



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

May 18, 2015

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

Re: Permit Modification Approval for API Number 5101705, Well #: BERGER 5H

Change intermediate 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,

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

Promoting a healthy environment.

05/22/2015

4705101705



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

April 27, 2015

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

RE: Berger 3H, 5H, 7H, and 9H
Casing Modification Change

Dear Ms. Hankins,

Please accept this as our formal request for a modification to the Intermediate & Coal Casing of the Berger 3H, 5H, 7H, and 9H drill permits. An updated Page 2 of the WW-6B and updated schematics are attached. If you have any questions, please contact me at (724) 564-3781 or kristenbrooks@chevron.com.

Sincerely,

A handwritten signature in cursive script that reads "Kristen Brooks".

Kristen Brooks
Permit Coordinator
Chevron Appalachia, LLC

Enclosure

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Office of Oil and Gas
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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			40'	40'	CTS
Fresh Water	13-3/8"	New	J-55	54.5#	300'	300'	CTS
Coal							
Intermediate	9-5/8"	New	J-55	40#	2,665'	2,665'	CTS
Production	5-1/2"	New	P-110	20#	13,287'	13,287'	CTS
Tubing							
Liners							

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TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Max. Associated Surface 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	200 psi	Class A	1.18
Coal							
Intermediate	9-5/8"	12-1/4"	0.395"	3,950 psi	2050 psi	Class A	1.29
Production	5-1/2"	8-1/2"	0.361"	12,640 psi	2426 psi	Class A	2.2
Tubing							
Liners							

PACKERS

Kind:				Received APR 28 2015
Sizes:				
Depths Set:				

Office of Oil and Gas
 WV Dept. of Environmental Protection



Berger 5H

Marshall Co WV
26 sept, 2013

Casing & Cementing Details

Ground Level Elevation: 1,292' ft above SL
Depth meas. from KB: 0' ft above GL

	Casing Formation	DEPTH		Inclination	HOLE SIZE	CASING SPECS	CEMENT INFO	GENERAL INFO
		MD	TVD					
	20" Conductor	40'				<u>Conductor</u> Minimum 40 ft from GL or at least 10 ft into bedrock		
Bow Spring: 1-shoe jt, 1-every 2nd jt 1 on ea 2-3 jts across previous shoe. Rigid: 2-within 100 ft of surface	Deepest Aquifer	165'				<u>Surface String</u> 13-3/8" 54.5# J-55 BTC 0.38" wall Capacity = .1545 bbl/ft Annulus = .1237 bbl/ft (+ 6 bbl for shoe track) Burst = 2720 psi	Cement to Surface	
	13 3/8" Casing	300'			17-1/2"	Minimum 35 ft - Optimum 50 ft past deepest coal		
	Basket Top Coal Deepest Coal	780' 825' 835'					<u>Intermediate Casing</u> 9-5/8" 40# J-55 BTC 8.835" ID - 8.679" DD Capacity = .0758 bbl/ft Annulus = .0557 bbl/ft (+ 3.1 bbl for shoe track) Burst = 3950 psi Collapse = 3090 psi	Cement to Surface
Bow Spring: 1-shoe jt, 1-every 2nd jt 1 on ea 2-3 jts across previous shoe. Double-Bow: 2-within 100 ft of surface	Red Beds	1,185'						
	Berea	2,565'						
	9-5/8" Casing	2,665'			12-1/4"	Set below the Berea		
	KOP	5,000'		0°		<u>Prod. Casing</u> 5-1/2", 20# P-110, VA Superior Capacity = .0221 bbl/ft (+1 bbl for shoe track) Burst = 12,640 psi Collapse = 11,080 psi ID = 4.778" Drift = 4.653" <u>Centralization</u> See Drilling Program	Cement to Surface	
	Burkett Sh.		6,409'	30°		• 1 Turbolator per joint for 3 joints above and 3 joints below 9-5/8" shoe		
	Tully Lm. Hamilton Sh.							
	U. Marcellus		6,510'	45°				
	Cherry Valley		6,534'	60°				
	L. Marcellus		6,536'	80°				
	Landing Point Basal Marcellus Onondaga	6,986'	6,538' 6,558' 6,563'	90°			• 2 double Bow Spring per 1 joint from top Marcellus to KOP • 2 SpiraGlider per joint from shoe to top of Marcellus	
	5-1/2" Casing	13,287'	6,538'	90°	6,301' 8-1/2"	45 ft Shoe		

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Berger 5H

Marshall Co. WV
March 23, 2015

Casing & Cementing Details

Casing	DEPTH		Inclination	HOLE SIZE	CASING SPECS	CEMENT INFO	GENERAL INFO
	MD	TVD					
30.0" Conductor	40'			35"	Conductor	grout to surface	Minimum 40 ft from GL or at least 10 ft into bedrock
13.3/8" Casing	300'			17 1/2"	Fresh Water Casing 13-3/8" 54.5# J-55 BTC		Minimum 50 ft past deepest known fresh water
9.5/8" Casing	2,665'			12 1/4"	Intermediate Casing 9-5/8" 40# J55 BTC		
					Prod. Casing 5-1/2", 20# P-110, VA Superior		
				90.0°			45ft Shoe Track 12,755'

See 4/25/15
Received

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05/22/2015