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west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Monday, November 2, 2020  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC  
POST OFFICE BOX 12359  
SPRING, TX 773914954

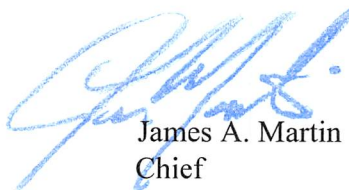
Re: Permit Modification Approval for STATE OF WV DNR C BRK 10H  
47-009-00309-00-00

**Cement yield on Casing Plan Updated**

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, appearing to read 'James A. Martin', is positioned above the printed name and title.

James A. Martin  
Chief

Operator's Well Number: STATE OF WV DNR C BRK 10H  
Farm Name: STATE OF W.V. DNR  
U.S. WELL NUMBER: 47-009-00309-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 11/02/2020

**Promoting a healthy environment.**

WW-6B  
(04/15)

API NO. 47-009 - 00309  
OPERATOR WELL NO. State of WV DNR C BRK 10H  
Well Pad Name: State of WV DNR C BRK

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 009-Brooke 4-Cross 620-Steubenville  
Operator ID County District Quadrangle

2) Operator's Well Number: State of WV DNR C BRK 10H Well Pad Name: State of WV DNR C BRK

3) Farm Name/Surface Owner: State of WV DNR Public Road Access: Putney Ridge Road

4) Elevation, current ground: 993' Elevation, proposed post-construction: 990'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

6) Existing Pad: Yes or No No 

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Target Formation- Marcellus, Vertical Well, Target Top TVD- 5655', Target Base TVD- 5755', Anticipated Thickness- 100', Associated Pressure- 3741

8) Proposed Total Vertical Depth: \_\_\_\_\_

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: \_\_\_\_\_

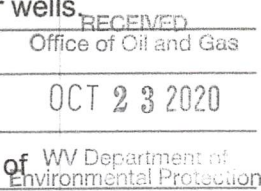
11) Proposed Horizontal Leg Length: \_\_\_\_\_

12) Approximate Fresh Water Strata Depths: 396'

13) Method to Determine Fresh Water Depths: Salinity profiles, deeper than nearby water wells

14) Approximate Saltwater Depths: 575' salinity profile analysis

15) Approximate Coal Seam Depths: 6'

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: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

WW-6B  
(04/15)

API NO. 47- 009 - 00309  
 OPERATOR WELL NO. State of WV DNR C BRK 10H  
 Well Pad Name: State of WV DNR C BRK

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	H-40	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	H-40	48#	496'	496'	476 sx/CTS
Coal	See	Conductor	Casing				
Intermediate	9 5/8"	New	J-55	36#	1454'	1454'	550 sx/CTS
Production	5 1/2"	New	HCP-110	20#	5755'	5755'	lead 677 sx 1011 283 sx/100' inside int
Tubing							
Liners							

*C-200* 10-15-20

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	Conductor	Casing				
Intermediate	9 5/8"	12 1/4"	0.352	3520	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			<i>this stayed the same BW</i>				
Liners							

PACKERS

RECEIVED  
Office of Oil and Gas

OCT 23 2020

WV Department of  
Environmental Protection

Kind:				
Sizes:				
Depths Set:				

10H

October 19, 2020

Ms. Laura Adkins  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

**RE: Proposed Expedited Modification:** State of WV DNR C BRK 5H  
State of WV DNR C BRK 6H  
State of WV DNR C BRK 8H  
State of WV DNR C BRK 10H

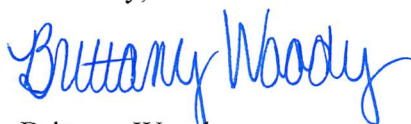
Dear Ms. Adkins

Enclosed please find a modification for the above captioned well. We made changes to the cement yield on page two of the 6B per the DEP inspector's request. This well is situated on the Edge's property, in Sand Hill District, Marshall County, West Virginia. Enclosed documents:  
-Updated 6B

If you have any questions or desire additional information, please me at 304-884-1613

Thank you.

Sincerely,



Brittany Woody  
Senior Regulatory Analyst  
Southwestern Energy Production Company, LLC

RECEIVED  
Office of Oil and Gas

OCT 23 2020

WV Department of  
Environmental Protection

CL# 1053068  
Amt \$ 5000  
Date 10/13/20

$\frac{R^+}{A} \rightarrow V^+$