

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

API 47-103-02977 County Wetzel District Grant  
Quad Pine Grove 7.5' Pad Name WJ Criswell 405 Field/Pool Name \_\_\_\_\_  
Farm name WJ Criswell Well Number WJ Criswell 405 N-2H  
Operator (as registered with the OOG) American Energy - Marcellus, LLC  
Address 301 NW 63rd, Suite 600 City Oklahoma City State OK Zip 73116

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4384254.4 Easting 532772.2  
Landing Point of Curve Northing 4384553.9 Easting 532751.5  
Bottom Hole Northing 4386157.9 Easting 530460.7

Elevation (ft) 1393' 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) \_\_\_\_\_

Date permit issued 03/14/2014 Date drilling commenced 8/8/2014 Date drilling ceased 9/17/2014  
Date completion activities began 3/11/2015 Date completion activities ceased 3/20/2015  
Verbal plugging (Y/N) N Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 563' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 2250' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 1193' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Received  
Office of Oil & Gas  
JUN 11 2015  
Reviewed by:  
JL 6/25/15  
WS 7/01/15

API 47-103 - 02977

Farm name WJ Criswell

Well number WJ Criswell 405 N-2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wu/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	26"	20"	93'		K-55		
Surface	17-1/2"	13-3/8"	1255'		J-55		Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	3501'		J-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17257'		P-110		Y
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Class A	1132	15.6	1.18	1277.3	0'	4
Coal							
Intermediate 1	Type 1	1109	15	Lead 1.29, Tail 1.30	1431.5	0'	7
Intermediate 2							
Intermediate 3							
Production	50/50 Poz	3147	1st & 2nd 14.3, Tail 14.7	1st 1.23, 2nd 1.31, Tail 1.50	4375	0'	18.73
Tubing							

Drillers TD (ft) 17314'

Loggers TD (ft) \_\_\_\_\_

Deepest formation penetrated Marcellus

Plug back to (ft) \_\_\_\_\_

Plug back procedure \_\_\_\_\_

Kick off depth (ft) \_\_\_\_\_

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 There were 12 centralizers in the surface casing string, 21 in the intermediate casing and 120 in the production casing string.

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 \_\_\_\_\_



API 47- 103 - 02977 Farm name WJ Criswell Well number WJ Criswell 405 N-2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	7522	TVD	17314 MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface 4217 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas 10194 mcfpd Oil 37 bpd NGL 9.24 bpd Water 124 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP		BOTTOM		DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
Shale	0	154	0	154	
Shale/Sand	154	1193	154	1198	
Pittsburgh Coal	1193	1195	1198	1200	
Shale/Sand	1195	2261	1200	2278	
Shale	2261	2312	2278	2330	
Shale/Sand	2312	2394	2330	2415	
Big Injun	2394	2639	2415	2660	
Shale/Sand	2639	3221	2660	3243	
Gordon	3221	3291	3243	3312	
Shale/Sand	3291	7167	3312	7445	
Middlesex	7167	7344	7445	7725	
Genesee	7344	7356	7725	7746	
Hamilton	7380	7468	7792	8046	
Please see attached					

Please insert additional pages as applicable.

Drilling Contractor Baker Hughes  
 Address 1681 E Main Street City Bridgeport State WV Zip 26330  
 Logging Company \_\_\_\_\_  
 Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Cementing Company \_\_\_\_\_  
 Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Stimulating Company Producers Service Company  
 Address 109 Graham Street City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

Completed by Ariel Bravo Telephone 405-607-5529  
 Signature [Signature] Title Regulatory Technician Date 06/04/2015

Received  
Office of Oil & Gas  
JUN 11 2015

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

Well Name WJ CRISWELL 405 N-2H	API 47103029770000	Property Number 1470017	Well Status PRODUCTION	State WEST VIRGINIA	County WETZEL	Well Spud Date 8/28/2014	RR Date 9/17/2014	Comp Date 3/11/2015
-----------------------------------	-----------------------	----------------------------	---------------------------	------------------------	------------------	-----------------------------	----------------------	------------------------

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Botm (TVD) (ftKB)	Shots Plan	Current Status	Com
61	12/17/2014	7,462.3	7,462.7	8		Stg 61
61	12/17/2014	7,468.3	7,468.6	8		Stg 61
61	12/17/2014	7,473.2	7,473.5	8		Stg 61
61	12/17/2014	7,477.3	7,477.5	8		Stg 61
61	12/17/2014	7,480.4	7,480.6	8		Stg 61
60	12/17/2014	7,482.2	7,482.3	8		Stg 60
60	12/17/2014	7,484.4	7,484.6	8		Stg 60
60	12/17/2014	7,488.3	7,488.6	8		Stg 60
60	12/17/2014	7,492.8	7,493.1	8		Stg 60
60	12/17/2014	7,497.1	7,497.3	8		Stg 60
59	12/16/2014	7,500.6	7,500.8	8		Stg 59
59	12/16/2014	7,502.6	7,502.7	8		Stg 59
59	12/16/2014	7,503.5	7,503.6	8		Stg 59
59	12/16/2014	7,504.1	7,504.1	8		Stg 59
59	12/16/2014	7,504.4	7,504.4	8		Stg 59
58	12/16/2014	7,504.6	7,504.6	8		Stg 58
58	12/16/2014	7,504.5	7,504.5	8		Stg 58
58	12/16/2014	7,504.4	7,504.4	8		Stg 58
58	12/16/2014	7,504.2	7,504.2	8		Stg 58
58	12/16/2014	7,504.0	7,504.0	8		Stg 58
57	12/15/2014	7,503.7	7,503.7	8		Stg 57
57	12/15/2014	7,503.4	7,503.4	8		Stg 57
57	12/15/2014	7,503.2	7,503.1	8		Stg 57
57	12/15/2014	7,502.9	7,502.9	8		Stg 57
57	12/15/2014	7,502.6	7,502.6	8		Stg 57
56	12/13/2014	7,502.3	7,502.3	8		Stg 56
56	12/13/2014	7,502.0	7,502.0	8		Stg 56
56	12/13/2014	7,501.8	7,501.8	8		Stg 56
56	12/13/2014	7,501.5	7,501.5	8		Stg 56
56	12/13/2014	7,501.4	7,501.4	8		Stg 56
55	12/13/2014	7,501.3	7,501.3	8		Stg 55
55	12/13/2014	7,501.4	7,501.4	8		Stg 55
55	12/13/2014	7,501.6	7,501.6	8		Stg 55
55	12/13/2014	7,501.9	7,501.9	8		Stg 55
55	12/13/2014	7,502.2	7,502.3	8		Stg 55
54	12/12/2014	7,502.6	7,502.7	8		Stg 54
54	12/12/2014	7,503.1	7,503.1	8		Stg 54
54	12/12/2014	7,503.5	7,503.5	8		Stg 54
54	12/12/2014	7,503.9	7,503.9	8		Stg 54
54	12/12/2014	7,504.3	7,504.3	8		Stg 54
53	12/11/2014	7,504.7	7,504.8	8		Stg 53
53	12/11/2014	7,505.2	7,505.2	8		Stg 53
53	12/11/2014	7,505.7	7,505.8	8		Stg 53
53	12/11/2014	7,506.4	7,506.4	8		Stg 53
53	12/11/2014	7,507.1	7,507.1	8		Stg 53

Received  
 Office of Oil & Gas  
 JUN 11 2015

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
52	12/11/2014	7,507.9	7,507.9	8		Stg 52
52	12/11/2014	7,508.7	7,508.8	8		Stg 52
52	12/11/2014	7,509.5	7,509.6	8		Stg 52
52	12/11/2014	7,510.3	7,510.4	8		Stg 52
52	12/11/2014	7,511.2	7,511.2	8		Stg 52
51	12/10/2014	7,512.0	7,512.0	8		Stg 51
51	12/10/2014	7,512.8	7,512.8	8		Stg 51
51	12/10/2014	7,513.6	7,513.6	8		Stg 51
51	12/10/2014	7,514.4	7,514.4	8		Stg 51
51	12/10/2014	7,515.1	7,515.2	8		Stg 51
50	12/10/2014	7,516.0	7,516.0	8		Stg 51
50	12/9/2014	7,516.7	7,516.8	8		Stg 50
50	12/9/2014	7,517.5	7,517.5	8		Stg 50
50	12/9/2014	7,518.3	7,518.3	8		Stg 50
50	12/9/2014	7,518.4	7,518.4	8		Stg 50
49	12/9/2014	7,519.0	7,519.1	8		Stg 50
49	12/9/2014	7,519.9	7,519.9	8		Stg 49
49	12/9/2014	7,520.6	7,520.7	8		Stg 49
49	12/9/2014	7,521.4	7,521.5	8		Stg 49
49	12/9/2014	7,522.2	7,522.2	8		Stg 49
48	12/9/2014	7,522.9	7,523.0	8		Stg 49
48	12/8/2014	7,523.8	7,523.8	8		Stg 48
48	12/8/2014	7,524.6	7,524.6	8		Stg 48
48	12/8/2014	7,525.4	7,525.4	8		Stg 48
48	12/8/2014	7,526.2	7,526.2	8		Stg 48
47	12/8/2014	7,527.8	7,527.8	8		Stg 47
47	12/8/2014	7,528.5	7,528.6	8		Stg 47
47	12/8/2014	7,529.2	7,529.3	8		Stg 47
47	12/8/2014	7,529.8	7,529.8	8		Stg 47
47	12/8/2014	7,530.2	7,530.2	8		Stg 47
46	12/7/2014	7,530.6	7,530.6	8		Stg 46
46	12/7/2014	7,530.9	7,530.9	8		Stg 46
46	12/7/2014	7,531.2	7,531.2	8		Stg 46
46	12/7/2014	7,531.5	7,531.5	8		Stg 46
46	12/7/2014	7,531.8	7,531.8	8		Stg 46
45	12/7/2014	7,532.1	7,532.1	8		Stg 45
45	12/7/2014	7,532.4	7,532.5	8		Stg 45
45	12/7/2014	7,532.8	7,532.8	8		Stg 45
45	12/7/2014	7,533.1	7,533.2	8		Stg 45
45	12/7/2014	7,533.5	7,533.5	8		Stg 45
44	12/6/2014	7,533.9	7,533.9	8		Stg 44
44	12/6/2014	7,534.2	7,534.2	8		Stg 44
44	12/6/2014	7,534.4	7,534.4	8		Stg 44
44	12/6/2014	7,534.5	7,534.5	8		Stg 44
44	12/6/2014	7,534.5	7,534.5	8		Stg 44
43	12/6/2014	7,534.3	7,534.3	8		Stg 43

**Received**  
**Office of Oil & Gas**

JUN 11 2015

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
43	12/6/2014	7,534.1	7,534.0	8		Stg 43
43	12/6/2014	7,533.7	7,533.7	8		Stg 43
43	12/6/2014	7,533.4	7,533.4	8		Stg 43
43	12/6/2014	7,533.1	7,533.1	8		Stg 43
42	12/5/2014	7,532.8	7,532.8	8		Stg 42
42	12/5/2014	7,532.5	7,532.5	8		Stg 42
42	12/5/2014	7,532.2	7,532.2	8		Stg 42
42	12/5/2014	7,531.8	7,531.8	8		Stg 42
42	12/5/2014	7,531.5	7,531.4	8		Stg 42
41	12/5/2014	7,531.1	7,531.1	8		Stg 42
41	12/5/2014	7,530.7	7,530.7	8		Stg 41
41	12/5/2014	7,530.4	7,530.3	8		Stg 41
41	12/5/2014	7,530.0	7,530.0	8		Stg 41
41	12/5/2014	7,529.6	7,529.6	8		Stg 41
40	12/4/2014	7,529.3	7,529.3	8		Stg 41
40	12/4/2014	7,529.0	7,529.0	8		Stg 40
40	12/4/2014	7,528.7	7,528.7	8		Stg 40
40	12/4/2014	7,528.3	7,528.3	8		Stg 40
40	12/4/2014	7,528.0	7,527.9	8		Stg 40
39	12/3/2014	7,527.5	7,527.5	8		Stg 40
39	12/3/2014	7,527.2	7,527.1	8		Stg 39
39	12/3/2014	7,526.8	7,526.8	8		Stg 39
39	12/3/2014	7,526.5	7,526.4	8		Stg 39
39	12/3/2014	7,526.1	7,526.1	8		Stg 39
38	12/3/2014	7,525.7	7,525.7	8		Stg 39
38	12/3/2014	7,525.5	7,525.5	8		Stg 38
38	12/3/2014	7,525.4	7,525.4	8		Stg 38
38	12/3/2014	7,525.4	7,525.4	8		Stg 38
38	12/3/2014	7,525.4	7,525.4	8		Stg 38
37	12/2/2014	7,525.4	7,525.4	8		Stg 38
37	12/2/2014	7,525.4	7,525.4	8		Stg 37
37	12/2/2014	7,525.4	7,525.4	8		Stg 37
37	12/2/2014	7,525.4	7,525.4	8		Stg 37
37	12/2/2014	7,525.4	7,525.4	8		Stg 37
37	12/2/2014	7,525.4	7,525.4	8		Stg 37
36	12/2/2014	7,525.4	7,525.4	8		Stg 37
36	12/2/2014	7,525.4	7,525.4	8		Stg 36
36	12/2/2014	7,525.4	7,525.4	8		Stg 36
36	12/2/2014	7,525.4	7,525.4	8		Stg 36
36	12/2/2014	7,525.4	7,525.4	8		Stg 36
36	12/2/2014	7,525.4	7,525.4	8		Stg 36
35	12/1/2014	7,525.4	7,525.4	8		Stg 36
35	12/1/2014	7,525.4	7,525.4	8		Stg 35
35	12/1/2014	7,525.4	7,525.4	8		Stg 35
35	12/1/2014	7,525.4	7,525.4	8		Stg 35
35	12/1/2014	7,525.2	7,525.2	8		Stg 35
34	11/25/2014	7,525.0	7,525.0	8		Stg 35
34	11/25/2014	7,524.7	7,524.7	8		Stg 34

Received  
 Office of Oil & Gas  
 JUN 11 2015

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
34	11/25/2014	7,524.5	7,524.5	8		Stg 34
34	11/25/2014	7,524.3	7,524.2	8		Stg 34
34	11/25/2014	7,524.0	7,524.0	8		Stg 34
33	11/25/2014	7,523.7	7,523.7	8		Stg 33
33	11/25/2014	7,523.5	7,523.5	8		Stg 33
33	11/25/2014	7,523.3	7,523.3	8		Stg 33
33	11/25/2014	7,523.2	7,523.2	8		Stg 33
33	11/25/2014	7,523.1	7,523.1	8		Stg 33
32	11/24/2014	7,523.0	7,523.0	8		Stg 32
32	11/24/2014	7,522.9	7,522.8	8		Stg 32
32	11/24/2014	7,522.7	7,522.7	8		Stg 32
32	11/24/2014	7,522.6	7,522.6	8		Stg 32
32	11/24/2014	7,522.5	7,522.5	8		Stg 32
31	11/24/2014	7,522.4	7,522.4	8		Stg 31
31	11/24/2014	7,522.2	7,522.2	8		Stg 31
31	11/24/2014	7,522.1	7,522.1	8		Stg 31
31	11/24/2014	7,522.0	7,522.0	8		Stg 31
31	11/24/2014	7,521.9	7,521.9	8		Stg 31
30	11/23/2014	7,521.8	7,521.8	8		Stg 30
30	11/23/2014	7,521.7	7,521.7	8		Stg 30
30	11/23/2014	7,521.6	7,521.5	8		Stg 30
30	11/23/2014	7,521.4	7,521.4	8		Stg 30
30	11/23/2014	7,521.3	7,521.3	8		Stg 30
29	11/22/2014	7,521.2	7,521.2	8		Stg 29
29	11/22/2014	7,521.0	7,521.0	8		Stg 29
29	11/22/2014	7,520.9	7,520.9	8		Stg 29
29	11/22/2014	7,520.7	7,520.7	8		Stg 29
29	11/22/2014	7,520.6	7,520.5	8		Stg 29
28	11/22/2014	7,520.3	7,520.3	8		Stg 28
28	11/22/2014	7,520.1	7,520.0	8		Stg 28
28	11/22/2014	7,519.7	7,519.7	8		Stg 28
28	11/22/2014	7,519.4	7,519.4	8		Stg 28
28	11/22/2014	7,519.1	7,519.1	8		Stg 28
27	11/21/2014	7,518.9	7,518.8	8		Stg 27
27	11/21/2014	7,518.6	7,518.5	8		Stg 27
27	11/21/2014	7,518.2	7,518.2	8		Stg 27
27	11/21/2014	7,517.9	7,517.8	8		Stg 27
27	11/21/2014	7,517.5	7,517.5	8		Stg 27
26	11/21/2014	7,517.2	7,517.1	8		Stg 26
26	11/21/2014	7,516.8	7,516.8	8		Stg 26
26	11/21/2014	7,516.5	7,516.5	8		Stg 26
26	11/21/2014	7,516.1	7,516.1	8		Stg 26
26	11/21/2014	7,515.8	7,515.8	8		Stg 26
25	11/20/2014	7,515.4	7,515.4	8		Stg 25
25	11/20/2014	7,515.1	7,515.1	8		Stg 25
25	11/20/2014	7,514.8	7,514.8	8		Stg 25

Received  
Office of Oil & Gas  
JUN 11 2015



**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
25	11/20/2014	7,514.6	7,514.6	8		Stg 25
25	11/20/2014	7,514.6	7,514.6	8		Stg 25
25	11/20/2014	7,514.4	7,514.4	8		Stg 25
24	11/20/2014	7,514.3	7,514.3	8		Stg 24
24	11/20/2014	7,514.1	7,514.1	8		Stg 24
24	11/20/2014	7,514.0	7,514.0	8		Stg 24
24	11/20/2014	7,513.9	7,513.9	8		Stg 24
24	11/20/2014	7,513.8	7,513.8	8		Stg 24
23	11/19/2014	7,513.7	7,513.7	8		Stg 23
23	11/19/2014	7,513.7	7,513.7	8		Stg 23
23	11/19/2014	7,513.9	7,513.9	8		Stg 23
23	11/19/2014	7,514.1	7,514.2	8		Stg 23
23	11/19/2014	7,514.4	7,514.4	8		Stg 23
22	11/18/2014	7,514.7	7,514.7	8		Stg 22
22	11/18/2014	7,515.0	7,515.0	8		Stg 22
22	11/18/2014	7,515.2	7,515.3	8		Stg 22
22	11/18/2014	7,515.5	7,515.5	8		Stg 22
22	11/18/2014	7,515.8	7,515.8	8		Stg 22
21	11/17/2014	7,516.1	7,516.1	8		Stg 21
21	11/17/2014	7,516.3	7,516.3	8		Stg 21
21	11/17/2014	7,516.5	7,516.5	8		Stg 21
21	11/17/2014	7,516.7	7,516.7	8		Stg 21
21	11/17/2014	7,516.7	7,516.7	8		Stg 21
20	11/14/2014	7,516.7	7,516.7	8		Stg 20
20	11/14/2014	7,516.6	7,516.6	8		Stg 20
20	11/14/2014	7,516.6	7,516.6	8		Stg 20
20	11/14/2014	7,516.6	7,516.6	8		Stg 20
20	11/14/2014	7,516.5	7,516.5	8		Stg 20
19	11/14/2014	7,516.5	7,516.5	8		Stg 19
19	11/14/2014	7,516.5	7,516.5	8		Stg 19
19	11/14/2014	7,516.4	7,516.4	8		Stg 19
19	11/14/2014	7,516.4	7,516.4	8		Stg 19
19	11/14/2014	7,516.4	7,516.4	8		Stg 19
18	11/13/2014	7,516.4	7,516.4	8		Stg 18
18	11/13/2014	7,516.4	7,516.4	8		Stg 18
18	11/13/2014	7,516.3	7,516.3	8		Stg 18
18	11/13/2014	7,516.3	7,516.3	8		Stg 18
18	11/13/2014	7,516.3	7,516.3	8		Stg 18
17	11/13/2014	7,516.2	7,516.2	8		Stg 17
17	11/13/2014	7,516.1	7,516.1	8		Stg 17
17	11/13/2014	7,516.0	7,516.0	8		Stg 17
17	11/13/2014	7,515.9	7,515.9	8		Stg 17
17	11/13/2014	7,515.7	7,515.7	8		Stg 17
16	11/12/2014	7,515.6	7,515.6	8		Stg 16
16	11/12/2014	7,515.4	7,515.4	8		Stg 16
16	11/12/2014	7,515.2	7,515.1	8		Stg 16

**Received  
Office of Oil & Gas**

JUN 11 2015

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
16	11/12/2014	7,514.9	7,514.9	8		Stg 16
16	11/12/2014	7,514.6	7,514.5	8		Stg 16
15	11/12/2014	7,514.2	7,514.1	8		Stg 15
15	11/12/2014	7,513.8	7,513.8	8		Stg 15
15	11/12/2014	7,513.4	7,513.4	8		Stg 15
15	11/12/2014	7,513.1	7,513.1	8		Stg 15
15	11/12/2014	7,512.8	7,512.8	8		Stg 15
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
14	11/11/2014	7,512.7	7,512.7	8		Stg 14
13	11/11/2014	7,512.7	7,512.7	8		Stg 13
13	11/11/2014	7,512.7	7,512.7	8		Stg 13
13	11/11/2014	7,512.8	7,512.8	8		Stg 13
13	11/11/2014	7,512.8	7,512.8	8		Stg 13
13	11/11/2014	7,512.8	7,512.8	8		Stg 13
12	11/10/2014	7,512.9	7,512.9	8		Stg 12
12	11/10/2014	7,513.0	7,513.0	8		Stg 12
12	11/10/2014	7,513.1	7,513.2	8		Stg 12
12	11/10/2014	7,513.4	7,513.4	8		Stg 12
12	11/10/2014	7,513.6	7,513.6	8		Stg 12
11	11/9/2014	7,513.8	7,513.8	8		Stg 11
11	11/9/2014	7,514.0	7,514.0	8		Stg 11
11	11/9/2014	7,514.2	7,514.2	8		Stg 11
11	11/9/2014	7,514.4	7,514.4	8		Stg 11
11	11/9/2014	7,514.7	7,514.7	8		Stg 11
10	11/8/2014	7,514.9	7,515.0	8		Stg 10
10	11/8/2014	7,515.2	7,515.2	8		Stg 10
10	11/8/2014	7,515.5	7,515.5	8		Stg 10
10	11/8/2014	7,515.7	7,515.8	8		Stg 10
10	11/8/2014	7,516.0	7,516.0	8		Stg 10
9	11/7/2014	7,516.3	7,516.3	8		Stg 9
9	11/7/2014	7,516.5	7,516.5	8		Stg 9
9	11/7/2014	7,516.8	7,516.8	8		Stg 9
9	11/7/2014	7,517.0	7,517.0	8		Stg 9
9	11/7/2014	7,517.3	7,517.3	8		Stg 9
8	11/7/2014	7,517.5	7,517.5	8		Stg 8
8	11/7/2014	7,517.7	7,517.7	8		Stg 8
8	11/7/2014	7,517.9	7,517.9	8		Stg 8
8	11/7/2014	7,518.0	7,518.1	8		Stg 8
8	11/7/2014	7,518.2	7,518.2	8		Stg 8
7	11/6/2014	7,518.2	7,518.2	8		Stg 7
7	11/6/2014	7,518.2	7,518.2	8		Stg 7
7	11/6/2014	7,518.2	7,518.2	8		Stg 7
7	11/6/2014	7,518.2	7,518.2	8		Stg 7

**Received**  
**Office of Oil & Gas**  
 JUN 11 2015

**Perforations**

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
7	11/6/2014	7,518.2	7,518.2	8		Stg 7
6	11/6/2014	7,518.2	7,518.2	8		Stg 6
6	11/6/2014	7,518.2	7,518.2	8		Stg 6
6	11/6/2014	7,518.2	7,518.2	8		Stg 6
6	11/6/2014	7,518.2	7,518.2	8		Stg 6
6	11/6/2014	7,518.2	7,518.2	8		Stg 6
5	11/5/2014	7,518.3	7,518.3	8		Stg 5
5	11/5/2014	7,518.4	7,518.4	8		Stg 5
5	11/5/2014	7,518.7	7,518.7	8		Stg 5
5	11/5/2014	7,518.9	7,518.9	8		Stg 5
5	11/5/2014	7,519.2	7,519.2	8		Stg 5
4	11/4/2014	7,519.5	7,519.5	8		Stg 4
4	11/4/2014	7,519.7	7,519.7	8		Stg 4
4	11/4/2014	7,519.8	7,519.8	8		Stg 4
4	11/4/2014	7,519.8	7,519.8	8		Stg 4
4	11/4/2014	7,519.8	7,519.8	8		Stg 4
4	11/4/2014	7,519.8	7,519.8	8		Stg 4
3	11/4/2014	7,519.8	7,519.8	8		Stg 3
3	11/4/2014	7,519.8	7,519.8	8		Stg 3
3	11/4/2014	7,519.8	7,519.8	8		Stg 3
3	11/4/2014	7,519.7	7,519.7	8		Stg 3
3	11/4/2014	7,519.7	7,519.7	8		Stg 3
2	11/3/2014	7,519.7	7,519.7	8		Stg 2
2	11/3/2014	7,519.7	7,519.7	8		Stg 2
2	11/3/2014	7,519.7	7,519.7	8		Stg 2
2	11/3/2014	7,519.8	7,519.8	8		Stg 2
2	11/3/2014	7,520.0	7,520.0	8		Stg 2
1	10/31/2014	7,520.2	7,520.2	8		Stg 1
1	10/31/2014	7,520.4	7,520.4	8		Stg 1
1	10/31/2014	7,520.6	7,520.6	8		Stg 1
1	10/31/2014	7,520.8	7,520.8	8		Stg 1
1	10/31/2014	7,521.0	7,521.0	8		Stg 1

Received  
Office of Oil & Gas  
JUN 11 2015

Well Name WJ CRISWELL 405 N-2H	API 47103029770000	Property Number 1470017	Well Status PRODUCTION	State WEST VIRGINIA	County WETZEL	Well Spud Date 8/28/2014	RR Date 9/17/2014	Comp Date 3/11/2015
-----------------------------------	-----------------------	----------------------------	---------------------------	------------------------	------------------	-----------------------------	----------------------	------------------------

### Well Treatment Summary

Stage #	Date	Q Treat Avg (bb/min)	Avg Treat Pressure (psi)	P Break (psi)	ISIP (psi)	Prop Placed (lb)	Total Clean Volume Pumped (bb)
1	11/3/2014	80	8,545.0	6,756.0	4,621.0	224,800	5404.00
2	11/4/2014	77	8,705.0	6,789.0	5,080.0	225,100	5212.00
3	11/4/2014	79	8,756.0	6,801.0	5,850.0	225,400	5921.00
4	11/5/2014	80	8,576.0	5,623.0	4,750.0	224,000	4848.00
5	11/6/2014	77	8,769.0	6,420.0	4,659.0	224,900	5722.00
6	11/6/2014	80	8,425.0	6,132.0	4,676.0	225,000	4883.00
7	11/7/2014	80	8,121.0	5,935.0	4,680.0	225,000	4879.00
8	11/7/2014	80	8,305.0	5,744.0	4,636.0	225,000	4748.00
9	11/8/2014	80	8,621.0	6,149.0	5,000.0	225,000	4646.00
10	11/9/2014	78	9,012.0	6,669.0	5,157.0	225,000	4716.00
11	11/10/2014	71	9,067.0	6,650.0	5,250.0	224,900	6130.00
12	11/11/2014	80	8,324.0	6,270.0	5,281.0	224,200	4597.00
13	11/11/2014	80	8,005.0	6,252.0	4,790.0	225,000	4612.00
14	11/12/2014	80	8,077.0	6,008.0	5,410.0	224,800	4583.00
15	11/12/2014	80	8,329.0	6,394.0	4,193.0	225,400	4694.00
16	11/13/2014	80	8,225.0	6,357.0	5,002.0	225,000	4723.00
17	11/13/2014	80	8,325.0	6,309.0	5,694.0	225,000	4727.00
18	11/14/2014	80	8,155.0	5,724.0	5,089.0	224,900	4580.00
19	11/14/2014	80	8,035.0	5,869.0	5,367.0	225,000	4701.00
20	11/17/2014	80	8,615.0	6,363.0	4,964.0	225,300	4494.00
21	11/18/2014	75	8,575.0	6,100.0	5,043.0	225,000	4654.00
22	11/19/2014	78	8,168.0	6,367.0	5,579.0	225,000	4684.00
23	11/20/2014	80	8,260.0	6,027.0	4,986.0	225,000	4672.00
24	11/20/2014	80	8,230.0	5,972.0	5,110.0	225,000	4677.00
25	11/21/2014	71	8,113.0	5,100.0	0.0	200,000	4631.00
26	11/21/2014	79	8,040.0	6,204.0	4,944.0	250,000	4640.00
27	11/22/2014	81	7,999.0	6,200.0	5,574.0	225,000	4589.00
28	11/22/2014	81	8,101.0	6,158.0	5,517.0	225,000	4550.00
29	11/23/2014	80	8,080.0	5,859.0	5,857.0	225,000	4398.00
30	11/24/2014	79	8,175.0	6,091.0	5,016.0	225,000	4529.00
31	11/24/2014	75	8,161.0	6,066.0	4,069.0	225,000	4569.00
32	11/25/2014	77	8,089.0	6,342.0	4,704.0	224,900	4539.00
33	11/25/2014	80	8,012.0	6,197.0	4,709.0	224,800	4461.00
34	12/1/2014	80	7,887.0	6,608.0	5,601.0	224,600	4479.00
35	12/2/2014	78	8,215.0	5,957.0	4,539.0	225,000	4556.00
36	12/2/2014	80	8,104.0	6,208.0	4,969.0	225,000	4507.00
37	12/3/2014	79	8,372.0	6,130.0	5,637.0	225,000	4593.00
38	12/3/2014	75	8,643.0	6,191.0	4,438.0	225,000	5187.00
39	12/4/2014	80	8,097.0	6,408.0	4,795.0	225,000	4474.00
40	12/5/2014	80	7,985.0	7,600.0	4,537.0	225,000	4515.00
41	12/5/2014	81	8,203.0	6,159.0	4,435.0	225,000	4472.00
42	12/6/2014	80	7,750.0	6,489.0	4,461.0	224,800	4719.00
43	12/6/2014	80	8,150.0	6,338.0	5,118.0	225,000	4577.00
44	12/7/2014	80	8,032.0	6,319.0	5,852.0	225,000	4360.00

Received  
 Office of Oil & Gas  
 JUN 11 2015

**Well Treatment Summary**

Stage #	Date	Q Treat Avg (bbl/min)	Avg Treat Pressure (psi)	P Break (psi)	ISIP (psi)	Prop Placed (lb)	Total Clean Volume Pumped (bbl)
45	12/7/2014	80	8,103.0	5,977.0	5,327.0	225,000	4435.00
46	12/8/2014	80	7,782.0	5,955.0	4,086.0	225,000	4541.00
47	12/8/2014	80	7,750.0	6,022.0	4,350.0	225,000	4390.00
48	12/9/2014	80	8,043.0	6,300.0	5,790.0	224,900	5378.00
49	12/9/2014	84	7,666.0	5,798.0	4,728.0	225,000	4210.00
50	12/10/2014	68	8,536.0	7,480.0	5,370.0	225,000	5347.00
51	12/11/2014	80	8,150.0	7,510.0	4,839.0	225,000	4140.00
52	12/11/2014	80	7,800.0	5,988.0	4,756.0	225,000	4434.00
53	12/12/2014	82	7,960.0	6,179.0	5,306.0	225,000	4160.00
54	12/13/2014	81	8,099.0	5,884.0	5,883.0	225,000	4218.00
55	12/13/2014	69	8,925.0	6,110.0	4,180.0	225,000	5114.00
56	12/15/2014	80	7,983.0	6,550.0	4,658.0	225,000	4190.00
57	12/16/2014	81	7,658.0	6,220.0	4,689.0	225,000	4175.00
58	12/16/2014	80	7,564.0	5,827.0	5,777.0	225,000	4089.00
59	12/17/2014	80	7,791.0	6,118.0	4,877.0	225,000	4093.00
60	12/17/2014	80	7,507.0	6,220.0	4,465.0	225,000	4149.00
61	12/18/2014	80	7,504.0	6,509.0	4,217.0	225,100	4164.00

Received  
Office of Oil & Gas

JUN 11 2015

Formation / Lithology	Top Depth TVD	Bottom Depth TVD	Top Depth MD	Bottom Depth MD
Shale	0	154	0	154
Shale/Sand	154	1193	154	1198
PITTSBURGH COAL	1193	1195	1198	1200
Shale/Sand	1195	2261	1200	2278
Shale	2261	2312	2278	2330
Shale/Sand	2312	2394	2330	2415
BIG INJUN	2394	2639	2415	2660
Shale/Sand	2639	3221	2660	3243
GORDON	3221	3291	3243	3312
Shale/Sand	3291	7167	3312	7445
MIDDLESEX	7167	7344	7,445	7725
GENESEO	7344	7356	7,725	7746
TULLY	7,356	7380	7,746	7792
HAMILTON	7380	7468	7792	8046
MARCELLUS	7468		8,046	
TD OF LATERAL		7522		17289

Received  
Office of Oil & Gas  
JUN 11 2015



**AMERICAN ENERGY  
MARCELLUS**

June 9, 2015

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: John Kearney or whomever concerned  
601 57<sup>th</sup> Street  
Charleston, West Virginia 25304

Re: Well Operator's Report of Well Work  
WJ Criswell 405 N-1H, N-2H and N-3H

Dear Mr. Kearney,

American Energy – Marcellus, LLC respectfully submits the following WR-35 reports for the WJ Criswell 405 N-1H, N-2H and N-3H wells along with three attachments, for the three subject wells referenced above located in Wetzel County, West Virginia.

We have completed these reports to the best of our knowledge. Please note, American Energy – Marcellus, LLC acquired these wells from HG Energy, LLC. Prior to the finalization of the acquisition, HG Energy, LLC drilled the subject wells, while American Energy – Marcellus, LLC completed these wells. For any outstanding questions regarding the drilling of these wells, please contact HG Energy, LLC.

If you need any additional information, please feel free to contact me.

Best Regards,

Ariel Bravo  
Regulatory Technician  
[ariel.bravo@aep-lp.com](mailto:ariel.bravo@aep-lp.com)  
Cell 405-403-4803  
Office 405-607-5529

**Received**  
**Office of Oil & Gas**  
JUN 11 2015

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	11/3/2014
Job End Date	12/18/2014
State	West Virginia
County	Wetzel
API Number	47-103-02977-00-00
Operator Name	American Energy Utica
Well Name and Number	WJ Criswell 405 N-2H
Longitude	-80.61847220
Latitude	39.60734560
Datum	NAD27
Federal/Tribal Well	NO
True Vertical Depth	7,525
Total Base Water Volume (gal)	11,941,692
Total Base Non Water Volume:	0



Received  
Office of Oil & Gas  
JUN 11 2015

## 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	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.82848	None
Sand (Proppant)	PSC	Proppant	Silica Substrate	14808-60-7	100.00000	11.95865	None
PRO GEL 4.0L	Producers Service Corp	Gelling Agent	Distillates (Petroleum), hydrotreated light	64742-47-8	65.00000	0.06126	None
			Guar Gum	9000-30-0	50.00000	0.04712	None
			Nonylphenol, Ethoxylate	9016-45-9	5.00000	0.00471	None
			Nonionic Surfactant	60828-78-6	5.00000	0.00471	None
			Nonionic Surfactant	60828-78-6	5.00000	0.00471	None
Hydrochloric Acid (15%)	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	10.00000	0.09492	None
FRA 407	Producers Service Corp	Friction Reducer	Petroleum Distillates	64742-47-8	40.00000	0.02833	None
			Polyacrylamide salt	Proprietary	30.00000	0.02125	None
			Sodium Chloride	7647-14-5	5.00000	0.00354	None
			Ammonium Chloride	12125-02-9	5.00000	0.00354	None



			Ethoxylate Alcohol	Proprietary	5.00000	0.00354	None
			Tall oil	Proprietary	2.00000	0.00142	None
PRO FLO 102 M	Producers Service Corp	Surfactant	Proprietary Ingredient	Proprietary	1.00000	0.00071	None
			Methyl Alcohol	67-56-1	60.00000	0.04309	None
PRO SCALE CLEAR 112	Producers Service Corp	Scale Inhibitor	N-dodecyl-2-pyrroldione	2687-96-9	5.00000	0.00359	None
			Polymer	Proprietary	50.00000	0.00688	None
BIO CLEAR 2000	Producers Service Corp	Biocide	ethylene glycol	107-21-1	40.00000	0.00551	None
			Polyether	25322-68-3	48.00000	0.00676	None
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00282	None
			Proprietary Ingredient	Proprietary	2.00000	0.00028	None
PROHIB II	Producers Service Corp	Inhibitor	Proprietary Ingredient	Proprietary	1.00000	0.00014	None
			Dimethylcocoamine, bis (chloroethyl) ether, diquatary ammonium salt	68607-28-3	40.00000	0.00034	None
			Ethylene Glycol	107-21-1	20.00000	0.00017	None
			Methyl Alcohol	67-56-1	20.00000	0.00017	None
			2-Butoxyethanol	111-76-2	20.00000	0.00017	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00013	None
			Propargyl Alcohol	107-19-7	15.00000	0.00013	None
PRO BREAKER 4	Producers Service Corp	Breaker	Coco alkyldimethylamines	61788-93-0	2.50000	0.00002	None
			Sucrose	57-50-1	40.00000	0.00005	None
			Ethylene Glycol	107-21-1	40.00000	0.00005	None
			Proprietary Ingredient	Proprietary	1.00000	0.00000	None
			Proprietary Ingredient	Proprietary	1.00000	0.00000	None
			Polyether Polyol	9003-11-6	1.00000	0.00000	None
			Hexamethylenetetramine	100-97-0	1.00000	0.00000	None
			Sodium Bicarbonate	144-55-8	1.00000	0.00000	None
			Proprietary Ingredient	Proprietary	1.00000	0.00000	None

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

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

Received  
Office of Oil & Gas  
JUN 11 2015

BOTTOM HOLE: LON: -80°38'42.9"

LON: -80°37'06.3"

9880

LAT: 39°37'30"  
MAP OF  
H.G. ENERGY, LLC  
-CRISWELL 405 UNIT-

LON: 80°35'00"

6425

LAT: 39°36'26.5" BOTTOM HOLE: LAT: 39°37'28.6"

**SURVEY NOTES**

1 - Well ties and Latitude and Longitude were measured by DGPS (Sub-meter Mapping Grade). Bearings are referenced to UTM Grid North (Zone 17 North - NAD 1927).

2 - Surface owners & adjoiners information obtained from Wetzel Co. Assessor's Office. Lease names, & line mapping provided by HGE GIS system. Ends of unit lines mapped by M.L.S. LLC & HGE.

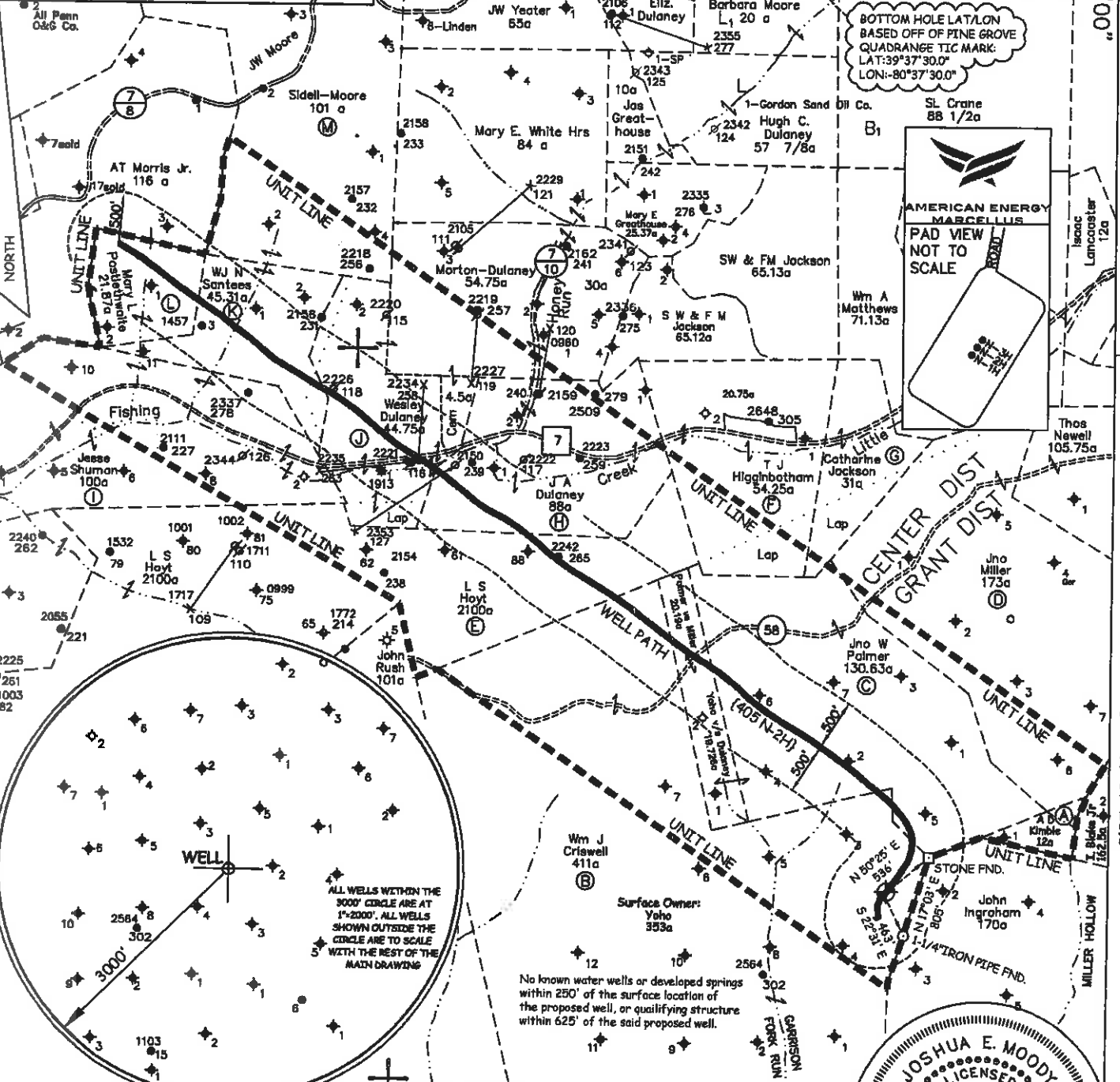
3 - No Title Opinion was provided to the Surveyor during this survey. This survey is subject to a complete title Opinion.

UTM Coordinates  
(Zone 17N-NAD 1983)

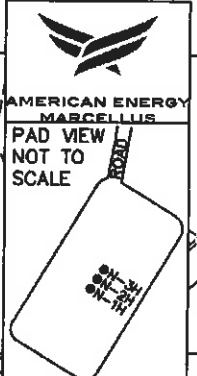
Surface N-4,384,258m.  
E-532,775m.

Bottom Hole N-4,386,162m.  
E-530,463m.

UTM 27  
LOCATION REFERENCES  
N 50°25' E 536' STONE FOUND  
S 22°31' E 463' IRON PIPE FOUND



BOTTOM HOLE LAT/LON  
BASED OFF OF PINE GROVE  
QUADRANGLE TIC MARK:  
LAT: 39°37'30.0"  
LON: -80°37'30.0"



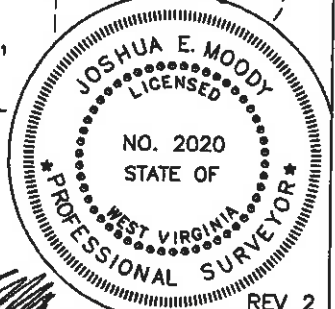
JOB # 13-001  
DRAWING # 13HG405B 406B  
SCALE 1" = 1500'  
MINIMUM DEGREE OF ACCURACY 1/200'  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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 REGULATIONS ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



WEST VIRGINIA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION,  
OFFICE OF OIL AND GAS

MOODY LAND SURVEYING, LLC  
ST. MARYS, WV 26170



REV 2  
JOSHUA E. MOODY, P.S. 2020  
DATE 10/27/14  
OPERATOR'S WELL # 405 N-2H

WEST VIRGINIA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

WELL TYPE: OIL  GAS  LIQUID INJECTION \_\_\_\_\_ WASTE DISPOSAL \_\_\_\_\_ HORIZONTAL   
(IF "GAS") PRODUCTION  STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW   
LOCATION: ELEVATION 1393' WATERSHED NORTH FOR, FISHING CREEK API WELL # \_\_\_\_\_  
DISTRICT GRANT COUNTY WETZEL 47 - 103 -  
QUADRANGLE BIG RUN 7.5' STATE COUNTY PERMIT

SURFACE OWNER BERNARD LEE YOHO, JR. (surface hole) ACREAGE 353 ACRES +/-  
OIL & GAS ROYALTY OWNER OXY USA, INC. ET AL. LEASE ACREAGE 490.45 ACRES +/-  
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 LOCATION  
PLUG & ABANDON \_\_\_\_\_ CLEAN OUT & REPLUG \_\_\_\_\_  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD= 7,522.52' MD= 17,314'  
WELL OPERATOR AMERICAN ENERGY-MARCELLUS DEDICATED AGENT BRANDON MCKINLEY  
ADDRESS 3501 NW 63rd STREET Office of Oil & Gas 3501 NW 63rd STREET  
OKLAHOMA CITY, OK 73116 OKLAHOMA CITY, OK 73116

COUNTY NAME  
PERMIT