



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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, May 20, 2019
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for SWN A WTZ 405H
47-103-03253-00-00

Modified production casing

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.

James A. Martin
Chief

A handwritten signature in blue ink, appearing to read "James A. Martin", is written over a light blue circular stamp.

Operator's Well Number: SWN A WTZ 405H
Farm Name: SWN PRODUCTION COMPANY
U.S. WELL NUMBER: 47-103-03253-00-00
Horizontal 6A New Drill
Date Modification Issued: May 20, 2019

Promoting a healthy environment.

05/24/2019

May 16, 2019

Mr. James Kennedy
Office of Oil & Gas
601 57th Street
Charleston, WV 25304

RE: Proposed Modification: SWN A WTZ 205H & SWN A WTZ 405H

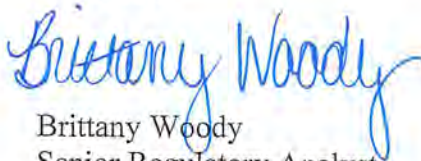
Dear Ms. Adkins

Enclosed please find the updated 6B, casing program, and WBD for the above captioned wells. We are doing a tapered casing program by adding additional production casing. These wells are situated on the SWN Production Company's property, in Proctor District, Wetzel County, West Virginia.

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

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WW-6B
(04/15)

API NO. 47-103 -
OPERATOR WELL NO. SWN A WTZ 405H
Well Pad Name: SWN A WTZ Pad

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 103- Wetzel 12-Proctor 681-Wileyville
Operator ID County District Quadrangle

2) Operator's Well Number: SWN A WTZ 405H Well Pad Name: SWN A WTZ Pad

3) Farm Name/Surface Owner: SWN Production Company, LLC Public Road Access: Macedonia Ridge

4) Elevation, current ground: 1337' Elevation, proposed post-construction: 1342'

5) Well Type (a) Gas Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

6) Existing Pad: Yes or No No *DMAH 5/15/19*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Target Top TVD- 7367', Target Base TVD- 7405', Anticipated Thickness- 38', Associated Pressure- 4813

8) Proposed Total Vertical Depth: 7389'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 25972'

11) Proposed Horizontal Leg Length: 17902.70'

12) Approximate Fresh Water Strata Depths: 300'

13) Method to Determine Fresh Water Depths: The base of fresh water at the alternate minimum depth of 300'.

14) Approximate Saltwater Depths: 1364' Salinity Profile Analysis

15) Approximate Coal Seam Depths: 1229'

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: _____

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WW-6B
(04/15)

API NO. 47- ¹⁰³ -
OPERATOR WELL NO. SWN A Wtz 405H
Well Pad Name: SWN A Wtz Pad

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	J-55	54.5#	400'	400'	392 sx/CTS
Coal							
Intermediate	9 5/8"	New	J-55	36#	2779'	2779'	1080 sx/CTS
Production	6	New	HP-110	24#	6898'	6898'	Total 2180x/Tot 1410x/Include Intermediate
	5 1/2"	New	HP-110	23#	3175'	3175'	
		New	HP-110	20#	15899'	15899'	

DMAH 5/15/19

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	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	633	Class A	1.19/50% Excess
Coal							
Intermediate	9 5/8"	12.25"	0.395	3950	1768	Class A	1.19/50% Excess
Production	6"	8.75"	0.4	14580	9500	Class A	1.20/50% Excess
	5 1/2"	8.5"	0.415	16240	9500	Class A	1.20/50% Excess
		8.5"	0.361	14360	9500	Class A	1.20/50% Excess

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PACKERS

Kind:				
Sizes:				
Depths Set:				

WW-6B
(10/14)

API NO. 47-103 - _____
OPERATOR WELL NO. SWN A WTZ 405H
Well Pad Name: SWN A WTZ Pad

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and stimulate any potential zones between and including the Benson to Marcellus. **If we should encounter a void place basket above and below void area- balance cement to bottom of void and grout from basket to surface or run external casing packer/cementing stage tool above void interval and perform 2 stage cementing operation dependent upon depth of void. Run casing not less than 20' below void nor more than 75' below void. (*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts.)

DMAH 5/15/19

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. The well is produced through surface facilities consisting of high pressure production unites, vertical separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 100 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.77

22) Area to be disturbed for well pad only, less access road (acres): 6.61

23) Describe centralizer placement for each casing string:

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

24) Describe all cement additives associated with each cement type:

See Attachment ***

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25) Proposed borehole conditioning procedures:

All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

*Note: Attach additional sheets as needed.

