

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

API 47-103-02978 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-3H
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 4384258.2 Easting 532774.7
Landing Point of Curve Northing 4384807.9 Easting 532920.2
Bottom Hole Northing 4386296.9 Easting 530793.7

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 07/12/2014 Date drilling ceased 10/09/2014
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

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

Reviewed by:
JK 6/25/15
WS 7/01/15

API 47-103 - 02978

Farm name WJ Criswell

Well number WJ Criswell 405 N-3H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	93'	New	H-40		
Surface	17-1/2"	13-3/8"	1304'	New	J-55		Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	3481'	New	J-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17361'	New	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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Class A	1075	15.6	1.18		0	5
Coal							
Intermediate 1	Type 1	1107	15.0	Lead 1.28, Tail 1.30	1429.3	0	5.18
Intermediate 2							
Intermediate 3							
Production	50/50 PNE	3147	1st & 2nd 14.3, Tail 14.7	1st 1.28, 2nd 1.31, Tail 1.50	4412.3	0	17.92
Tubing							

Drillers TD (ft) 17397

Loggers TD (ft) _____

Deepest formation penetrated Marcellus

Plug back to (ft) _____

Plug back procedure _____

Kick off depth (ft) 6386'

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 13 centralizers in the surface casing string, 22 in the intermediate casing and 121 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 - 02978

Farm name WJ Criswell

Well number WJ Criswell 405 N-3H

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 3905 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 11033 mcfpd Oil 5 bpd NGL 6.5 bpd Water 164 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
Shale	0	200	0	200	
Shale/Sand	200	1225	200	1225	
Pittsburgh Coal	1225	1227	1225	1227	
Shale/Sand	1227	2283	1227	2293	
Shale	2283	2334	2293	2344	
Shale/Sand	2234	2450	2344	2470	
Big Injun	2450	2700	2470	2716	
Shale/Sand	2700	3260	2716	3278	
Gordon	3260	3330	3278	3345	
Shale/Sand	3330	7217	3345	7788	
Middlesex	7217	7350	7788	8209	
Geneseo	7350	7359	8209	8234	
Tully	7359	7383	8234	8305	
	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

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

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Well Name WJ CRISWELL 405 N-3H	API 47103029780000	Property Number 1470010	Well Status PRODUCTION	State WEST VIRGINIA	County WETZEL	Well Spud Date 7/12/2014	RR Date 10/9/2014	Comp Date 3/11/2015
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Perforations

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
59	12/18/2014	7,414.1	7,414.7	8		Stg 59
59	12/18/2014	7,422.7	7,423.2	8		Stg 59
59	12/18/2014	7,430.8	7,431.3	8		Stg 59
59	12/18/2014	7,438.4	7,438.9	8		Stg 59
59	12/18/2014	7,445.8	7,446.3	8		Stg 59
58	12/17/2014	7,453.1	7,453.5	8		Stg 58
58	12/17/2014	7,459.8	7,460.2	8		Stg 58
58	12/17/2014	7,466.2	7,466.6	8		Stg 58
58	12/17/2014	7,472.3	7,472.7	8		Stg 58
58	12/17/2014	7,477.8	7,478.2	8		Stg 58
57	12/17/2014	7,482.5	7,482.8	8		Stg 57
57	12/17/2014	7,486.1	7,486.4	8		Stg 57
57	12/17/2014	7,489.3	7,489.5	8		Stg 57
57	12/17/2014	7,492.3	7,492.5	8		Stg 57
57	12/17/2014	7,495.4	7,495.6	8		Stg 57
56	12/16/2014	7,498.7	7,498.9	8		Stg 56
56	12/16/2014	7,501.9	7,502.1	8		Stg 56
56	12/16/2014	7,504.8	7,505.0	8		Stg 56
56	12/16/2014	7,507.2	7,507.3	8		Stg 56
56	12/16/2014	7,508.6	7,508.6	8		Stg 56
55	12/15/2014	7,509.2	7,509.2	8		Stg 55
55	12/15/2014	7,509.5	7,509.5	8		Stg 55
55	12/15/2014	7,509.7	7,509.7	8		Stg 55
55	12/15/2014	7,510.0	7,510.0	8		Stg 55
55	12/15/2014	7,510.3	7,510.3	8		Stg 55
54	12/15/2014	7,510.5	7,510.5	8		Stg 54
54	12/15/2014	7,510.6	7,510.6	8		Stg 54
54	12/15/2014	7,510.7	7,510.7	8		Stg 54
54	12/15/2014	7,510.8	7,510.8	8		Stg 54
54	12/15/2014	7,511.0	7,511.0	8		Stg 54
53	12/13/2014	7,511.1	7,511.1	8		Stg 53
53	12/13/2014	7,511.3	7,511.3	8		Stg 53
53	12/13/2014	7,511.4	7,511.4	8		Stg 53
53	12/13/2014	7,511.6	7,511.6	8		Stg 53
53	12/13/2014	7,511.7	7,511.7	8		Stg 53
52	12/12/2014	7,511.9	7,511.9	8		Stg 52
52	12/12/2014	7,512.0	7,512.0	8		Stg 52
52	12/12/2014	7,512.1	7,512.1	8		Stg 52
52	12/12/2014	7,512.2	7,512.2	8		Stg 52
52	12/12/2014	7,512.3	7,512.3	8		Stg 52
51	12/12/2014	7,512.4	7,512.4	8		Stg 51
51	12/12/2014	7,512.6	7,512.6	8		Stg 51
51	12/12/2014	7,512.6	7,512.6	8		Stg 51
51	12/12/2014	7,512.6	7,512.6	8		Stg 51
51	12/12/2014	7,512.6	7,512.6	8		Stg 51

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Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
50	12/11/2014	7,512.5	7,512.5	8		Stg 50
50	12/11/2014	7,512.5	7,512.5	8		Stg 50
50	12/11/2014	7,512.5	7,512.5	8		Stg 50
50	12/11/2014	7,512.4	7,512.4	8		Stg 50
50	12/11/2014	7,512.3	7,512.3	8		Stg 50
49	12/10/2014	7,512.2	7,512.2	8		Stg 49
49	12/10/2014	7,512.1	7,512.1	8		Stg 49
49	12/10/2014	7,511.9	7,511.9	8		Stg 49
49	12/10/2014	7,511.8	7,511.8	8		Stg 49
49	12/10/2014	7,511.6	7,511.6	8		Stg 49
48	12/10/2014	7,511.4	7,511.4	8		Stg 48
48	12/10/2014	7,511.3	7,511.3	8		Stg 48
48	12/10/2014	7,511.1	7,511.1	8		Stg 48
48	12/10/2014	7,511.0	7,511.0	8		Stg 48
48	12/10/2014	7,511.1	7,511.1	8		Stg 48
47	12/9/2014	7,511.4	7,511.4	8		Stg 47
47	12/9/2014	7,511.9	7,511.9	8		Stg 47
47	12/9/2014	7,512.5	7,512.5	8		Stg 47
47	12/9/2014	7,513.2	7,513.3	8		Stg 47
47	12/9/2014	7,514.0	7,514.1	8		Stg 47
46	12/9/2014	7,514.8	7,514.9	8		Stg 46
46	12/9/2014	7,515.6	7,515.6	8		Stg 46
46	12/9/2014	7,516.3	7,516.3	8		Stg 46
46	12/9/2014	7,516.8	7,516.8	8		Stg 46
46	12/9/2014	7,517.3	7,517.3	8		Stg 46
45	12/8/2014	7,517.6	7,517.7	8		Stg 45
45	12/8/2014	7,517.9	7,518.0	8		Stg 45
45	12/8/2014	7,518.2	7,518.2	8		Stg 45
45	12/8/2014	7,518.5	7,518.5	8		Stg 45
45	12/8/2014	7,518.8	7,518.8	8		Stg 45
44	12/7/2014	7,519.1	7,519.2	8		Stg 44
44	12/7/2014	7,519.5	7,519.5	8		Stg 44
44	12/7/2014	7,519.8	7,519.8	8		Stg 44
44	12/7/2014	7,520.1	7,520.1	8		Stg 44
44	12/7/2014	7,520.4	7,520.4	8		Stg 44
43	12/7/2014	7,520.6	7,520.6	8		Stg 43
43	12/7/2014	7,520.6	7,520.6	8		Stg 43
43	12/7/2014	7,520.7	7,520.7	8		Stg 43
43	12/7/2014	7,521.0	7,521.0	8		Stg 43
43	12/7/2014	7,521.4	7,521.4	8		Stg 43
42	12/6/2014	7,521.9	7,521.9	8		Stg 42
42	12/6/2014	7,522.4	7,522.4	8		Stg 42
42	12/6/2014	7,522.9	7,522.9	8		Stg 42
42	12/6/2014	7,523.4	7,523.4	8		Stg 42
42	12/6/2014	7,523.8	7,523.9	8		Stg 42
41	12/5/2014	7,524.3	7,524.4	8		Stg 41

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Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
41	12/5/2014	7,524.8	7,524.9	8		Stg 41
41	12/5/2014	7,525.4	7,525.4	8		Stg 41
41	12/5/2014	7,525.9	7,526.0	8		Stg 41
41	12/5/2014	7,526.4	7,526.5	8		Stg 41
40	12/5/2014	7,527.0	7,527.0	8		Stg 40
40	12/5/2014	7,527.5	7,527.5	8		Stg 40
40	12/5/2014	7,527.9	7,527.9	8		Stg 40
40	12/5/2014	7,528.2	7,528.2	8		Stg 40
40	12/5/2014	7,528.5	7,528.5	8		Stg 40
39	12/4/2014	7,528.8	7,528.9	8		Stg 39
39	12/4/2014	7,529.2	7,529.2	8		Stg 39
39	12/4/2014	7,529.5	7,529.5	8		Stg 39
39	12/4/2014	7,529.6	7,529.6	8		Stg 39
39	12/4/2014	7,529.7	7,529.7	8		Stg 39
38	12/4/2014	7,529.7	7,529.7	8		Stg 38
38	12/4/2014	7,529.7	7,529.7	8		Stg 38
38	12/4/2014	7,529.6	7,529.6	8		Stg 38
38	12/4/2014	7,529.5	7,529.5	8		Stg 38
38	12/4/2014	7,529.4	7,529.4	8		Stg 38
37	12/3/2014	7,529.4	7,529.4	8		Stg 37
37	12/3/2014	7,529.3	7,529.3	8		Stg 37
37	12/3/2014	7,529.3	7,529.3	8		Stg 37
37	12/3/2014	7,529.2	7,529.2	8		Stg 37
37	12/3/2014	7,529.1	7,529.1	8		Stg 37
36	12/2/2014	7,529.1	7,529.1	8		Stg 36
36	12/2/2014	7,529.0	7,529.0	8		Stg 36
36	12/2/2014	7,528.8	7,528.8	8		Stg 36
36	12/2/2014	7,528.6	7,528.6	8		Stg 36
36	12/2/2014	7,528.3	7,528.3	8		Stg 36
35	12/2/2014	7,528.0	7,528.0	8		Stg 35
35	12/2/2014	7,527.7	7,527.6	8		Stg 35
35	12/2/2014	7,527.3	7,527.3	8		Stg 35
35	12/2/2014	7,526.9	7,526.9	8		Stg 35
35	12/2/2014	7,526.6	7,526.5	8		Stg 35
34	12/1/2014	7,526.2	7,526.2	8		Stg 34
34	12/1/2014	7,525.8	7,525.8	8		Stg 34
34	12/1/2014	7,525.5	7,525.4	8		Stg 34
34	12/1/2014	7,525.1	7,525.1	8		Stg 34
34	12/1/2014	7,524.8	7,524.8	8		Stg 34
33	12/1/2014	7,524.5	7,524.5	8		Stg 33
33	12/1/2014	7,524.2	7,524.2	8		Stg 33
33	12/1/2014	7,524.0	7,524.0	8		Stg 33
33	12/1/2014	7,523.9	7,523.9	8		Stg 33
33	12/1/2014	7,523.7	7,523.7	8		Stg 33
32	11/25/2014	7,523.7	7,523.7	8		Stg 32
32	11/25/2014	7,523.6	7,523.6	8		Stg 32

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Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
32	11/25/2014	7,523.6	7,523.6	8		Stg 32
32	11/25/2014	7,523.6	7,523.6	8		Stg 32
32	11/25/2014	7,523.6	7,523.5	8		Stg 32
31	11/24/2014	7,523.5	7,523.5	8		Stg 31
31	11/24/2014	7,523.5	7,523.5	8		Stg 31
31	11/24/2014	7,523.4	7,523.4	8		Stg 31
31	11/24/2014	7,523.4	7,523.4	8		Stg 31
31	11/24/2014	7,523.4	7,523.4	8		Stg 31
30	11/24/2014	7,523.4	7,523.4	8		Stg 30
30	11/24/2014	7,523.5	7,523.5	8		Stg 30
30	11/24/2014	7,523.6	7,523.6	8		Stg 30
30	11/24/2014	7,523.7	7,523.7	8		Stg 30
30	11/24/2014	7,523.8	7,523.8	8		Stg 30
29	11/23/2014	7,524.0	7,524.0	8		Stg 29
29	11/23/2014	7,524.4	7,524.4	8		Stg 29
29	11/23/2014	7,524.8	7,524.8	8		Stg 29
29	11/23/2014	7,525.2	7,525.3	8		Stg 29
29	11/23/2014	7,525.7	7,525.7	8		Stg 29
28	11/23/2014	7,526.2	7,526.2	8		Stg 28
28	11/23/2014	7,526.2	7,526.2	8		Stg 28
28	11/23/2014	7,526.5	7,526.5	8		Stg 28
28	11/23/2014	7,526.7	7,526.7	8		Stg 28
28	11/23/2014	7,526.8	7,526.8	8		Stg 28
28	11/22/2014	7,526.9	7,526.9	8		Stg 27
27	11/22/2014	7,526.9	7,526.9	8		Stg 27
27	11/22/2014	7,527.0	7,527.0	8		Stg 27
27	11/22/2014	7,527.0	7,527.0	8		Stg 27
27	11/22/2014	7,527.1	7,527.1	8		Stg 27
27	11/22/2014	7,527.1	7,527.1	8		Stg 27
26	11/21/2014	7,527.1	7,527.1	8		Stg 26
26	11/21/2014	7,526.9	7,526.9	8		Stg 26
26	11/21/2014	7,526.7	7,526.7	8		Stg 26
26	11/21/2014	7,526.5	7,526.5	8		Stg 26
26	11/21/2014	7,526.0	7,526.0	8		Stg 26
25	11/21/2014	7,526.0	7,526.0	8		Stg 25
25	11/21/2014	7,525.8	7,525.8	8		Stg 25
25	11/21/2014	7,525.6	7,525.5	8		Stg 25
25	11/21/2014	7,525.3	7,525.3	8		Stg 25
25	11/21/2014	7,525.0	7,525.0	8		Stg 25
24	11/20/2014	7,524.8	7,524.8	8		Stg 24
24	11/20/2014	7,524.6	7,524.6	8		Stg 24
24	11/20/2014	7,524.4	7,524.4	8		Stg 24
24	11/20/2014	7,524.2	7,524.2	8		Stg 24
24	11/20/2014	7,524.0	7,524.0	8		Stg 23
23	11/20/2014	7,523.7	7,523.7	8		Stg 23
23	11/20/2014	7,523.4	7,523.4	8		Stg 23

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 OFFICE OF PERFORATIONS
 PERFORATIONS
 SECTION

Perforations

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
23	11/20/2014	7,523.1	7,523.1	8		Stg 23
23	11/20/2014	7,522.7	7,522.7	8		Stg 23
23	11/20/2014	7,522.4	7,522.3	8		Stg 22
22	11/19/2014	7,522.0	7,522.0	8		Stg 22
22	11/19/2014	7,521.7	7,521.7	8		Stg 22
22	11/19/2014	7,521.4	7,521.4	8		Stg 22
22	11/19/2014	7,521.1	7,521.1	8		Stg 22
22	11/19/2014	7,520.8	7,520.8	8		Stg 22
21	11/18/2014	7,520.7	7,520.6	8		Stg 21
21	11/18/2014	7,520.6	7,520.6	8		Stg 21
21	11/18/2014	7,520.7	7,520.7	8		Stg 21
21	11/18/2014	7,520.8	7,520.8	8		Stg 21
21	11/18/2014	7,520.8	7,520.8	8		Stg 21
20	11/18/2014	7,520.9	7,520.9	8		Stg 20
20	11/18/2014	7,521.0	7,521.0	8		Stg 20
20	11/18/2014	7,521.0	7,521.1	8		Stg 20
20	11/18/2014	7,521.1	7,521.1	8		Stg 20
20	11/18/2014	7,521.2	7,521.2	8		Stg 20
19	11/17/2014	7,521.3	7,521.3	8		Stg 19
19	11/17/2014	7,521.3	7,521.3	8		Stg 19
19	11/17/2014	7,521.4	7,521.4	8		Stg 19
19	11/17/2014	7,521.4	7,521.4	8		Stg 19
19	11/17/2014	7,521.4	7,521.4	8		Stg 19
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
18	11/17/2014	7,521.4	7,521.4	8		Stg 18
17	11/14/2014	7,521.4	7,521.4	8		Stg 17
17	11/14/2014	7,521.4	7,521.4	8		Stg 17
17	11/14/2014	7,521.4	7,521.4	8		Stg 17
17	11/14/2014	7,521.4	7,521.4	8		Stg 17
17	11/14/2014	7,521.3	7,521.3	8		Stg 17
16	11/13/2014	7,521.3	7,521.3	8		Stg 16
16	11/13/2014	7,521.2	7,521.2	8		Stg 16
16	11/13/2014	7,521.2	7,521.2	8		Stg 16
16	11/13/2014	7,521.1	7,521.1	8		Stg 16
16	11/13/2014	7,521.0	7,521.0	8		Stg 16
15	11/12/2014	7,521.0	7,521.0	8		Stg 15
15	11/12/2014	7,520.9	7,520.9	8		Stg 15
15	11/12/2014	7,520.8	7,520.8	8		Stg 15
15	11/12/2014	7,520.7	7,520.7	8		Stg 15
15	11/12/2014	7,520.7	7,520.7	8		Stg 15
14	11/11/2014	7,520.8	7,520.8	8		Stg 14
14	11/11/2014	7,520.9	7,520.9	8		Stg 14
14	11/11/2014	7,520.9	7,520.9	8		Stg 14

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Perforations

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
14	11/11/2014	7,521.0	7,521.0	8		Stg 14
14	11/11/2014	7,521.1	7,521.1	8		Stg 14
13	11/11/2014	7,521.3	7,521.3	8		Stg 13
13	11/11/2014	7,521.6	7,521.6	8		Stg 13
13	11/11/2014	7,522.0	7,522.0	8		Stg 13
13	11/11/2014	7,522.3	7,522.3	8		Stg 13
13	11/11/2014	7,522.5	7,522.5	8		Stg 13
12	11/10/2014	7,522.7	7,522.7	8		Stg 12
12	11/10/2014	7,522.8	7,522.9	8		Stg 12
12	11/10/2014	7,523.0	7,523.0	8		Stg 12
12	11/10/2014	7,523.1	7,523.1	8		Stg 12
12	11/10/2014	7,523.3	7,523.3	8		Stg 12
11	11/10/2014	7,523.5	7,523.5	8		Stg 11
11	11/10/2014	7,523.7	7,523.7	8		Stg 11
11	11/10/2014	7,524.0	7,524.0	8		Stg 11
11	11/10/2014	7,524.3	7,524.3	8		Stg 11
11	11/10/2014	7,524.6	7,524.6	8		Stg 11
10	11/9/2014	7,524.9	7,525.0	8		Stg 10
10	11/9/2014	7,525.2	7,525.2	8		Stg 10
10	11/9/2014	7,525.5	7,525.5	8		Stg 10
10	11/9/2014	7,525.7	7,525.7	8		Stg 10
10	11/9/2014	7,525.8	7,525.8	8		Stg 10
9	11/9/2014	7,525.8	7,525.8	8		Stg 9
9	11/9/2014	7,525.8	7,525.8	8		Stg 9
9	11/9/2014	7,525.8	7,525.8	8		Stg 9
9	11/9/2014	7,525.8	7,525.8	8		Stg 9
9	11/9/2014	7,525.9	7,525.9	8		Stg 9
8	11/8/2014	7,525.9	7,525.9	8		Stg 8
8	11/8/2014	7,526.0	7,526.0	8		Stg 8
8	11/8/2014	7,526.0	7,526.0	8		Stg 8
8	11/8/2014	7,526.0	7,526.1	8		Stg 8
8	11/8/2014	7,526.1	7,526.1	8		Stg 8
7	11/7/2014	7,526.2	7,526.2	8		Stg 7
7	11/7/2014	7,526.2	7,526.2	8		Stg 7
7	11/7/2014	7,526.3	7,526.3	8		Stg 7
7	11/7/2014	7,526.4	7,526.4	8		Stg 7
7	11/7/2014	7,526.4	7,526.4	8		Stg 7
6	11/7/2014	7,526.4	7,526.4	8		Stg 6
6	11/7/2014	7,526.4	7,526.5	8		Stg 6
6	11/7/2014	7,526.7	7,526.7	8		Stg 6
6	11/7/2014	7,527.0	7,527.1	8		Stg 6
6	11/7/2014	7,527.4	7,527.5	8		Stg 6
5	11/6/2014	7,527.9	7,527.9	8		Stg 5
5	11/6/2014	7,528.3	7,528.3	8		Stg 5
5	11/6/2014	7,528.7	7,528.7	8		Stg 5
5	11/6/2014	7,529.1	7,529.2	8		Stg 5

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Perforations

Stage #	Date	Top (TVD) (ftKB)	Btm (TVD) (ftKB)	Shots Plan	Current Status	Com
5	11/6/2014	7,529.6	7,529.6	8		Stg 5
4	11/6/2014	7,530.0	7,530.0	8		Stg 4
4	11/6/2014	7,530.4	7,530.4	8		Stg 4
4	11/6/2014	7,530.8	7,530.8	8		Stg 4
4	11/6/2014	7,531.2	7,531.3	8		Stg 4
4	11/6/2014	7,531.6	7,531.7	8		Stg 4
3	11/5/2014	7,532.1	7,532.1	8		Stg 3
3	11/5/2014	7,532.5	7,532.5	8		Stg 3
3	11/5/2014	7,532.9	7,532.9	8		Stg 3
3	11/5/2014	7,533.3	7,533.3	8		Stg 3
3	11/5/2014	7,533.6	7,533.7	8		Stg 3
2	11/4/2014	7,533.9	7,533.9	8		Stg 2
2	11/4/2014	7,533.9	7,533.9	8		Stg 2
2	11/4/2014	7,533.9	7,533.9	8		Stg 2
2	11/4/2014	7,533.8	7,533.8	8		Stg 2
2	11/4/2014	7,533.7	7,533.7	8		Stg 2
1	10/30/2014	7,533.6	7,533.6	8		Stg 1
1	10/30/2014	7,533.5	7,533.5	8		Stg 1
1	10/30/2014	7,533.3	7,533.3	8		Stg 1
1	10/30/2014	7,533.1	7,533.1	8		Stg 1
1	10/30/2014	7,532.9	7,532.9	8		Stg 1

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Well Name WJ CRISWELL 405 N-3H	API 47103029780000	Property Number 1470010	Well Status PRODUCTION	State WEST VIRGINIA	County WETZEL	Well Spud Date 7/12/2014	RR Date 10/9/2014	Comp Date 3/11/2015
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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)
1	11/4/2014	77	8,756.0	6,798.0	4,445.0	225,000	5033.00
2	11/5/2014	70	9,201.0	7,212.0	4,535.0	225,000	6084.00
3	11/5/2014	80	8,505.0	6,041.0	4,712.0	225,000	5246.00
4	11/6/2014	79	8,365.0	5,597.0	4,298.0	225,000	4805.00
5	11/7/2014	80	8,361.0	5,868.0	4,676.0	224,400	4903.00
6	11/7/2014	79	8,595.0	5,983.0	4,461.0	224,200	4859.00
7	11/8/2014	78	8,625.0	5,799.0	5,055.0	225,500	4715.00
8	11/9/2014	78	8,450.0	5,635.0	5,978.0	225,000	4598.00
9	11/9/2014	80	8,432.0	5,809.0	5,727.0	225,000	4734.00
10	11/10/2014	80	8,375.0	5,943.0	4,525.0	225,000	4614.00
11	11/10/2014	80	8,495.0	5,950.0	4,680.0	224,900	4677.00
12	11/11/2014	72	9,029.0	5,994.0	4,807.0	225,200	4700.00
13	11/11/2014	80	8,382.0	5,920.0	6,035.0	228,800	4579.00
14	11/12/2014	80	8,235.0	6,008.0	5,757.0	225,000	4623.00
15	11/13/2014	80	8,375.0	6,170.0	5,522.0	225,000	4588.00
16	11/14/2014	75	8,563.0	5,735.0	5,145.0	225,000	4580.00
17	11/17/2014	78	8,471.0	5,560.0	5,454.0	225,000	4678.00
18	11/17/2014	80	8,201.0	5,925.0	5,062.0	225,000	4746.00
19	11/18/2014	80	8,235.0	5,898.0	4,390.0	225,100	4600.00
20	11/18/2014	80	8,305.0	6,030.0	4,957.0	225,000	4468.00
21	11/19/2014	80	8,171.0	6,185.0	5,184.0	225,000	4701.00
22	11/20/2014	80	8,487.0	6,690.0	5,150.0	225,000	4893.00
23	11/20/2014	80	8,081.0	5,781.0	5,085.0	224,700	4574.00
24	11/21/2014	80	8,044.0	5,980.0	4,877.0	225,000	4608.00
25	11/21/2014	80	8,112.0	5,976.0	6,029.0	211,700	4543.00
26	11/22/2014	80	8,066.0	5,958.0	5,521.0	238,300	4565.00
27	11/23/2014	80	8,074.0	6,212.0	6,430.0	225,000	4381.00
28	11/23/2014	77	8,167.0	6,151.0	4,999.0	225,000	4454.00
29	11/24/2014	78	8,155.0	6,646.0	4,742.0	225,000	4394.00
30	11/24/2014	80	8,111.0	5,920.0	4,026.0	225,000	4530.00
31	11/25/2014	80	7,976.0	5,763.0	4,251.0	225,000	4541.00
32	12/1/2014	79	8,567.0	6,448.0	4,572.0	225,000	4613.00
33	12/1/2014	80	8,528.0	6,374.0	4,806.0	224,500	4486.00
34	12/2/2014	80	8,023.0	5,897.0	4,544.0	225,300	4608.00
35	12/2/2014	80	7,835.0	5,693.0	4,988.0	225,000	4520.00
36	12/3/2014	79	8,370.0	5,945.0	4,792.0	225,000	4560.00
37	12/4/2014	79	7,956.0	6,082.0	5,178.0	225,300	4323.00
38	12/4/2014	80	7,932.0	5,657.0	3,907.0	225,000	4437.00
39	12/5/2014	80	7,407.0	5,599.0	4,611.0	225,000	4568.00
40	12/5/2014	80	7,852.0	5,794.0	4,234.0	225,000	4572.00
41	12/6/2014	78	8,210.0	6,039.0	5,456.0	225,000	4527.00
42	12/7/2014	78	8,234.0	5,648.0	5,436.0	225,300	4677.00
43	12/7/2014	79	8,240.0	5,510.0	4,430.0	225,000	4542.00
44	12/8/2014	80	7,743.0	5,658.0	4,065.0	225,000	4449.00

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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	12/9/2014	80	8,220.0	5,800.0	3,959.0	225,000	4355.00
46	12/9/2014	83	7,934.0	5,492.0	4,908.0	225,000	4350.00
47	12/10/2014	83	7,410.0	5,706.0	5,926.0	225,000	4346.00
48	12/10/2014	81	8,050.0	6,144.0	4,365.0	225,000	4275.00
49	12/11/2014	80	8,080.0	6,287.0	4,426.0	224,900	4304.00
50	12/12/2014	81	7,940.0	5,850.0	5,284.0	224,700	4175.00
51	12/12/2014	81	8,136.0	6,005.0	5,636.0	225,000	4243.00
52	12/13/2014	81	7,791.0	5,944.0	5,450.0	225,000	4279.00
53	12/15/2014	80	7,772.0	5,721.0	4,706.0	224,900	4116.00
54	12/15/2014	80	7,521.0	5,820.0	5,812.0	225,000	4198.00
55	12/16/2014	80	7,634.0	6,061.0	5,575.0	225,000	4006.00
56	12/17/2014	81	7,461.0	5,724.0	4,311.0	225,000	4171.00
57	12/17/2014	80	7,812.0	6,285.0	4,644.0	225,000	4068.00
58	12/18/2014	80	7,643.0	7,072.0	4,707.0	225,100	4089.00
59	12/18/2014	81	7,038.0	7,042.0	3,905.0	225,000	4217.00

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Formation / Lithology	Top	Top	Bottom	Bottom
	Depth	Depth	Depth	Depth
	MD	TVD	MD	TVD
Shale	0	0	200	200
Shale/Sand	200	200	1225	1225
PITTSBURGH COAL	1225	1225	1227	1227
Shale/Sand	1227	1227	2293	2283
Shale	2293	2283	2344	2334
Shale/Sand	2344	2334	2470	2450
BIG INJUN	2470	2450	2716	2700
Shale/Sand	2716	2700	3278	3260
GORDON	3278	3260	3345	3330
Shale/Sand	3345	3330	7788	7217
MIDDLESEX	7,788	7217	8209	7350
GENESE0	8,209	7350	8234	7359
TULLY	8,234	7,359	8305	7383
HAMILTON	8305	7383	8646	7472
MARCELLUS	8,646	7472		
TD OF LATERAL			17397	7532

Received
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JUN 11 2015

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/4/2014
Job End Date:	12/18/2014
State:	West Virginia
County:	Wetzel
API Number:	47-103-02978-00-00
Operator Name:	American Energy Utica
Well Name and Number:	WJ-Criswell 405 N-3H
Longitude:	-80.61841670
Latitude:	39.60736110
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,521
Total Base Water Volume (gal):	11,238,570
Total Base Non Water Volume:	0



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Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	86.51198	None
Sand (Proppant)	PSC	Proppant	Silica Substrate	14808-60-7	100.00000	12.24798	None
PRO GEL 4.0L	Producers Service Corp	Gelling Agent	Distillates (Petroleum), hydrotreated light	64742-47-8	65.00000	0.06220	None
			Guar Gum	9000-30-0	50.00000	0.04784	None
			Nonionic Surfactant	60828-78-6	5.00000	0.00478	None
			Nonylphenol, Ethoxylate	9016-45-9	5.00000	0.00478	None
			Nonionic Surfactant	60828-78-6	5.00000	0.00478	None
Hydrochloric Acid (15%)	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	10.00000	0.09719	None
FRA 407	Producers Service Corp	Friction Reducer	Petroleum Distillates	64742-47-8	40.00000	0.03194	None
			Polyacrylamide salt	Proprietary	30.00000	0.02395	None
			Ethoxylate Alcohol	Proprietary	5.00000	0.00395	None
			Sodium Chloride	7647-14-5	5.00000	0.00395	None

			Ammonium Chloride	12125-02-9	5.00000	0.00399	None
			Fall oil	Proprietary	2.00000	0.00160	None
			Proprietary Ingredient	Proprietary	1.00000	0.00080	None
PRO FLO 102 M	Producers Service Corp	Surfactant					
			Methyl Alcohol	67-56-1	60.00000	0.03788	None
			N-dodecyl-2-pyrrolidone	2687-96-9	5.00000	0.00316	None
PRO SCALE CLEAR 112	Producers Service Corp	Scale Inhibitor					
			Polymer	Proprietary	50.00000	0.00696	None
			ethylene glycol	107-21-1	40.00000	0.00557	None
BIO CLEAR 2000	Producers Service Corp	Biocide					
			Polyether	25322-68-3	48.00000	0.00696	None
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00290	None
			Proprietary Ingredient	Proprietary	2.00000	0.00029	None
			Proprietary Ingredient	Proprietary	1.00000	0.00015	None
PROHIB II	Producers Service Corp	Inhibitor					
			Dimethylcocoamine, bis (chloroethyl) ether, diquatary ammonium salt	68607-28-3	40.00000	0.00035	None
			Ethylene Glycol	107-21-1	20.00000	0.00018	None
			2-Butoxyethanol	111-76-2	20.00000	0.00018	None
			Methyl Alcohol	67-56-1	20.00000	0.00018	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00013	None
			Propargyl Alcohol	107-19-7	15.00000	0.00013	None
			Coco alkyldimethylamines	61788-93-0	2.50000	0.00002	None
PRO BREAKER 4	Producers Service Corp	Breaker					
			Sucrose	57-50-1	40.00000	0.00006	None
			Ethylene Glycol	107-21-1	40.00000	0.00006	None
			Hexamethylenetetramine	100-97-0	1.00000	0.00000	None
			Polyether Polyol	9003-11-6	1.00000	0.00000	None
			Proprietary Ingredient	Proprietary	1.00000	0.00000	None
			Sodium Bicarbonate	144-55-8	1.00000	0.00000	None
			Proprietary Ingredient	Proprietary	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
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 JUN 11 2015

BOTTOM HOLE: LON:-80°38'29.0"

LON:-80°37'06.2"

9875

LAT: 39°37'30"

LON: 80°35'00"

6415

LAT:39°36'26.6" BOTTOM HOLE: LAT:39°37'32.9"

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 & adjacenters information obtained from Wetzel Co. Assessors Office. Lease names, & line mapping provided by HGE GIS system. Ends of unit lines mapped by MLS LLC & HGE.

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

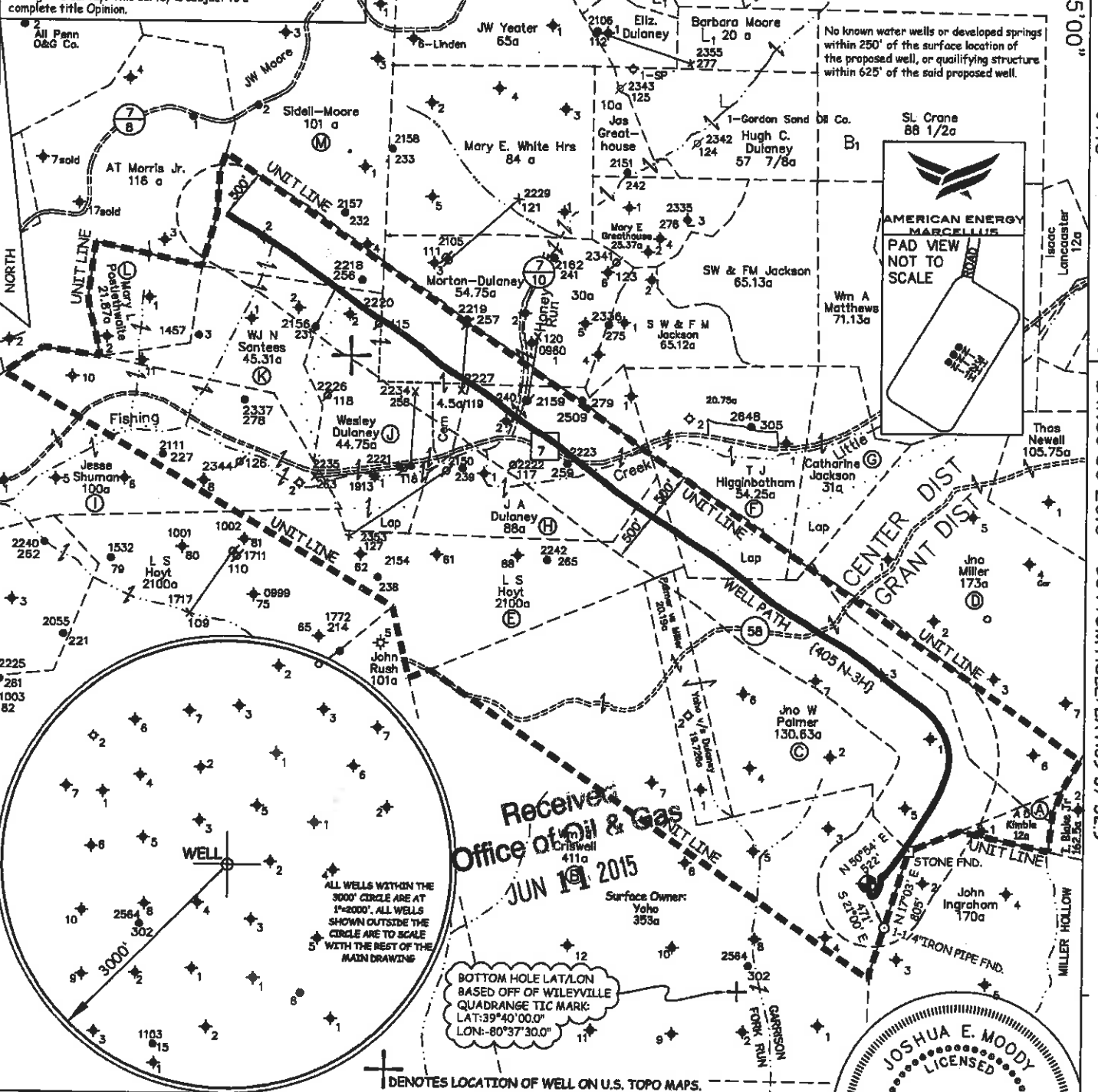
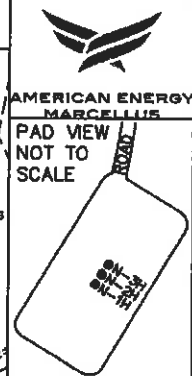
UTM Coordinates
(Zone 17N-NAD 1983)

Surface N-4,384,262m.
E-532,777m.

Bottom Hole N-4,386,296m.
E-530,793m.

UTM 27 LOCATION REFERENCES
N 50°54' E 522' STONE FOUND
S 21°00' E 471' IRON PIPE FOUND

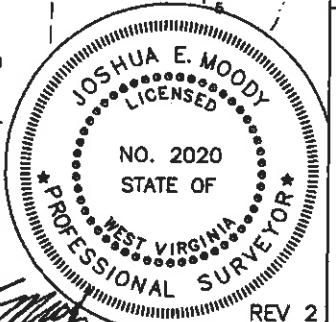
No known water wells or developed springs within 250' of the surface location of the proposed well, or qualifying structure within 625' of the said proposed well.



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JUN 19 2015

BOTTOM HOLE LAT/LON
BASED OFF OF WILEYVILLE
QUADRANGE TIC MARK:
LAT:39°40'00.0"
LON:-80°37'30.0"

⊕ DENOTES LOCATION OF WELL ON U.S. TOPO MAPS.



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

JOSHUA E. MOODY, P.S. 2020
DATE 10/27/14
OPERATOR'S WELL # 405 N-3H

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= 7,532.86' MD= 17,397'
WELL OPERATOR AMERICAN ENERGY-MARCELLUS DESIGNATED AGENT BRANDON MCKINLEY
ADDRESS 3501 NW 63rd STREET ADDRESS 3501 NW 63rd STREET
OKLAHOMA CITY, OK 73116 OKLAHOMA CITY, OK 73116

COUNTY NAME
PERMIT