | 34.55 | 313.86 | 6,688.1 | -36.3 | -153.6 | 23.9 | 8.83 | 8.81 | 1.19 |
| 6,749.0 | 38.19 | 316.96 | 6,713.1 | -23.2 | -166.5 | 40.8 | 13.15 | 11.74 | 10.00 |
| 6,779.0 | 40.99 | 319.28 | 6,736.2 | -9.0 | -179.2 | 58.8 | 10.55 | 9.33 | 7.73 |
| 6,810.0 | 43.61 | 320.81 | 6,759.1 | 7.0 | -192.6 | 78.7 | 9.08 | 8.45 | 4.94 |
| 6,841.0 | 47.65 | 323.59 | 6,780.8 | 24.5 | -206.2 | 100.0 | 14.52 | 13.03 | 8.97 |



07/29/2016

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 6,872.0 | 51.88 | 324.25 | 6,800.8 | 43.7 | -220.1 | 122.9 | 13.74 | 13.65 | 2.13 |
| 6,903.0 | 56.19 | 325.77 | 6,819.0 | 64.2 | -234.5 | 147.4 | 14.46 | 13.90 | 4.90 |
| 6,933.0 | 61.88 | 327.62 | 6,834.5 | 85.7 | -248.6 | 172.6 | 19.69 | 18.97 | 6.17 |
| 6,964.0 | 67.68 | 329.64 | 6,847.7 | 109.7 | -263.2 | 200.3 | 19.62 | 18.71 | 6.52 |
| 6,995.0 | 71.88 | 332.87 | 6,858.4 | 135.2 | -277.2 | 229.1 | 16.71 | 13.55 | 10.42 |
| 7,026.0 | 75.71 | 338.14 | 6,867.0 | 162.2 | -289.5 | 258.9 | 20.47 | 12.35 | 17.00 |
| 7,057.0 | 78.80 | 343.20 | 6,873.9 | 190.8 | -299.5 | 289.0 | 18.78 | 9.97 | 16.32 |
| 7,098.0 | 84.08 | 346.75 | 6,880.0 | 229.9 | -310.0 | 329.3 | 15.46 | 12.88 | 8.66 |
| 7,190.0 | 91.15 | 346.50 | 6,883.8 | 319.3 | -331.2 | 420.1 | 7.69 | 7.68 | -0.27 |
| 7,283.0 | 94.31 | 346.24 | 6,879.4 | 409.5 | -353.1 | 512.0 | 3.41 | 3.40 | -0.28 |
| 7,375.0 | 90.89 | 345.67 | 6,875.2 | 498.7 | -375.4 | 603.0 | 3.77 | -3.72 | -0.62 |
| 7,468.0 | 89.52 | 343.70 | 6,874.9 | 588.4 | -400.0 | 695.4 | 2.58 | -1.47 | -2.12 |
| 7,560.0 | 89.55 | 340.36 | 6,875.6 | 675.9 | -428.4 | 787.1 | 3.63 | 0.03 | -3.63 |
| 7,652.0 | 90.08 | 339.80 | 6,875.9 | 762.4 | -459.7 | 879.0 | 0.84 | 0.58 | -0.61 |
| 7,745.0 | 89.22 | 337.77 | 6,876.5 | 849.0 | -493.4 | 972.0 | 2.37 | -0.92 | -2.18 |
| 7,837.0 | 89.94 | 335.40 | 6,877.2 | 933.5 | -529.9 | 1,064.0 | 2.69 | 0.78 | -2.58 |
| 7,930.0 | 91.51 | 334.57 | 6,876.0 | 1,017.7 | -569.2 | 1,156.9 | 1.91 | 1.69 | -0.89 |
| 8,022.0 | 91.37 | 331.28 | 6,873.7 | 1,099.6 | -611.1 | 1,248.5 | 3.58 | -0.15 | -3.58 |
| 8,115.0 | 91.12 | 334.51 | 6,871.7 | 1,182.4 | -653.4 | 1,341.1 | 3.48 | -0.27 | 3.47 |
| 8,207.0 | 90.14 | 336.43 | 6,870.6 | 1,266.0 | -691.6 | 1,432.9 | 2.34 | -1.07 | 2.09 |
| 8,300.0 | 91.37 | 342.05 | 6,869.4 | 1,353.0 | -724.6 | 1,525.9 | 6.19 | 1.32 | 6.04 |
| 8,392.0 | 91.79 | 342.76 | 6,866.9 | 1,440.6 | -752.4 | 1,617.6 | 0.90 | 0.46 | 0.77 |
| 8,484.0 | 89.97 | 340.43 | 6,865.5 | 1,527.9 | -781.4 | 1,709.4 | 3.21 | -1.98 | -2.53 |
| 8,577.0 | 91.29 | 338.50 | 6,864.5 | 1,615.0 | -814.0 | 1,802.3 | 2.51 | 1.42 | -2.08 |
| 8,670.0 | 92.82 | 335.73 | 6,861.1 | 1,700.6 | -850.2 | 1,895.2 | 3.40 | 1.65 | -2.98 |
| 8,762.0 | 93.36 | 335.61 | 6,856.2 | 1,784.3 | -888.0 | 1,987.0 | 0.60 | 0.59 | -0.13 |
| 8,855.0 | 91.79 | 336.35 | 6,852.0 | 1,869.2 | -925.8 | 2,079.9 | 1.87 | -1.69 | 0.80 |
| 8,948.0 | 89.30 | 335.84 | 6,851.1 | 1,954.2 | -963.5 | 2,172.8 | 2.73 | -2.68 | -0.55 |
| 9,040.0 | 90.11 | 337.07 | 6,851.6 | 2,038.5 | -1,000.3 | 2,264.8 | 1.60 | 0.88 | 1.34 |
| 9,133.0 | 90.06 | 336.39 | 6,851.4 | 2,123.9 | -1,037.0 | 2,357.8 | 0.73 | -0.05 | -0.73 |
| 9,225.0 | 89.86 | 336.80 | 6,851.5 | 2,208.4 | -1,073.6 | 2,449.7 | 0.50 | -0.22 | 0.45 |
| 9,318.0 | 90.45 | 339.75 | 6,851.2 | 2,294.8 | -1,108.0 | 2,542.7 | 3.23 | 0.63 | 3.17 |
| 9,410.0 | 91.03 | 342.97 | 6,850.1 | 2,381.9 | -1,137.4 | 2,634.5 | 3.56 | 0.63 | 3.50 |
| 9,503.0 | 89.41 | 342.06 | 6,849.7 | 2,470.6 | -1,165.3 | 2,727.2 | 2.00 | -1.74 | -0.98 |
| 9,596.0 | 88.18 | 339.84 | 6,851.7 | 2,558.5 | -1,195.7 | 2,820.1 | 2.73 | -1.32 | -2.39 |
| 9,689.0 | 90.00 | 338.70 | 6,853.1 | 2,645.5 | -1,228.6 | 2,913.1 | 2.31 | 1.96 | -1.23 |
| 9,781.0 | 91.06 | 335.40 | 6,852.3 | 2,730.2 | -1,264.4 | 3,005.0 | 3.77 | 1.15 | -3.59 |
| 9,874.0 | 92.26 | 338.02 | 6,849.6 | 2,815.5 | -1,301.2 | 3,098.0 | 3.10 | 1.29 | 2.82 |
| 9,967.0 | 91.01 | 334.81 | 6,846.9 | 2,900.7 | -1,338.4 | 3,190.9 | 3.70 | -1.34 | -3.44 |
| 10,059.0 | 88.21 | 331.72 | 6,847.6 | 2,982.9 | -1,379.8 | 3,282.5 | 4.53 | -3.04 | -3.36 |
| 10,152.0 | 87.12 | 333.85 | 6,851.3 | 3,065.5 | -1,422.3 | 3,375.1 | 2.57 | -1.17 | 2.29 |
| 10,244.0 | 89.19 | 336.24 | 6,854.3 | 3,148.8 | -1,461.0 | 3,466.9 | 3.44 | 2.25 | 2.60 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 10,337.0 | 92.96 | 338.78 | 6,852.6 | 3,234.7 | -1,496.6 | 3,559.8 | 4.89 | 4.05 | 2.73 |
| 10,430.0 | 93.30 | 338.61 | 6,847.5 | 3,321.3 | -1,530.3 | 3,652.7 | 0.41 | 0.37 | -0.18 |
| 10,522.0 | 92.01 | 340.68 | 6,843.2 | 3,407.4 | -1,562.3 | 3,744.5 | 2.65 | -1.40 | 2.25 |
| 10,615.0 | 92.12 | 339.05 | 6,839.9 | 3,494.7 | -1,594.3 | 3,837.4 | 1.76 | 0.12 | -1.75 |
| 10,708.0 | 90.92 | 339.53 | 6,837.4 | 3,581.6 | -1,627.2 | 3,930.4 | 1.39 | -1.29 | 0.52 |
| 10,800.0 | 90.25 | 340.60 | 6,836.5 | 3,668.1 | -1,658.5 | 4,022.3 | 1.37 | -0.73 | 1.16 |
| 10,893.0 | 88.60 | 339.17 | 6,837.4 | 3,755.4 | -1,690.5 | 4,115.2 | 2.35 | -1.77 | -1.54 |
| 10,985.0 | 88.27 | 338.20 | 6,839.9 | 3,841.1 | -1,723.9 | 4,207.2 | 1.11 | -0.36 | -1.05 |
| 11,078.0 | 89.80 | 337.96 | 6,841.5 | 3,927.4 | -1,758.7 | 4,300.2 | 1.67 | 1.65 | -0.26 |
| 11,170.0 | 90.50 | 339.44 | 6,841.2 | 4,013.1 | -1,792.1 | 4,392.2 | 1.78 | 0.76 | 1.61 |
| 11,263.0 | 89.72 | 337.93 | 6,841.1 | 4,099.7 | -1,825.9 | 4,485.2 | 1.83 | -0.84 | -1.62 |
| 11,355.0 | 90.11 | 336.97 | 6,841.2 | 4,184.7 | -1,861.2 | 4,577.2 | 1.13 | 0.42 | -1.04 |
| 11,448.0 | 90.95 | 337.10 | 6,840.3 | 4,270.3 | -1,897.4 | 4,670.1 | 0.91 | 0.90 | 0.14 |
| 11,540.0 | 91.26 | 335.74 | 6,838.6 | 4,354.6 | -1,934.2 | 4,762.1 | 1.52 | 0.34 | -1.48 |
| 11,633.0 | 90.25 | 337.38 | 6,837.3 | 4,439.9 | -1,971.2 | 4,855.0 | 2.07 | -1.09 | 1.76 |
| 11,726.0 | 89.69 | 340.01 | 6,837.4 | 4,526.5 | -2,005.0 | 4,948.0 | 2.89 | -0.60 | 2.83 |
| 11,818.0 | 90.20 | 338.76 | 6,837.5 | 4,612.7 | -2,037.4 | 5,040.0 | 1.47 | 0.55 | -1.36 |
| 11,911.0 | 90.20 | 338.30 | 6,837.1 | 4,699.2 | -2,071.4 | 5,133.0 | 0.49 | 0.00 | -0.49 |
| 12,003.0 | 90.56 | 338.20 | 6,836.5 | 4,784.6 | -2,105.5 | 5,225.0 | 0.41 | 0.39 | -0.11 |
| 12,095.0 | 90.67 | 338.72 | 6,835.5 | 4,870.2 | -2,139.3 | 5,317.0 | 0.58 | 0.12 | 0.57 |
| 12,188.0 | 89.75 | 338.84 | 6,835.2 | 4,956.9 | -2,173.0 | 5,410.0 | 1.00 | -0.99 | 0.13 |
| 12,280.0 | 89.58 | 336.99 | 6,835.7 | 5,042.2 | -2,207.6 | 5,502.0 | 2.02 | -0.18 | -2.01 |
| 12,373.0 | 90.17 | 338.25 | 6,835.9 | 5,128.1 | -2,243.0 | 5,595.0 | 1.50 | 0.63 | 1.35 |
| 12,465.0 | 90.00 | 339.23 | 6,835.8 | 5,213.9 | -2,276.3 | 5,687.0 | 1.08 | -0.18 | 1.07 |
| 12,558.0 | 89.58 | 340.94 | 6,836.2 | 5,301.3 | -2,308.0 | 5,779.9 | 1.89 | -0.45 | 1.84 |
| 12,650.0 | 89.08 | 340.12 | 6,837.2 | 5,388.0 | -2,338.7 | 5,871.8 | 1.04 | -0.54 | -0.89 |
| 12,743.0 | 88.83 | 339.11 | 6,838.9 | 5,475.2 | -2,371.1 | 5,964.7 | 1.12 | -0.27 | -1.09 |
| 12,835.0 | 88.99 | 336.53 | 6,840.7 | 5,560.4 | -2,405.8 | 6,056.7 | 2.81 | 0.17 | -2.80 |
| 12,928.0 | 90.95 | 336.90 | 6,840.7 | 5,645.8 | -2,442.5 | 6,149.7 | 2.14 | 2.11 | 0.40 |
| 13,020.0 | 91.48 | 336.76 | 6,838.8 | 5,730.4 | -2,478.7 | 6,241.6 | 0.60 | 0.58 | -0.15 |
| 13,113.0 | 89.92 | 334.02 | 6,837.6 | 5,814.9 | -2,517.5 | 6,334.5 | 3.39 | -1.68 | -2.95 |
| 13,205.0 | 90.14 | 332.65 | 6,837.6 | 5,897.1 | -2,558.7 | 6,426.2 | 1.51 | 0.24 | -1.49 |
| 13,298.0 | 90.67 | 333.28 | 6,836.9 | 5,979.9 | -2,601.0 | 6,518.9 | 0.89 | 0.57 | 0.68 |
| 13,390.0 | 90.50 | 334.65 | 6,836.0 | 6,062.6 | -2,641.4 | 6,610.6 | 1.50 | -0.18 | 1.49 |
| 13,483.0 | 90.64 | 337.70 | 6,835.1 | 6,147.7 | -2,678.9 | 6,703.6 | 3.28 | 0.15 | 3.28 |
| 13,576.0 | 91.01 | 339.56 | 6,833.7 | 6,234.3 | -2,712.8 | 6,796.5 | 2.04 | 0.40 | 2.00 |
| 13,668.0 | 89.80 | 338.42 | 6,833.1 | 6,320.1 | -2,745.8 | 6,888.5 | 1.81 | -1.32 | -1.24 |
| 13,761.0 | 92.04 | 338.54 | 6,831.6 | 6,406.6 | -2,779.9 | 6,981.5 | 2.41 | 2.41 | 0.13 |
| 13,853.0 | 93.30 | 340.86 | 6,827.3 | 6,492.8 | -2,811.8 | 7,073.4 | 2.87 | 1.37 | 2.52 |
| 13,946.0 | 92.49 | 341.51 | 6,822.6 | 6,580.7 | -2,841.8 | 7,166.1 | 1.12 | -0.87 | 0.70 |
| 14,038.0 | 90.50 | 340.66 | 6,820.2 | 6,667.7 | -2,871.6 | 7,257.9 | 2.35 | -2.16 | -0.92 |
| 14,131.0 | 89.19 | 339.48 | 6,820.5 | 6,755.2 | -2,903.3 | 7,350.9 | 1.90 | -1.41 | -1.27 |
| 14,224.0 | 89.25 | 339.15 | 6,821.7 | 6,842.2 | -2,936.1 | 7,443.8 | 0.36 | 0.06 | -0.35 |

# Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

**Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|
| 14,316.0 | 89.25 | 338.20 | 6,822.9 | 6,927.8 | -2,969.6 | 7,535.8 | 1.03 | 0.00 | -1.03 |
| 14,409.0 | 89.47 | 337.61 | 6,824.0 | 7,014.0 | -3,004.6 | 7,628.8 | 0.68 | 0.24 | -0.63 |
| 14,501.0 | 90.08 | 337.25 | 6,824.3 | 7,099.0 | -3,039.9 | 7,720.8 | 0.77 | 0.66 | -0.39 |
| 14,594.0 | 90.22 | 338.97 | 6,824.1 | 7,185.3 | -3,074.5 | 7,813.8 | 1.86 | 0.15 | 1.85 |
| 14,687.0 | 90.87 | 338.47 | 6,823.2 | 7,271.9 | -3,108.3 | 7,906.8 | 0.88 | 0.70 | -0.54 |
| 14,779.0 | 90.75 | 338.12 | 6,821.9 | 7,357.4 | -3,142.3 | 7,998.8 | 0.40 | -0.13 | -0.38 |
| 14,872.0 | 91.40 | 338.03 | 6,820.1 | 7,443.6 | -3,177.0 | 8,091.8 | 0.71 | 0.70 | -0.10 |
| 14,964.0 | 89.52 | 337.61 | 6,819.4 | 7,528.8 | -3,211.8 | 8,183.7 | 2.09 | -2.04 | -0.46 |
| 15,057.0 | 89.97 | 336.79 | 6,819.8 | 7,614.6 | -3,247.8 | 8,276.7 | 1.01 | 0.48 | -0.88 |
| 15,149.0 | 90.48 | 335.74 | 6,819.5 | 7,698.8 | -3,284.8 | 8,368.7 | 1.27 | 0.55 | -1.14 |
| 15,242.0 | 90.06 | 336.77 | 6,819.0 | 7,783.9 | -3,322.3 | 8,461.6 | 1.20 | -0.45 | 1.11 |
| 15,334.0 | 90.25 | 337.87 | 6,818.8 | 7,868.8 | -3,357.7 | 8,553.6 | 1.21 | 0.21 | 1.20 |
| 15,427.0 | 90.89 | 337.04 | 6,817.9 | 7,954.7 | -3,393.4 | 8,646.6 | 1.13 | 0.69 | -0.89 |
| 15,520.0 | 90.28 | 338.02 | 6,816.9 | 8,040.6 | -3,428.9 | 8,739.6 | 1.24 | -0.66 | 1.05 |
| 15,612.0 | 89.44 | 338.25 | 6,817.1 | 8,126.0 | -3,463.2 | 8,831.6 | 0.95 | -0.91 | 0.25 |
| 15,705.0 | 89.89 | 337.69 | 6,817.7 | 8,212.2 | -3,498.1 | 8,924.6 | 0.77 | 0.48 | -0.60 |
| 15,795.0 | 89.39 | 338.09 | 6,818.2 | 8,295.6 | -3,532.0 | 9,014.6 | 0.71 | -0.56 | 0.44 |
| 15,890.0 | 90.14 | 341.05 | 6,818.6 | 8,384.6 | -3,565.1 | 9,109.6 | 3.21 | 0.79 | 3.12 |
| 15,982.0 | 89.50 | 342.27 | 6,818.9 | 8,471.9 | -3,594.1 | 9,201.4 | 1.50 | -0.70 | 1.33 |
| 16,075.0 | 88.97 | 339.54 | 6,820.2 | 8,559.8 | -3,624.5 | 9,294.2 | 2.99 | -0.57 | -2.94 |
| 16,135.0 | 88.97 | 338.41 | 6,821.2 | 8,615.8 | -3,646.0 | 9,354.2 | 1.88 | 0.00 | -1.88 |
| 16,190.0 | 88.97 | 338.41 | 6,822.2 | 8,666.9 | -3,666.2 | 9,409.2 | 0.00 | 0.00 | 0.00 |
| **PTB: [16190.0' MD][88.97° Inc][338.41° Azi]** | | | | | | | | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| PBHL Gibson Unit 2H<br>- actual wellpath misses target center by 55.5usft at 16190.0usft MD (6822.2 TVD, 8666.9 N, -3666.2 E)<br>- Point | 0.00 | 0.00 | 6,797.0 | 8,706.8 | -3,695.5 | 14,303,899.98 | 1,712,201.08 | 39° 23' 22.660 N | 80° 44' 45.341 W |
| LP Gibson Unit 2H<br>- actual wellpath misses target center by 22.9usft at 7195.9usft MD (6883.7 TVD, 325.0 N, -332.6 E)<br>- Point | 0.00 | 0.00 | 6,878.0 | 330.0 | -311.0 | 14,295,523.16 | 1,715,585.55 | 39° 21' 59.738 N | 80° 44' 2.532 W |

**Design Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 16,190.0 | 6,822.2 | 8,666.9 | -3,666.2 | PTB: [16190.0' MD][88.97° Inc][338.41° Azi] |

| | | | |
|---|---|---|---|
| **Company:** | Antero | **Local Co-ordinate Reference:** | Well Gibson Unit 2H |
| **Project:** | Doddridge County WV | **TVD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Site:** | R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola | **MD Reference:** | KB Elevation @ 1016.0usft (Precision 522) |
| **Well:** | Gibson Unit 2H | **North Reference:** | Grid |
| **Wellbore:** | Original Hole | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys | **Database:** | North East R5000 Database |

Checked By: _____ Approved By: _____ Date: _____



07/29/2016

# Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Job Start Date: | 12/2/2015 |
| Job End Date: | 12/28/2015 |
| State: | West Virginia |
| County: | Doddridge |
| API Number: | 47-017-06372-00-00 |
| Operator Name: | Antero Resources Corporation |
| Well Name and Number: | Gibson Unit 2H |
| Longitude: | -80.74622000 |
| Latitude: | 39.38952000 |
| Datum: | NAD27 |
| Federal/Tribal Well: | NO |
| True Vertical Depth: | 6,882 |
| Total Base Water Volume (gal): | 12,884,130 |
| Total Base Non Water Volume: | 0 |

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

International Oil & Gas

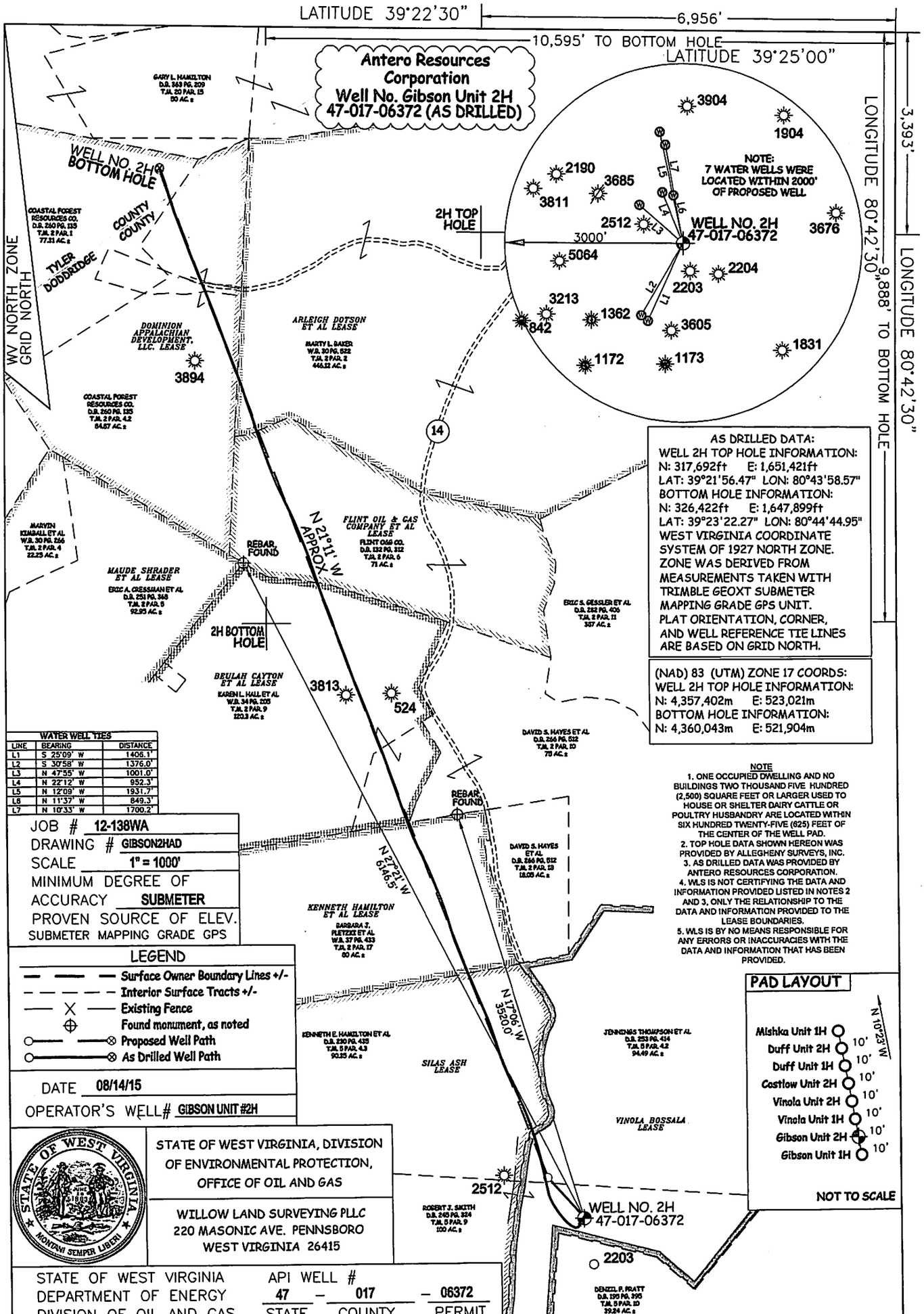
**Hydraulic Fracturing Fluid Composition:**

| 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 | Operator | Carrier | | | | | |
| | | | Water | 7732-18-5 | 100.00000 | 90.24972 | |
| Sand, White | Baker Hughes | Proppant | | | | | |
| | | | Listed with Other Chemicals | NA | | 9.30926 | |
| HCl, 20.1 - 28% | Baker Hughes | Acidizing | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.22002 | |
| GW-3LDF | Baker Hughes | Gelling Agent | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.12112 | |
| FRW-18 | Baker Hughes | Friction Reducer | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.01900 | |
| Alpha 1427 | Baker Hughes | Biocide | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.00431 | |
| Enzyme G-NE | Baker Hughes | Breaker | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.00068 | |
| Calcium Chloride | Baker Hughes | Salts | | | | | |
| | | | Listed with Other Chemicals | NA | | 0.00017 | |
| 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. | | | | | | | |
| | | Other Chemicals | | | | | |
| | | | Crystalline Silica (Quartz) | 14808-60-7 | | 9.31375 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Hydrochloric Acid | 7647-01-0 | | 0.06161 | |
| | | | Guar Gum | 9000-30-0 | | 0.05383 | |
| | | | Petroleum Distillates | 64742-47-8 | | 0.04591 | |
| | | | Paraffinic Petroleum Distillate | 64742-55-8 | | 0.02692 | |
| | | | Poly (acrylamide-co-acrylic acid) partial sodium salt | 62649-23-4 | | 0.01900 | |
| | | | Ethylene Glycol | 107-21-1 | | 0.00483 | |
| | | | Isotridecanol, ethoxylated | 9043-30-5 | | 0.00449 | |
| | | | Sodium Chloride | 7647-14-5 | | 0.00333 | |
| | | | 2-propenoic, polymer with sodium phosphinate, sodium salt | 71050-62-9 | | 0.00322 | |
| | | | Glutaraldehyde | 111-30-8 | | 0.00258 | |
| | | | Ammonium Chloride | 12125-02-9 | | 0.00190 | |
| | | | Oleamide DEA | 93-83-4 | | 0.00127 | |
| | | | Ethoxylated Alcohol | 68551-12-2 | | 0.00127 | |
| | | | Calcium Chloride | 10043-52-4 | | 0.00097 | |
| | | | Didecyl Dimethyl Ammonium Chloride | 7173-51-5 | | 0.00086 | |
| | | | Calcium Chloride | 10043-52-4 | | 0.00081 | |
| | | | Quaternary Ammonium Compound | 68424-85-1 | | 0.00043 | |
| | | | Ethanol | 64-17-5 | | 0.00043 | |
| | | | Polyoxythylene Sorbitan Monooleate | 9005-65-6 | | 0.00032 | |
| | | | Sorbitan Monooleate | 1338-43-8 | | 0.00032 | |
| | | | Potassium Chloride | 7447-40-7 | | 0.00016 | |
| | | | 2-Butoxy-1-Propanol | 15821-83-7 | | 0.00009 | |
| | | | Hemicellulase Enzyme Concentrate | 9025-56-3 | | 0.00003 | |

* 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)




| WATER WELL TIES | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S 25°09' W | 1406.1' |
| L2 | S 30°58' W | 1376.0' |
| L3 | N 47°55' W | 1001.0' |
| L4 | N 22°12' W | 952.3' |
| L5 | N 12°09' W | 1931.7' |
| L6 | N 11°37' W | 849.3' |
| L7 | N 10°33' W | 1700.2' |

AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 317,692ft E: 1,651,421ft
LAT: 39°21'56.47" LON: 80°43'58.57"
BOTTOM HOLE INFORMATION:
N: 326,422ft E: 1,647,899ft
LAT: 39°23'22.27" LON: 80°44'44.95"
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 2H TOP HOLE INFORMATION:
N: 4,357,402m E: 523,021m
BOTTOM HOLE INFORMATION:
N: 4,360,043m E: 521,904m

NOTE
1. ONE OCCUPIED DWELLING AND NO 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.

PAD LAYOUT
Mishka Unit 1H
Duff Unit 2H
Duff Unit 1H
Costlow Unit 2H
Vinola Unit 2H
Vinola Unit 1H
Gibson Unit 2H
Gibson Unit 1H
10'
NOT TO SCALE

JOB # 12-138WA
DRAWING # GIBSON2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

DATE 08/14/15
OPERATOR'S WELL# GIBSON UNIT #2H

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

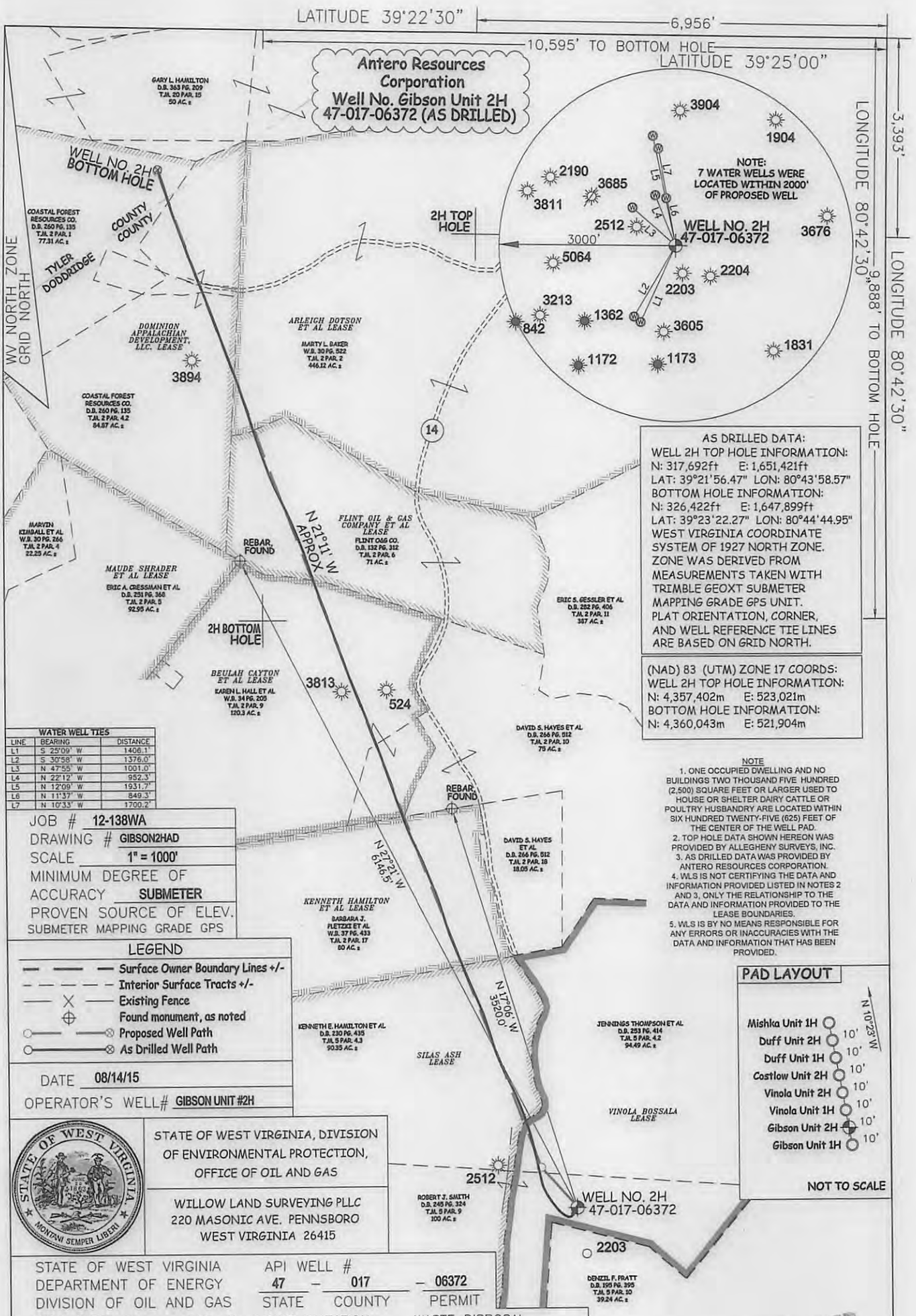
API WELL # 47 – 017 – 06372
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,004' ORIGINAL - 998' AS DRILLED WATERSHED MCELROY CREEK
QUADRANGLE SMITHBURG 7.5' (TH) CENTERPOINT 7.5' (SH) DISTRICT GRANT COUNTY DODDRIDGE
SURFACE OWNER ROBERT J. SMITH ACREAGE 100 ACRES +/-
OIL & GAS ROYALTY OWNER VINOLA BOSSALA; SILAS ASH; KENNETH HAMILTON ET AL; BEULAH CAYTON ET AL; FLINT OIL & GAS COMPANY ET AL; ARLEIGH DOTSON ET AL; DOMINION APPALACHIAN DEV, LLC.
LEASE ACREAGE 120 ACRES±; 120 ACRES±; 80 ACRES±; 123.5 ACRES±; 70 ACRES±; 446.5 ACRES±; 167.29 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 6,822' TVD 16,190' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

FORM WW-6

RECEIVED
Office of Oil and Gas
MAR 25 2016
WV Department of Environmental Protection
07/29/2016


LATITUDE 39°22'30"
6,956'
10,595' TO BOTTOM HOLE
LATITUDE 39°25'00"
3,393'
LONGITUDE 80°42'30"
9,888' TO BOTTOM HOLE
LONGITUDE 80°42'30"
Antero Resources Corporation
Well No. Gibson Unit 2H
47-017-06372 (AS DRILLED)
WELL NO. 2H BOTTOM HOLE
2H TOP HOLE
WELL NO. 2H
47-017-06372
3000'
NOTE:
7 WATER WELLS WERE LOCATED WITHIN 2000' OF PROPOSED WELL
3904
1904
2190
3685
3811
2512
3676
5064
2204
2203
3213
842
1362
3605
1831
1172
1173
WV NORTH ZONE GRID NORTH
COUNTY COUNTY
TYLER DODDRIDGE
COASTAL FOREST RESOURCES CO. D.B. 260 PG. 135 T.M. 2 PAR. 1 77.31 AC. ±
GARY L. HAMILTON D.B. 365 PG. 209 T.M. 20 PAR. 15 50 AC. ±
DOMINION APPALACHIAN DEVELOPMENT, LLC. LEASE
3894
COASTAL FOREST RESOURCES CO. D.B. 260 PG. 135 T.M. 2 PAR. 4.2 84.87 AC. ±
ARLEIGH DOTSON ET AL LEASE
MARTY L. BAKER W.B. 30 PG. 522 T.M. 2 PAR. 2 446.12 AC. ±
14
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MARVIN KIMBALL ET AL W.B. 30 PG. 266 T.M. 2 PAR. 4 22.25 AC. ±
MAUDE SHRADER ET AL LEASE
ERIC A. CRESSMAN ET AL D.B. 251 PG. 368 T.M. 2 PAR. 5 92.95 AC. ±
REBAR FOUND
N 21°11' W APPROX.
FLINT OIL & GAS COMPANY ET AL LEASE
FLINT O&G CO. D.B. 132 PG. 312 T.M. 2 PAR. 6 71 AC. ±
ERIC S. GESSLER ET AL D.B. 282 PG. 405 T.M. 2 PAR. 11 387 AC. ±
2H BOTTOM HOLE
BEULAH CAYTON ET AL LEASE
KAREN L. HALL ET AL W.B. 34 PG. 205 T.M. 2 PAR. 9 120.3 AC. ±
3813
524
DAVID S. HAYES ET AL D.B. 266 PG. 512 T.M. 2 PAR. 10 75 AC. ±
REBAR FOUND
N 22°21' W 6146.5'
DAVID S. HAYES ET AL D.B. 266 PG. 512 T.M. 2 PAR. 18 18.05 AC. ±
KENNETH HAMILTON ET AL LEASE
BARBARA J. FLETZKI ET AL W.B. 37 PG. 433 T.M. 2 PAR. 17 50 AC. ±
N 17°06' W 3520.0'
KENNETH E. HAMILTON ET AL D.B. 230 PG. 435 T.M. 5 PAR. 4.3 90.35 AC. ±
SILAS ASH LEASE
JENNINGS THOMPSON ET AL D.B. 253 PG. 414 T.M. 5 PAR. 4.2 94.49 AC. ±
VINOLA BOSSALA LEASE
2512
ROBERT J. SMITH D.B. 245 PG. 324 T.M. 5 PAR. 9 100 AC. ±
WELL NO. 2H
47-017-06372
2203
DENZIL F. PRATT D.B. 195 PG. 395 T.M. 5 PAR. 10 39.24 AC. ±
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DATE 08/14/15
OPERATOR'S WELL# GIBSON UNIT #2H
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07/29/2016
WV Department of Environmental Protection