

ATS-12-259

OCD-HOBBS

HOBBS OCD

FEB 29 2012

RECEIVED

Form 3160-3
(April 2004)

FORM APPROVED
OMB No 1004-0137
Expires March 31, 2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work ☒ DRILL ☐ REENTER		5. Lease Serial No. NM-0392082-A	
1b. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator Cimarex Energy Co. of Colorado		7. If Unit or CA Agreement, Name and No	
3a. Address 600 N. Marienfeld St., Ste. 600; Midland, TX 79701		8. Lease Name and Well No. Hallertau 4 Federal No. 3H 39100	
3b. Phone No (include area code) 432-571-7800		9. API Well No. 30-025-40474	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At Surface 330 FNL & 2180 FEL At proposed prod Zone 330 FSL & 1670 FEL <i>per email from 2-25-12</i> Horizontal Bone Spring test		10. Field and Pool, or Exploratory Bone Spring Wildcat 97903	
14. Distance in miles and direction from nearest town or post office*		11. Sec, T R M or Blk and Survey or Area 4-26S-32E	
15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line if any) 330'		12. County or Parish Lea	
16. No of acres in lease 1720.49 acres		13. State NM	
17. Spacing Unit dedicated to this well W2E2 160 acres		18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 386'	
19. Proposed Depth MD 14014 TVD 9472		20. BLM/BIA Bond No on File NM-2575	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3306' GR		22. Approximate date work will start* 03.01.12	
		23. Estimated duration 25-30 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form

- | | |
|--|--|
| 1. Well plat certified by a registered surveyor | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above) |
| 2. A Drilling Plan | 5. Operator Certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office) | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Zeno Farris</i>	Name (Printed/Typed) Zeno Farris	Date 01.22.12
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Title Manager Operations Administration		
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Approved By (Signature) <i>/s/ Don Peterson</i>	Name (Printed/Typed)	Date FEB 28 2012
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Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	
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Application approval 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.
Conditions of approval, if any, are attached
APPROVAL FOR TWO YEARS

Title 18 U S S 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

*(Instructions on page 2)

Carlsbad Controlled Water Basin

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

MAR 06 2012

Approval Subject to General Requirements
& Special Stipulations Attached

K 03/06/12

Application to Drill
Hallertau 4 Federal No. 3H
Cimarex Energy Co. of Colorado
Unit B, Section 4
T26S-R32E; Lea County, NM

In response to questions asked under Section II B of Bulletin NTL-6, the following information is provided for your consideration:

- 1 Location: SHL 330 FNL & 2180 FEL
BHL 330 FSL & 1670 FEL *2280 (2290) 1-25-12*
- 2 Elevation above sea level: 3306' GR
- 3 Geologic name of surface formation: Quaternary Alluvium Deposits
- 4 Drilling tools and associated equipment: Conventional rotary drilling rig using fluid as a circulating medium for solids removal.
- 5 Proposed drilling depth: MD 14014 TVD 9472
- 6 Estimated tops of geological markers:

Rustler	1215
T. Salt	1338
B. Salt	4325
Delaware	4554
Cherry Canyon	5568
Brushy Canyon	7202
Lower Brushy Canyon	8445
Bone Spring	8639
2nd Bone Spring Sand	10000
- 7 Possible mineral bearing formation:
Bone Spring Oil
- 8 Proposed Mud Circulating System:

Depth	Mud Wt	Visc	Fluid Loss	Type Mud
0' to 1235'	8.4 - 8.6	28	NC	FW
1235' to 4534'	10.0	30-32	NC	Brine water
4534' to 14014'	8.4 - 9.5	30-32	NC	FW, brine, and 2% KCl in the lateral

Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

Proposed drilling Plan

Drill 8 3/4" hole to KOP 9165 and drill 8 3/4" lateral to TD @ 14014 MD, 9472 TVD. Run 5 1/2" 17# P-110 LTC from 0-14014 and cement.

Application to Drill
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9 Casing & Cementing Program:

String	Hole Size	Depth	Casing OD	Weight	Collar	Grade
Surface	17½"	0' to 1235'	New 13¾"	48#	STC	H-40
Intermediate	12¼"	0' to 4534'	New 9¾"	4036#	LTC	J-55
Production	8¾"	0' to 14014'	New 5½"	17#	LTC	P-110

For Operator 2/2/12

10 Cementing:

Surface	835SKS Class C Cement + 4% Bentomite + 2% CaCl 13.5ppg 1.75yield 100% Excess TOC Surface Centralizers per Onshorder 2.III.B.1.f
Intermediate	Lead:1240SKS Type C Cement, 5% NaCl WOW, D132 (ext) 27.522 lb/sk, D020 (ext) 6%, D042 (ext) 3lb/sk, D130 (LCM) 0.125lb/sk 12.6ppg 2.06yield 70% Excess Tail:200SKS Type C Cement 14.8ppg 1.33 yield 25% Excess TOC Surface
Production	Lead:945SKS Type H cement, NaCl 5% WOW, D132 (ext) 39.39lb/sk, D020 (ext) 10%, D046 Antifoam 0.20%, D130 LCM 0.125lb/sk, D112 1% 11.8ppg 2.56 yield 45% Excess Tail:745SKS D049 Cement, 1.3% NaCl, 0.4% D207 fluid loss, 0.2% AnitFoam, 0.3% retarder, 2.0% D174 Expanding Agent 14.5ppg 1.44 yield 25% Excess TOC 4300' Centralizers every 3rd joint in lateral to provide adequate cement coverage every 100' unless lateral doglegs require greater spacing between centralizers.

Depth to ground water is 275 according to the State Engineer. Fresh water zones will be protected by setting 13¾" casing at 1235 and cementing to surface. Hydrocarbon zones will be protected by setting 9¾" casing at 4538 and cementing to surface, and by setting 5½" casing at 14014 and cementing to 4300.

<u>Collapse Factor</u>	<u>Burst Factor</u>	<u>Tension Factor</u>
1.125	1.125	1.6

11 Pressure control Equipment:

A 13¾" 5000 PSI working pressure BOP tested to 3000 psi consisting of one set of blind rams and one set of pipe rams and a 5000# annular type preventer. A choke manifold and 120 gallon accumulator with floor and remote operating stations and auxiliary power system. Rotating head as needed. A kelly cock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor. Mud gas separator to be used when drilling in H2S areas.

BOP unit will be hydraulically operated. BOP will be nipped up and operated at least once a day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling. From the base of the 13¾" casing through the running of production casing, the well will be equipped with a 5000 psi BOP system tested to 3000 psi.

BOPs will be tested by an independent service company to 250 psi low and 3000 psi high. Hydril will be tested to 250 psi low and 1500 psi high.

Cimarex Energy Co. of Colorado (operator) requests a variance if Cactus 101 (rig name) is used to drill this well to use a co-flex line between the BOP and choke manifold.

Manufacturer: Midwest Hose & Specialty

Serial Number: 59473

Length: 35' Size: 4-1/16" Ends flanges/clamps

WP rating: 10,000 psi Anchors required by manufacturer – Yes/No

Application to Drill
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Cimarex Energy Co. of Colorado
Unit B, Section 4
T26S-R32E; Lea County, NM

12 Testing, Logging and Coring Program: See COA

- A. Mud logging program: 2 man unit from 4534' to TD
- B. Electric logging program: CNL / LDT / CAL / GR, DLL / CAL / GR
- C. No DSTs or cores are planned at this time.

13 Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Cimarex does not anticipate that there will be enough H₂S from the surface to the Bone Spring formations to meet the BLM's minimum requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H₂S Safety package on all wells, attached is an "H₂S Drilling Operations Plan." Adequate flare lines will be installed off the mud / gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used.

Estimated BHP 4400 psi Estimated BHT 130°

14 Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved.

Drilling expected to take 30-35 days

If production casing is run an additional 30 days will be required to complete and construct surface facilities.

15 Other Facets of Operations:

After running casing, cased hole gamma ray neutron collar logs will be run from total depth over possible pay intervals.

Bone Spring pay will be perforated and stimulated.

The proposed well will be tested and potentialized as an oil well.



Cimarex Energy Co.

Location Lea County, NM
Field (Hallertau) Sec 4, T26S, R32E
Facility Hallertau 4 Federal

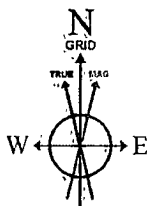
Slot: No 3H SHL
Well No 3H
Wellbore No 3H PWB



Well Profile Data

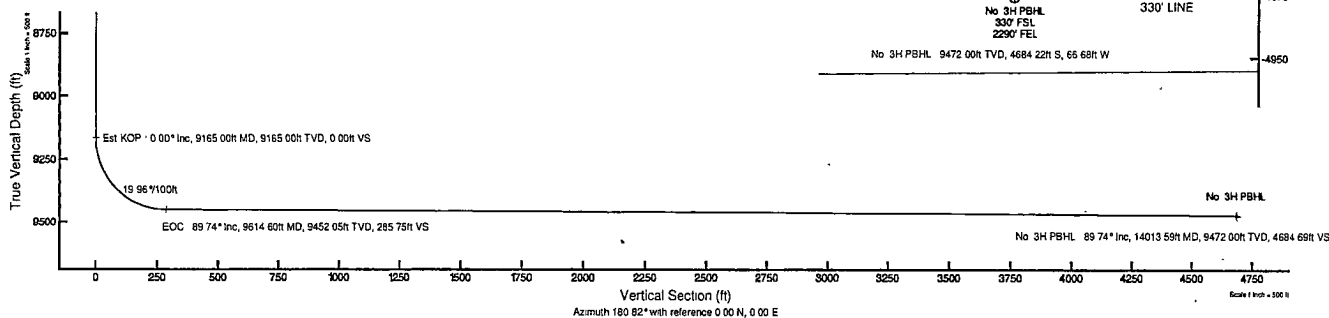
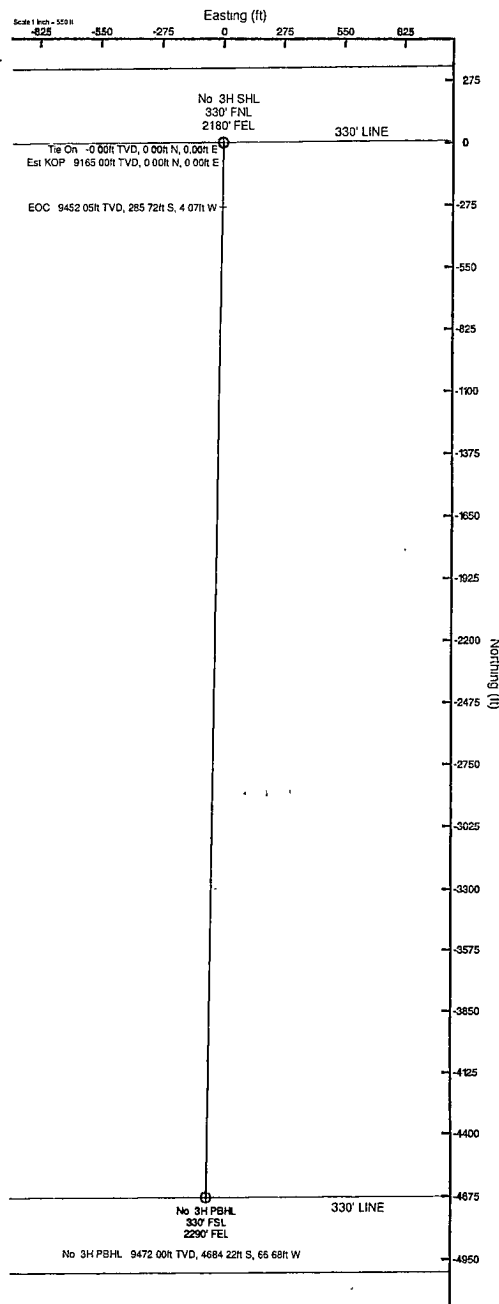
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (*/100ft)	VS (ft)
Tie On	0.00	0.000	180.816	0.00	0.00	0.00	0.00	0.00
Est KOP	9165.00	0.000	180.816	9165.00	0.00	0.00	0.00	0.00
EOC	9614.60	89.740	180.816	9452.05	-285.72	-4.07	19.96	285.75
No 3H PBHL	14013.59	89.740	180.816	9472.00	-4684.22	-66.68	0.00	4684.69

Plot reference wellpath is Prelim_3	Grid System NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet
True vertical depths are referenced to Rig on No 3H SHL (KB)	North Reference Grid north
Measured depths are referenced to Rig on No 3H SHL (KB)	Scale: True distance
Rig on No 3H SHL (KB) to Mean Sea Level: 3306 feet	Depths are in feet
Mean Sea Level to Mud line (At Slot: No 3H SHL) 0 feet	Created by: genbry on 1/23/2012
Coordinates are in feet referenced to Slot	



BGGM (1945.0 to 2012.0) Dip: 60.03° Field 48498 nT
Magnetic North is 7.61 degrees East of True North (at 11/28/2011)
Grid North is 0.35 degrees East of True North
To correct azimuth from True to Grid subtract 0.35 degrees
To correct azimuth from Magnetic to Grid add 7.26 degrees

For example, if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 7.26 = 97.26





Planned Wellpath Report

Prelim_3
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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(Hallertau) Sec 4, T26S, R32E	Wellbore	No. 3H PWB
Facility	Hallertau 4 Federal		

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico SP, Eastern Zone (3001), US feet	Software System	WellArchitect® 3.0.0
North Reference	Grid	User	Gentbry
Scale	0.999956	Report Generated	1/23/2012 at 1:34:08 PM
Convergence at slot	0.35° East	Database/Source file	WellArchitect_DB/No._3H_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-13.93	-1519.81	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W
Facility Reference Pt			745669.47	393012.62	32°04'43.514"N	103°40'25.012"W
Field Reference Pt			745669.47	393012.62	32°04'43.514"N	103°40'25.012"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 3H SHL (KB) to GL	3306.00ft
Horizontal Reference Pt	Slot	Rig on No. 3H SHL (KB) to Mean Sea Level	3306.00ft
Vertical Reference Pt	Rig on No. 3H SHL (KB)	Rig on No. 3H SHL (KB) to Mud Line at Slot (No. 3H SHL)	3306.00ft
MD Reference Pt	Rig on No. 3H SHL (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	180.82°



Planned Wellpath Report

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Field	(Hallertau) Sec 4, T26S, R32E	Wellbore	No. 3H PWB
Facility	Hallertau 4 Federal		

WELLPATH DATA (147 stations) * = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00	0.000	180.816	0.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Tie On
100.00†	0.000	180.816	100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
200.00†	0.000	180.816	200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
300.00†	0.000	180.816	300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
400.00†	0.000	180.816	400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
500.00†	0.000	180.816	500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
600.00†	0.000	180.816	600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
700.00†	0.000	180.816	700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
800.00†	0.000	180.816	800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
900.00†	0.000	180.816	900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1000.00†	0.000	180.816	1000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1100.00†	0.000	180.816	1100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1200.00†	0.000	180.816	1200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1300.00†	0.000	180.816	1300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1400.00†	0.000	180.816	1400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1500.00†	0.000	180.816	1500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1600.00†	0.000	180.816	1600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1700.00†	0.000	180.816	1700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1800.00†	0.000	180.816	1800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
1900.00†	0.000	180.816	1900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2000.00†	0.000	180.816	2000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2100.00†	0.000	180.816	2100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2200.00†	0.000	180.816	2200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2300.00†	0.000	180.816	2300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2400.00†	0.000	180.816	2400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2500.00†	0.000	180.816	2500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2600.00†	0.000	180.816	2600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2700.00†	0.000	180.816	2700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2800.00†	0.000	180.816	2800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
2900.00†	0.000	180.816	2900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3000.00†	0.000	180.816	3000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3100.00†	0.000	180.816	3100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3200.00†	0.000	180.816	3200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3300.00†	0.000	180.816	3300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3400.00†	0.000	180.816	3400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3500.00†	0.000	180.816	3500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3600.00†	0.000	180.816	3600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3700.00†	0.000	180.816	3700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3800.00†	0.000	180.816	3800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
3900.00†	0.000	180.816	3900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4000.00†	0.000	180.816	4000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4100.00†	0.000	180.816	4100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4200.00†	0.000	180.816	4200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4300.00†	0.000	180.816	4300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4400.00†	0.000	180.816	4400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION			
Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(Hallertau) Sec 4, T26S, R32E	Wellbore	No. 3H PWB
Facility	Hallertau 4 Federal		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station												
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4500.00†	0.000	180.816	4500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4530.00†	0.000	180.816	4530.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Delaware
4600.00†	0.000	180.816	4600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4700.00†	0.000	180.816	4700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4800.00†	0.000	180.816	4800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
4900.00†	0.000	180.816	4900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5000.00†	0.000	180.816	5000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5100.00†	0.000	180.816	5100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5200.00†	0.000	180.816	5200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5300.00†	0.000	180.816	5300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5400.00†	0.000	180.816	5400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5500.00†	0.000	180.816	5500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5600.00†	0.000	180.816	5600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5700.00†	0.000	180.816	5700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5800.00†	0.000	180.816	5800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
5900.00†	0.000	180.816	5900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6000.00†	0.000	180.816	6000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6100.00†	0.000	180.816	6100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6200.00†	0.000	180.816	6200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6300.00†	0.000	180.816	6300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6400.00†	0.000	180.816	6400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6500.00†	0.000	180.816	6500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6600.00†	0.000	180.816	6600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6700.00†	0.000	180.816	6700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6800.00†	0.000	180.816	6800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
6900.00†	0.000	180.816	6900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7000.00†	0.000	180.816	7000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7100.00†	0.000	180.816	7100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7200.00†	0.000	180.816	7200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7300.00†	0.000	180.816	7300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7400.00†	0.000	180.816	7400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7500.00†	0.000	180.816	7500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7600.00†	0.000	180.816	7600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7700.00†	0.000	180.816	7700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7800.00†	0.000	180.816	7800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
7900.00†	0.000	180.816	7900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8000.00†	0.000	180.816	8000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8100.00†	0.000	180.816	8100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8200.00†	0.000	180.816	8200.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8300.00†	0.000	180.816	8300.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8400.00†	0.000	180.816	8400.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8500.00†	0.000	180.816	8500.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8600.00†	0.000	180.816	8600.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Bone Spring
8700.00†	0.000	180.816	8700.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8715.00†	0.000	180.816	8715.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Bone Spring A Shale



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(Hallertau) Sec 4, T26S, R32E	Wellbore	No. 3H PWB
Facility	Hallertau 4 Federal		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8800.00†	0.000	180.816	8800.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
8900.00†	0.000	180.816	8900.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
9000.00†	0.000	180.816	9000.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
9100.00†	0.000	180.816	9100.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	
9140.00†	0.000	180.816	9140.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Bone Spring Br Carb
9165.00	0.000	180.816	9165.00	0.00	0.00	0.00	744149.72	392998.69	32°04'43.468"N	103°40'42.676"W	0.00	Est KOP
9200.00†	6.986	180.816	9199.91	2.13	-2.13	-0.03	744149.69	392996.56	32°04'43.447"N	103°40'42.677"W	19.96	
9300.00†	26.946	180.816	9295.08	31.16	-31.16	-0.44	744149.28	392967.53	32°04'43.159"N	103°40'42.684"W	19.96	
9400.00†	46.906	180.816	9374.62	90.94	-90.93	-1.29	744148.43	392907.77	32°04'42.568"N	103°40'42.698"W	19.96	
9500.00†	66.866	180.816	9428.97	174.27	-174.26	-2.48	744147.24	392824.44	32°04'41.744"N	103°40'42.717"W	19.96	
9600.00†	86.826	180.816	9451.61	271.16	-271.13	-3.86	744145.86	392727.57	32°04'40.785"N	103°40'42.740"W	19.96	
9614.60	89.740	180.816	9452.05	285.75	-285.72	-4.07	744145.66	392712.98	32°04'40.641"N	103°40'42.744"W	19.96	EOC
9700.00†	89.740	180.816	9452.44	371.15	-371.11	-5.28	744144.44	392627.60	32°04'39.796"N	103°40'42.764"W	0.00	
9800.00†	89.740	180.816	9452.89	471.15	-471.10	-6.71	744143.02	392527.61	32°04'38.807"N	103°40'42.787"W	0.00	
9900.00†	89.740	180.816	9453.34	571.15	-571.09	-8.13	744141.59	392427.63	32°04'37.817"N	103°40'42.811"W	0.00	
10000.00†	89.740	180.816	9453.80	671.15	-671.08	-9.55	744140.17	392327.65	32°04'36.828"N	103°40'42.835"W	0.00	
10100.00†	89.740	180.816	9454.25	771.15	-771.07	-10.98	744138.75	392227.66	32°04'35.839"N	103°40'42.858"W	0.00	
10200.00†	89.740	180.816	9454.70	871.15	-871.06	-12.40	744137.32	392127.68	32°04'34.849"N	103°40'42.882"W	0.00	
10300.00†	89.740	180.816	9455.16	971.14	-971.05	-13.82	744135.90	392027.69	32°04'33.860"N	103°40'42.905"W	0.00	
10400.00†	89.740	180.816	9455.61	1071.14	-1071.03	-15.25	744134.48	391927.71	32°04'32.871"N	103°40'42.929"W	0.00	
10500.00†	89.740	180.816	9456.07	1171.14	-1171.02	-16.67	744133.05	391827.72	32°04'31.881"N	103°40'42.953"W	0.00	
10600.00†	89.740	180.816	9456.52	1271.14	-1271.01	-18.09	744131.63	391727.74	32°04'30.892"N	103°40'42.976"W	0.00	
10700.00†	89.740	180.816	9456.97	1371.14	-1371.00	-19.52	744130.21	391627.76	32°04'29.903"N	103°40'43.000"W	0.00	
10800.00†	89.740	180.816	9457.43	1471.14	-1470.99	-20.94	744128.79	391527.77	32°04'28.913"N	103°40'43.023"W	0.00	
10900.00†	89.740	180.816	9457.88	1571.14	-1570.98	-22.36	744127.36	391427.79	32°04'27.924"N	103°40'43.047"W	0.00	
11000.00†	89.740	180.816	9458.33	1671.14	-1670.97	-23.79	744125.94	391327.80	32°04'26.935"N	103°40'43.071"W	0.00	
11100.00†	89.740	180.816	9458.79	1771.14	-1770.96	-25.21	744124.52	391227.82	32°04'25.945"N	103°40'43.094"W	0.00	
11200.00†	89.740	180.816	9459.24	1871.13	-1870.95	-26.63	744123.09	391127.83	32°04'24.956"N	103°40'43.118"W	0.00	
11300.00†	89.740	180.816	9459.69	1971.13	-1970.93	-28.06	744121.67	391027.85	32°04'23.967"N	103°40'43.141"W	0.00	
11400.00†	89.740	180.816	9460.15	2071.13	-2070.92	-29.48	744120.25	390927.87	32°04'22.977"N	103°40'43.165"W	0.00	
11500.00†	89.740	180.816	9460.60	2171.13	-2170.91	-30.90	744118.82	390827.88	32°04'21.988"N	103°40'43.189"W	0.00	
11600.00†	89.740	180.816	9461.05	2271.13	-2270.90	-32.33	744117.40	390727.90	32°04'20.999"N	103°40'43.212"W	0.00	
11700.00†	89.740	180.816	9461.51	2371.13	-2370.89	-33.75	744115.98	390627.91	32°04'20.009"N	103°40'43.236"W	0.00	
11800.00†	89.740	180.816	9461.96	2471.13	-2470.88	-35.17	744114.55	390527.93	32°04'19.020"N	103°40'43.259"W	0.00	
11900.00†	89.740	180.816	9462.41	2571.13	-2570.87	-36.60	744113.13	390427.94	32°04'18.031"N	103°40'43.283"W	0.00	
12000.00†	89.740	180.816	9462.87	2671.13	-2670.86	-38.02	744111.71	390327.96	32°04'17.041"N	103°40'43.307"W	0.00	
12100.00†	89.740	180.816	9463.32	2771.13	-2770.84	-39.44	744110.28	390227.98	32°04'16.052"N	103°40'43.330"W	0.00	
12200.00†	89.740	180.816	9463.78	2871.12	-2870.83	-40.87	744108.86	390127.99	32°04'15.063"N	103°40'43.354"W	0.00	
12300.00†	89.740	180.816	9464.23	2971.12	-2970.82	-42.29	744107.44	390028.01	32°04'14.073"N	103°40'43.377"W	0.00	
12400.00†	89.740	180.816	9464.68	3071.12	-3070.81	-43.71	744106.01	389928.02	32°04'13.084"N	103°40'43.401"W	0.00	
12500.00†	89.740	180.816	9465.14	3171.12	-3170.80	-45.14	744104.59	389828.04	32°04'12.095"N	103°40'43.424"W	0.00	
12600.00†	89.740	180.816	9465.59	3271.12	-3270.79	-46.56	744103.17	389728.05	32°04'11.105"N	103°40'43.448"W	0.00	
12700.00†	89.740	180.816	9466.04	3371.12	-3370.78	-47.98	744101.74	389628.07	32°04'10.116"N	103°40'43.472"W	0.00	
12800.00†	89.740	180.816	9466.50	3471.12	-3470.77	-49.41	744100.32	389528.09	32°04'09.127"N	103°40'43.495"W	0.00	
12900.00†	89.740	180.816	9466.95	3571.12	-3570.76	-50.83	744098.90	389428.10	32°04'08.137"N	103°40'43.519"W	0.00	



Planned Wellpath Report

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REFERENCE WELLPATH IDENTIFICATION

Operator	Cimarex Energy Co.	Slot	No. 3H SHL
Area	Lea County, NM	Well	No. 3H
Field	(Hallertau) Sec 4, T26S, R32E	Wellbore	No. 3H PWB
Facility	Hallertau 4 Federal		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
13000.00†	89.740	180.816	9467.40	3671.12	-3670.74	-52.25	744097.47	389328.12	32°04'07.148"N	103°40'43.542"W	0.00	
13100.00†	89.740	180.816	9467.86	3771.12	-3770.73	-53.68	744096.05	389228.13	32°04'06.159"N	103°40'43.566"W	0.00	
13200.00†	89.740	180.816	9468.31	3871.11	-3870.72	-55.10	744094.63	389128.15	32°04'05.169"N	103°40'43.590"W	0.00	
13300.00†	89.740	180.816	9468.76	3971.11	-3970.71	-56.52	744093.20	389028.16	32°04'04.180"N	103°40'43.613"W	0.00	
13400.00†	89.740	180.816	9469.22	4071.11	-4070.70	-57.95	744091.78	388928.18	32°04'03.191"N	103°40'43.637"W	0.00	
13500.00†	89.740	180.816	9469.67	4171.11	-4170.69	-59.37	744090.36	388828.20	32°04'02.202"N	103°40'43.660"W	0.00	
13600.00†	89.740	180.816	9470.12	4271.11	-4270.68	-60.79	744088.93	388728.21	32°04'01.212"N	103°40'43.684"W	0.00	
13700.00†	89.740	180.816	9470.58	4371.11	-4370.67	-62.22	744087.51	388628.23	32°04'00.223"N	103°40'43.708"W	0.00	
13800.00†	89.740	180.816	9471.03	4471.11	-4470.66	-63.64	744086.09	388528.24	32°03'59.234"N	103°40'43.731"W	0.00	
13900.00†	89.740	180.816	9471.48	4571.11	-4570.64	-65.06	744084.66	388428.26	32°03'58.244"N	103°40'43.755"W	0.00	
14000.00†	89.740	180.816	9471.94	4671.11	-4670.63	-66.49	744083.24	388328.27	32°03'57.255"N	103°40'43.778"W	0.00	
14013.59	89.740	180.816	9472.00	4684.69	-4684.22	-66.68	744083.05	388314.69	32°03'57.120"N	103°40'43.782"W	0.00	No. 3H PBHL

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
1) No. 3H PBHL	14013.59	9472.00	-4684.22	-66.68	744083.05	388314.69	32°03'57.120"N	103°40'43.782"W	point

SURVEY PROGRAM - Ref Wellbore: No. 3H PWB - Ref Wellpath: Prelim_3

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
3306.00	14013.59	NaviTrak (Standard)		No. 3H PWB

SR & A

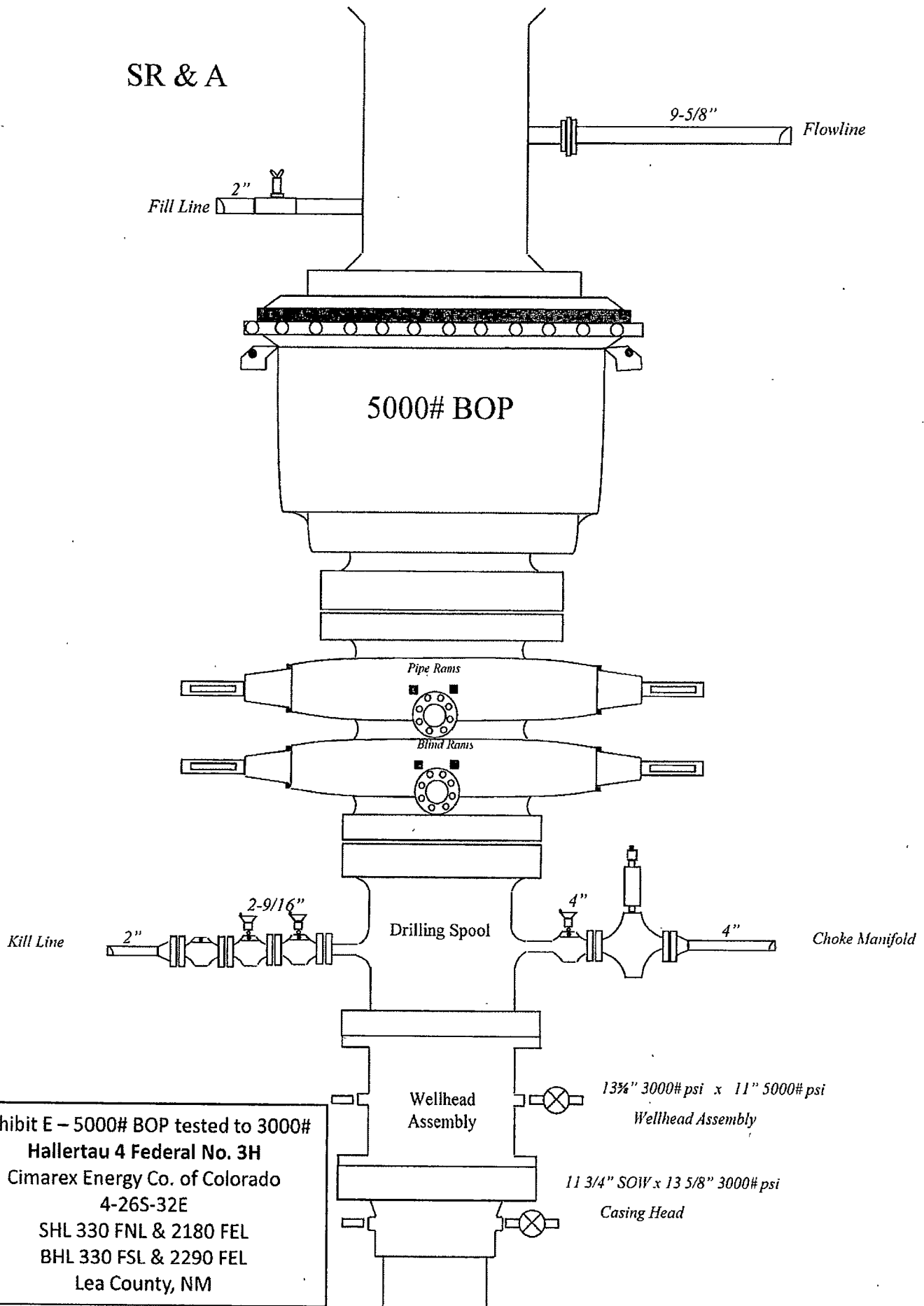


Exhibit E – 5000# BOP tested to 3000#
Hallertau 4 Federal No. 3H
Cimarex Energy Co. of Colorado
4-26S-32E
SHL 330 FNL & 2180 FEL
BHL 330 FSL & 2290 FEL
Lea County, NM

Exhibit E-1 – Choke Manifold Diagram
Hallertau 4 Federal No. 3H
Cimarex Energy Co. of Colorado
4-26S-32E
SHL 330 FNL & 2180 FEL
BHL 330 FSL & 2290 FEL
Lea County, NM

