Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NMOCD Artesia
MAR 13 2017
RECEIVED

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

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 page 2

5. Lease Serial No.
NMNM94839

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
WIGEON 23 FED COM 4H

2. Name of Operator
CIMAREX ENERGY COMPANY OF CO
Contact: ARICKA EASTERLING
E-Mail: aeasterling@cimarex.com

9. API Well No.
30-015-43156-00-X1

3a. Address
202 S CHEYENNE AVE SUITE 1000
TULSA, OK 74103.4346

3b. Phone No. (include area code)
Ph: 918-560-7060

10. Field and Pool or Exploratory Area
WILDCAT

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 23 T25S R26E NENE 305FNL 757FEL
32.071865 N Lat, 104.152660 W Lon

11. County or Parish, State
EDDY COUNTY, NM

12. CHECK THE 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	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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 must 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 must be filed once testing has been completed. Final Abandonment Notices must 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 respectfully request approval to change the BHL there by changing the directional plan. No additional surface disturbance is required.

Approved:
BHL: 330 FSL & 660 FEL Sec. 26-25S-26E
Proposed
BHL: 330 FSL & 330 FEL Sec. 26-25S-26E

Please see attached plat, drill prelim and drill plan.

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Accepted for record - NMOCD

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #363279 verified by the BLM Well Information System
For CIMAREX ENERGY COMPANY OF CO, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 01/31/2017 (17PP0115SE)

Name *(Printed/Typed)* ARICKA EASTERLING — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 01/09/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

APPROVED
FEB 22 2017
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

Approved By — Title — Date

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.

(Instructions on page 2)

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

1. Geological Formations

TVD of target 9,720
MD at TD 19,479

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	0	N/A	
OSE Groundwater	50	N/A	
Top Salt	1115	N/A	
Base Salt	1720	N/A	
Bell Canyon	1970	N/A	
Cherry Canyon	2808	N/A	
Brushy Canyon	3890	N/A	
Bone Spring	5450	Hydrocarbons	
1st Bone Spring Ss	6420	Hydrocarbons	
2nd Bone Spring Ls	6650	Hydrocarbons	
2nd Bone Spring Ss	6950	Hydrocarbons	
3rd BS Limestone	7390	Hydrocarbons	
3rd Bone Spring Ss	8300	Hydrocarbons	
Wolfcamp	8645	Hydrocarbons	
Wolfcamp B	9300	Hydrocarbons	
Wolfcamp C	9500	Hydrocarbons	
Wolfcamp D	9550	Hydrocarbons	
Wolfcamp Lower	9934	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	400	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	4.04	9.45	16.77
12 1/4	0	1900	9-5/8"	36.00	J-55	LT&C	2.00	3.49	6.62
8 3/4	0	9143	7"	26.00	L-80	LT&C	1.24	1.66	2.02
8 3/4	9143	10638	7"	26.00	L-80	BT&C	1.16	1.56	40.26
6	9143	19479	4-1/2"	11.60	P-110	BT&C	1.25	1.77	54.83
				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.	Y
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 ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	78	14.80	1.34	6.32	9.5	Lead: Class C + LCM
See COA	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	361	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	111	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	594	10.80	2.35	9.60	17:43	Lead: Tuned Light I Class H
See COA	191	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	643	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
See COA						

Casing String	TOC	% Excess
Surface	0	31
Intermediate	0	44
Production	1700	23
Completion System	~~10638~~	10

tieback to top of liner @ 9143'

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		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	~~3M~~ 5M Per Terri Stathem	Annular	X	50% of working pressure
			Blind Ram	X	5M ~~3M~~ 2/22/2017
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram	X	5M
			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 400'	FW Spud Mud	8.30 - 8.80	28	N/C
400' to 1900'	Brine Water	9.70 - 10.20	30-32	N/C
1900' to 10638'	FW/Cut Brine	8.70 - 9.20	30-32	N/C
10638' to 19479'	Oil Based Mud	11.50 - 12.00	50-70	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 fromTD 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

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	4650 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	H2S is present
X	H2S plan is attached

8. Other Facets of Operation

Schlumberger

Cimarex Wigeon 23 Federal Com 4H Rev3 RM 6Jan17 Proposal Geodetic Report

(Non-Def Plan)

CIMAREX

Report Date:	January 06, 2017 - 09:07 AM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex	**Vertical Section Azimuth:**	177.612 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Wigeon 23 Federal Com 4H / Cimarex Wigeon 23 Federal Com 4H	**TVD Reference Datum:**	Unknown
Well:	Cimarex Wigeon 23 Federal Com 4H	**TVD Reference Elevation:**	3281.100 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	3281.100 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.517 °
Survey Name:	Cimarex Wigeon 23 Federal Com 4H Rev3 RM 6Jan17	**Total Gravity Field Strength:**	998.4385mgn (9.80665 Based)
Survey Date:	January 06, 2017	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	109.821 ° / 10055.368 ft / 6.345 / 1.035	**Total Magnetic Field Strength:**	48055.261 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.863 °
Location Lat / Long:	N 32° 7' 18.64603", W 104° 15' 26.60056"	**Declination Date:**	January 06, 2017
Location Grid N/E Y/X:	N 408071.970 ftUS, E 564848.140 ftUS	**Magnetic Declination Model:**	HDGM 2016
CRS Grid Convergence Angle:	0.0404 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99990972	**Grid Convergence Used:**	0.0404 °
Version / Patch:	2.10.254.0	**Total Corr Mag North->Grid North:**	7.4764 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [305' FNL, 757' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	100.00	0.00	148.20	100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	200.00	0.00	148.20	200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	300.00	0.00	148.20	300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	400.00	0.00	148.20	400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	500.00	0.00	148.20	500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	600.00	0.00	148.20	600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	700.00	0.00	148.20	700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	800.00	0.00	148.20	800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	900.00	0.00	148.20	900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1000.00	0.00	148.20	1000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1100.00	0.00	148.20	1100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1200.00	0.00	148.20	1200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1300.00	0.00	148.20	1300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1400.00	0.00	148.20	1400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1500.00	0.00	148.20	1500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1600.00	0.00	148.20	1600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1700.00	0.00	148.20	1700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1800.00	0.00	148.20	1800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	1900.00	0.00	148.20	1900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2000.00	0.00	148.20	2000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2100.00	0.00	148.20	2100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2200.00	0.00	148.20	2200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2300.00	0.00	148.20	2300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2400.00	0.00	148.20	2400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2500.00	0.00	148.20	2500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2600.00	0.00	148.20	2600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2700.00	0.00	148.20	2700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2800.00	0.00	148.20	2800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	2900.00	0.00	148.20	2900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3000.00	0.00	148.20	3000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3100.00	0.00	148.20	3100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3200.00	0.00	148.20	3200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3300.00	0.00	148.20	3300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3400.00	0.00	148.20	3400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3500.00	0.00	148.20	3500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3600.00	0.00	148.20	3600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3700.00	0.00	148.20	3700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3800.00	0.00	148.20	3800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	3900.00	0.00	148.20	3900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4000.00	0.00	148.20	4000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4100.00	0.00	148.20	4100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4200.00	0.00	148.20	4200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4300.00	0.00	148.20	4300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4400.00	0.00	148.20	4400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4500.00	0.00	148.20	4500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4600.00	0.00	148.20	4600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4700.00	0.00	148.20	4700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4800.00	0.00	148.20	4800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	4900.00	0.00	148.20	4900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5000.00	0.00	148.20	5000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5100.00	0.00	148.20	5100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5200.00	0.00	148.20	5200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5300.00	0.00	148.20	5300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5400.00	0.00	148.20	5400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5500.00	0.00	148.20	5500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5600.00	0.00	148.20	5600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5700.00	0.00	148.20	5700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5800.00	0.00	148.20	5800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	5900.00	0.00	148.20	5900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6000.00	0.00	148.20	6000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6100.00	0.00	148.20	6100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6200.00	0.00	148.20	6200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6300.00	0.00	148.20	6300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6400.00	0.00	148.20	6400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6500.00	0.00	148.20	6500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6600.00	0.00	148.20	6600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6700.00	0.00	148.20	6700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6800.00	0.00	148.20	6800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	6900.00	0.00	148.20	6900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7000.00	0.00	148.20	7000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7100.00	0.00	148.20	7100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7200.00	0.00	148.20	7200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7300.00	0.00	148.20	7300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7400.00	0.00	148.20	7400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7500.00	0.00	148.20	7500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7600.00	0.00	148.20	7600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7700.00	0.00	148.20	7700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7800.00	0.00	148.20	7800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	7900.00	0.00	148.20	7900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8000.00	0.00	148.20	8000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8100.00	0.00	148.20	8100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8200.00	0.00	148.20	8200.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8300.00	0.00	148.20	8300.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8400.00	0.00	148.20	8400.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	8500.00	0.00	148.20	8500.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8600.00	0.00	148.20	8600.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8700.00	0.00	148.20	8700.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8800.00	0.00	148.20	8800.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	8900.00	0.00	148.20	8900.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	9000.00	0.00	148.20	9000.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	9100.00	0.00	148.20	9100.00	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
Build 12°/100' DLS	9142.55	0.00	148.20	9142.55	0.00	0.00	0.00	0.00	408071.97	564848.14	N 32 7 18.65	W 104 15 26.60
	9200.00	6.89	148.20	9199.86	3.01	-2.93	1.82	12.00	408069.04	564849.96	N 32 7 18.62	W 104 15 26.58
	9300.00	18.89	148.20	9297.16	22.41	-21.86	13.56	12.00	408050.11	564861.70	N 32 7 18.43	W 104 15 26.44
	9400.00	30.89	148.20	9387.70	59.01	-57.57	35.70	12.00	408014.40	564883.83	N 32 7 18.08	W 104 15 26.19
	9500.00	42.89	148.20	9467.53	111.21	-108.50	67.28	12.00	407963.48	564915.41	N 32 7 17.57	W 104 15 25.82
	9600.00	54.89	148.20	9533.16	176.73	-172.43	106.91	12.00	407899.56	564955.04	N 32 7 16.94	W 104 15 25.36
	9700.00	66.89	148.20	9581.71	252.70	-246.55	152.87	12.00	407825.45	565000.99	N 32 7 16.21	W 104 15 24.83
Build & Turn 4°/100' DLS	9767.55	75.00	148.20	9603.75	308.27	-300.77	186.48	12.00	407771.23	565034.61	N 32 7 15.67	W 104 15 24.43
	9800.00	75.50	149.44	9612.01	335.77	-327.61	202.73	4.00	407744.39	565050.85	N 32 7 15.40	W 104 15 24.25
	9900.00	77.09	153.22	9635.70	422.87	-412.84	249.33	4.00	407659.17	565097.44	N 32 7 14.56	W 104 15 23.70
	10000.00	78.74	156.94	9656.64	513.17	-501.50	290.51	4.00	407570.51	565138.62	N 32 7 13.68	W 104 15 23.23
	10100.00	80.43	160.63	9674.73	606.24	-593.17	326.08	4.00	407478.85	565174.19	N 32 7 12.77	W 104 15 22.81
	10200.00	82.16	164.28	9689.87	701.63	-687.40	355.86	4.00	407384.63	565203.97	N 32 7 11.84	W 104 15 22.47
	10300.00	83.92	167.90	9702.00	798.88	-783.74	379.72	4.00	407288.31	565227.82	N 32 7 10.89	W 104 15 22.19
	10400.00	85.70	171.49	9711.05	897.50	-881.70	397.52	4.00	407190.35	565245.62	N 32 7 9.92	W 104 15 21.99
	10500.00	87.50	175.07	9716.99	997.02	-980.82	409.19	4.00	407091.24	565257.29	N 32 7 8.94	W 104 15 21.85
	10600.00	89.31	178.64	9719.77	1096.95	-1080.61	414.67	4.00	406991.46	565262.77	N 32 7 7.95	W 104 15 21.79
Landing Point	10638.07	90.00	180.00	9720.00	1135.00	-1118.67	415.12	4.00	406953.40	565263.22	N 32 7 7.57	W 104 15 21.78
	10700.00	90.00	180.00	9720.00	1196.88	-1180.61	415.12	0.00	406891.47	565263.22	N 32 7 6.96	W 104 15 21.78
	10800.00	90.00	180.00	9720.00	1296.79	-1280.61	415.12	0.00	406791.48	565263.22	N 32 7 5.97	W 104 15 21.78
	10900.00	90.00	180.00	9720.00	1396.70	-1380.61	415.12	0.00	406691.49	565263.23	N 32 7 4.98	W 104 15 21.79
	11000.00	90.00	180.00	9720.00	1496.62	-1480.61	415.13	0.00	406591.50	565263.23	N 32 7 3.99	W 104 15 21.79
	11100.00	90.00	180.00	9720.00	1596.53	-1580.61	415.13	0.00	406491.51	565263.23	N 32 7 3.00	W 104 15 21.79
	11200.00	90.00	180.00	9720.00	1696.44	-1680.61	415.13	0.00	406391.52	565263.23	N 32 7 2.01	W 104 15 21.79
	11300.00	90.00	180.00	9720.00	1796.36	-1780.61	415.13	0.00	406291.53	565263.23	N 32 7 1.02	W 104 15 21.79
	11400.00	90.00	180.00	9720.00	1896.27	-1880.61	415.13	0.00	406191.54	565263.24	N 32 7 0.03	W 104 15 21.79
	11500.00	90.00	180.00	9720.00	1996.18	-1980.61	415.14	0.00	406091.55	565263.24	N 32 6 59.04	W 104 15 21.79
	11600.00	90.00	180.00	9720.00	2096.09	-2080.61	415.14	0.00	405991.56	565263.24	N 32 6 58.05	W 104 15 21.79
	11700.00	90.00	180.00	9720.00	2196.01	-2180.61	415.14	0.00	405891.56	565263.24	N 32 6 57.07	W 104 15 21.79
	11800.00	90.00	180.00	9720.00	2295.92	-2280.61	415.14	0.00	405791.57	565263.24	N 32 6 56.08	W 104 15 21.79
	11900.00	90.00	180.00	9720.00	2395.83	-2380.61	415.14	0.00	405691.58	565263.24	N 32 6 55.09	W 104 15 21.79
	12000.00	90.00	180.00	9720.00	2495.75	-2480.61	415.15	0.00	405591.59	565263.25	N 32 6 54.10	W 104 15 21.79
	12100.00	90.00	180.00	9720.00	2595.66	-2580.61	415.15	0.00	405491.60	565263.25	N 32 6 53.11	W 104 15 21.79
	12200.00	90.00	180.00	9720.00	2695.57	-2680.61	415.15	0.00	405391.61	565263.25	N 32 6 52.12	W 104 15 21.80
	12300.00	90.00	180.00	9720.00	2795.49	-2780.61	415.15	0.00	405291.62	565263.25	N 32 6 51.13	W 104 15 21.80
	12400.00	90.00	180.00	9720.00	2895.40	-2880.61	415.15	0.00	405191.63	565263.25	N 32 6 50.14	W 104 15 21.80
	12500.00	90.00	180.00	9720.00	2995.31	-2980.61	415.15	0.00	405091.64	565263.26	N 32 6 49.15	W 104 15 21.80
	12600.00	90.00	180.00	9720.00	3095.23	-3080.61	415.16	0.00	404991.65	565263.26	N 32 6 48.16	W 104 15 21.80
	12700.00	90.00	180.00	9720.00	3195.14	-3180.61	415.16	0.00	404891.66	565263.26	N 32 6 47.17	W 104 15 21.80
	12800.00	90.00	180.00	9720.00	3295.05	-3280.61	415.16	0.00	404791.67	565263.26	N 32 6 46.18	W 104 15 21.80
	12900.00	90.00	180.00	9720.00	3394.97	-3380.61	415.16	0.00	404691.68	565263.26	N 32 6 45.19	W 104 15 21.80
	13000.00	90.00	180.00	9720.00	3494.88	-3480.61	415.16	0.00	404591.68	565263.27	N 32 6 44.20	W 104 15 21.80
	13100.00	90.00	180.00	9720.00	3594.79	-3580.61	415.17	0.00	404491.69	565263.27	N 32 6 43.21	W 104 15 21.80
	13200.00	90.00	180.00	9720.00	3694.71	-3680.61	415.17	0.00	404391.70	565263.27	N 32 6 42.22	W 104 15 21.80
	13300.00	90.00	180.00	9720.00	3794.62	-3780.61	415.17	0.00	404291.71	565263.27	N 32 6 41.23	W 104 15 21.80
	13400.00	90.00	180.00	9720.00	3894.53	-3880.61	415.17	0.00	404191.72	565263.27	N 32 6 40.24	W 104 15 21.81
	13500.00	90.00	180.00	9720.00	3994.45	-3980.61	415.17	0.00	404091.73	565263.28	N 32 6 39.25	W 104 15 21.81
	13600.00	90.00	180.00	9720.00	4094.36	-4080.61	415.18	0.00	403991.74	565263.28	N 32 6 38.26	W 104 15 21.81
	13700.00	90.00	180.00	9720.00	4194.27	-4180.61	415.18	0.00	403891.75	565263.28	N 32 6 37.27	W 104 15 21.81
	13800.00	90.00	180.00	9720.00	4294.19	-4280.61	415.18	0.00	403791.76	565263.28	N 32 6 36.29	W 104 15 21.81

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	13900.00	90.00	180.00	9720.00	4394.10	-4380.61	415.18	0.00	403691.77	565263.28	N 32 6 35.30	W 104 15 21.81
	14000.00	90.00	180.00	9720.00	4494.01	-4480.61	415.18	0.00	403591.78	565263.29	N 32 6 34.31	W 104 15 21.81
	14100.00	90.00	180.00	9720.00	4593.93	-4580.61	415.19	0.00	403491.79	565263.29	N 32 6 33.32	W 104 15 21.81
	14200.00	90.00	180.00	9720.00	4693.84	-4680.61	415.19	0.00	403391.80	565263.29	N 32 6 32.33	W 104 15 21.81
	14300.00	90.00	180.00	9720.00	4793.75	-4780.61	415.19	0.00	403291.80	565263.29	N 32 6 31.34	W 104 15 21.81
	14400.00	90.00	180.00	9720.00	4893.67	-4880.61	415.19	0.00	403191.81	565263.29	N 32 6 30.35	W 104 15 21.81
	14500.00	90.00	180.00	9720.00	4993.58	-4980.61	415.19	0.00	403091.82	565263.29	N 32 6 29.36	W 104 15 21.81
	14600.00	90.00	180.00	9720.00	5093.49	-5080.61	415.19	0.00	402991.83	565263.30	N 32 6 28.37	W 104 15 21.82
	14700.00	90.00	180.00	9720.00	5193.41	-5180.61	415.20	0.00	402891.84	565263.30	N 32 6 27.38	W 104 15 21.82
	14800.00	90.00	180.00	9720.00	5293.32	-5280.61	415.20	0.00	402791.85	565263.30	N 32 6 26.39	W 104 15 21.82
	14900.00	90.00	180.00	9720.00	5393.23	-5380.61	415.20	0.00	402691.86	565263.30	N 32 6 25.40	W 104 15 21.82
	15000.00	90.00	180.00	9720.00	5493.15	-5480.61	415.20	0.00	402591.87	565263.30	N 32 6 24.41	W 104 15 21.82
	15100.00	90.00	180.00	9720.00	5593.06	-5580.61	415.20	0.00	402491.88	565263.31	N 32 6 23.42	W 104 15 21.82
	15200.00	90.00	180.00	9720.00	5692.97	-5680.61	415.21	0.00	402391.89	565263.31	N 32 6 22.43	W 104 15 21.82
	15300.00	90.00	180.00	9720.00	5792.89	-5780.61	415.21	0.00	402291.90	565263.31	N 32 6 21.44	W 104 15 21.82
	15400.00	90.00	180.00	9720.00	5892.80	-5880.61	415.21	0.00	402191.91	565263.31	N 32 6 20.45	W 104 15 21.82
	15500.00	90.00	180.00	9720.00	5992.71	-5980.61	415.21	0.00	402091.92	565263.31	N 32 6 19.46	W 104 15 21.82
	15600.00	90.00	180.00	9720.00	6092.63	-6080.61	415.21	0.00	401991.92	565263.32	N 32 6 18.47	W 104 15 21.82
	15700.00	90.00	180.00	9720.00	6192.54	-6180.61	415.22	0.00	401891.93	565263.32	N 32 6 17.48	W 104 15 21.82
	15800.00	90.00	180.00	9720.00	6292.45	-6280.61	415.22	0.00	401791.94	565263.32	N 32 6 16.49	W 104 15 21.82
	15900.00	90.00	180.00	9720.00	6392.37	-6380.61	415.22	0.00	401691.95	565263.32	N 32 6 15.50	W 104 15 21.83
	16000.00	90.00	180.00	9720.00	6492.28	-6480.61	415.22	0.00	401591.96	565263.32	N 32 6 14.52	W 104 15 21.83
	16100.00	90.00	180.00	9720.00	6592.19	-6580.61	415.22	0.00	401491.97	565263.33	N 32 6 13.53	W 104 15 21.83
	16200.00	90.00	180.00	9720.00	6692.11	-6680.61	415.23	0.00	401391.98	565263.33	N 32 6 12.54	W 104 15 21.83
	16300.00	90.00	180.00	9720.00	6792.02	-6780.61	415.23	0.00	401291.99	565263.33	N 32 6 11.55	W 104 15 21.83
	16400.00	90.00	180.00	9720.00	6891.93	-6880.61	415.23	0.00	401192.00	565263.33	N 32 6 10.56	W 104 15 21.83
	16500.00	90.00	180.00	9720.00	6991.84	-6980.61	415.23	0.00	401092.01	565263.33	N 32 6 9.57	W 104 15 21.83
	16600.00	90.00	180.00	9720.00	7091.76	-7080.61	415.23	0.00	400992.02	565263.33	N 32 6 8.58	W 104 15 21.83
	16700.00	90.00	180.00	9720.00	7191.67	-7180.61	415.24	0.00	400892.03	565263.34	N 32 6 7.59	W 104 15 21.83
	16800.00	90.00	180.00	9720.00	7291.58	-7280.61	415.24	0.00	400792.04	565263.34	N 32 6 6.60	W 104 15 21.83
	16900.00	90.00	180.00	9720.00	7391.50	-7380.61	415.24	0.00	400692.04	565263.34	N 32 6 5.61	W 104 15 21.83
	17000.00	90.00	180.00	9720.00	7491.41	-7480.61	415.24	0.00	400592.05	565263.34	N 32 6 4.62	W 104 15 21.83
	17100.00	90.00	180.00	9720.00	7591.32	-7580.61	415.24	0.00	400492.06	565263.34	N 32 6 3.63	W 104 15 21.84
	17200.00	90.00	180.00	9720.00	7691.24	-7680.61	415.24	0.00	400392.07	565263.35	N 32 6 2.64	W 104 15 21.84
	17300.00	90.00	180.00	9720.00	7791.15	-7780.61	415.25	0.00	400292.08	565263.35	N 32 6 1.65	W 104 15 21.84
	17400.00	90.00	180.00	9720.00	7891.06	-7880.61	415.25	0.00	400192.09	565263.35	N 32 6 0.66	W 104 15 21.84
	17500.00	90.00	180.00	9720.00	7990.98	-7980.61	415.25	0.00	400092.10	565263.35	N 32 5 59.67	W 104 15 21.84
	17600.00	90.00	180.00	9720.00	8090.89	-8080.61	415.25	0.00	399992.11	565263.35	N 32 5 58.68	W 104 15 21.84
	17700.00	90.00	180.00	9720.00	8190.80	-8180.61	415.25	0.00	399892.12	565263.36	N 32 5 57.69	W 104 15 21.84
	17800.00	90.00	180.00	9720.00	8290.72	-8280.61	415.26	0.00	399792.13	565263.36	N 32 5 56.70	W 104 15 21.84
	17900.00	90.00	180.00	9720.00	8390.63	-8380.61	415.26	0.00	399692.14	565263.36	N 32 5 55.71	W 104 15 21.84
	18000.00	90.00	180.00	9720.00	8490.54	-8480.61	415.26	0.00	399592.15	565263.36	N 32 5 54.72	W 104 15 21.84
	18100.00	90.00	180.00	9720.00	8590.46	-8580.61	415.26	0.00	399492.16	565263.36	N 32 5 53.74	W 104 15 21.84
	18200.00	90.00	180.00	9720.00	8690.37	-8680.61	415.26	0.00	399392.16	565263.37	N 32 5 52.75	W 104 15 21.84
	18300.00	90.00	180.00	9720.00	8790.28	-8780.61	415.27	0.00	399292.17	565263.37	N 32 5 51.76	W 104 15 21.85
	18400.00	90.00	180.00	9720.00	8890.20	-8880.61	415.27	0.00	399192.18	565263.37	N 32 5 50.77	W 104 15 21.85
	18500.00	90.00	180.00	9720.00	8990.11	-8980.61	415.27	0.00	399092.19	565263.37	N 32 5 49.78	W 104 15 21.85
	18600.00	90.00	180.00	9720.00	9090.02	-9080.61	415.27	0.00	398992.20	565263.37	N 32 5 48.79	W 104 15 21.85
	18700.00	90.00	180.00	9720.00	9189.94	-9180.61	415.27	0.00	398892.21	565263.38	N 32 5 47.80	W 104 15 21.85
	18800.00	90.00	180.00	9720.00	9289.85	-9280.61	415.28	0.00	398792.22	565263.38	N 32 5 46.81	W 104 15 21.85
	18900.00	90.00	180.00	9720.00	9389.76	-9380.61	415.28	0.00	398692.23	565263.38	N 32 5 45.82	W 104 15 21.85
	19000.00	90.00	180.00	9720.00	9489.68	-9480.61	415.28	0.00	398592.24	565263.38	N 32 5 44.83	W 104 15 21.85
	19100.00	90.00	180.00	9720.00	9589.59	-9580.61	415.28	0.00	398492.25	565263.38	N 32 5 43.84	W 104 15 21.85
	19200.00	90.00	180.00	9720.00	9689.50	-9680.61	415.28	0.00	398392.26	565263.38	N 32 5 42.85	W 104 15 21.85
	19300.00	90.00	180.00	9720.00	9789.42	-9780.61	415.28	0.00	398292.27	565263.39	N 32 5 41.86	W 104 15 21.85
	19400.00	90.00	180.00	9720.00	9889.33	-9880.61	415.29	0.00	398192.28	565263.39	N 32 5 40.87	W 104 15 21.85

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Cimarex Wigeon 23 Federal Com 4H - PBHL [330' FNL, 330' FEL]	19479.36	90.00	180.00	9720.00	9968.62	-9959.97	415.29	0.00	398112.92	565263.39	N 32 5 40.09	W 104 15 21.85

Survey Type: Non-Def Plan

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)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	19479.362	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Wigeon 23 Federal Com 4H

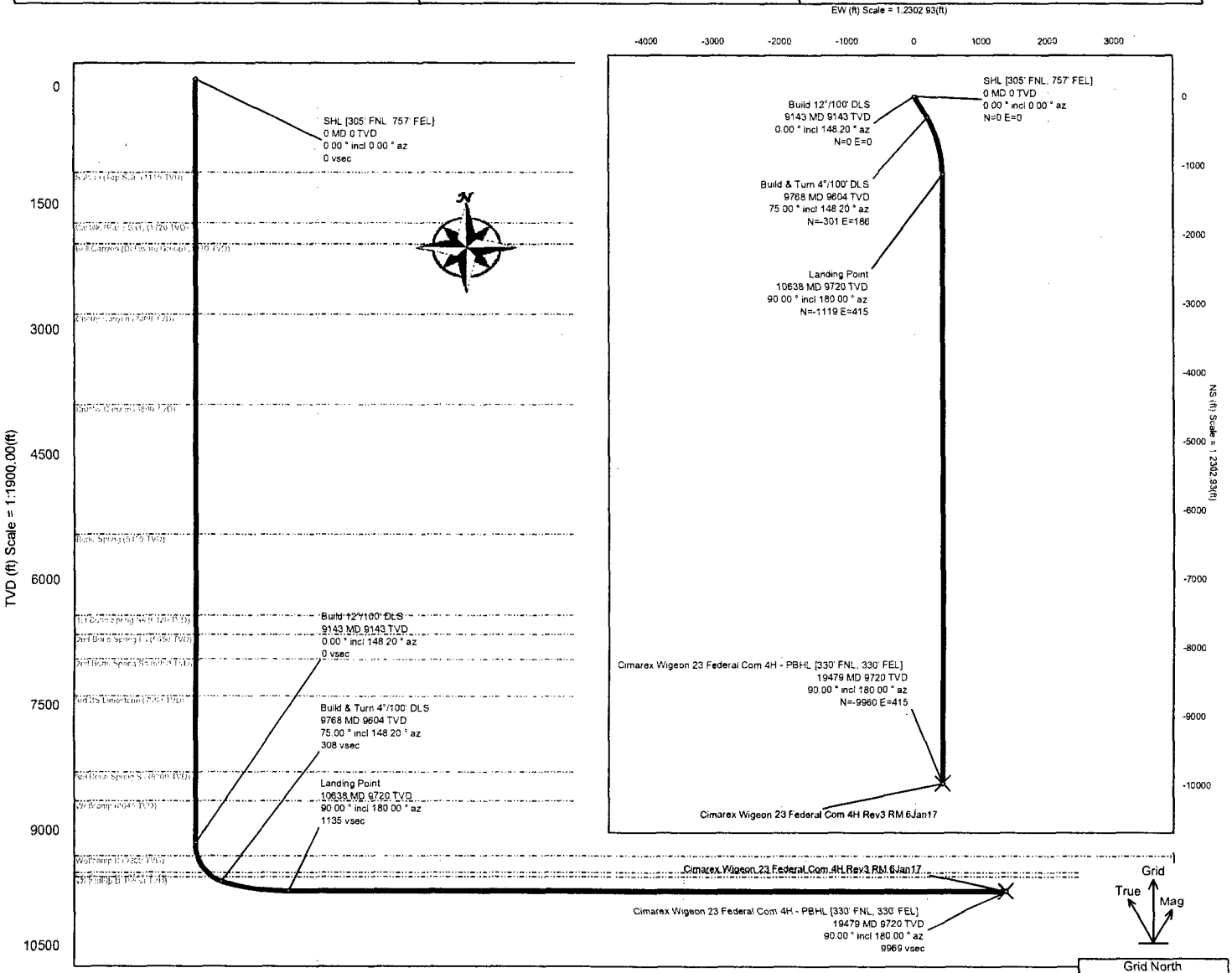
Schlumberger

Cimarex Rev 3

CIMAREX

Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Wigeon 23 Federal Com 4H	NM Eddy County (NAD 83)	Cimarex Wigeon 23 Federal Com 4H

Gravity & Magnetic Parameters					Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet				Miscellaneous			
Model:	HDGM 2016	Dip: 59.863°	Date:	06-Jan-2017	Lat:	N 32 7 16.65	Northing:	408071.97ftUS	Grid Conv:	0.0404°	Slot: Cimarex Wigeon 23 Federal Com 4H	TVD Ref:	Unknown(3281.1ft above MSL)
MagDec:	7.517°	FS: 48055.261nT	Gravity FS:	998.438mgn (9.80665 Based)	Lon:	W 104 15 26.60	Easting:	564848.14ftUS	Scale Fact:	0.99990972	Plan:	Cimarex Wigeon 23 Federal Com 4H Rev3 RM 6Jan17	



Vertical Section (ft) Azim = 177.61239284639° Scale = 1:1900.00(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [305' FNL, 757' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Salado (Top Salt)	1115.00	0.00	148.20	1115.00	0.00	0.00	0.00	0.00
Castille (Base Salt)	1720.00	0.00	148.20	1720.00	0.00	0.00	0.00	0.00
Bell Canyon (Delaware Group)	1970.00	0.00	148.20	1970.00	0.00	0.00	0.00	0.00
Cherry Canyon	2808.00	0.00	148.20	2808.00	0.00	0.00	0.00	0.00
Brushy Canyon	3890.00	0.00	148.20	3890.00	0.00	0.00	0.00	0.00
Bone Spring	5450.00	0.00	148.20	5450.00	0.00	0.00	0.00	0.00
1st Bone Spring Ss	6420.00	0.00	148.20	6420.00	0.00	0.00	0.00	0.00
2nd Bone Spring Ls	6650.00	0.00	148.20	6650.00	0.00	0.00	0.00	0.00
2nd Bone Spring Ss	6950.00	0.00	148.20	6950.00	0.00	0.00	0.00	0.00
3rd BS Limestone	7390.00	0.00	148.20	7390.00	0.00	0.00	0.00	0.00
3rd Bone Spring Ss	8300.00	0.00	148.20	8300.00	0.00	0.00	0.00	0.00
Wolfcamp	8645.00	0.00	148.20	8645.00	0.00	0.00	0.00	0.00
Build 12°/100' DLS	9142.55	0.00	148.20	9142.55	0.00	0.00	0.00	0.00
Wolfcamp B	9303.00	19.25	148.20	9300.00	23.27	-22.70	14.07	12.00
Wolfcamp C	9546.49	48.47	148.20	9500.00	140.18	-136.76	84.80	12.00
Wolfcamp D	9630.71	58.58	148.20	9550.00	199.09	-194.25	120.44	12.00
Build & Turn 4°/100' DLS	9767.55	75.00	148.20	9603.75	308.27	-300.77	186.48	12.00
Landing Point	10638.07	90.00	180.00	9720.00	1135.00	-1118.67	415.12	4.00
Cimarex Wigeon 23 Federal Com 4H - PBHL [330' FNL, 330' FEL]	19479.36	90.00	180.00	9720.00	9968.62	-9959.97	415.29	0.00
Wolfcamp Lower	NaN			9934.00				

BISON CONNECT

Sanchez, Jennifer <j1sanchez@blm.gov>

Wigeon 23 Fed Com 4H (30-015-43156)

5 messages

Sanchez, Jennifer <j1sanchez@blm.gov> Wed, Feb 22, 2017 at 8:36 AM
To: Aricka Easterling <AEasterling@cimarex.com>, tstathem@cimarex.com
Cc: Christopher Walls <cwalls@blm.gov>

Hi Aricka,

I was working on EC#363279. Cimarex is wanting to change this Bone Spring well into a Wolfcamp. However, there is a pending APD Bonnie 35 Federal Com 2H, a cimarex well, that is being proposed in the Wolfcamp. Looks like there could be a collision issue. Cimarex will need to submit an anti-collision report or with draw this sundry and remain in the Bone Spring. The two wells overlap in section 26.

Terri Stathem <TStathem@cimarex.com> Wed, Feb 22, 2017 at 11:57 AM
To: "Sanchez, Jennifer" <j1sanchez@blm.gov>, Aricka Easterling <AEasterling@cimarex.com>
Cc: Christopher Walls <cwalls@blm.gov>

The Bonnie 35 Fed 2H is pending approval with the BLM and we will be revising the BHL to stay in Sec. 35 –

I can send the C102 to change the BHL for the Bonnie 2 now if needed – but thought it might add to some confusion.

Thanks,

Terri Stathem

Manager – Regulatory Compliance

202 S. Cheyenne Ave, Suite 1000

Tulsa, OK 74103-3001

Office: 918-585-1100

Direct: 432-620-1936

Cell: 918-633-9702

Fax: 918-749-8059

CIMAREX

From: Sanchez, Jennifer [mailto:j1sanchez@blm.gov]
Sent: Wednesday, February 22, 2017 9:36 AM
To: Aricka Easterling <AEasterling@cimarex.com>; Terri Stathem <TStathem@cimarex.com>
Cc: Christopher Walls <cwalls@blm.gov>
Subject: [External] Wigeon 23 Fed Com 4H (30-015-43156)

Hi Aricka,

I was working on EC#363279. Cimarex is wanting to change this Bone Spring well into a Wolfcamp. However, there is a pending APD Bonnie 35 Federal Com 2H, a cimarex well, that is being proposed in the Wolfcamp. Looks like there could be a collision issue. Cimarex will need to submit an anti-collision report or with draw this sundry and remain in the Bone Spring. The two wells overlap in section 26.

Sanchez, Jennifer <j1sanchez@blm.gov> Wed, Feb 22, 2017 at 1:37 PM
To: Terri Stathem <TStathem@cimarex.com>
Cc: Aricka Easterling <AEasterling@cimarex.com>, Christopher Walls <cwalls@blm.gov>

Since that will be going through AFMSS II maybe Chris can answer you if now is the best time to make those changes. I'll use this email to attached to the sundry for now.
[Quoted text hidden]

Sanchez, Jennifer <j1sanchez@blm.gov> Wed, Feb 22, 2017 at 2:32 PM
To: Terri Stathem <TStathem@cimarex.com>, Aricka Easterling <AEasterling@cimarex.com>

I have another question. The 7" is landing in the wolfcamp (basically TVD), but you aren't increasing your mud weight till after that. You are only using a 3M on the 7" and than a 5M for the lateral. Cimarex will need to justify that mudweight or use a 5M prior to drilling the 7" and the 4-1/2" which I can make those changes on the sundry for you and you will already have a 5M out there.
[Quoted text hidden]

Terri Stathem <TStathem@cimarex.com> Wed, Feb 22, 2017 at 3:17 PM
To: "Sanchez, Jennifer" <j1sanchez@blm.gov>, Aricka Easterling <AEasterling@cimarex.com>

Jennifer, we will use a 5M for the 7" and 4-1/2" casing.

Thanks,

Terri Stathem

Manager – Regulatory Compliance

202 S. Cheyenne Ave, Suite 1000

Tulsa, OK 74103-3001

Office: 918-585-1100

Direct: 432-620-1936

Cell: 918-633-9702

Fax: 918-749-8059

From: Sanchez, Jennifer [mailto:j1sanchez@blm.gov]
Sent: Wednesday, February 22, 2017 3:32 PM
To: Terri Stathem <TStathem@cimarex.com>; Aricka Easterling <AEasterling@cimarex.com>
Subject: Re: [External] Wigeon 23 Fed Com 4H (30-015-43156)

[Quoted text hidden]

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Cimarex Energy Co
LEASE NO.:	NM94839
WELL NAME & NO.:	4H-Wigeon 23 Fed Com
SURFACE HOLE FOOTAGE:	305'/N & 757'/E
BOTTOM HOLE FOOTAGE	330'/S & 330'/E
LOCATION:	Sec. 23, T. 25 S., R. 26 E.
COUNTY:	Eddy County, New Mexico
API:	30-015-43156

The original COAs still stand with the following drilling modifications:

I. DRILLING

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) for Water Basin:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. 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.

Possibility of water flows in the Salado and Castile.
Possibility of lost circulation in the Delaware.

HIGH CAVE/KARST
A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. ON A THREE STRING DESIGN; IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

1. The **13-3/8** inch surface casing shall be set at approximately **400** 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. Excess calculates to 10% - Additional cement may be required.**

    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.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing 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 cave/karst. Excess calculates to 23% - 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 (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

3. The minimum required fill of cement behind the **7** inch production casing is:

    ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Excess calculates to 17% - Additional cement may be required.**

Formation below the 7" 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.

4. The minimum required fill of cement behind the **4-1/2** inch production Liner is:

   ☒ Cement to top of liner. Operator shall provide method of verification. **Excess calculates to negative 9% - Additional cement will be required.**

5. 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.

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. 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.

   a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** 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.**

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. In a water basin, 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. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

   b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

   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. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

   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.

   g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

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

F. 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.

JAM 022217