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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)

Tuesday, April 10, 2018  
PERMIT MODIFICATION APPROVAL  
Vertical / New Drill

KEYROCK ENERGY LLC  
106 FERRELL AVENUE, SUITE 5  
  
KINGSPORT, TN 37663

Re: Permit Modification Approval for CHILDERS NO. 1  
47-011-00999-00-00

**RUN 300' OF FRESH WATER CASING AND 2125' OF COAL CASING, WITH BOTH STRINGS CEMENTED TO SURFACE.**

KEYROCK ENERGY 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", with a small "JAM" monogram to the right.

Operator's Well Number: CHILDERS NO. 1  
Farm Name: BUDDY L. & ALEXANDER D. CHILDERS  
U.S. WELL NUMBER: 47-011-00999-00-00  
Vertical New Drill  
Date Modification Issued: 04/10/2018

Promoting a healthy environment.

WW - 2B  
(Rev. 8/10)



4-10-2018

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

1) Well Operator: Keyrock Energy LLC      494507629      Cabell      Grant      Milton 7.5'  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Childers 1      3) Elevation: 689'

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

5) Proposed Target Formation(s): Lower Huron      Proposed Target Depth: 3400'  
 6) Proposed Total Depth: 3450' Feet      Formation at Proposed Total Depth: Lower Huron  
 7) Approximate fresh water strata depths: 165'  
 8) Approximate salt water depths: 680'

9) Approximate coal seam depths: 400', 590'

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 and stimulate using foam frac for a new well (estimated using 40k lbs foam frac.) Will not produce from the Marcellus formation.

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE	INTERVALS	CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	13-3/8"			30'	30'	
Fresh Water	9-5/8"			300'	300'	109 Cu. Ft. CTS
<u>Coal</u>	7"			2,125'	2,125'	346 Cu. Ft. CTS
Production	4-1/2"			3,300'	3,300'	145 Cu. Ft. Cement to 2,000'
Tubing	2-3/8"			3,250'	3,250'	Per WW DEP Rule
Liners						

Packers: Kind: \_\_\_\_\_  
 Sizes: \_\_\_\_\_  
 Depths Set \_\_\_\_\_