

Elm Ridge Resources

IGS 146
SEC 21 - T33N – R8W
2124' FSL, 1693' FEL (Surface)
1900 FNL, 720 FEL (BHL)
La Plata County, Colorado

DRILLING PROGRAM

1. Estimated Formation Tops(MD):

Tertiary	Surface
Fruitland Coal	3559'
PC	3600'
TD	±3989'

2. Estimated Depth of Anticipated Minerals(MD):

Gas	Fruitland	3559'
Gas	PC	3600'

3. Minimum Specifications for Pressure Control Equipment:

BOP equipment and accessories will meet or exceed BLM requirements outlined in 43 CFR Part 3160.

A 3000# double ram hydraulic BOP will be used (see attached diagram). Since maximum anticipated formation pressure is 1200 psig, accessories to the BOP will meet BLM requirements for a 2000 psig system (exhibit 1). The accumulator system capacity will be sufficient to close all BOPE with a 50% safety factor. Fill line, kill line, and line to choke manifold will be 2". BOP's will be tested every 24 hours and will be recorded on IADC log.

Surface casing will be tested to 1500 psig for 30 minutes.

Accessories to BOPE will include upper and lower kelly cocks with handles, stabbing valve to fit drill pipe on floor at all times, string float at bit, 3000# choke manifold with 2" adjustable and 2" positive chokes, and pressure gauge.

EIGHT POINT DRILLING PROGRAM (cont.)**IGS 146**4. Proposed Casing Program:

<u>HOLE SIZE</u>	<u>INTERVAL</u>	<u>SIZE</u>	<u>WT,GR,JT</u>
12-1/4"	0-500'	8-5/8"	24#, J-55, LTC
7-7/8"	500'-3989'	5-1/2 "	17#, J55, LTC

Cementing Program:

Surface Casing: Cement with 20 bbls of fresh ahead of ± 400 sks of std cement, 1/4# Flocele, 15.80 lb/gal yield 1.18 5.20 gal/sk. Cement volumes include excess to circulate cement to surface. A guide shoe and insert float and three centralizers will be used. WOC 8 hours. Pressure test casing to 1500 psi.

Production Casing: Cement casing string with 470 sx Class "B" Lead containing 65/35 poz with 6% gel, 2% CaCl and 1/4#/sk cellophane flakes (Yield = 1.97 cu. ft./sk, Weight = 10.2 #/gal). Follow with 240 sx 50/50 Poz containing 2% Gel 5# Gilsonite 1/4# Flocele, 13.5# and 1.34 yield. Cement volumes include excess to circulate cement to surface. In the event cement is not circulated, a temperature survey will be run to determine the actual cement top as required. Cementing equipment will include a guide shoe, float collar and 10 centralizers.

Note: Final slurry calculated from open hole caliper +35%

5. Mud Program:

A native, water-based mud system will be used initially, followed by a low solids, non-dispersed gel system to condition the hole for logs. Adequate amounts of lost circulation material as well as weighting materials will be on location if needed. Adequate sorbitive agents will be on location to handle potential spills of fuel/lubricants on the surface.

<u>Depth</u>	<u>Mud Weight</u>	<u>Type</u>	<u>Viscosity</u>	<u>Fluid Loss</u>	<u>Remarks</u>
0'-500	8.4-8.8	Native	NC	NC	

<u>Depth</u>	<u>Mud Weight</u>	<u>Type</u>	<u>Viscosity</u>	<u>Fluid Loss</u>	<u>Remarks</u>
500'-3989'	8.8-10.5	LSND	35-40	10-12cc	

EIGHT POINT DRILLING PROGRAM (cont.)
IGS 146

6. Anticipated Testing and Coring Program:

No DST's or cores are planned. Openhole logs will include GR, Induction and Density logs. These logs will be run from TD to the bottom of the surface casing. An Induction, caliper and GR will be run from TD to the bottom of the surface casing.

7. Anticipated or Abnormal Pressures, Temperatures:

No abnormal pressures or temperatures are expected. Maximum reservoir pressure expected in the Fruitland Coal is 1100 psig.

8. Operations:

Anticipated spud date is **3rd Quarter 2014** or as soon as permits are received. Estimated drilling time is 8 days. The Fruitland will be completed as a cased hole, hydraulically fractured well. Completion operations are expected to take 10 days and will commence approximately one month after spud.

Additional considerations and information

$$P_b = (MW)(DEPTH)(.052)$$

$$F_t = (WT)(DEPTH)(2)$$

$$P_c = (MW)(DEPTH)(.052)(1.125)$$

Surface Casing

Interval	Length	Description	API Rating			
			Collapse	Burst	Tension	Capacity
			(psi)	(psi)	(M lbs)	Bbl/ft
0'-500	500	8-5/8" 24#, J55 8rd, STC	1370	2950	244	.0636

Connection Type	Make-up Torque (Ft-lbs)		
	Optimum	Minimum	Maximum
8-5/8" 24#, J55 8rd, STC	2440	1830	3050

Production Casing

Interval	Length	Description	API Rating			
			Collapse	Burst	Tension	Capacity
			(psi)	(psi)	(M lbs)	(Bbl /ft)
0'-3989'	3989'	5-1/2" 17.0# J-55 LTC	4910	5320	247	0.0232

Connection Type	Make-up Torque (Ft-lbs)		
	Minimum	Optimum	Maximum
5-1/2" 17#, J-55 LTC	1850	2470	3090