



COG Operating LLC

Lea County, NM

Sombrero Federal Com

#4H

OH

Plan: Design #1

Standard Planning Report

11 June, 2015

HOBBS OCD
JUN 06 2016
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Wellplanning Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Lea County, NM
Site: Sombrero Federal Com
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #4H
TVD Reference: WELL @ 3502.8usft (Original Well Elev)
MD Reference: WELL @ 3502.8usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project Lea County, NM

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site Sombrero Federal Com

Site Position: Northing: 441,802.50 usft Latitude: 32° 12' 41.070 N
From: Map Easting: 779,235.50 usft Longitude: 103° 25' 49.789 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.48 °

Well #4H

Well Position +N/-S 0.0 usft Northing: 441,802.50 usft Latitude: 32° 12' 41.070 N
+E/-W 0.0 usft Easting: 779,235.50 usft Longitude: 103° 25' 49.789 W
Position Uncertainty 0.0 usft Wellhead Elevation: Ground Level: 3,474.8 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/11/2015	7.03	60.10	48,224

Design Design #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.51

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
8,973.5	0.00	0.00	8,973.5	0.0	0.0	0.00	0.00	0.00	0.00	
9,723.6	90.00	359.51	9,451.0	477.5	-4.1	12.00	12.00	0.00	359.51	
10,746.1	90.00	359.51	9,451.0	1,499.9	-12.8	0.00	0.00	0.00	0.00	
10,848.8	92.05	359.51	9,449.2	1,602.6	-13.7	2.00	2.00	0.00	0.13	
16,377.7	92.05	359.51	9,251.0	7,127.8	-60.5	0.00	0.00	0.00	0.00	PBHL(Somb#4H)



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Survey Calculation Method: Minimum Curvature

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00



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Well #4H
WELL @ 3502.8usft (Original Well Elev)
WELL @ 3502.8usft (Original Well Elev)
Grid
Minimum Curvature

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)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,973.5	0.00	0.00	8,973.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP - 8973.5 'MD, 0.00° INC, 0.00° AZI									
8,975.0	0.18	359.51	8,975.0	0.0	0.0	0.0	12.00	12.00	0.00
9,000.0	3.18	359.51	9,000.0	0.7	0.0	0.7	12.00	12.00	0.00
9,025.0	6.18	359.51	9,024.9	2.8	0.0	2.8	12.00	12.00	0.00
9,050.0	9.18	359.51	9,049.7	6.1	-0.1	6.1	12.00	12.00	0.00
9,075.0	12.18	359.51	9,074.2	10.7	-0.1	10.7	12.00	12.00	0.00
9,100.0	15.18	359.51	9,098.5	16.7	-0.1	16.7	12.00	12.00	0.00
9,125.0	18.18	359.51	9,122.5	23.8	-0.2	23.8	12.00	12.00	0.00
9,150.0	21.18	359.51	9,146.0	32.2	-0.3	32.3	12.00	12.00	0.00
9,175.0	24.18	359.51	9,169.1	41.9	-0.4	41.9	12.00	12.00	0.00
9,200.0	27.18	359.51	9,191.6	52.7	-0.5	52.7	12.00	12.00	0.00
9,225.0	30.18	359.51	9,213.5	64.7	-0.6	64.7	12.00	12.00	0.00
9,250.0	33.18	359.51	9,234.8	77.8	-0.7	77.8	12.00	12.00	0.00
9,275.0	36.18	359.51	9,255.4	92.1	-0.8	92.1	12.00	12.00	0.00
9,300.0	39.18	359.51	9,275.1	107.3	-0.9	107.3	12.00	12.00	0.00
9,325.0	42.18	359.51	9,294.1	123.6	-1.1	123.6	12.00	12.00	0.00



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WELL @ 3502.8usft (Original Well Elev)
WELL @ 3502.8usft (Original Well Elev)
Grid
Minimum Curvature

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)
9,350.0	45.18	359.51	9,312.2	140.9	-1.2	140.9	12.00	12.00	0.00
9,375.0	48.18	359.51	9,329.3	159.1	-1.4	159.1	12.00	12.00	0.00
9,400.0	51.18	359.51	9,345.5	178.1	-1.5	178.1	12.00	12.00	0.00
9,425.0	54.18	359.51	9,360.7	198.0	-1.7	198.0	12.00	12.00	0.00
9,450.0	57.18	359.51	9,374.8	218.7	-1.9	218.7	12.00	12.00	0.00
9,475.0	60.18	359.51	9,387.8	240.0	-2.1	240.0	12.00	12.00	0.00
9,500.0	63.18	359.51	9,399.6	262.0	-2.2	262.0	12.00	12.00	0.00
9,525.0	66.18	359.51	9,410.3	284.6	-2.4	284.6	12.00	12.00	0.00
9,550.0	69.17	359.51	9,419.8	307.7	-2.6	307.7	12.00	12.00	0.00
9,575.0	72.17	359.51	9,428.1	331.3	-2.8	331.3	12.00	12.00	0.00
9,600.0	75.17	359.51	9,435.1	355.3	-3.0	355.3	12.00	12.00	0.00
9,625.0	78.17	359.51	9,440.9	379.6	-3.2	379.6	12.00	12.00	0.00
9,650.0	81.17	359.51	9,445.3	404.2	-3.5	404.2	12.00	12.00	0.00
9,675.0	84.17	359.51	9,448.5	429.0	-3.7	429.0	12.00	12.00	0.00
9,700.0	87.17	359.51	9,450.4	453.9	-3.9	454.0	12.00	12.00	0.00
9,723.6	90.00	359.51	9,451.0	477.5	-4.1	477.5	12.00	12.00	0.00
EOC- 9723.6 'MD, 90.00° INC, 359.51° AZI									
9,800.0	90.00	359.51	9,451.0	553.9	-4.7	553.9	0.00	0.00	0.00
9,900.0	90.00	359.51	9,451.0	653.9	-5.6	653.9	0.00	0.00	0.00
10,000.0	90.00	359.51	9,451.0	753.9	-6.4	753.9	0.00	0.00	0.00
10,100.0	90.00	359.51	9,451.0	853.9	-7.3	853.9	0.00	0.00	0.00
10,200.0	90.00	359.51	9,451.0	953.9	-8.2	953.9	0.00	0.00	0.00
10,300.0	90.00	359.51	9,451.0	1,053.9	-9.0	1,053.9	0.00	0.00	0.00
10,400.0	90.00	359.51	9,451.0	1,153.9	-9.9	1,153.9	0.00	0.00	0.00
10,500.0	90.00	359.51	9,451.0	1,253.9	-10.7	1,253.9	0.00	0.00	0.00
10,600.0	90.00	359.51	9,451.0	1,353.9	-11.6	1,353.9	0.00	0.00	0.00
10,700.0	90.00	359.51	9,451.0	1,453.9	-12.4	1,453.9	0.00	0.00	0.00
10,746.1	90.00	359.51	9,451.0	1,499.9	-12.8	1,500.0	0.00	0.00	0.00
TGT1- 10746.1 'MD, 90.00° INC, 359.51° AZI									
10,800.0	91.08	359.51	9,450.5	1,553.9	-13.3	1,553.9	2.00	2.00	0.00
10,848.8	92.05	359.51	9,449.2	1,602.6	-13.7	1,602.7	2.00	2.00	0.00
10,900.0	92.05	359.51	9,447.3	1,653.8	-14.1	1,653.9	0.00	0.00	0.00
11,000.0	92.05	359.51	9,443.7	1,753.8	-15.0	1,753.8	0.00	0.00	0.00
11,100.0	92.05	359.51	9,440.2	1,853.7	-15.8	1,853.8	0.00	0.00	0.00
11,200.0	92.05	359.51	9,436.6	1,953.6	-16.7	1,953.7	0.00	0.00	0.00
11,300.0	92.05	359.51	9,433.0	2,053.6	-17.5	2,053.6	0.00	0.00	0.00
11,400.0	92.05	359.51	9,429.4	2,153.5	-18.4	2,153.6	0.00	0.00	0.00
11,500.0	92.05	359.51	9,425.8	2,253.4	-19.2	2,253.5	0.00	0.00	0.00
11,600.0	92.05	359.51	9,422.2	2,353.4	-20.1	2,353.4	0.00	0.00	0.00
11,700.0	92.05	359.51	9,418.7	2,453.3	-20.9	2,453.4	0.00	0.00	0.00
11,800.0	92.05	359.51	9,415.1	2,553.2	-21.8	2,553.3	0.00	0.00	0.00
11,900.0	92.05	359.51	9,411.5	2,653.2	-22.6	2,653.2	0.00	0.00	0.00
12,000.0	92.05	359.51	9,407.9	2,753.1	-23.4	2,753.2	0.00	0.00	0.00
12,100.0	92.05	359.51	9,404.3	2,853.0	-24.3	2,853.1	0.00	0.00	0.00
12,200.0	92.05	359.51	9,400.7	2,952.9	-25.1	2,953.1	0.00	0.00	0.00
12,300.0	92.05	359.51	9,397.1	3,052.9	-26.0	3,053.0	0.00	0.00	0.00
12,400.0	92.05	359.51	9,393.6	3,152.8	-26.8	3,152.9	0.00	0.00	0.00
12,500.0	92.05	359.51	9,390.0	3,252.7	-27.7	3,252.9	0.00	0.00	0.00
12,600.0	92.05	359.51	9,386.4	3,352.7	-28.5	3,352.8	0.00	0.00	0.00
12,700.0	92.05	359.51	9,382.8	3,452.6	-29.4	3,452.7	0.00	0.00	0.00
12,800.0	92.05	359.51	9,379.2	3,552.5	-30.2	3,552.7	0.00	0.00	0.00
12,900.0	92.05	359.51	9,375.6	3,652.5	-31.1	3,652.6	0.00	0.00	0.00
13,000.0	92.05	359.51	9,372.1	3,752.4	-31.9	3,752.5	0.00	0.00	0.00
13,100.0	92.05	359.51	9,368.5	3,852.3	-32.8	3,852.5	0.00	0.00	0.00



Wellplanning Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Lea County, NM
Site: Sombbrero Federal Com
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well #4H
WELL @ 3502.8usft (Original Well Elev)
WELL @ 3502.8usft (Original Well Elev)
Grid
Minimum Curvature

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)
13,200.0	92.05	359.51	9,364.9	3,952.3	-33.6	3,952.4	0.00	0.00	0.00
13,300.0	92.05	359.51	9,361.3	4,052.2	-34.4	4,052.3	0.00	0.00	0.00
13,400.0	92.05	359.51	9,357.7	4,152.1	-35.3	4,152.3	0.00	0.00	0.00
13,500.0	92.05	359.51	9,354.1	4,252.1	-36.1	4,252.2	0.00	0.00	0.00
13,600.0	92.05	359.51	9,350.6	4,352.0	-37.0	4,352.2	0.00	0.00	0.00
13,700.0	92.05	359.51	9,347.0	4,451.9	-37.8	4,452.1	0.00	0.00	0.00
13,800.0	92.05	359.51	9,343.4	4,551.9	-38.7	4,552.0	0.00	0.00	0.00
13,900.0	92.05	359.51	9,339.8	4,651.8	-39.5	4,652.0	0.00	0.00	0.00
14,000.0	92.05	359.51	9,336.2	4,751.7	-40.4	4,751.9	0.00	0.00	0.00
14,100.0	92.05	359.51	9,332.6	4,851.7	-41.2	4,851.8	0.00	0.00	0.00
14,200.0	92.05	359.51	9,329.0	4,951.6	-42.1	4,951.8	0.00	0.00	0.00
14,300.0	92.05	359.51	9,325.5	5,051.5	-42.9	5,051.7	0.00	0.00	0.00
14,400.0	92.05	359.51	9,321.9	5,151.5	-43.8	5,151.6	0.00	0.00	0.00
14,500.0	92.05	359.51	9,318.3	5,251.4	-44.6	5,251.6	0.00	0.00	0.00
14,600.0	92.05	359.51	9,314.7	5,351.3	-45.5	5,351.5	0.00	0.00	0.00
14,700.0	92.05	359.51	9,311.1	5,451.3	-46.3	5,451.4	0.00	0.00	0.00
14,800.0	92.05	359.51	9,307.5	5,551.2	-47.1	5,551.4	0.00	0.00	0.00
14,900.0	92.05	359.51	9,304.0	5,651.1	-48.0	5,651.3	0.00	0.00	0.00
15,000.0	92.05	359.51	9,300.4	5,751.0	-48.8	5,751.3	0.00	0.00	0.00
15,100.0	92.05	359.51	9,296.8	5,851.0	-49.7	5,851.2	0.00	0.00	0.00
15,200.0	92.05	359.51	9,293.2	5,950.9	-50.5	5,951.1	0.00	0.00	0.00
15,300.0	92.05	359.51	9,289.6	6,050.8	-51.4	6,051.1	0.00	0.00	0.00
15,400.0	92.05	359.51	9,286.0	6,150.8	-52.2	6,151.0	0.00	0.00	0.00
15,500.0	92.05	359.51	9,282.5	6,250.7	-53.1	6,250.9	0.00	0.00	0.00
15,600.0	92.05	359.51	9,278.9	6,350.6	-53.9	6,350.9	0.00	0.00	0.00
15,700.0	92.05	359.51	9,275.3	6,450.6	-54.8	6,450.8	0.00	0.00	0.00
15,800.0	92.05	359.51	9,271.7	6,550.5	-55.6	6,550.7	0.00	0.00	0.00
15,900.0	92.05	359.51	9,268.1	6,650.4	-56.5	6,650.7	0.00	0.00	0.00
16,000.0	92.05	359.51	9,264.5	6,750.4	-57.3	6,750.6	0.00	0.00	0.00
16,100.0	92.05	359.51	9,261.0	6,850.3	-58.1	6,850.5	0.00	0.00	0.00
16,200.0	92.05	359.51	9,257.4	6,950.2	-59.0	6,950.5	0.00	0.00	0.00
16,300.0	92.05	359.51	9,253.8	7,050.2	-59.8	7,050.4	0.00	0.00	0.00
16,377.7	92.05	359.51	9,251.0	7,127.8	-60.5	7,128.1	0.00	0.00	0.00

TD at 16377.7 - PBHL(Somb#4H)

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(Somb#4H)	0.00	0.00	9,251.0	7,127.8	-60.5	448,930.30	779,175.00	32° 13' 51.605 N	103° 25' 49.796 W
- plan hits target center									
- Point									



Wellplanning Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Lea County, NM
Site: Sombrero Federal Com
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #4H
TVD Reference: WELL @ 3502.8usft (Original Well Elev)
MD Reference: WELL @ 3502.8usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,973.5	8,973.5	0.0	0.0	KOP - 8973.5 'MD, 0.00° INC, 0.00° AZI
9,723.6	9,451.0	477.5	-4.1	EOC- 9723.6 'MD, 90.00° INC, 359.51° AZI
10,746.1	9,451.0	1,499.9	-12.8	TGT1- 10746.1 'MD, 90.00° INC, 359.51° AZI
16,377.7	9,251.0	1,602.6	-13.7	TD at 16377.7



COG Operating LLC
Project: Lea County, NM
Site: Sombbrero Federal Com
Well: #4H
Wellbore: OH

Plan: Design #1 (#4H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSeet
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	8973.5	0.00	0.00	8973.5	0.0	0.0	0.00	0.00	0.0
3	9723.6	90.00	359.51	9451.0	477.5	-4.1	12.00	359.51	477.5
4	10746.1	90.00	359.51	9451.0	1499.9	-12.8	0.00	0.00	1500.0
5	10848.8	92.05	359.51	9449.2	1602.6	-13.7	2.00	0.13	1602.7
6	16377.7	92.05	359.51	9251.0	7127.8	-60.5	0.00	0.00	7128.1

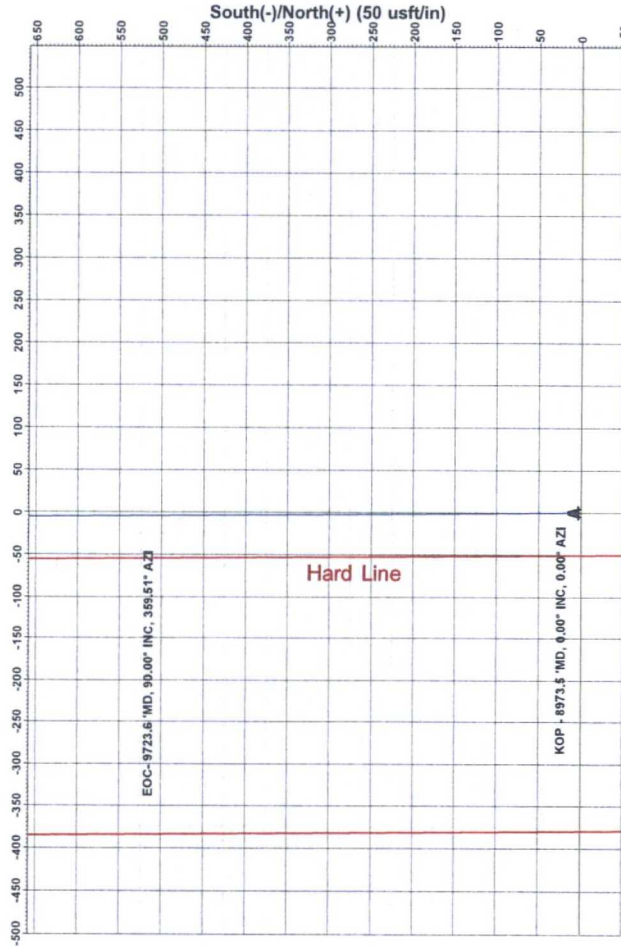
WELL DETAILS: #4H

Ground Elevation: 3474.8
RKB Elevation: WELL @ 3502.8usft (Original Well Elev)
Rig Name: Original Well Elev

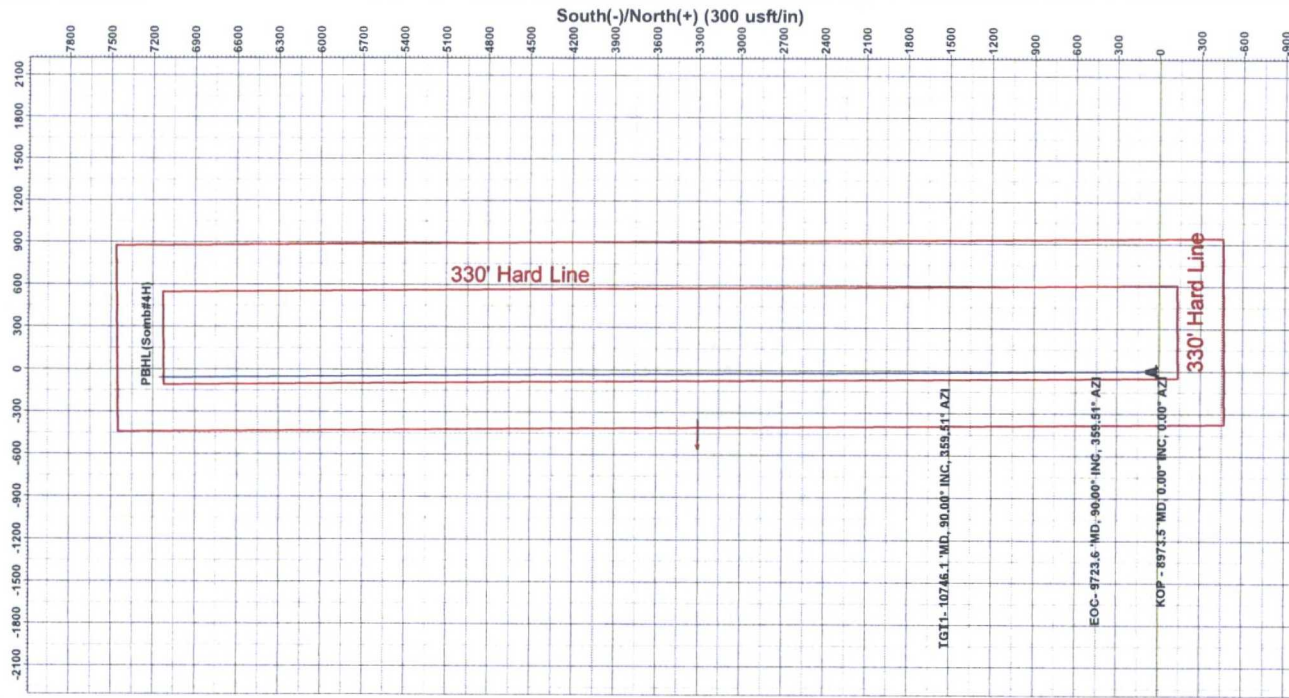
Northing 441802.50
Easting 779235.50
Latitude 32° 12' 41.070 N
Longitude 103° 25' 49.789 W



West(-)/East(+) (50 usft/in)



West(-)/East(+) (300 usft/in)



KOP - 873.5 MD, 0.00° INC, 0.00° AZI

EOC - 9723.6 MD, 90.00° INC, 359.51° AZI

TGT1 - 10746.1 MD, 90.00° INC, 359.51° AZI

EOC - 9723.6 MD, 90.00° INC, 359.51° AZI

KOP - 873.5 MD, 0.00° INC, 0.00° AZI

330' Hard Line



Vertical Section at 359.51° (300 usft/in)

Nexus Directional Solutions

PROJECT DETAILS: Lea County, NM
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
Local North: Grid