



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Thursday, May 13, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for GLADYS BRIGGS MSH 405H
47-051-02371-00-00

Modifications Approved: Cement Changes, Update Rig Information, Increase Intermediate Casing Depth

SWN PRODUCTION COMPANY, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A handwritten signature in blue ink that reads "James A. Martin".

James A. Martin
Chief

Operator's Well Number: GLADYS BRIGGS MSH 405H
Farm Name: GLADYS R. BRIGGS ESTATE
U.S. WELL NUMBER: 47-051-02371-00-00
Horizontal 6A New Drill
Date Modification Issued: May 17, 2021

Promoting a healthy environment.

05/21/2021

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: SWN Production Co., LLC 494512924 051-MARsha 4-Liberty 278-Cameron
Operator ID County District Quadrangle

2) Operator's Well Number: Gladys Briggs MSH 405H Well Pad Name: Gladys Briggs MSH pad

3) Farm Name/Surface Owner: Gladys R. Briggs Estate Public Road Access: Fish Creek Road

4) Elevation, current ground: 1383' Elevation, proposed post-construction: 1383'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 7117', Target Base TVD- 7163', Anticipated Thickness- 46', Associated Pressure- 4656

8) Proposed Total Vertical Depth: 7148'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16,849'

11) Proposed Horizontal Leg Length: 8257.20'

12) Approximate Fresh Water Strata Depths: 732'

13) Method to Determine Fresh Water Depths: Salinity Profile Analysis and offset water wells

14) Approximate Saltwater Depths: 1220' Salinity Profile

15) Approximate Coal Seam Depths: 1099'

16) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: Marshall County Coal Resources, Inc.
Depth: 1099'
Seam: Pittsburgh
Owner: American Consolidated Natural Resources

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18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	802'	802'	912 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J/K-55	36#/40#	2700'	2700'	1068 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	16849'	16849'	Tall 2967 sx/ 100' Inside Intermediate
Tubing							
Liners							

Bryan Harris
4-21-21

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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Southwestern Energy Company

Proposed Drilling Program

Well: **GLADYS BRIGGS MSH 405**
 Field: **VICTORY FIELD WET**
 County: **MARSHALL**
 SHL: **39.7671 Latitude -80.6160 Longitude**
 BHL: **39.7921 Latitude -80.6258 Longitude**
 KB Elev: **1,409 ft MSL**

Re-entry Rig: **SDC 41**
 Prospect: **Marcellus Shale**
 State: **WV**
 KB: **26 ft AGL** GL Elev: **1,383 ft MSL**



No COAL VOID Anticipated

Gas Storage Interval : 1,991' - 2,492' (Maxton, Big Injun)
 PROD TOC@ 2,800' MD

TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval	
				From	To
Conductor	20	94.0 #	J-55	0'	126'
Surface	13.375	48.0 #	H-40	0'	802'
Intm/Coal	9.625	36# / 40#	J/K-55	0'	2,700'
Production	5.5	20.0 #	P-110 HP	0'	16,849'

126' to 822' Air/Mist
 822' to 1,800' Air/Mist
 1,800' to 2,720' 10.5# WBM
 2,720' to 7,095' Air/Mist
 Air TD at 7,095'

CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	912	A	15.6
Intermediate:	1068	A	15.6-16.0
Production:	2967	A	14.5-15.6

7,095' to 8,216' 12.0-12.2 ppg
 8,216' to 16,849' 12.2-13.0 ppg

KOP at 7,095' MD

Freshwater Depth - 732' TVD
 Coal Depth - 1,099' TVD
 Saltwater Depth - 1,220' TVD
 TVD - 7,148'
 TMD - 16,849'

7,148' Target Center

TD at 16,849' MD
 7,145' TVD

EOB at 8,216' MD

Onondaga 7,160' TVD

SHL Onondaga 7,163' TVD

Created by: Alex Pfeifer on 04/19/2021

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