



30-015-39514

COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Falabella 31 Fee

#7H

OH

Plan: Plan #1 06-26-13

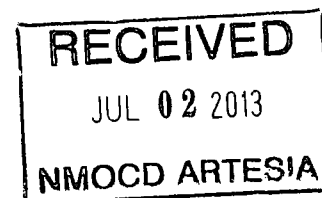
Surface: 150' FSL, 1700' FEL, Sec 31, T18S, R26E, Unit O

PP: 330' FSL, 1700' FEL, Sec 31, T18S, R26E, Unit O

BHL: 330' FNL, 1700' FEL, Sec 31, T18S, R26E, Unit B

Standard Planning Report

26 June, 2013





Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #7H:
Company:	COG Operating LLC	TVD Reference:	GL @ 3403.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3403.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 06-26-13		

Project:	Eddy County, New Mexico (NAD 27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Falabella 31 Fee		
Site Position:		Northing:	617,359.30 usft
From:	Map	Easting:	472,777.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 49.876122 N
		Longitude:	104° 25' 18.575151 W
		Grid Convergence:	-0.05 °

Well:	#7H		
Well Position	+N/-S	-3.90 usft	Northing:
	+E/-W	1,216.90 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,403.00 usft

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010_14	01/30/13	7.81	60.44	48,644

Design:	Plan #1 06-26-13			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	359.65

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,360.65	0.00	0.00	2,360.65	0.00	0.00	0.00	0.00	0.00	0.00	
3,197.01	92.00	359.65	2,881.20	539.04	-3.25	11.00	11.00	0.00	359.65	
7,520.88	92.00	359.65	2,730.30	4,860.20	-29.30	0.00	0.00	0.00	0.00	PBHL-Falabella 31 #7



Phoenix Technology Services
Planning Report



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Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3403.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 06-26-13		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,360.65	0.00	0.00	2,360.65	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 11.00									
2,400.00	4.33	359.65	2,399.96	1.49	-0.01	1.49	11.00	11.00	0.00
2,500.00	15.33	359.65	2,498.34	18.53	-0.11	18.53	11.00	11.00	0.00
2,600.00	26.33	359.65	2,591.66	54.03	-0.33	54.03	11.00	11.00	0.00
2,700.00	37.33	359.65	2,676.50	106.69	-0.64	106.69	11.00	11.00	0.00
2,800.00	48.33	359.65	2,749.72	174.56	-1.05	174.57	11.00	11.00	0.00
2,807.22	49.12	359.65	2,754.48	179.99	-1.09	179.99	11.00	11.00	0.00
PP-Falabella 31 #7H									
2,900.00	59.33	359.65	2,808.65	255.16	-1.54	255.17	11.00	11.00	0.00
3,000.00	70.33	359.65	2,851.12	345.53	-2.08	345.53	11.00	11.00	0.00
3,100.00	81.33	359.65	2,875.56	442.33	-2.67	442.34	11.00	11.00	0.00
3,191.91	91.44	359.65	2,881.35	533.94	-3.22	533.95	11.00	11.00	0.00
TL 2900' TVD @ 0 VZ, 92.0°									
3,197.01	92.00	359.65	2,881.20	539.04	-3.25	539.05	11.00	11.00	0.00
LP Start 4323.87 hold at 3197.01 MD									
3,200.00	92.00	359.65	2,881.10	542.03	-3.27	542.04	0.00	0.00	0.00
3,300.00	92.00	359.65	2,877.61	641.96	-3.87	641.97	0.00	0.00	0.00
3,400.00	92.00	359.65	2,874.12	741.90	-4.47	741.91	0.00	0.00	0.00
3,500.00	92.00	359.65	2,870.63	841.84	-5.08	841.85	0.00	0.00	0.00
3,600.00	92.00	359.65	2,867.14	941.78	-5.68	941.79	0.00	0.00	0.00
3,700.00	92.00	359.65	2,863.65	1,041.71	-6.28	1,041.73	0.00	0.00	0.00
3,800.00	92.00	359.65	2,860.16	1,141.65	-6.88	1,141.67	0.00	0.00	0.00
3,900.00	92.00	359.65	2,856.67	1,241.59	-7.48	1,241.61	0.00	0.00	0.00
4,000.00	92.00	359.65	2,853.18	1,341.52	-8.09	1,341.55	0.00	0.00	0.00
4,100.00	92.00	359.65	2,849.69	1,441.46	-8.69	1,441.49	0.00	0.00	0.00
4,200.00	92.00	359.65	2,846.20	1,541.40	-9.29	1,541.43	0.00	0.00	0.00
4,300.00	92.00	359.65	2,842.71	1,641.34	-9.89	1,641.37	0.00	0.00	0.00
4,400.00	92.00	359.65	2,839.22	1,741.27	-10.50	1,741.30	0.00	0.00	0.00
4,500.00	92.00	359.65	2,835.73	1,841.21	-11.10	1,841.24	0.00	0.00	0.00
4,600.00	92.00	359.65	2,832.24	1,941.15	-11.70	1,941.18	0.00	0.00	0.00
4,700.00	92.00	359.65	2,828.75	2,041.09	-12.30	2,041.12	0.00	0.00	0.00
4,800.00	92.00	359.65	2,825.26	2,141.02	-12.91	2,141.06	0.00	0.00	0.00
4,900.00	92.00	359.65	2,821.77	2,240.96	-13.51	2,241.00	0.00	0.00	0.00
5,000.00	92.00	359.65	2,818.28	2,340.90	-14.11	2,340.94	0.00	0.00	0.00
5,100.00	92.00	359.65	2,814.79	2,440.83	-14.71	2,440.88	0.00	0.00	0.00
5,200.00	92.00	359.65	2,811.30	2,540.77	-15.32	2,540.82	0.00	0.00	0.00
5,300.00	92.00	359.65	2,807.81	2,640.71	-15.92	2,640.76	0.00	0.00	0.00
5,400.00	92.00	359.65	2,804.32	2,740.65	-16.52	2,740.70	0.00	0.00	0.00
5,500.00	92.00	359.65	2,800.83	2,840.58	-17.12	2,840.63	0.00	0.00	0.00
5,600.00	92.00	359.65	2,797.34	2,940.52	-17.73	2,940.57	0.00	0.00	0.00
5,700.00	92.00	359.65	2,793.85	3,040.46	-18.33	3,040.51	0.00	0.00	0.00
5,800.00	92.00	359.65	2,790.36	3,140.39	-18.93	3,140.45	0.00	0.00	0.00
5,900.00	92.00	359.65	2,786.87	3,240.33	-19.53	3,240.39	0.00	0.00	0.00
6,000.00	92.00	359.65	2,783.38	3,340.27	-20.14	3,340.33	0.00	0.00	0.00
6,100.00	92.00	359.65	2,779.89	3,440.21	-20.74	3,440.27	0.00	0.00	0.00
6,200.00	92.00	359.65	2,776.40	3,540.14	-21.34	3,540.21	0.00	0.00	0.00
6,300.00	92.00	359.65	2,772.91	3,640.08	-21.94	3,640.15	0.00	0.00	0.00
6,400.00	92.00	359.65	2,769.42	3,740.02	-22.55	3,740.09	0.00	0.00	0.00
6,500.00	92.00	359.65	2,765.93	3,839.96	-23.15	3,840.03	0.00	0.00	0.00
6,600.00	92.00	359.65	2,762.44	3,939.89	-23.75	3,939.96	0.00	0.00	0.00
6,700.00	92.00	359.65	2,758.95	4,039.83	-24.35	4,039.90	0.00	0.00	0.00
6,800.00	92.00	359.65	2,755.46	4,139.77	-24.96	4,139.84	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #7H
Company:	COG Operating LLC	TVD Reference:	GL @ 3403.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3403.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 06-26-13		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
6,900.00	92.00	359.65	2,751.97	4,239.70	-25.56	4,239.78	0.00	0.00	0.00	
7,000.00	92.00	359.65	2,748.48	4,339.64	-26.16	4,339.72	0.00	0.00	0.00	
7,100.00	92.00	359.65	2,744.99	4,439.58	-26.76	4,439.66	0.00	0.00	0.00	
7,200.00	92.00	359.65	2,741.50	4,539.52	-27.37	4,539.60	0.00	0.00	0.00	
7,300.00	92.00	359.65	2,738.01	4,639.45	-27.97	4,639.54	0.00	0.00	0.00	
7,400.00	92.00	359.65	2,734.52	4,739.39	-28.57	4,739.48	0.00	0.00	0.00	
7,500.00	92.00	359.65	2,731.03	4,839.33	-29.17	4,839.42	0.00	0.00	0.00	
7,520.88	92.00	359.65	2,730.30	4,860.20	-29.30	4,860.28	0.00	0.00	0.00	
TD at 7520.88 - PBHL-Falabella 31 #7H										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
PBHL-Falabella 31 #7H	0.00	360.00	2,730.30	4,860.20	-29.30	622,215.60	473,964.80	32° 42' 37.941759 N	104° 25' 4.722623 W	
- plan hits target center										
- Point										
PP-Falabella 31 #7H	0.00	0.00	2,754.49	180.00	-1.09	617,535.40	473,993.02	32° 41' 51.628554 N	104° 25' 4.348719 W	
- plan hits target center										
- Point										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,191.91	2,881.35	TL, 2900' TVD @ 0 VZ, 92.0°		-2.00	359.65	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment	
2,360.65	2,360.65	0.00	0.00	KOP Start Build 11.00	
3,197.01	2,881.20	539.04	-3.25	LP Start 4323.87 hold at 3197.01 MD	
7,520.88	2,730.30	4,860.20	-29.30	TD at 7520.88	



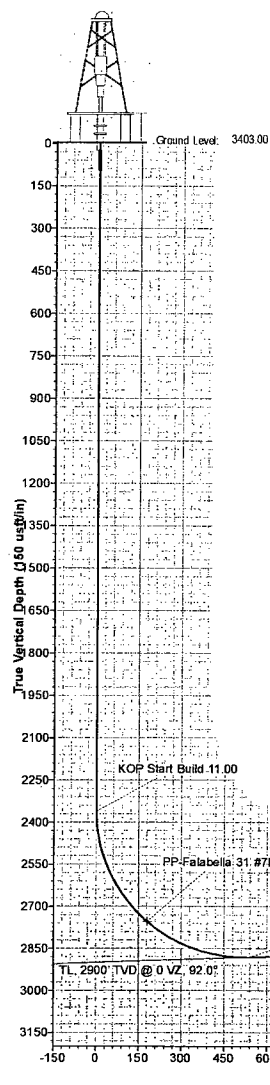
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Falabella 31 Fee
Well: #7H
Wellbore: OH
Design: Plan #1 06-26-13



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.05°
Magnetic North: 7.86°
Magnetic Field
Strength: 48644.05nT
Dip Angle: 50.44°
Date: 01/30/2013
Model: IGRF2010_14



WELL DETAILS									
	+N-S	+E-W	Northing	Ground Level	3403.00	Latitude	Longitude		
	0.00	0.00	617359.40	Easting	473994.10	32° 41' 48.847351 N	104° 25' 4.334341 W		

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2360.65	0.00	0.00	2360.65	0.00	0.00	0.00	0.00	0.00
3	3197.01	92.00	359.65	2881.20	539.04	3.25	11.00	359.65	539.05
4	7520.88	92.00	359.65	2730.30	4860.20	-29.30	0.00	0.00	4860.29

Annotation: KOP Start Build 11.00, LP Start 4323.87 hold at 3197.01 MD, TD at 7520.88, PBHL-Falabella 31 #7H

DESIGN TARGET DETAILS									
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape	
PBHL-Falabella 31 #7H	2730.30	4860.20	-29.30	622215.60	473994.80	32° 42' 37.941756 N	104° 25' 4.722623 W	Point	
PP-Falabella 31 #7H	2754.49	180.00	-1.09	617535.40	473993.01	32° 41' 51.628554 N	104° 25' 4.348719 W	Point	plan hits target center

PROJECT DETAILS: Eddy County, New Mexico (NAD 27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Falabella 31 Fee
Site Centre Northing: 617359.30
Easting: 472777.20
Positional Uncertainty: 0.00
Convergence: -0.05
Local North: Grid

LEGEND
— #3H, OH, Plan #1 03-19-13 V0
— Plan #1 06-26-13

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well #7H, Grid North
Latitude: 32° 41' 48.847351 N
Longitude: 104° 25' 4.334341 W
Grid East: 473994.10
Grid North: 617355.40
Scale Factor: 1.000
Geomagnetic Model: IGRF2010_14
Sample Date: 30-Jan-13
Magnetic Declination: 7.81°
Dip Angle from Horizontal: 60.44°
Magnetic Field Strength: 48644
To convert a Magnetic Direction to a Grid Direction, Add 7.86°
To convert a Magnetic Direction to a True Direction, Add 7.81° East
To convert a True Direction to a Grid Direction, Add 0.05°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
2881.35	3191.91	TL 2900' TVD @ 0 VZ, 92.0°	-2.00	359.65

