

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD

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.

5. Lease Serial No.
NMNM130854

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.
COTTONBERRY 20 FEDERAL COM 3H9. API Well No.
30-015-43454-00-X110. Field and Pool, or Exploratory
UNKNOWN

11. County or Parish, and State

EDDY COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

CIMAREX ENERGY COMPANY OF CO-Mail: aeasterling@cimarex.com

Contact: ARICKA EASTERLING

3a. Address

202 S CHEYENNE AVE SUITE 1000
TULSA, OK 74103.4346

3b. Phone No. (include area code)

Ph: 918-560-7060

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 17 T25S R27E SWSE 195FSL 2185FEL

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ 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 recompleat 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 recompleat 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 proposes to change the SHL to accommodate the drilling rig. No additional disturbance is required for the well pad.

Approved:

SHL 195 FSL & 2185 FEL Sec. 17-25S-27E

Proposed:

SHL-161 FSL & 2225 FEL Sec. 20-25S-27E

Please see attached proposed drilling plan, directional plan and plat

12/1/15
for record
NMOC

NM OIL CONSERVATION
ARTESIA DISTRICT
NOV 30 2015

RECEIVED

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #323819 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 11/23/2015 (16CRW0019SE)

Name (Printed/Typed) ARICKA EASTERLING

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 11/17/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Title

Date 11/24/15

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

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.

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-43454	² Pool Code 97816	³ Pool Name WC-015-S2S271SA ; Bone Spring
⁴ Property Code 315640	⁵ Property Name COTTONBERRY 20 FEDERAL COM	⁶ Well Number 3H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 3135.7'

" Surface Location

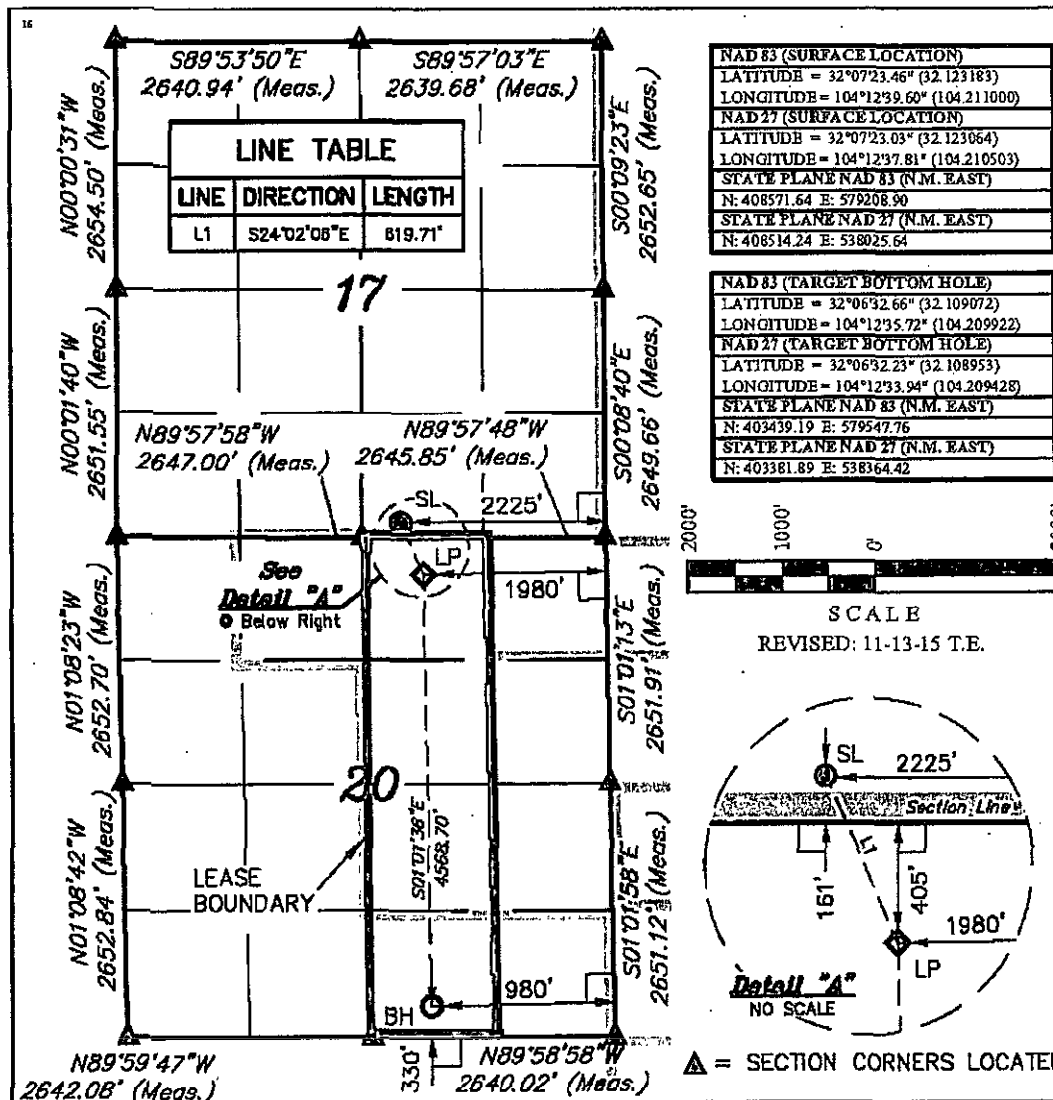
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	17	25S	27E		161	SOUTH	2225	EAST	EDDY

" Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	20	25S	27E		330	SOUTH	1980	EAST	EDDY

¹² Dedicated Acres 160	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



**" OPERATOR
CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: *Aricka Easterling* Date: 11/17/15

Printed Name: Aricka Easterling

E-mail Address: aeasterling@cimarex.com

**" SURVEYOR
CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

June 11, 2014

Date of Survey
Signature and Seal of Professional Surveyor:



Certificate Number:

1. Geological Formations

TVD of target 7,322

Pilot Hole TD N/A

MD at TD 12,327

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	0	N/A	
OSE Groundwater	100	N/A	
Top Salt	1270	N/A	
Base Salt	1867	N/A	
Bell Canyon	2061	N/A	
Cherry Canyon	3016	N/A	
Brushy Canyon	4056	N/A	
Brushy Canyon Lower	5338	N/A	
Bone Spring	5612	Hydrocarbons	
Bone Spring A Shale	5756	Hydrocarbons	
Bone Spring C Shale	6103	Hydrocarbons	
1st Bone Spring ss	6618	Hydrocarbons	
2nd Bone Spring ss	6985	Hydrocarbons	
2nd BS Ss Horz Target	7322	Hydrocarbons	
3rd BS Limestone	7420	Hydrocarbons	
Lwr 2nd Bone Spring Ss	7825	Hydrocarbons	
Base Lwr 2nd BS Ss	7998	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Casing Size	Weight (lb/ft)	Grade	Conn	SF Collapse	SF Burst	SF Tension
17 1/2	0	450	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	3.59	8.40	14.91
12 1/4	0	PPD 2041	9-5/8"	36.00	J-55	LT&C	1.87	3.25	6.17
8 3/4	0	6747	5-1/2"	17.00	L-80	LT&C	1.95	2.40	2.72
8 3/4	6747	12326	5-1/2"	17.00	L-80	BT&C	1.80	2.21	40.61
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	N
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	91	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	386	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	120	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	646	10.80	2.35	9.60	17:43	Lead: Tuned Light I Class H
	1210	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	33
Intermediate	0	44
Production	1790 1841	17

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram	X	2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram	X	3M
			Pipe Ram		
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
N	Are anchors required by manufacturer?	

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 450'	FW Spud Mud	8.30 - 8.80	28	N/C
450' to 2041'	Brine Water	9.70 - 10.20	30-32	N/C
2041' to 12326'	FW/Cut Brine	8.70 - 9.20	30-32	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?

PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well - vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval
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7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	3502 psi
Abnormal Temperature	No

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

X	H ₂ S is present
X	H ₂ S plan is attached

8. Other Facets of Operation



Borehole: Original Wellbore

Well:

Cimarex Cottonberry 20 Federal #3H

Field:

NM Eddy County (NAD 83)

Structure:

Cimarex Cottonberry 20 Federal #3H

Gravity & Magnetic Parameters

Model: HCOB 2015

Date: 08/09/2015

MagDec: 7.380°

Gravity PS: 980.444mgals (USMS Base)

Lat: N 32 7 23.46

Long: W 104 11 28.60

Northgr: 48871.540US

Scale Fact: 0.9999973

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

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WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

WGS84 to NAD83

True

Mag

Grid North

Tel Corr (M-S 7.537)

Mag Dec (7.380°)

Grid Corr (0.005°)

Critical Points

MD

AS2M

VSBC

W-1004

W-1004

W-1004

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Cimarex Cottonberry 20 Federal #3H Rev1 OPB 18-May-15 Proposal

Geodetic Report

(Non-Def Plan)



Report Date: November 16, 2015 - 04:59 PM
Client: Cimarex
Field: NM Eddy County (NAD 83)
Structure / Slot: Cimarex Cottonberry 20 Federal #3H / Cimarex Cottonberry 20 Federal #3H
Well: Cimarex Cottonberry 20 Federal #3H
Borehole: Original Wellbore
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Cottonberry 20 Federal #3H Rev1 OPB 18-May-15
Survey Date: August 22, 2014
Tort / AHD / DDI / ERO Ratio: 119.793 ° / 5298.648 ft / 6.029 / 0.724

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 176.223 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3160.700 ft above MSL
Seabed / Ground Elevation: 3135.700 ft above MSL
Magnetic Declination: 7.588 °
Total Gravity Field Strength: 998.4479mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 48196.805 nT

Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet

Location Lat / Long: N 32° 7' 23.4601" W 104° 12' 39.59649"

Location Grid N/E Y/X: N 408571.640 ftUS, E 579208.900 ftUS

CRS Grid Convergence Angle: 0.0651 °

Grid Scale Factor: 0.99991073

Version / Patch: 2.8.572.0

Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
Cimarex Cottonberry 20 Federal #3H SHL [163 FNL, 2225' FEL]	0.00	0.00	90.00	0.00	-3160.70	0.00	0.00	0.00	N/A	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	100.00	0.00	90.00	100.00	-3060.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	200.00	0.00	90.00	200.00	-2960.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	300.00	0.00	90.00	300.00	-2860.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	400.00	0.00	90.00	400.00	-2760.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	500.00	0.00	90.00	500.00	-2660.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	600.00	0.00	90.00	600.00	-2560.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	700.00	0.00	90.00	700.00	-2460.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	800.00	0.00	90.00	800.00	-2360.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	900.00	0.00	90.00	900.00	-2260.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1000.00	0.00	90.00	1000.00	-2160.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1100.00	0.00	90.00	1100.00	-2060.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1200.00	0.00	90.00	1200.00	-1960.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1300.00	0.00	90.00	1300.00	-1860.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1400.00	0.00	90.00	1400.00	-1760.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Build 12"/100'	1500.00	0.00	90.00	1500.00	-1660.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1600.00	0.00	90.00	1600.00	-1560.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1700.00	0.00	90.00	1700.00	-1460.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1800.00	0.00	90.00	1800.00	-1360.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	1900.00	0.00	90.00	1900.00	-1260.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2000.00	0.00	90.00	2000.00	-1160.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2100.00	0.00	90.00	2100.00	-1060.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2200.00	0.00	90.00	2200.00	-960.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2300.00	0.00	90.00	2300.00	-860.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2400.00	0.00	90.00	2400.00	-760.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
Build & Turn 12"/100' DLS	2500.00	0.00	90.00	2500.00	-660.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2600.00	0.00	90.00	2600.00	-560.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2700.00	0.00	90.00	2700.00	-460.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2800.00	0.00	90.00	2800.00	-360.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	2900.00	0.00	90.00	2900.00	-260.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3000.00	0.00	90.00	3000.00	-160.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3100.00	0.00	90.00	3100.00	-60.70	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3200.00	0.00	90.00	3200.00	39.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3300.00	0.00	90.00	3300.00	139.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3400.00	0.00	90.00	3400.00	239.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
Build 12"/100'	3500.00	0.00	90.00	3500.00	339.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3600.00	0.00	90.00	3600.00	439.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3700.00	0.00	90.00	3700.00	539.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3800.00	0.00	90.00	3800.00	639.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	3900.00	0.00	90.00	3900.00	739.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4000.00	0.00	90.00	4000.00	839.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4100.00	0.00	90.00	4100.00	939.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4200.00	0.00	90.00	4200.00	1039.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4300.00	0.00	90.00	4300.00	1139.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4400.00	0.00	90.00	4400.00	1239.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
Build 12"/100'	4500.00	0.00	90.00	4500.00	1339.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4600.00	0.00	90.00	4600.00	1439.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4700.00	0.00	90.00	4700.00	1539.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4800.00	0.00	90.00	4800.00	1639.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	4900.00	0.00	90.00	4900.00	1739.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5000.00	0.00	90.00	5000.00	1839.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5100.00	0.00	90.00	5100.00	1939.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5200.00	0.00	90.00	5200.00	2039.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5300.00	0.00	90.00	5300.00	2139.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5400.00	0.00	90.00	5400.00	2239.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
Build 12"/100'	5500.00	0.00	90.00	5500.00	2339.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5600.00	0.00	90.00	5600.00	2439.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5700.00	0.00	90.00	5700.00	2539.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5800.00	0.00	90.00	5800.00	2639.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	5900.00	0.00	90.00	5900.00	2739.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6000.00	0.00	90.00	6000.00	2839.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6100.00	0.00	90.00	6100.00	2939.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6200.00	0.00	90.00	6200.00	3039.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6300.00	0.00	90.00	6300.00	3139.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6400.00	0.00	90.00	6400.00	3239.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
Build 12"/100'	6500.00	0.00	90.00	6500.00	3339.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6600.00	0.00	90.00	6600.00	3439.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6700.00	0.00	90.00	6700.00	3539.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6800.00	0.00	90.00	6800.00	3639.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	6900.00	0.00	90.00	6900.00	3739.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	7000.00	0.00	90.00	7000.00	3839.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	7100.00	0.00	90.00	7100.00	3939.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	7200.00	0.00	90.00	7200.00	4039.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	7300.00	0.00	90.00	7300.00	4139.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60
	7400.00	0.00	90.00	7400.00	4239.30	0.00	0.00	0.00	0.00	408571.64	579208.90	N 32 7 23.46	W 104 12 39.60

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
Landing Point	7400.00	62.40	162.02	7257.84	4097.14	237.83	-220.56	266.39	12.00	408351.10	579475.27	N 32 7 21.27	W 104 12 36.50
	7500.00	72.48	169.08	7296.21	4135.51	328.23	-309.85	289.18	12.00	408261.82	579498.06	N 32 7 20.39	W 104 12 36.24
	7600.00	82.78	175.39	7317.62	4156.92	425.49	-406.46	302.25	12.00	408165.22	579511.12	N 32 7 19.43	W 104 12 36.09
	7669.54	90.00	179.59	7322.00	4161.30	494.81	-475.73	305.27	12.00	408065.95	579514.15	N 32 7 18.75	W 104 12 36.05
	7700.00	90.00	179.59	7322.00	4161.30	525.22	-506.19	305.49	0.00	408065.49	579514.37	N 32 7 18.45	W 104 12 36.05
	7800.00	90.00	179.59	7322.00	4161.30	625.05	-606.19	306.22	0.00	407965.50	579515.09	N 32 7 17.46	W 104 12 36.04
	7900.00	90.00	179.59	7322.00	4161.30	724.88	-706.19	306.94	0.00	407865.51	579515.81	N 32 7 16.47	W 104 12 36.04
	8000.00	90.00	179.59	7322.00	4161.30	824.70	-806.19	307.66	0.00	407765.53	579516.53	N 32 7 15.48	W 104 12 36.03
	8100.00	90.00	179.59	7322.00	4161.30	924.53	-906.18	308.38	0.00	407665.54	579517.25	N 32 7 14.49	W 104 12 36.02
	8200.00	90.00	179.59	7322.00	4161.30	1024.36	-1006.18	309.10	0.00	407565.55	579517.98	N 32 7 13.50	W 104 12 36.02
	8300.00	90.00	179.59	7322.00	4161.30	1124.19	-1106.18	309.83	0.00	407465.56	579518.70	N 32 7 12.51	W 104 12 36.01
	8400.00	90.00	179.59	7322.00	4161.30	1224.01	-1206.18	310.55	0.00	407365.57	579519.42	N 32 7 11.52	W 104 12 36.00
	8500.00	90.00	179.59	7322.00	4161.30	1323.84	-1306.17	311.27	0.00	407265.59	579520.14	N 32 7 10.53	W 104 12 35.99
	8600.00	90.00	179.59	7322.00	4161.30	1423.67	-1406.17	311.99	0.00	407165.60	579520.86	N 32 7 9.54	W 104 12 35.99
	8700.00	90.00	179.59	7322.00	4161.30	1523.50	-1506.17	312.71	0.00	407065.61	579521.58	N 32 7 8.55	W 104 12 35.98
	8800.00	90.00	179.59	7322.00	4161.30	1623.33	-1606.17	313.43	0.00	406965.62	579522.31	N 32 7 7.56	W 104 12 35.97
	8900.00	90.00	179.59	7322.00	4161.30	1723.15	-1706.16	314.16	0.00	406865.63	579523.03	N 32 7 6.57	W 104 12 35.97
	9000.00	90.00	179.59	7322.00	4161.30	1822.98	-1806.16	314.88	0.00	406765.64	579523.75	N 32 7 5.58	W 104 12 35.96
	9100.00	90.00	179.59	7322.00	4161.30	1922.81	-1906.16	315.60	0.00	406665.66	579524.47	N 32 7 4.59	W 104 12 35.95
	9200.00	90.00	179.59	7322.00	4161.30	2022.64	-2006.16	316.32	0.00	406565.67	579525.19	N 32 7 3.61	W 104 12 35.95
	9300.00	90.00	179.59	7322.00	4161.30	2122.46	-2106.15	317.04	0.00	406465.68	579525.91	N 32 7 2.62	W 104 12 35.94
	9400.00	90.00	179.59	7322.00	4161.30	2222.29	-2206.15	317.76	0.00	406365.69	579526.64	N 32 7 1.63	W 104 12 35.93
	9500.00	90.00	179.59	7322.00	4161.30	2322.12	-2306.15	318.49	0.00	406265.70	579527.36	N 32 7 0.64	W 104 12 35.92
	9600.00	90.00	179.59	7322.00	4161.30	2421.95	-2406.15	319.21	0.00	406165.71	579528.08	N 32 6 59.65	W 104 12 35.92
	9700.00	90.00	179.59	7322.00	4161.30	2521.78	-2506.14	319.93	0.00	406065.73	579528.80	N 32 6 58.66	W 104 12 35.91
	9800.00	90.00	179.59	7322.00	4161.30	2621.60	-2606.14	320.65	0.00	405965.74	579529.52	N 32 6 57.67	W 104 12 35.90
	9900.00	90.00	179.59	7322.00	4161.30	2721.43	-2706.14	321.37	0.00	405865.75	579530.24	N 32 6 56.68	W 104 12 35.90
	10000.00	90.00	179.59	7322.00	4161.30	2821.26	-2806.13	322.10	0.00	405765.76	579530.97	N 32 6 55.69	W 104 12 35.89
	10100.00	90.00	179.59	7322.00	4161.30	2921.09	-2906.13	322.84	0.00	405665.77	579531.69	N 32 6 54.70	W 104 12 35.88
	10200.00	90.00	179.59	7322.00	4161.30	3020.91	-3006.13	323.54	0.00	405565.78	579532.41	N 32 6 53.71	W 104 12 35.87
	10300.00	90.00	179.59	7322.00	4161.30	3120.74	-3106.13	324.26	0.00	405465.80	579533.13	N 32 6 52.72	W 104 12 35.87
	10400.00	90.00	179.59	7322.00	4161.30	3220.57	-3206.12	324.98	0.00	405365.81	579533.85	N 32 6 51.73	W 104 12 35.86
	10500.00	90.00	179.59	7322.00	4161.30	3320.40	-3306.12	325.70	0.00	405265.82	579534.58	N 32 6 50.74	W 104 12 35.85
	10600.00	90.00	179.59	7322.00	4161.30	3420.22	-3406.12	326.43	0.00	405165.83	579535.30	N 32 6 49.75	W 104 12 35.85
	10700.00	90.00	179.59	7322.00	4161.30	3520.05	-3506.12	327.15	0.00	405065.84	579536.02	N 32 6 48.76	W 104 12 35.84
	10800.00	90.00	179.59	7322.00	4161.30	3619.88	-3606.11	327.87	0.00	404965.86	579536.74	N 32 6 47.77	W 104 12 35.83
	10900.00	90.00	179.59	7322.00	4161.30	3719.71	-3706.11	328.59	0.00	404865.87	579537.46	N 32 6 46.78	W 104 12 35.83
	11000.00	90.00	179.59	7322.00	4161.30	3819.54	-3806.11	329.31	0.00	404765.88	579538.18	N 32 6 45.79	W 104 12 35.82
	11100.00	90.00	179.59	7322.00	4161.30	3919.36	-3906.11	330.04	0.00	404665.89	579538.91	N 32 6 44.80	W 104 12 35.81
	11200.00	90.00	179.59	7322.00	4161.30	4019.19	-4006.10	330.76	0.00	404565.90	579539.63	N 32 6 43.81	W 104 12 35.80
	11300.00	90.00	179.59	7322.00	4161.30	4119.02	-4106.10	331.48	0.00	404465.91	579540.35	N 32 6 42.83	W 104 12 35.80
	11400.00	90.00	179.59	7322.00	4161.30	4218.85	-4206.10	332.20	0.00	404365.93	579541.07	N 32 6 41.84	W 104 12 35.79
	11500.00	90.00	179.59	7322.00	4161.30	4318.67	-4306.10	332.92	0.00	404265.94	579541.79	N 32 6 40.85	W 104 12 35.78
	11600.00	90.00	179.59	7322.00	4161.30	4418.50	-4406.09	333.64	0.00	404165.95	579542.51	N 32 6 39.86	W 104 12 35.78
	11700.00	90.00	179.59	7322.00	4161.30	4518.33	-4506.09	334.37	0.00	404065.96	579543.24	N 32 6 38.87	W 104 12 35.77
	11800.00	90.00	179.59	7322.00	4161.30	4618.16	-4606.09	335.09	0.00	403965.97	579543.96	N 32 6 37.88	W 104 12 35.76
	11900.00	90.00	179.59	7322.00	4161.30	4717.98	-4706.09	335.81	0.00	403865.98	579544.68	N 32 6 36.89	W 104 12 35.75
	12000.00	90.00	179.59	7322.00	4161.30	4817.81	-4806.08	336.53	0.00	403766.00	579545.40	N 32 6 35.90	W 104 12 35.75
	12100.00	90.00	179.59	7322.00	4161.30	4917.64	-4906.08	337.25	0.00	403666.01	579546.12	N 32 6 34.91	W 104 12 35.74
	12200.00	90.00	179.59	7322.00	4161.30	5017.47	-5006.08	337.98	0.00	403566.02	579546.84	N 32 6 33.92	W 104 12 35.73
	12300.00	90.00	179.59	7322.00	4161.30	5117.30	-5106.07	338.70	0.00	403466.03	579547.57	N 32 6 32.93	W 104 12 35.73
Cimarex Cottonberry 20 Federal 3H - PBHL [330' FSL, 1980' FEL]	12326.84	90.00	179.59	7322.00	4161.30	5144.09	-5132.92	338.89	0.00	403439.19	579547.76	N 32 6 32.66	W 104 12 35.72

Survey Type: Non-Def Plan

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
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Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	25.000	1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Original Wellbore / Cimarex Cottonberry 20 Federal #3H Rev1
	1	25.000	12326.844	1/100.000	30.000	30.000	SLB_MWD-STD	OPB 18-May-15 Original Wellbore / Cimarex Cottonberry 20 Federal #3H Rev1