

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

API 47-001-03267 County Barbour District Cove
Quad Thorton 7.5' Pad Name Mackey-Wolfe Field/Pool Name _____
Farm name Mackey-Wolfe Well Number 203
Operator (as registered with the OOG) Mountaineer Keystone
Address 1111 Van Voorhis Road, Suite G City Morgantown State WV Zip 26505

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 14257569.236 Easting 1955594.199
Landing Point of Curve Northing 14258006.32 Easting 1954852.76
Bottom Hole Northing 14264387.87 Easting 1951984.35

Elevation (ft) 1647.6 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)
Fresh Water on surface and intermediate, light WBM on vertical. SOBM on curve and lateral

Date permit issued 8-6-2013 Date drilling commenced 9-23-2013 Date drilling ceased 10-16-2012
Date completion activities began 10/28/13 Date completion activities ceased 12/2/13
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 None noted Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted Void(s) encountered (Y/N) depths N
Coal depth(s) ft None noted - See tops Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:
EC

API 47-001 - 03267 Farm name Mackey-Wolfe Well number 203

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	20"	20"	40	New	78.6 - J-55	None	NA
Surface	17 - 1/2"	13 - 3/8"	800	New	54.5 - J-55	None	Y
Coal							
Intermediate 1	12 - 1/4"	9 - 5/8"	1939	New	36 - J-55	None	Y
Intermediate 2							
Intermediate 3							
Production	8 - 3/4"	5.5"	15378	New	20 - P110	None	Y
Tubing							
Packer type and depth set							

Comment Details Conductor pipe was driven in. Surface cement job had full returns throughout job with 40 bbls of cement returned to surface. Intermediate casing also had full returns throughout job with 23 bbls of cement returned at surface.
Production cement job and top of cement at 1,800' and full returns throughout job. Cement spacer was returned at surface to confirm top of cement.

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	NA	NA	NA	NA	NA	NA	NA
Surface	Type-1	808	15.6	1.18	953.4	Surface	8
Coal							
Intermediate 1	Type -1	655	15.6	1.2	786	Surface	8
Intermediate 2							
Intermediate 3							
Production	50/50 Poz	3152	14.5	1.2	3782.4	1,800	8
Tubing							

Drillers TD (ft) 15,398' Loggers TD (ft) NA
Deepest formation penetrated Marcellus Shale Plug back to (ft) _____
Plug back procedure _____

Kick off depth (ft) 6,800'

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 20"- No centralizers
13 3/8" - one bow spring centralizer on every joint
9 5/8" - one bow spring centralizer every third joint from TD to surface
5- 1/2" - one semi rigid centralizer on every other joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 3,000 TOC will be 3,000'; there will be no centralizers from 3'000' to surface.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 1,400 Shots of Titan 22.7 gr charges in a 3-1/8" gun shot at 60 degrees phasing

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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Farm name Mackey-Wolfe

Well number 203

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	11/1/13	15090	15248	40	Marcellus
2	11/2/13	14890	15048	40	Marcellus
3	11/2/13	14690	14848	40	Marcellus
4	11/3/13	14490	14648	40	Marcellus
5	11/4/13	14290	14445	40	Marcellus
6	11/4/13	14095	14248	40	Marcellus
7	11/4/13	13890	14048	40	Marcellus
8	11/4/13	13690	13848	40	Marcellus
9	11/5/13	13490	13648	40	Marcellus
10	11/5/13	13290	13448	40	Marcellus
11	11/5/13	13090	13248	40	Marcellus
12	11/5/13	12890	13048	40	Marcellus
13	11/6/13	12690	12845	40	Marcellus
14	11/6/13	12495	12648	40	Marcellus
15	11/6/13	12290	12448	40	Marcellus
16	11/6/13	12090	12248	40	Marcellus

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)
1	11/2/13	75	8409	6194	5585	259560	8247	0
2	11/2/13	76	8501	5859	5614	375100	7557	0
3	11/2/13	76	8322	6824	5682	402700	8959	0
4	11/3/13	76	8263	7469	5671	397300	7867	0
5	11/3/13	76	8241	5882	5833	290820	6691	0
6	11/3/13	80	8158	6012	5235	402540	8063	0
7	11/3/13	75	8196	6183	5304	403200	8801	0
8	11/4/13	82	8090	5992	5917	395880	7948	0
9	11/4/13	82	8308	6226	6081	391840	7721	0
10	11/4/13	81	8242	6135	6298	399220	7612	0
11	11/4/13	81	8325	6381	6230	399840	7768	0
12	11/5/13	77	8490	7181	6136	214860	6210	0
13	11/5/13	80	8284	6583	6143	296700	7049	0
14	11/5/13	81	8415	6976	5952	28660	7222	0
15	11/5/13	81	8177	6435	6114	400260	7459	0
16	11/6/13	81	8170	6309	5563	400600	7596	0

Please insert additional pages as applicable.

API 47- _____ - _____ Farm name _____ Well number _____

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
	TVD	MD
Marcellus Shale		

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

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

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd
 GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
See Attachment					

Please insert additional pages as applicable.

Drilling Contractor Patterson -UTI
 Address P.O Box 260111 City Dallas State TX Zip 75321

Logging Company NA
 Address _____ City _____ State _____ Zip _____

Cementing Company Universal Well Services Inc
 Address 18360 Technology Drive Box 4 City Meadville State PA Zip 16335

Stimulating Company _____
 Address _____ City _____ State _____ Zip _____

Please insert additional pages as applicable.

Completed by Amy Miller Telephone 724-940-1100
 Signature _____ Title Regulatory Compliance Specialist Date 12/31/13