

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. NMNM06764
2. Name of Operator CIMAREX ENERGY COMPANY OF CO		6. If Indian, Allottee or Tribe Name
Contact: HOPE KNAULS E-Mail: hknauls@cimarex.com		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 600 NORTH MARIENFELD STREET SUITE 600 MIDLAND, TX 79701	3b. Phone No. (include area code) Ph: 918.295.1799	8. Well Name and No. HACKBERRY 23 FEDERAL COM 3H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 24 T19S R30E NWSW 2130FSL 180FWL 32.383997 N Lat, 103.560064 W Lon		9. API Well No. 30-015-42078-00-X1
		10. Field and Pool, or Exploratory WILDCAT HACKBERRY, BS, NW
		11. County or Parish, and State EDDY COUNTY, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

CIMAREX ENERGY RESPECTFULLY APPROVAL TO CHANGE CASING DESIGN AS INDICATED ON THE ATTACHED CASING PLAN. SEE ATTACHMENTS

Accepted for record
NMOC D
102774
OCT 27 2014
RECEIVED

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #272516 verified by the BLM Well Information System For CIMAREX ENERGY COMPANY OF CO, sent to the Carlsbad Committed to AFMSS for processing by CHRISTOPHER WALLS on 10/23/2014 (15CRW0016SE)	
Name (Printed/Typed) HOPE KNAULS	Title REGULATORY TECHNICIAN
Signature (Electronic Submission)	Date 10/21/2014
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
Approved By	Title
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	
Office	Date
BUREAU OF LAND MANAGEMENT	
CARLSBAD FIELD OFFICE	
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.	

Cimarex energy requests to change the casing design on the Hackberry 23 Federal Com 3H. Change in casing design will result in a change of cement volumes.

Current approved casing design and cement design

2. Casing Program: *See COA*

Casing Depth from (ft)	Casing Setting Depth (ft) MID	Casing Setting Depth (ft) TWD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	Surface Pressure & BHP (psig)	Mud Weight (ppg)	Collapse SF (1.125)	Burst SF (1.125)	Cumulative Air Weight (lbs)	Tension SF (1.6)
Surface														
0'	325'	325'	20	16	84	P-55	RT&C	New	346	8.4	8.35	20.4	27300	48.6
Intermediate 1														
0'	1930'	1930'	14 3/4	11 3/4	42	P-110	ST&C	New	728	10	10.1	2.5	23500	4.2
Intermediate 2														
0'	3480'	3480'	11	8 5/8	32	P-110	ST&C	New	1565	8.6	1.62	2.5	111800	3.1
Production														
0'	8007'	8007'	7 7/8	5 1/2	17	P-110	LT&C	New	19730	9	2.00	5.0	115000	3.1
8007'	19320'	8580'	7 7/8	5 1/2	17	P-110	DT&C	New	5861	9	1.65	1.0	9041	35.1

NOTE: Intermediate 2 Casing has a DV Tool / ACP set @ 1800'

See COA

Surface	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Tail	500	1.34	14.8	664	Class C + LCM
TOC:	0'	160% Excess	Centralizers per Onshore Order 2.III.B.1f		

Intermediate 1	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	580	1.88	12.9	1087	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
Tail	200	1.34	14.8	266	Class C + retarder + LCM
TOC:	0'	96% Excess			

Intermediate 2	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	350	1.88	12.9	651	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
Tail	230	1.34	14.8	297	Class C + retarder + LCM
TOC:	1800'	0% Excess	DV Tool / ACP set between 1800' - 1900'		

See COA

	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	240	1.88	12.9	449	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
Tail	200	1.34	14.8	264	Class C + retarder + LCM
TOC:	0'	116% Excess			

Production	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	450	2.4	11.9	1080	35:65 (poz/H) + salt + Sodium Metasilicate + Bentonite + Fluid Loss + Dispersant + LCM + Retarder
Tail	2413	1.24	14.5	2992	50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder

Proposed casing design and cement design

Surface casing will change from 16" to 20"

Intermediate 1 will change from 11 3/4" to 13 3/8".

Intermediate 2 will change from 8 5/8" to 9 5/8".

The 5-1/2" production casing has been removed and 7" production casing will be run to the EOC and a 4-1/2" completion system will be run in the lateral.

Casing Depth From (ft)	Casing Setting Depth (ft) MD	Casing Setting Depth (ft) TVD	Open Hole Size (inches)	Casing Size (inches)	Casing Weight (lb/ft)	Casing Grade	Thread	Condition	SI Surface Pressure & BHP (psig)	Mud Weight (ppg)	Collapse SF (1.125)	Burst SF (1.125)	Cumulative Air Weight (lbs)	Tension SF (1.8)
Surface														
0'	325'	325'	26	20	94	H-40	ST&C	New	146	8.4	3.66	10.5	30550	22.0
Intermediate 1 (Collapse is figured for a 1/3 internal evacuation equal to the proposed TVD of the next section)														
0'	1930'	1930'	17 1/2	13 3/8	54.5	J-55	ST&C	New	869	10	1.13	3.2	105185	4.9
Intermediate 2 (Collapse is figured for a 1/3 internal evacuation equal to the proposed TVD of the next section)														
0'	3600'	3600'	12 1/4	9 5/8	36	J-55	LT&C	New	1620	8.6	1.25	2.2	129600	4.4
Production														
0'	9108'	8580'	8 3/4	7	26	P-110	LT&C	New	1973.4	9	1.55	5.0	228126	3.0
Completion System														
8355'	19010'	8580'	6 1/8	4 1/2	11.60	P-110	BT&C	New	3861	9	1.89	2.8	5046	72.7

Casing Design Criteria and Casing Loading Assumptions:

Surface, Production, and Casing System:

Tension: A 1.8 design factor without effects of buoyancy.

Collapse: A 1.125 design factor with full internal evacuation.

Burst: A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.

Intermediate 1 & 2 Casing:

Tension: A 1.8 design factor without effects of buoyancy.

Collapse: A 1.125 design factor with 1/3 internal evacuation equal to the proposed TVD of the next section.

Burst: A 1.125 design with a surface pressure equal to the fracture gradient at setting depth less gas gradient to surface.

Surface	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Tail	520	1.34	14.8	685	Class C + LCM
TOC: 0' 40% Excess Centralizers per Onshore Order 2.III.B.1f					

Intermediate 1	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	860	1.88	12.9	1613	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
Tail	270	1.32	14.8	358	Class C + retarder + LCM
TOC: 0' 57% Excess					

Intermediate 2	Stage 1				
	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
	300	1.88	12.9	564	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
	230	1.32	14.8	304	Class C + retarder + LCM
TOC: 2000' 50% Excess DV Tool/ ACP set between 2000' - 2100'					

	Stage 2				
	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
	350	1.88	12.9	658	35:65 (poz/C) + Salt + Bentonite + LCM + retarder
	50	1.32	14.8	66	Class C + retarder + LCM
TOC: 0' 0% Excess					

Production	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Lead	404	2.4	11.9	970	Fluid Loss + Dispersant + LCM + Retarder
Tail	198	1.24	14.5	246	
TOC: 2400' 25% Excess					

Completion System	Sacks	Yield (cuft/sx)	Weight (ppg)	Cubic Feet	Cement Blend
Tail	850	1.24	14.5	1054	50:50 (poz/H) + Bentonite + Salt + Fluid Loss + Dispersant + LCM + Retarder
Cement volumes will be adjusted depending on hole size.					
TOC: 8355' 5% Excess					

Pressure Control

On 20" surface casing, a 2M BOP system will be installed (annular preventer)

On 13 3/8" intermediate 1, a 3M system will be installed (Blind Rams, Pipe Rams, & Annular preventer).

On 9 5/8" intermediate 2, a 5M system will be installed (Blind Rams, Pipe Rams, & Annular Preventer).

On 7" production, a 5M system will be installed (Blind Rams, Pipe Rams, & annular Preventer).

BOPS will be tested by an independent service company.

20" Surface Casing: 250 psi low/1000 psi high

13 3/8" intermediate 1: Rams tested to 250 psi low/ 3000 psi high. Annular preventer tested to 250 psi low/ 2500 psi high.

9 5/8" intermediate 2: Rams tested to 250 psi low/ 5000 psi high. Annular preventer tested to 250 psi low/ 2500 psi high.

7" intermediate 2: Rams tested to 250 psi low/ 5000 psi high. Annular preventer tested to 250 psi low/ 2500 psi high.

Drilling 12-1/4" hole
below 13-3/8" Casing

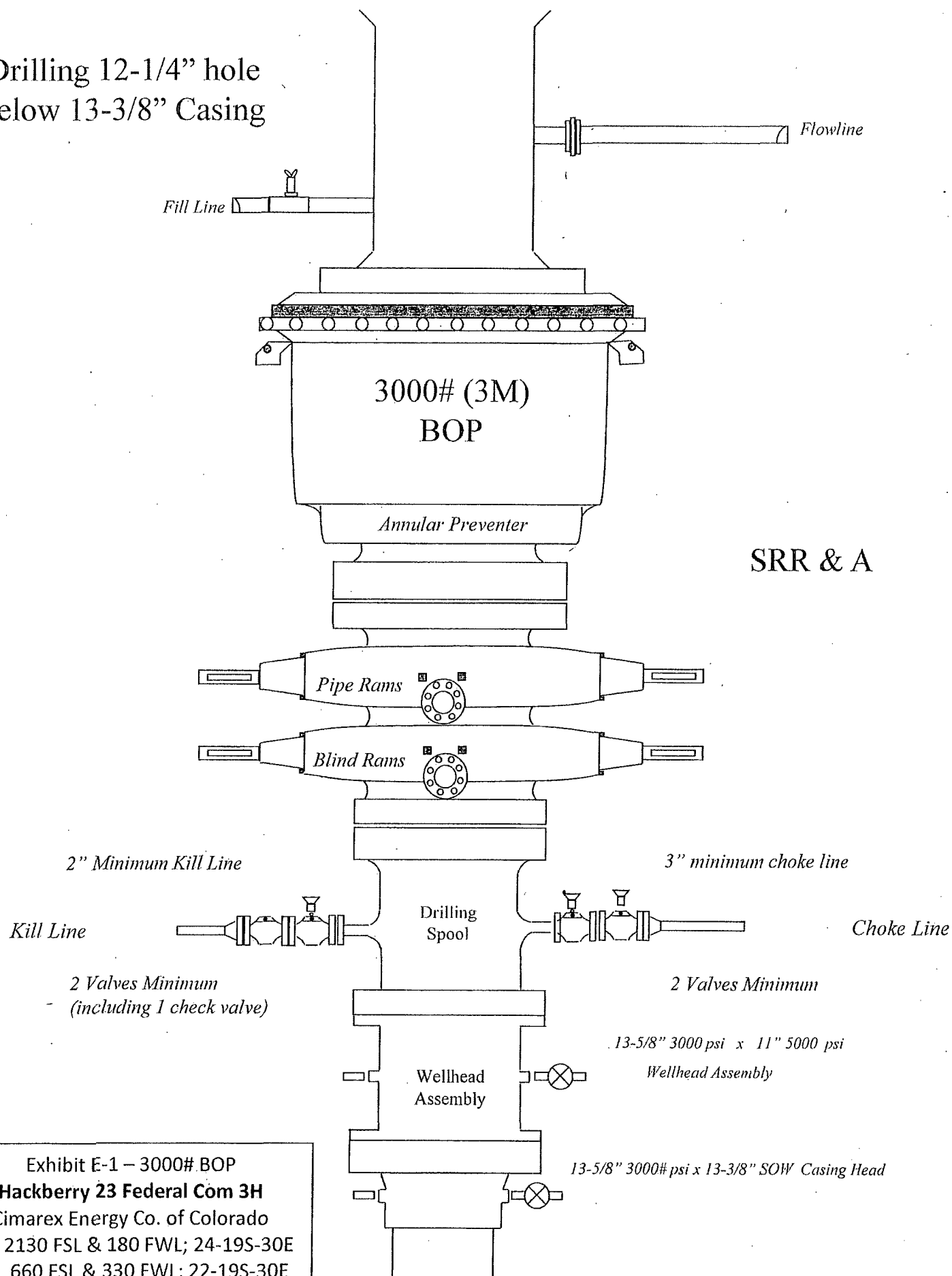
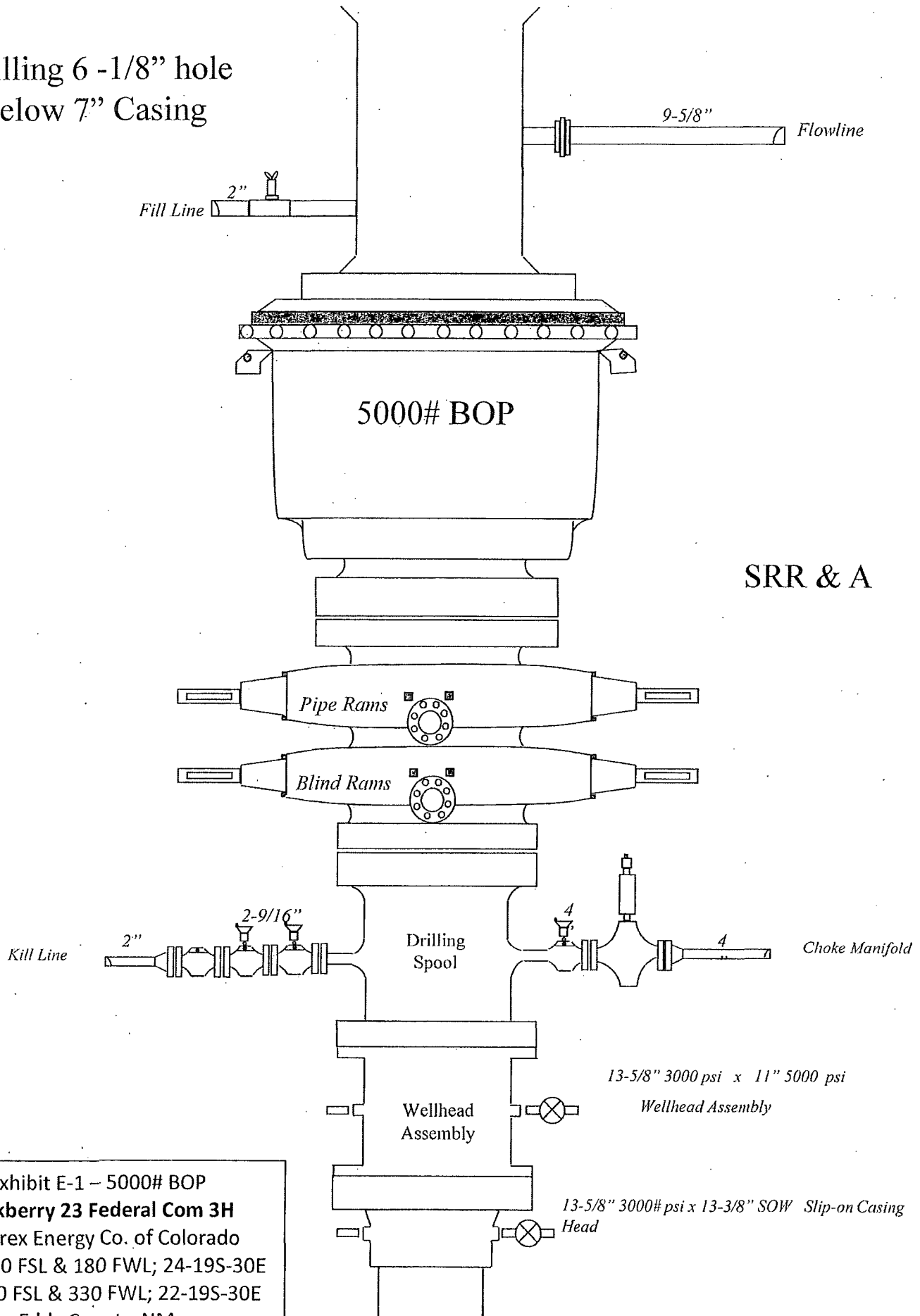


Exhibit E-1 – 3000# BOP
Hackberry 23 Federal Com 3H
Cimarex Energy Co. of Colorado
SHL 2130 FSL & 180 FWL; 24-19S-30E
BHL 660 FSL & 330 FWL; 22-19S-30E
Eddy County, NM

Drilling 6 -1/8" hole
below 7" Casing



SRR & A

Exhibit E-1 – 5000# BOP
Hackberry 23 Federal Com 3H
Cimarex Energy Co. of Colorado
SHL 2130 FSL & 180 FWL; 24-19S-30E
BHL 660 FSL & 330 FWL; 22-19S-30E
Eddy County, NM

CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy Co. of Colorado
LEASE NO.:	NMNM-06764
WELL NAME & NO.:	Hackberry 23 Federal Com 3H
SURFACE HOLE FOOTAGE:	2130' FSL & 0180' FWL
BOTTOM HOLE FOOTAGE:	0660' FSL & 0330' FWL Sec. 22, T. 19 S., R 30 E.
LOCATION:	Section 24, T. 19 S., R 30 E., NMPM
COUNTY:	Eddy County, New Mexico

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

1. **Hydrogen Sulfide (H₂S) monitors shall be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

**Capitan Reef
R-111-P-Potash**

Possibility of water in the Artesia Group, Salado, and Delaware.

Possibility of lost circulation in the Artesia Group, Rustler, Capitan Reef, and Delaware.

- 1. The 20 inch surface casing shall be set at approximately 325 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. If salt is encountered, set casing at least 25 feet above the salt. Additional Cement may be required – excess calculates to 12%.**
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.**
 - b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

1st Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

- 2. The minimum required fill of cement behind the **13-3/8 inch 1st intermediate casing**, which shall be set at approximately **1930 feet**, is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

- 3. The minimum required fill of cement behind the **9-5/8 inch 2nd intermediate casing**, which shall be set at approximately **3600 feet**, is:

Operator has proposed DV tool between 2000'-2100', but with the change in casing depth this is no longer acceptable. DV tool shall be at least 50' below previous casing shoe. Operator shall adjust cement proportionately according to the depth change. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

- a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

- b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef and potash. Excess calculates to 0% - Additional cement may be required.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

Centralizers approved as written.

4. The minimum required fill of cement behind the 7 inch production casing is:
 - ☒ Cement should tie-back at least **50 feet above the Capitan Reef** (Top of Capitan Reef estimated at 2548'). Operator shall provide method of verification.
5. The minimum required fill of cement behind the 4-1/2 inch production liner is:
 - ☒ Cement should tie-back to the top of the liner. Operator shall provide method of verification.
6. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
7. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. **A variance is granted for the use of a diverter on the 16" surface casing.**
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi.**

5. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13-3/8** 1st intermediate casing shoe shall be **3000 (3M)** psi
6. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** 2nd intermediate casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**
7. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer.**
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock with a corresponding chart (i.e. two hour clock-two hour chart, one hour clock-one hour chart).
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
 - f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

CRW 102314