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west virginia department of environmental protection

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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](http://www.dep.wv.gov)

## PERMIT MODIFICATION APPROVAL

August 14, 2013

RAVEN RIDGE ENERGY  
3230 PENNSYLVANIA AVENUE  
CHARLESTON, WV 25302

Re: Permit Modification Approval for API Number 3906350 , Well #: CRUM 2A  
**MODIFY CASING TO FRACTURE**

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  
Regulatory/Compliance Manager  
Office of Oil and Gas

I  
8/14/2013

WW - 2B  
(Rev. 8/10)

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

1) Well Operator: RAVEN RIDGE ENERGY      494485865      KANAWHA - 39      BIG SANDY - 1      CLENDENIN - 299  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: CRUM 2A      3) Elevation: 1052'

4) Well Type: (a) Oil X or Gas X  
(b) If Gas: Production X / Underground Storage \_\_\_\_\_  
Deep \_\_\_\_\_ / Shallow X

5) Proposed Target Formation(s): WEIR      Proposed Target Depth: 2,300'  
6) Proposed Total Depth: 2,500' Feet      Formation at Proposed Total Depth: 2200' - 2,300'  
7) Approximate fresh water strata depths: 200'  
8) Approximate salt water depths: 1,300' - 1,800'

9) Approximate coal seam depths: NO COAL LISTED IN TITLE

10) Approximate void depths,(coal, Karst, other): NONE

11) Does land contain coal seams tributary to active mine? NO

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)  
DRILL, STIMULATE AND FRAC (ACID & WATER) A NEW WELL.

*Amy W. Miller*  
8.16.13

13) CASING AND TUBING PROGRAM

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	
Conductor						
Fresh Water	9 5/8"	LS	17LBS	350'	350'	CTS
Coal						
Intermediate	7"	J55	23LBS	1,850'	1,850'	CTS
Production	4 1/2"	J55	10.5LBS	2200'	2200'	150 Sacks Cmt.
Tubing						
Liners						

**Received**  
AUG - 6 2013

Office of Oil and Gas  
WV Dept. of Environmental Protection

Packers: Kind: Well is Drilled Running Casing to  
Sizes: Stimulate (W)  
Depths Set \_\_\_\_\_

## Nottingham, Justin E

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**From:** Danielle Boggs <dani.bays@cunninghamenergy.com>  
**Sent:** Tuesday, August 06, 2013 1:44 PM  
**To:** Nottingham, Justin E  
**Cc:** Smith, Gene C; Urban, Terry W; ryan.cunningham@cunninghamenergy.com  
**Subject:** Modifications  
**Attachments:** SKMBT\_C35130806130900.pdf

Hey Justin –

Please see attached modified WW-2B forms for the following wells:

White 1A – API 47-3906354  
White 2A – API 47-3906351  
Osborne 1A – API 47-3906347  
Osborne 2A – API 47-3906350  
Crum 1A – API 47-3906349

We wish to modify these permits to show that we wish to stimulate these wells rather than shoot them as we had first requested.

Si  
Thank you,  
*Danielle N. Boggs*  
Cunningham Energy  
3230 Pennsylvania Ave  
Charleston, WV 25302  
Direct: (304) 344-9291  
Cell: (304) 553-5850  
Fax: (304) 344-9290  
[www.cunninghamenergy.com](http://www.cunninghamenergy.com)



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