

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

API 47 - 103 - 02974 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-1H
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 4384250.6 Easting 532769.6
Landing Point of Curve Northing 4384299.9 Easting 532582.9
Bottom Hole Northing 4385821.5 Easting 530409.7

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 02/26/2014 Date drilling commenced 5/27/2014 Date drilling ceased 8/27/2014
Date completion activities began 3/11/2015 Date completion activities ceased _____
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 558' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2230' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1194' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

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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	24"	20"	57'	New	J-55		Y
Surface	17-1/2"	13-3/8"	1241'	New	J-55		Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	3514'	New	J-55		Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16500'	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	1230	15.6	1.17	1128	1340'	
Coal							
Intermediate 1							
Intermediate 2	Type 1	1109	15	Lead 1.29, Tail 1.30	1431.5	3550'	8
Intermediate 3							
Production	50/50 PNE	3000	1st & 2nd 14.3, Tail 14.7	1st 1.23, 2nd 1.31, Tail 1.50	4150.8	16512'	20.57
Tubing							

Drillers TD (ft) 16512' 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 6 centralizers in the surface casing string, 23 in the intermediate casing and 128 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 _____

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	7596'	TVD	16419' MD
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3802 psi Bottom Hole _____ psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 8078 mcfpd Oil 90 bpd NGL 0 bpd Water 189 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	154	0	154	
Shale/Sand	154	1194	154	1194	
Pittsburgh Coal	1194	1196	1194	1194	
Shale/Sand	1194	2250	1196	2250	
Shale	2250	2364	2250	2364	
Shale/Sand	2364	2396	2364	2402	
Big Injun	2396	2640	2402	2648	
Shale/Sand	2640	3228	2648	3236	
Gordon	3228	3301	3236	3309	
Shale/Sand	3301	7163	3309	7236	
Middlesex	7163	7341	7236	7573	
Geneseo	7341	7350	7573	7605	
Tully	7350	7374	7605	7682	
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