



COG Production LLC

Lea County, NM
Sec 26, T24S, R32E
Eider Federal #13H

Wellbore #1

Plan: Design #1

HOBBS OGD
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DDC Well Planning Report

17 June, 2015





HP
Well Planning Report



Database: Compass
Company: COG Production LLC
Project: Lea County, NM
Site: Sec 26, T24S, R32E
Well: Eider Federal #13H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Eider Federal #13H
TVD Reference: Well @ 3617.0usft (Ensign #772)
MD Reference: Well @ 3617.0usft (Ensign #772)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project: Lea County, NM
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: Sec 26, T24S, R32E
Site Position: Northing: 435,401.50 usft Latitude: 32° 11' 42.688 N
From: Map Easting: 711,288.90 usft Longitude: 103° 39' 1.082 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.36 °

Well: Eider Federal #13H
Well Position: +N/-S -28.6 usft Northing: 435,372.90 usft Latitude: 32° 11' 42.279 N
+E/-W 1,991.5 usft Easting: 713,280.40 usft Longitude: 103° 38' 37.910 W
Position Uncertainty: 0.0 usft Wellhead Elevation: 0.0 usft Ground Level: 3,586.0 usft

Wellbore: Wellbore #1
Magnetics Model Name Sample Date Declination (°) Dip Angle (°) Field Strength (nT)
IGRF2015 6/8/2015 7.20 60.05 48,120

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 0.0 178.51

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	
9,212.5	0.00	0.00	9,212.5	0.0	0.0	0.00	0.00	0.00	0.00	
9,962.5	90.00	178.51	9,690.0	-477.3	12.4	12.00	12.00	23.80	178.51	
19,476.8	90.00	178.51	9,690.0	-9,988.4	259.4	0.00	0.00	0.00	0.00	PBHL Eider Federal #



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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)
KOP 12°/100'									
9,212.5	0.00	0.00	9,212.5	0.0	0.0	0.0	0.00	0.00	0.00
9,300.0	10.50	178.51	9,299.5	-8.0	0.2	8.0	12.00	12.00	0.00
L Avalon Sh									
9,393.3	21.69	178.51	9,389.0	-33.8	0.9	33.8	12.00	12.00	0.00
9,400.0	22.50	178.51	9,395.2	-36.3	0.9	36.3	12.00	12.00	0.00
9,500.0	34.50	178.51	9,482.9	-83.9	2.2	84.0	12.00	12.00	0.00
9,600.0	46.50	178.51	9,558.8	-148.7	3.9	148.8	12.00	12.00	0.00
9,700.0	58.50	178.51	9,619.6	-227.9	5.9	228.0	12.00	12.00	0.00
9,800.0	70.50	178.51	9,662.6	-318.0	8.3	318.1	12.00	12.00	0.00
9,900.0	82.50	178.51	9,685.9	-415.0	10.8	415.1	12.00	12.00	0.00
End of Curve / 90° Inc / 178.51° Azm / 9690' TVD									
9,962.5	90.00	178.51	9,690.0	-477.3	12.4	477.5	12.00	12.00	0.00
10,000.0	90.00	178.51	9,690.0	-514.8	13.4	515.0	0.00	0.00	0.00
10,100.0	90.00	178.51	9,690.0	-614.8	16.0	615.0	0.00	0.00	0.00
10,200.0	90.00	178.51	9,690.0	-714.7	18.6	715.0	0.00	0.00	0.00
10,300.0	90.00	178.51	9,690.0	-814.7	21.2	815.0	0.00	0.00	0.00
10,400.0	90.00	178.51	9,690.0	-914.7	23.8	915.0	0.00	0.00	0.00
10,500.0	90.00	178.51	9,690.0	-1,014.6	26.3	1,015.0	0.00	0.00	0.00
10,600.0	90.00	178.51	9,690.0	-1,114.6	28.9	1,115.0	0.00	0.00	0.00
10,700.0	90.00	178.51	9,690.0	-1,214.6	31.5	1,215.0	0.00	0.00	0.00
10,800.0	90.00	178.51	9,690.0	-1,314.5	34.1	1,315.0	0.00	0.00	0.00
10,900.0	90.00	178.51	9,690.0	-1,414.5	36.7	1,415.0	0.00	0.00	0.00
11,000.0	90.00	178.51	9,690.0	-1,514.5	39.3	1,515.0	0.00	0.00	0.00
11,100.0	90.00	178.51	9,690.0	-1,614.4	41.9	1,615.0	0.00	0.00	0.00
11,200.0	90.00	178.51	9,690.0	-1,714.4	44.5	1,715.0	0.00	0.00	0.00
11,300.0	90.00	178.51	9,690.0	-1,814.4	47.1	1,815.0	0.00	0.00	0.00
11,400.0	90.00	178.51	9,690.0	-1,914.3	49.7	1,915.0	0.00	0.00	0.00
11,500.0	90.00	178.51	9,690.0	-2,014.3	52.3	2,015.0	0.00	0.00	0.00
11,600.0	90.00	178.51	9,690.0	-2,114.3	54.9	2,115.0	0.00	0.00	0.00
11,700.0	90.00	178.51	9,690.0	-2,214.2	57.5	2,215.0	0.00	0.00	0.00
11,800.0	90.00	178.51	9,690.0	-2,314.2	60.1	2,315.0	0.00	0.00	0.00
11,900.0	90.00	178.51	9,690.0	-2,414.2	62.7	2,415.0	0.00	0.00	0.00
12,000.0	90.00	178.51	9,690.0	-2,514.1	65.3	2,515.0	0.00	0.00	0.00
12,100.0	90.00	178.51	9,690.0	-2,614.1	67.9	2,615.0	0.00	0.00	0.00
12,200.0	90.00	178.51	9,690.0	-2,714.0	70.5	2,715.0	0.00	0.00	0.00
12,300.0	90.00	178.51	9,690.0	-2,814.0	73.1	2,815.0	0.00	0.00	0.00
12,400.0	90.00	178.51	9,690.0	-2,914.0	75.7	2,915.0	0.00	0.00	0.00
12,500.0	90.00	178.51	9,690.0	-3,013.9	78.3	3,015.0	0.00	0.00	0.00
12,600.0	90.00	178.51	9,690.0	-3,113.9	80.9	3,115.0	0.00	0.00	0.00
12,700.0	90.00	178.51	9,690.0	-3,213.9	83.5	3,215.0	0.00	0.00	0.00
12,800.0	90.00	178.51	9,690.0	-3,313.8	86.1	3,315.0	0.00	0.00	0.00
12,900.0	90.00	178.51	9,690.0	-3,413.8	88.7	3,415.0	0.00	0.00	0.00
13,000.0	90.00	178.51	9,690.0	-3,513.8	91.3	3,515.0	0.00	0.00	0.00
13,100.0	90.00	178.51	9,690.0	-3,613.7	93.8	3,615.0	0.00	0.00	0.00
13,200.0	90.00	178.51	9,690.0	-3,713.7	96.4	3,715.0	0.00	0.00	0.00
13,300.0	90.00	178.51	9,690.0	-3,813.7	99.0	3,815.0	0.00	0.00	0.00
13,400.0	90.00	178.51	9,690.0	-3,913.6	101.6	3,915.0	0.00	0.00	0.00
13,500.0	90.00	178.51	9,690.0	-4,013.6	104.2	4,015.0	0.00	0.00	0.00
13,600.0	90.00	178.51	9,690.0	-4,113.6	106.8	4,115.0	0.00	0.00	0.00
13,700.0	90.00	178.51	9,690.0	-4,213.5	109.4	4,215.0	0.00	0.00	0.00
13,800.0	90.00	178.51	9,690.0	-4,313.5	112.0	4,315.0	0.00	0.00	0.00
13,900.0	90.00	178.51	9,690.0	-4,413.5	114.6	4,415.0	0.00	0.00	0.00



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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)
14,000.0	90.00	178.51	9,690.0	-4,513.4	117.2	4,515.0	0.00	0.00	0.00
14,100.0	90.00	178.51	9,690.0	-4,613.4	119.8	4,615.0	0.00	0.00	0.00
14,200.0	90.00	178.51	9,690.0	-4,713.4	122.4	4,715.0	0.00	0.00	0.00
14,300.0	90.00	178.51	9,690.0	-4,813.3	125.0	4,815.0	0.00	0.00	0.00
14,400.0	90.00	178.51	9,690.0	-4,913.3	127.6	4,915.0	0.00	0.00	0.00
14,500.0	90.00	178.51	9,690.0	-5,013.3	130.2	5,015.0	0.00	0.00	0.00
14,600.0	90.00	178.51	9,690.0	-5,113.2	132.8	5,115.0	0.00	0.00	0.00
14,700.0	90.00	178.51	9,690.0	-5,213.2	135.4	5,215.0	0.00	0.00	0.00
14,800.0	90.00	178.51	9,690.0	-5,313.2	138.0	5,315.0	0.00	0.00	0.00
14,900.0	90.00	178.51	9,690.0	-5,413.1	140.6	5,415.0	0.00	0.00	0.00
15,000.0	90.00	178.51	9,690.0	-5,513.1	143.2	5,515.0	0.00	0.00	0.00
15,100.0	90.00	178.51	9,690.0	-5,613.1	145.8	5,615.0	0.00	0.00	0.00
15,200.0	90.00	178.51	9,690.0	-5,713.0	148.4	5,715.0	0.00	0.00	0.00
15,300.0	90.00	178.51	9,690.0	-5,813.0	151.0	5,815.0	0.00	0.00	0.00
15,400.0	90.00	178.51	9,690.0	-5,913.0	153.6	5,915.0	0.00	0.00	0.00
15,500.0	90.00	178.51	9,690.0	-6,012.9	156.2	6,015.0	0.00	0.00	0.00
15,600.0	90.00	178.51	9,690.0	-6,112.9	158.8	6,115.0	0.00	0.00	0.00
15,700.0	90.00	178.51	9,690.0	-6,212.9	161.3	6,215.0	0.00	0.00	0.00
15,800.0	90.00	178.51	9,690.0	-6,312.8	163.9	6,315.0	0.00	0.00	0.00
15,900.0	90.00	178.51	9,690.0	-6,412.8	166.5	6,415.0	0.00	0.00	0.00
16,000.0	90.00	178.51	9,690.0	-6,512.8	169.1	6,515.0	0.00	0.00	0.00
16,100.0	90.00	178.51	9,690.0	-6,612.7	171.7	6,615.0	0.00	0.00	0.00
16,200.0	90.00	178.51	9,690.0	-6,712.7	174.3	6,715.0	0.00	0.00	0.00
16,300.0	90.00	178.51	9,690.0	-6,812.7	176.9	6,815.0	0.00	0.00	0.00
16,400.0	90.00	178.51	9,690.0	-6,912.6	179.5	6,915.0	0.00	0.00	0.00
16,500.0	90.00	178.51	9,690.0	-7,012.6	182.1	7,015.0	0.00	0.00	0.00
16,600.0	90.00	178.51	9,690.0	-7,112.6	184.7	7,115.0	0.00	0.00	0.00
16,700.0	90.00	178.51	9,690.0	-7,212.5	187.3	7,215.0	0.00	0.00	0.00
16,800.0	90.00	178.51	9,690.0	-7,312.5	189.9	7,315.0	0.00	0.00	0.00
16,900.0	90.00	178.51	9,690.0	-7,412.5	192.5	7,415.0	0.00	0.00	0.00
17,000.0	90.00	178.51	9,690.0	-7,512.4	195.1	7,515.0	0.00	0.00	0.00
17,100.0	90.00	178.51	9,690.0	-7,612.4	197.7	7,615.0	0.00	0.00	0.00
17,200.0	90.00	178.51	9,690.0	-7,712.4	200.3	7,715.0	0.00	0.00	0.00
17,300.0	90.00	178.51	9,690.0	-7,812.3	202.9	7,815.0	0.00	0.00	0.00
17,400.0	90.00	178.51	9,690.0	-7,912.3	205.5	7,915.0	0.00	0.00	0.00
17,500.0	90.00	178.51	9,690.0	-8,012.3	208.1	8,015.0	0.00	0.00	0.00
17,600.0	90.00	178.51	9,690.0	-8,112.2	210.7	8,115.0	0.00	0.00	0.00
17,700.0	90.00	178.51	9,690.0	-8,212.2	213.3	8,215.0	0.00	0.00	0.00
17,800.0	90.00	178.51	9,690.0	-8,312.2	215.9	8,315.0	0.00	0.00	0.00
17,900.0	90.00	178.51	9,690.0	-8,412.1	218.5	8,415.0	0.00	0.00	0.00
18,000.0	90.00	178.51	9,690.0	-8,512.1	221.1	8,515.0	0.00	0.00	0.00
18,100.0	90.00	178.51	9,690.0	-8,612.1	223.7	8,615.0	0.00	0.00	0.00
18,200.0	90.00	178.51	9,690.0	-8,712.0	226.3	8,715.0	0.00	0.00	0.00
18,300.0	90.00	178.51	9,690.0	-8,812.0	228.8	8,815.0	0.00	0.00	0.00
18,400.0	90.00	178.51	9,690.0	-8,912.0	231.4	8,915.0	0.00	0.00	0.00
18,500.0	90.00	178.51	9,690.0	-9,011.9	234.0	9,015.0	0.00	0.00	0.00
18,600.0	90.00	178.51	9,690.0	-9,111.9	236.6	9,115.0	0.00	0.00	0.00
18,700.0	90.00	178.51	9,690.0	-9,211.9	239.2	9,215.0	0.00	0.00	0.00
18,800.0	90.00	178.51	9,690.0	-9,311.8	241.8	9,315.0	0.00	0.00	0.00
18,900.0	90.00	178.51	9,690.0	-9,411.8	244.4	9,415.0	0.00	0.00	0.00
19,000.0	90.00	178.51	9,690.0	-9,511.8	247.0	9,515.0	0.00	0.00	0.00
19,100.0	90.00	178.51	9,690.0	-9,611.7	249.6	9,615.0	0.00	0.00	0.00
19,200.0	90.00	178.51	9,690.0	-9,711.7	252.2	9,715.0	0.00	0.00	0.00
19,300.0	90.00	178.51	9,690.0	-9,811.7	254.8	9,815.0	0.00	0.00	0.00



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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)
19,400.0	90.00	178.51	9,690.0	-9,911.6	257.4	9,915.0	0.00	0.00	0.00
PBHL @ 19477' MD / 9690' TVD									
19,476.8	90.00	178.51	9,690.0	-9,988.4	259.4	9,991.8	0.00	0.00	0.00

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 Eider Federal #13	0.00	0.00	9,690.0	-9,988.4	259.4	425,384.50	713,539.80	32° 10' 3.420 N	103° 38' 35.637 W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,160.0	1,160.0	Rustler		0.00	178.51
1,405.0	1,405.0	TOS		0.00	178.51
4,710.0	4,710.0	BOS (Fletcher)		0.00	178.51
4,942.0	4,942.0	LMAR (Top Delaware)		0.00	178.51
4,977.0	4,977.0	BLCN		0.00	178.51
5,880.0	5,880.0	CYCN		0.00	178.51
7,230.0	7,230.0	BYCN		0.00	178.51
8,858.0	8,858.0	Bone Sprg (BSGL)		0.00	178.51
9,008.0	9,008.0	U Avalon Sh		0.00	178.51
9,393.3	9,389.0	L Avalon Sh		0.00	178.51

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,212.5	9,212.5	0.0	0.0	KOP 12°/100'
9,962.5	9,690.0	-477.3	12.4	End of Curve / 90° Inc / 178.51° Azm / 9690' TVD
19,476.8	9,690.0	-9,988.4	259.4	PBHL @ 19477' MD / 9690' TVD