

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

API 47 - 075 - 00027-00-00 County Pocahontas District Greenbank
Quad Sinks of Gandy Pad Name _____ Field/Pool Name Glady
Farm name U.S.A. Dept. Int. Tr. 26 Well Number 7459
Operator (as registered with the OOG) Columbia Gas Transmission, LLC
Address 1700 MacCorkle Ave. SE City Charleston State WV Zip 25314

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4285253.66 Easting 609512.50
Landing Point of Curve Northing N/A Easting N/A
Bottom Hole Northing Not measured (vertical wellbore) Easting Not measured (vertical wellbore)

Elevation (ft) 3817.8 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 5/21/2018 Date drilling commenced N/A Date drilling ceased N/A
Date completion activities began 11/30/2018 Date completion activities ceased 12/4/2018
Verbal plugging (Y/N) N/A 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 80 (reported by driller in 1965) Open mine(s) (Y/N) depths N
Salt water depth(s) ft None reported by driller in 1965 Void(s) encountered (Y/N) depths None reported by driller in 1965
Coal depth(s) ft None reported by driller in 1965 Cavern(s) encountered (Y/N) depths None reported by driller in 1965
Is coal being mined in area (Y/N) N

Reviewed
Danay Miller

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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		13-3/8"	32'	Used	48 lbs./ft.		Y
Surface							
Coal							
Intermediate 1		9-5/8"	1494'	Used	32 lbs./ft.		Y
Intermediate 2							
Intermediate 3							
Production		7"	6564'	Used	23 lbs./ft.		Y
Tubing							
Packer type and depth set							

Comment Details 2-3/8" tubing was removed during rework.

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							
Coal							
Intermediate 1					668 cu. ft.		
Intermediate 2							
Intermediate 3							
Production					1484 cu. ft.		
Tubing							

Drillers TD (ft) 6855' Loggers TD (ft) 6855'

Deepest formation penetrated Helderberg 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 _____

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS Open hole from 6564' to 6855'.

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

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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

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)
	11/30/18							160 bbl acid
	11/30/18							143000 SCF <input checked="" type="checkbox"/>
	12/3/18						187 bbl	213 bbl acid
	12/3/18							135000 SCF <input checked="" type="checkbox"/>
	12/4/18						75 bbl	315000 SCF <input checked="" type="checkbox"/>

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Oriskany	6567'	TVD	6567' MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1850 psi Bottom Hole 2425 psi DURATION OF TEST 3.75 hrs

OPEN FLOW Gas 4019 mcfpd Oil _____ bpd NGL _____ bpd Water _____ 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)
Sandstone/Shale	0	5979'	0	5979'	Fresh water at 80' (as reported by driller in 1965)
Tully Limestone	5979'	6000'	5979'	6000'	
Marcellus Shale	6000'	6293'	6000'	6293'	
Metabentonite	6293'	6293'	6293'	6293'	
Onodaga Limestone	6293'	6347'	6293'	6347'	
Chert	6347'	6500'	6347'	6500'	
Cherty Shale	6500'	6528'	6500'	6528'	
Needmore Shale	6528'	6567'	6528'	6567'	
Oriskany Sandstone	6567'	6781'	6567'	6781'	Gas at 6592' (as reported by driller in 1965)
Helderberg Limestone	6781'	6855'	6781'	6855'	

Please insert additional pages as applicable.

Drilling Contractor _____
Address _____ City _____ State _____ Zip _____

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company _____
Address _____ City _____ State _____ Zip _____

Stimulating Company Key Energy Services, Inc.
Address Weatherford Boulevard City Buckhannon State WV Zip 26201

Please insert additional pages as applicable.

Completed by Brad Nelson Telephone 724-250-0610
Signature *Brad Nelson* Title Storage Engineer Date 12/13/2018 RECEIVED Office of Oil and Gas

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

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