west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

July 15, 2015

CHEVRON APPALACHIA, LLC
POST OFFICE BOX 611
MOON TOWN, PA 15108

Re: Permit Modification Approval for API Number 5101804, Well #: TAYLOR C 5H

Modify Casing

Oil and Gas Operator:
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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

for Gene Smith

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

Kristen Brooks
Permit Coordinator

Appalachian/Michigan
Strategic Business Unit
Chevron North America
Exploration and Production
A Division of Chevron U.S.A. Inc.
800 Mountain View Drive
Smithfield, PA 15478
Tel 724-564-3700
Fax 724-564-2365
kristenbrooks@chevron.com

June 24, 2015

West Virginia D.E.P.
Office of Oil & Gas
601 57th Street SE
Charleston, WV 25304-2345

RE: Taylor C 1H – 9H
Casing Modification Change

Dear Ms. Hankins,

Please accept this as our formal request for a modification to the Well Work Permit Application (WW-6B) for the Taylor C 1H – 9H Casing & Tubing Program. If you have any questions, please contact me at (724) 564-3781 or kristenbrooks@chevron.com.

Sincerely,

Kristen Brooks

Kristen Brooks
Permit Coordinator
Chevron Appalachia, LLC

Enclosures

Received
JUL - 9 2015
Office of Oil and Gas
WV Dept. of Environmental Protection

WW-6B
(04/15)

API NO. 47- 51 - 01804
OPERATOR WELL NO. 5H
Well Pad Name: Taylor C

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

1) Well Operator: Chevron Appalachia, LLC | 49449935 | Marshall | Clay | Glen Easton, WV
Operator ID | County | District | Quadrangle

2) Operator's Well Number: 5H Well Pad Name: Taylor C

3) Farm Name/Surface Owner: Williams Ohio Valley Mistream LLC Public Road Access: CR 17 Fork Ridge Rd

4) Elevation, current ground: 1257' Elevation, proposed post-construction: 1236'

5) Well Type (a) Gas X Oil ____ Underground Storage ____
Other ____
(b)If Gas Shallow X Deep ____
Horizontal X

JW 6/23/15

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6533', 49' - 0.64 psi/ft

8) Proposed Total Vertical Depth: 6555'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16,242'

11) Proposed Horizontal Leg Length: 8,742'

12) Approximate Fresh Water Strata Depths: 470' GL

13) Method to Determine Fresh Water Depths: 1 mi radius offset wells, freshwater wells, and freshwater base level

14) Approximate Saltwater Depths: 1276', 1880'-2370' KB: Francis 1V offset well

15) Approximate Coal Seam Depths: 800' GL

16) Approximate Depth to Possible Void (coal mine, karst, other): None

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

(a) If Yes, provide Mine Info: Name: Ireland Mine
Depth: 800' GL
Seam: Pittsburgh No. 8
Owner: CONSOL Energy

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Office of Oil & Gas
JUN 26 2015

API NO. 47- 51 - 01804
OPERATOR WELL NO. 5H
Well Pad Name: Taylor C

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			40'	40'	141.8
Fresh Water	13-3/8"	New	J-55	54.5#	520'	520'	691.0
Intermediate	9-5/8"	New	N-80	40#	2,104'	2,104'	941.0
Production	5-1/2"	New	P-110	20#	16,242'	16,242'	3889.0
Tubing							
Liners							

JN 6/23/15

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"	26"					
Fresh Water	13-3/8"	17-1/2"	0.380"	2,730 psi	1,911 psi	Class A	1.18
Intermediate	9-5/8"	12-1/4"	0.395"	3,950 psi	2,768 psi	Class A	1.29
Production	5-1/2"	8-1/2"	0.361"	12,640 psi	9,975 psi	Class A	1.61
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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API NO. 47- 51 - 01804
OPERATOR WELL NO. 5H
Well Pad Name: Taylor C

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

Drill 17-1/2" hole to 600 then run and cement 13-3/8" casing to surface covering the fresh water. Drill 12.25" hole to 2,330' then run and cement to surface 9 5/8" casing, covering the Big Injun. Drill 8 1/2" hole to KOP at 5,478'. Drill 8 1/2" curve and lateral to 16,242' MD and 6,555 TVD. Run 5 1/2" production casing and cement back to surface'.

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

Chevron will utilizing plug and perf method with 50 stages using 8,572 bbl of fluid and 315,000 lbm of sand per stage

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.01

22) Area to be disturbed for well pad only, less access road (acres): 4.66

23) Describe centralizer placement for each casing string:

There will be a bow spring centralizer every two jts on the Water string and intermediate. The production string will have two centralizer every jt in the lateral and curve, then one every jt from KOP to surface.

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

For the Water String the blend will contain class A cement, 3% CaCl2, and flake. The intermediate will contain class A cement, 10% CaCl2, Salt, and flake. The Production cement will have a lead and tail cement. The lead will contain class A cement, KCl, dispersant, suspension agent, and retarder. The tail will contain class A cement, Calcium Carbonate, KCl, dispersant, de-foamer,suspension agent, and friction reducer.

25) Proposed borehole conditioning procedures:

Well will be circulated a minimum of 3 bottoms up once casing point has been reached on all hole sections and until uniform mud properties are achieved.

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*Note: Attach additional sheets as needed.