



30-015-39515

COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Falabella 31 Fee

#8H

OH

Plan: Plan #1 06-26-13

Surface: 150' FSL, 380' FEL, Sec 31, T18S, R26E, Unit P

PP: 330' FSL, 380' FEL, Sec 31, T18S, R26E, Unit P

BHL: 330' FNL, 380' FEL, Sec 31, T18S, R26E, Unit A

Standard Planning Report

26 June, 2013





Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3440.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3440.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#8H	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:	#8H		
Well Position	+N/-S	-8.00 usft	Northing:
	+E/-W	2,536.60 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,391.00 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	01/30/13	7.81
			Dip Angle
			60.44
			Field Strength
			48,645

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
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			359.66

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	
2,340.69	0.00	0.00	2,340.69	0.00	0.00	0.00	0.00	0.00	0.00	
3,177.05	92.00	359.66	2,861.24	539.04	-3.24	11.00	11.00	0.00	359.66	
7,510.73	92.00	359.66	2,710.00	4,870.00	-29.30	0.00	0.00	0.00	0.00	PBHL-Falabella 31 #E



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3440.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3440.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#8H	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
2,340.69	0.00	0.00	2,340.69	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 11.00									
2,400.00	6.52	359.66	2,399.87	3.37	-0.02	3.37	11.00	11.00	0.00
2,500.00	17.52	359.66	2,497.53	24.17	-0.15	24.17	11.00	11.00	0.00
2,600.00	28.52	359.66	2,589.42	63.22	-0.38	63.23	11.00	11.00	0.00
2,700.00	39.52	359.66	2,672.17	119.09	-0.72	119.09	11.00	11.00	0.00
2,787.30	49.13	359.66	2,734.55	180.02	-1.08	180.02	11.00	11.00	0.00
PP-Falabella 31 #8H									
2,800.00	50.52	359.66	2,742.75	189.72	-1.14	189.73	11.00	11.00	0.00
2,900.00	61.52	359.66	2,798.54	272.52	-1.64	272.53	11.00	11.00	0.00
3,000.00	72.52	359.66	2,837.52	364.44	-2.19	364.45	11.00	11.00	0.00
3,100.00	83.52	359.66	2,858.24	462.12	-2.78	462.12	11.00	11.00	0.00
3,168.69	91.08	359.66	2,861.47	530.68	-3.19	530.69	11.00	11.00	0.00
TL 2880' TVD @ 0 VZ, 92.0°									
3,177.05	92.00	359.66	2,861.24	539.04	-3.24	539.05	11.00	11.00	0.00
LP Start 4333.68 hold at 3177.05 MD									
3,200.00	92.00	359.66	2,860.44	561.97	-3.38	561.98	0.00	0.00	0.00
3,300.00	92.00	359.66	2,856.95	661.91	-3.98	661.92	0.00	0.00	0.00
3,400.00	92.00	359.66	2,853.46	761.85	-4.58	761.86	0.00	0.00	0.00
3,500.00	92.00	359.66	2,849.97	861.78	-5.18	861.80	0.00	0.00	0.00
3,600.00	92.00	359.66	2,846.48	961.72	-5.79	961.74	0.00	0.00	0.00
3,700.00	92.00	359.66	2,842.99	1,061.66	-6.39	1,061.68	0.00	0.00	0.00
3,800.00	92.00	359.66	2,839.50	1,161.59	-6.99	1,161.62	0.00	0.00	0.00
3,900.00	92.00	359.66	2,836.01	1,261.53	-7.59	1,261.56	0.00	0.00	0.00
4,000.00	92.00	359.66	2,832.52	1,361.47	-8.19	1,361.49	0.00	0.00	0.00
4,100.00	92.00	359.66	2,829.03	1,461.41	-8.79	1,461.43	0.00	0.00	0.00
4,200.00	92.00	359.66	2,825.54	1,561.34	-9.39	1,561.37	0.00	0.00	0.00
4,300.00	92.00	359.66	2,822.05	1,661.28	-9.99	1,661.31	0.00	0.00	0.00
4,400.00	92.00	359.66	2,818.56	1,761.22	-10.60	1,761.25	0.00	0.00	0.00
4,500.00	92.00	359.66	2,815.07	1,861.16	-11.20	1,861.19	0.00	0.00	0.00
4,600.00	92.00	359.66	2,811.58	1,961.09	-11.80	1,961.13	0.00	0.00	0.00
4,700.00	92.00	359.66	2,808.09	2,061.03	-12.40	2,061.07	0.00	0.00	0.00
4,800.00	92.00	359.66	2,804.60	2,160.97	-13.00	2,161.01	0.00	0.00	0.00
4,900.00	92.00	359.66	2,801.11	2,260.90	-13.60	2,260.95	0.00	0.00	0.00
5,000.00	92.00	359.66	2,797.62	2,360.84	-14.20	2,360.88	0.00	0.00	0.00
5,100.00	92.00	359.66	2,794.13	2,460.78	-14.81	2,460.82	0.00	0.00	0.00
5,200.00	92.00	359.66	2,790.64	2,560.72	-15.41	2,560.76	0.00	0.00	0.00
5,300.00	92.00	359.66	2,787.15	2,660.65	-16.01	2,660.70	0.00	0.00	0.00
5,400.00	92.00	359.66	2,783.66	2,760.59	-16.61	2,760.64	0.00	0.00	0.00
5,500.00	92.00	359.66	2,780.17	2,860.53	-17.21	2,860.58	0.00	0.00	0.00
5,600.00	92.00	359.66	2,776.68	2,960.47	-17.81	2,960.52	0.00	0.00	0.00
5,700.00	92.00	359.66	2,773.19	3,060.40	-18.41	3,060.46	0.00	0.00	0.00
5,800.00	92.00	359.66	2,769.70	3,160.34	-19.01	3,160.40	0.00	0.00	0.00
5,900.00	92.00	359.66	2,766.21	3,260.28	-19.62	3,260.34	0.00	0.00	0.00
6,000.00	92.00	359.66	2,762.72	3,360.22	-20.22	3,360.28	0.00	0.00	0.00
6,100.00	92.00	359.66	2,759.23	3,460.15	-20.82	3,460.21	0.00	0.00	0.00
6,200.00	92.00	359.66	2,755.74	3,560.09	-21.42	3,560.15	0.00	0.00	0.00
6,300.00	92.00	359.66	2,752.25	3,660.03	-22.02	3,660.09	0.00	0.00	0.00
6,400.00	92.00	359.66	2,748.76	3,759.96	-22.62	3,760.03	0.00	0.00	0.00
6,500.00	92.00	359.66	2,745.27	3,859.90	-23.22	3,859.97	0.00	0.00	0.00
6,600.00	92.00	359.66	2,741.78	3,959.84	-23.82	3,959.91	0.00	0.00	0.00
6,700.00	92.00	359.66	2,738.29	4,059.78	-24.43	4,059.85	0.00	0.00	0.00
6,800.00	92.00	359.66	2,734.80	4,159.71	-25.03	4,159.79	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



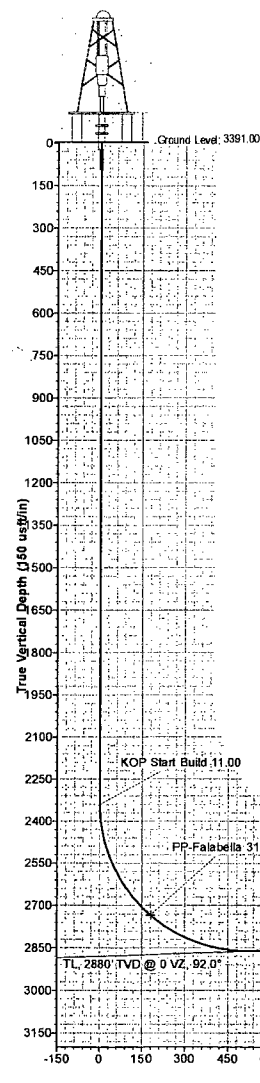
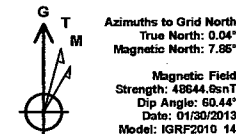
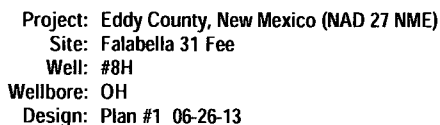
Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3440.00usft
Project:	Eddy County - New Mexico (NAD:27-NME)	MD Reference:	GL @ 3440.00usft
Site:	Falabella 31 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	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	359.66	2,731.31	4,259.65	-25.63	4,259.73	0.00	0.00	0.00
7,000.00	92.00	359.66	2,727.82	4,359.59	-26.23	4,359.67	0.00	0.00	0.00
7,100.00	92.00	359.66	2,724.33	4,459.53	-26.83	4,459.61	0.00	0.00	0.00
7,200.00	92.00	359.66	2,720.84	4,559.46	-27.43	4,559.54	0.00	0.00	0.00
7,300.00	92.00	359.66	2,717.35	4,659.40	-28.03	4,659.48	0.00	0.00	0.00
7,400.00	92.00	359.66	2,713.86	4,759.34	-28.63	4,759.42	0.00	0.00	0.00
7,500.00	92.00	359.66	2,710.37	4,859.27	-29.24	4,859.36	0.00	0.00	0.00
7,510.73	92.00	359.66	2,710.00	4,870.00	-29.30	4,870.09	0.00	0.00	0.00
TD at 7510.73 - PBHL-Falabella 31 #8H									

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 #8H	0.00	360.00	2,710.00	4,870.00	-29.30	622,221.30	475,284.50	32° 42' 38.008325 N	104° 24' 49.276582 W
- plan hits target center									
- Point									
PP-Falabella 31 #8H	0.00	0.00	2,734.54	180.00	-1.08	617,531.30	475,312.72	32° 41' 51.598128 N	104° 24' 48.904781 W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,168.69	2,861.47	TL, 2880' TVD @ 0 VZ, 92.0°		-2.00	359.66	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
2,340.69	2,340.69	0.00	0.00	KOP Start Build 11.00
3,177.05	2,861.24	539.04	-3.24	LP Start 4333.68 hold at 3177.05 MD
7,510.73	2,710.00	4,870.00	-29.30	TD at 7510.73



WELL DETAILS						
			Ground Level:	3391.00		
+N-S	+E-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	617351.30	475313.60	32° 41' 49.816924 N	104° 24' 48.890514 W	

SECTION DETAILS											
Sec	MD	inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	VSeet	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	2340.68	0.00	0.00	2340.68	0.00	0.00	0.00	0.00	0.00		KOP Start Build 11.00
3	3177.05	82.00	359.66	2861.24	539.04	-3.24	11.00	359.66	539.05		LP Start 4333.68 hold at 3177.05 MD
4	7510.73	92.00	359.66	2710.00	4870.00	-29.30	0.00	0.00	4870.09	PBHL-Falabella 31 #RH	TD at 7510.73

DESIGN TARGET DETAILS								
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
FBH-Falabella 31 #BH	2710.00	4870.00	-29.30	622221.30	475284.50	32° 42' 38.008325 N	104° 24' 48.275682 W	Point
	- plan his target center							
PP-Falabella 31 #BH	2734.54	180.00	-1.08	617531.30	475312.72	32° 41' 51.598127 N	104° 24' 48.804781 W	Point
	- plan his target center							

PROJECT DETAILS: Eddy County, New Mexico (NAD 27 NME)

Geoidic 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
Eastng: 472777.20

Positional Uncertainty: 0.00
Convergence: -0.05
Local North: Grid

LEGEND

———— #4H, OH, Plan #1 01-30-13 V0

———— Plan #1 06-26-13

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1886
Zone Name: New Mexico East 3001
Local Origin: Well #8H, Grid North
Latitude: 32° 41' 49.816924 N
Longitude: 104° 24' 48.896514 W
Grid East: 475313.80
Grid North: 617351.30
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: 48645
To convert a Magnetic Direction to a Grid Direction, Add 7.85°
To convert a Magnetic Direction to a True Direction, Add 7.81° East
To convert a True Direction to a Grid Direction, Add 0.04°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
2861.47	3168.69	TL, 2880' TVD @ 0 VZ, 92.0°	-2.00	359.66

