



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 27, T 21S., R 33 E
Well: Huckleberry State Com 505H
Wellbore: Wellbore #1
Plan: Plan #1 (Huckleberry State Com 505H/Wellbore #1)
Scandril Freedom



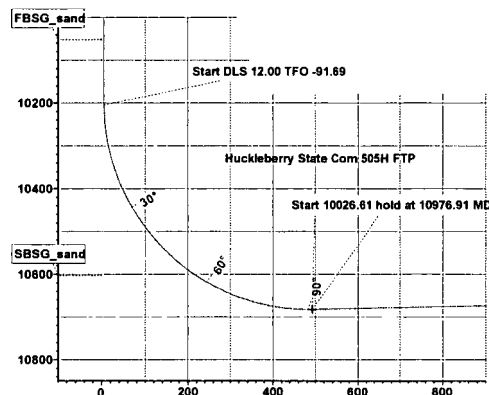
WELL DETAILS: Huckleberry State Com 505H

Ground Elevation:: 3716.10
RKB Elevation: KB=26° @ 3742.10usft (Scandril Freedom)
Rig Name: Scandril Freedom

Northing	Easting	Latitude	Longitude
530664.00	737122.90	32.45656	-103.56458

Planned Section Details

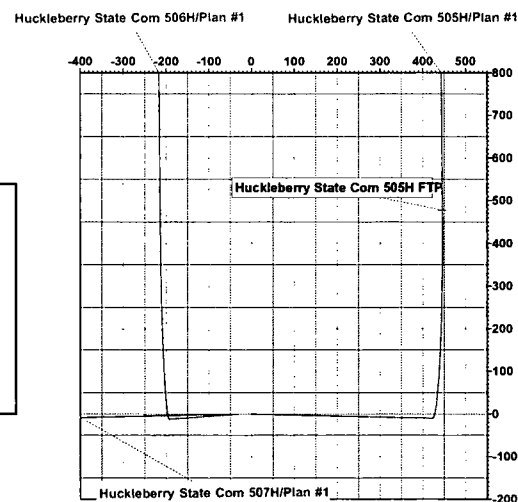
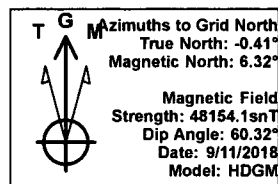
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00
3	2658.64	3.17	91.30	2658.66	-0.10	4.39	2.00	91.30	0.05
4	10216.35	3.17	91.30	10204.69	-9.61	422.58	0.00	0.00	5.11
5	10976.91	91.17	359.54	10682.10	477.80	445.70	12.00	-91.69	493.03
6	21003.52	91.17	359.54	10477.10	10502.00	365.90	0.00	0.00	10508.37



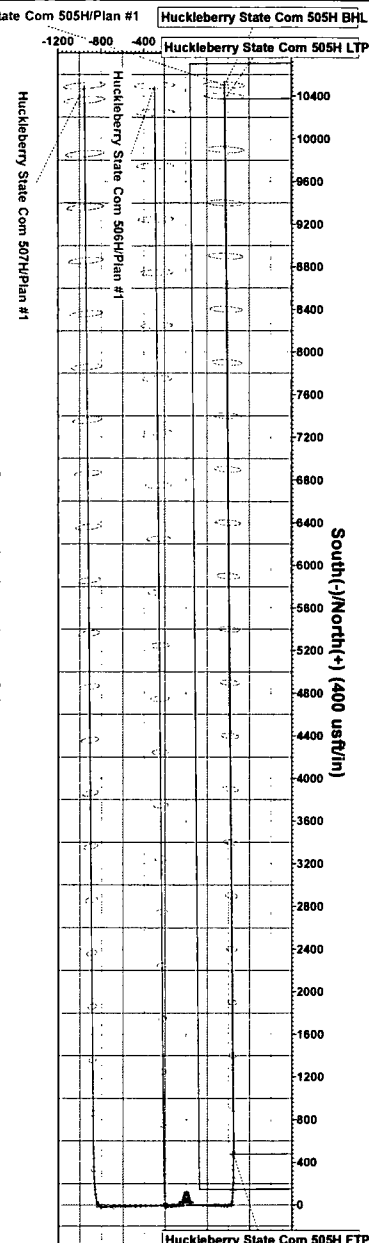
Vertical Section at 2.00° (100 usft/in)

HOBBS OCD
SEP 13 2018
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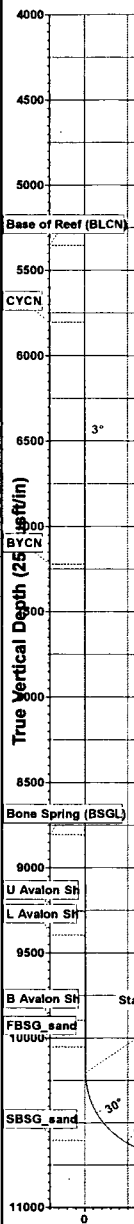
PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



West(-)/East(+) (100 usft/in)



Huckleberry State Com 505H/Plan #1



Vertical Section at 2.00° (250 usft/in)



C O N C H O

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 27, T 21S. , R 33 E

Huckleberry State Com 505H

Wellbore #1

Plan: Plan #1

Standard Survey Report

11 September, 2018



INTEGRITY
DIRECTIONAL

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 505H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3742.10usft (Scandriil Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3742.10usft (Scandriil Freedom)
Well:	Huckleberry State Com 505H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

Project	Lea County, NM (NAD27 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	Sec. 27, T 21S. , R 33 E		
Site Position:		Northing:	525,881.09 usft
From:	Map	Easting:	741,064.50 usft
Position Uncertainty:	5.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.44334
		Longitude:	-103.55192
		Grid Convergence:	0.42 °

Well	Huckleberry State Com 505H		
Well Position	+N/-S	0.00 usft	Northing: 530,664.00 usft
	+E/-W	0.00 usft	Easting: 737,122.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32.45656
		Longitude:	-103.56459
		Ground Level:	3,716.10 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	9/11/2018	6.73
		Dip Angle (°)	60.32
		Field Strength (nT)	48,154

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (°)	2.00

Survey Tool Program	Date 9/11/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
0.00	21,003.52	Plan #1 (Wellbore #1)	MWD
			Description
			MWD - Standard

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00

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Well:	Huckleberry State Com 505H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

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)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
2,600.00	2.00	91.30	2,599.98	-0.04	1.74	0.02	2.00	2.00	0.00
2,658.64	3.17	91.30	2,658.56	-0.10	4.39	0.05	2.00	2.00	0.00
Start 7557.71 hold at 2658.64 MD									
2,700.00	3.17	91.30	2,699.86	-0.15	6.68	0.08	0.00	0.00	0.00
2,800.00	3.17	91.30	2,799.70	-0.28	12.21	0.15	0.00	0.00	0.00
2,900.00	3.17	91.30	2,899.55	-0.40	17.75	0.21	0.00	0.00	0.00
3,000.00	3.17	91.30	2,999.40	-0.53	23.28	0.28	0.00	0.00	0.00
3,100.00	3.17	91.30	3,099.24	-0.66	28.81	0.35	0.00	0.00	0.00
3,200.00	3.17	91.30	3,199.09	-0.78	34.34	0.42	0.00	0.00	0.00
3,300.00	3.17	91.30	3,298.94	-0.91	39.88	0.48	0.00	0.00	0.00
3,400.00	3.17	91.30	3,398.78	-1.03	45.41	0.55	0.00	0.00	0.00
3,500.00	3.17	91.30	3,498.63	-1.16	50.94	0.62	0.00	0.00	0.00
3,600.00	3.17	91.30	3,598.48	-1.28	56.48	0.68	0.00	0.00	0.00
3,700.00	3.17	91.30	3,698.32	-1.41	62.01	0.75	0.00	0.00	0.00
3,800.00	3.17	91.30	3,798.17	-1.54	67.54	0.82	0.00	0.00	0.00
3,900.00	3.17	91.30	3,898.02	-1.66	73.08	0.88	0.00	0.00	0.00
4,000.00	3.17	91.30	3,997.86	-1.79	78.61	0.95	0.00	0.00	0.00
4,100.00	3.17	91.30	4,097.71	-1.91	84.14	1.02	0.00	0.00	0.00
4,200.00	3.17	91.30	4,197.56	-2.04	89.68	1.08	0.00	0.00	0.00
4,300.00	3.17	91.30	4,297.40	-2.17	95.21	1.15	0.00	0.00	0.00
4,400.00	3.17	91.30	4,397.25	-2.29	100.74	1.22	0.00	0.00	0.00
4,500.00	3.17	91.30	4,497.10	-2.42	106.28	1.29	0.00	0.00	0.00
4,600.00	3.17	91.30	4,596.94	-2.54	111.81	1.35	0.00	0.00	0.00
4,700.00	3.17	91.30	4,696.79	-2.67	117.34	1.42	0.00	0.00	0.00
4,800.00	3.17	91.30	4,796.64	-2.79	122.88	1.49	0.00	0.00	0.00
4,900.00	3.17	91.30	4,896.48	-2.92	128.41	1.55	0.00	0.00	0.00
5,000.00	3.17	91.30	4,996.33	-3.05	133.94	1.62	0.00	0.00	0.00

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MD Reference: KB=26' @ 3742.10usft (Scandril Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

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)
5,100.00	3.17	91.30	5,096.18	-3.17	139.48	1.69	0.00	0.00	0.00
5,200.00	3.17	91.30	5,196.02	-3.30	145.01	1.75	0.00	0.00	0.00
5,300.00	3.17	91.30	5,295.87	-3.42	150.54	1.82	0.00	0.00	0.00
5,400.00	3.17	91.30	5,395.72	-3.55	156.08	1.89	0.00	0.00	0.00
5,500.00	3.17	91.30	5,495.56	-3.68	161.61	1.95	0.00	0.00	0.00
5,600.00	3.17	91.30	5,595.41	-3.80	167.14	2.02	0.00	0.00	0.00
5,700.00	3.17	91.30	5,695.26	-3.93	172.68	2.09	0.00	0.00	0.00
5,800.00	3.17	91.30	5,795.10	-4.05	178.21	2.15	0.00	0.00	0.00
5,900.00	3.17	91.30	5,894.95	-4.18	183.74	2.22	0.00	0.00	0.00
6,000.00	3.17	91.30	5,994.80	-4.30	189.27	2.29	0.00	0.00	0.00
6,100.00	3.17	91.30	6,094.64	-4.43	194.81	2.36	0.00	0.00	0.00
6,200.00	3.17	91.30	6,194.49	-4.56	200.34	2.42	0.00	0.00	0.00
6,300.00	3.17	91.30	6,294.34	-4.68	205.87	2.49	0.00	0.00	0.00
6,400.00	3.17	91.30	6,394.18	-4.81	211.41	2.56	0.00	0.00	0.00
6,500.00	3.17	91.30	6,494.03	-4.93	216.94	2.62	0.00	0.00	0.00
6,600.00	3.17	91.30	6,593.88	-5.06	222.47	2.69	0.00	0.00	0.00
6,700.00	3.17	91.30	6,693.72	-5.19	228.01	2.76	0.00	0.00	0.00
6,800.00	3.17	91.30	6,793.57	-5.31	233.54	2.82	0.00	0.00	0.00
6,900.00	3.17	91.30	6,893.42	-5.44	239.07	2.89	0.00	0.00	0.00
7,000.00	3.17	91.30	6,993.26	-5.56	244.61	2.96	0.00	0.00	0.00
7,100.00	3.17	91.30	7,093.11	-5.69	250.14	3.02	0.00	0.00	0.00
7,200.00	3.17	91.30	7,192.96	-5.81	255.67	3.09	0.00	0.00	0.00
7,300.00	3.17	91.30	7,292.80	-5.94	261.21	3.16	0.00	0.00	0.00
7,400.00	3.17	91.30	7,392.65	-6.07	266.74	3.23	0.00	0.00	0.00
7,500.00	3.17	91.30	7,492.50	-6.19	272.27	3.29	0.00	0.00	0.00
7,600.00	3.17	91.30	7,592.35	-6.32	277.81	3.36	0.00	0.00	0.00
7,700.00	3.17	91.30	7,692.19	-6.44	283.34	3.43	0.00	0.00	0.00
7,800.00	3.17	91.30	7,792.04	-6.57	288.87	3.49	0.00	0.00	0.00
7,900.00	3.17	91.30	7,891.89	-6.70	294.41	3.56	0.00	0.00	0.00
8,000.00	3.17	91.30	7,991.73	-6.82	299.94	3.63	0.00	0.00	0.00
8,100.00	3.17	91.30	8,091.58	-6.95	305.47	3.69	0.00	0.00	0.00
8,200.00	3.17	91.30	8,191.43	-7.07	311.01	3.76	0.00	0.00	0.00
8,300.00	3.17	91.30	8,291.27	-7.20	316.54	3.83	0.00	0.00	0.00
8,400.00	3.17	91.30	8,391.12	-7.32	322.07	3.89	0.00	0.00	0.00
8,500.00	3.17	91.30	8,490.97	-7.45	327.61	3.96	0.00	0.00	0.00
8,600.00	3.17	91.30	8,590.81	-7.58	333.14	4.03	0.00	0.00	0.00
8,700.00	3.17	91.30	8,690.66	-7.70	338.67	4.09	0.00	0.00	0.00
8,800.00	3.17	91.30	8,790.51	-7.83	344.21	4.16	0.00	0.00	0.00
8,900.00	3.17	91.30	8,890.35	-7.95	349.74	4.23	0.00	0.00	0.00
9,000.00	3.17	91.30	8,990.20	-8.08	355.27	4.30	0.00	0.00	0.00
9,100.00	3.17	91.30	9,090.05	-8.21	360.80	4.36	0.00	0.00	0.00
9,200.00	3.17	91.30	9,189.89	-8.33	366.34	4.43	0.00	0.00	0.00
9,300.00	3.17	91.30	9,289.74	-8.46	371.87	4.50	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)
9,400.00	3.17	91.30	9,389.59	-8.58	377.40	4.56	0.00	0.00	0.00
9,500.00	3.17	91.30	9,489.43	-8.71	382.94	4.63	0.00	0.00	0.00
9,600.00	3.17	91.30	9,589.28	-8.83	388.47	4.70	0.00	0.00	0.00
9,700.00	3.17	91.30	9,689.13	-8.96	394.00	4.76	0.00	0.00	0.00
9,800.00	3.17	91.30	9,788.97	-9.09	399.54	4.83	0.00	0.00	0.00
9,900.00	3.17	91.30	9,888.82	-9.21	405.07	4.90	0.00	0.00	0.00
10,000.00	3.17	91.30	9,988.67	-9.34	410.60	4.96	0.00	0.00	0.00
10,100.00	3.17	91.30	10,088.51	-9.46	416.14	5.03	0.00	0.00	0.00
10,200.00	3.17	91.30	10,188.36	-9.59	421.67	5.10	0.00	0.00	0.00
10,216.35	3.17	91.30	10,204.69	-9.61	422.58	5.11	0.00	0.00	0.00
Start DLS 12.00 TFO -91.69									
10,300.00	10.43	17.12	10,287.79	-2.41	427.13	12.47	12.00	8.68	-88.68
10,400.00	22.16	7.43	10,383.62	25.05	432.25	40.08	12.00	11.73	-9.69
10,500.00	34.07	4.31	10,471.67	71.86	436.81	87.02	12.00	11.91	-3.12
10,600.00	46.03	2.67	10,548.08	135.97	440.61	151.23	12.00	11.95	-1.63
10,700.00	58.00	1.59	10,609.51	214.59	443.48	229.90	12.00	11.97	-1.08
10,800.00	69.98	0.77	10,653.29	304.28	445.29	319.60	12.00	11.98	-0.83
10,900.00	81.96	0.06	10,677.50	401.11	445.97	416.40	12.00	11.98	-0.71
10,976.91	91.17	359.54	10,682.10	477.80	445.70	493.03	12.00	11.98	-0.67
Start 10026.61 hold at 10976.91 MD - Huckleberry State Com 505H FTP									
11,000.00	91.17	359.54	10,681.63	500.88	445.52	516.09	0.00	0.00	0.00
11,100.00	91.17	359.54	10,679.58	600.86	444.72	615.98	0.00	0.00	0.00
11,200.00	91.17	359.54	10,677.54	700.84	443.92	715.87	0.00	0.00	0.00
11,300.00	91.17	359.54	10,675.49	800.81	443.13	815.76	0.00	0.00	0.00
11,400.00	91.17	359.54	10,673.45	900.79	442.33	915.64	0.00	0.00	0.00
11,500.00	91.17	359.54	10,671.41	1,000.76	441.54	1,015.53	0.00	0.00	0.00
11,600.00	91.17	359.54	10,669.36	1,100.74	440.74	1,115.42	0.00	0.00	0.00
11,700.00	91.17	359.54	10,667.32	1,200.72	439.95	1,215.31	0.00	0.00	0.00
11,800.00	91.17	359.54	10,665.27	1,300.69	439.15	1,315.19	0.00	0.00	0.00
11,900.00	91.17	359.54	10,663.23	1,400.67	438.35	1,415.08	0.00	0.00	0.00
12,000.00	91.17	359.54	10,661.18	1,500.64	437.56	1,514.97	0.00	0.00	0.00
12,100.00	91.17	359.54	10,659.14	1,600.62	436.76	1,614.86	0.00	0.00	0.00
12,200.00	91.17	359.54	10,657.09	1,700.59	435.97	1,714.74	0.00	0.00	0.00
12,300.00	91.17	359.54	10,655.05	1,800.57	435.17	1,814.63	0.00	0.00	0.00
12,400.00	91.17	359.54	10,653.00	1,900.55	434.37	1,914.52	0.00	0.00	0.00
12,500.00	91.17	359.54	10,650.96	2,000.52	433.58	2,014.41	0.00	0.00	0.00
12,600.00	91.17	359.54	10,648.92	2,100.50	432.78	2,114.29	0.00	0.00	0.00
12,700.00	91.17	359.54	10,646.87	2,200.47	431.99	2,214.18	0.00	0.00	0.00
12,800.00	91.17	359.54	10,644.83	2,300.45	431.19	2,314.07	0.00	0.00	0.00
12,900.00	91.17	359.54	10,642.78	2,400.43	430.39	2,413.96	0.00	0.00	0.00
13,000.00	91.17	359.54	10,640.74	2,500.40	429.60	2,513.84	0.00	0.00	0.00
13,100.00	91.17	359.54	10,638.69	2,600.38	428.80	2,613.73	0.00	0.00	0.00
13,200.00	91.17	359.54	10,636.65	2,700.35	428.01	2,713.62	0.00	0.00	0.00
13,300.00	91.17	359.54	10,634.60	2,800.33	427.21	2,813.51	0.00	0.00	0.00

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 505H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Well:	Huckleberry State Com 505H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

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)
13,400.00	91.17	359.54	10,632.56	2,900.31	426.42	2,913.40	0.00	0.00	0.00
13,500.00	91.17	359.54	10,630.51	3,000.28	425.62	3,013.28	0.00	0.00	0.00
13,600.00	91.17	359.54	10,628.47	3,100.26	424.82	3,113.17	0.00	0.00	0.00
13,700.00	91.17	359.54	10,626.43	3,200.23	424.03	3,213.06	0.00	0.00	0.00
13,800.00	91.17	359.54	10,624.38	3,300.21	423.23	3,312.95	0.00	0.00	0.00
13,900.00	91.17	359.54	10,622.34	3,400.19	422.44	3,412.83	0.00	0.00	0.00
14,000.00	91.17	359.54	10,620.29	3,500.16	421.64	3,512.72	0.00	0.00	0.00
14,100.00	91.17	359.54	10,618.25	3,600.14	420.84	3,612.61	0.00	0.00	0.00
14,200.00	91.17	359.54	10,616.20	3,700.11	420.05	3,712.50	0.00	0.00	0.00
14,300.00	91.17	359.54	10,614.16	3,800.09	419.25	3,812.38	0.00	0.00	0.00
14,400.00	91.17	359.54	10,612.11	3,900.07	418.46	3,912.27	0.00	0.00	0.00
14,500.00	91.17	359.54	10,610.07	4,000.04	417.66	4,012.16	0.00	0.00	0.00
14,600.00	91.17	359.54	10,608.02	4,100.02	416.86	4,112.05	0.00	0.00	0.00
14,700.00	91.17	359.54	10,605.98	4,199.99	416.07	4,211.93	0.00	0.00	0.00
14,800.00	91.17	359.54	10,603.93	4,299.97	415.27	4,311.82	0.00	0.00	0.00
14,900.00	91.17	359.54	10,601.89	4,399.95	414.48	4,411.71	0.00	0.00	0.00
15,000.00	91.17	359.54	10,599.85	4,499.92	413.68	4,511.60	0.00	0.00	0.00
15,100.00	91.17	359.54	10,597.80	4,599.90	412.89	4,611.48	0.00	0.00	0.00
15,200.00	91.17	359.54	10,595.76	4,699.87	412.09	4,711.37	0.00	0.00	0.00
15,300.00	91.17	359.54	10,593.71	4,799.85	411.29	4,811.26	0.00	0.00	0.00
15,400.00	91.17	359.54	10,591.67	4,899.82	410.50	4,911.15	0.00	0.00	0.00
15,500.00	91.17	359.54	10,589.62	4,999.80	409.70	5,011.03	0.00	0.00	0.00
15,600.00	91.17	359.54	10,587.58	5,099.78	408.91	5,110.92	0.00	0.00	0.00
15,700.00	91.17	359.54	10,585.53	5,199.75	408.11	5,210.81	0.00	0.00	0.00
15,800.00	91.17	359.54	10,583.49	5,299.73	407.31	5,310.70	0.00	0.00	0.00
15,900.00	91.17	359.54	10,581.44	5,399.70	406.52	5,410.58	0.00	0.00	0.00
16,000.00	91.17	359.54	10,579.40	5,499.68	405.72	5,510.47	0.00	0.00	0.00
16,100.00	91.17	359.54	10,577.36	5,599.66	404.93	5,610.36	0.00	0.00	0.00
16,200.00	91.17	359.54	10,575.31	5,699.63	404.13	5,710.25	0.00	0.00	0.00
16,300.00	91.17	359.54	10,573.27	5,799.61	403.33	5,810.14	0.00	0.00	0.00
16,400.00	91.17	359.54	10,571.22	5,899.58	402.54	5,910.02	0.00	0.00	0.00
16,500.00	91.17	359.54	10,569.18	5,999.56	401.74	6,009.91	0.00	0.00	0.00
16,600.00	91.17	359.54	10,567.13	6,099.54	400.95	6,109.80	0.00	0.00	0.00
16,700.00	91.17	359.54	10,565.09	6,199.51	400.15	6,209.69	0.00	0.00	0.00
16,800.00	91.17	359.54	10,563.04	6,299.49	399.36	6,309.57	0.00	0.00	0.00
16,900.00	91.17	359.54	10,561.00	6,399.46	398.56	6,409.46	0.00	0.00	0.00
17,000.00	91.17	359.54	10,558.95	6,499.44	397.76	6,509.35	0.00	0.00	0.00
17,100.00	91.17	359.54	10,556.91	6,599.42	396.97	6,609.24	0.00	0.00	0.00
17,200.00	91.17	359.54	10,554.87	6,699.39	396.17	6,709.12	0.00	0.00	0.00
17,300.00	91.17	359.54	10,552.82	6,799.37	395.38	6,809.01	0.00	0.00	0.00
17,400.00	91.17	359.54	10,550.78	6,899.34	394.58	6,908.90	0.00	0.00	0.00
17,500.00	91.17	359.54	10,548.73	6,999.32	393.78	7,008.79	0.00	0.00	0.00
17,600.00	91.17	359.54	10,546.69	7,099.30	392.99	7,108.67	0.00	0.00	0.00

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 505H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Well:	Huckleberry State Com 505H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

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)
17,700.00	91.17	359.54	10,544.64	7,199.27	392.19	7,208.56	0.00	0.00	0.00
17,800.00	91.17	359.54	10,542.60	7,299.25	391.40	7,308.45	0.00	0.00	0.00
17,900.00	91.17	359.54	10,540.55	7,399.22	390.60	7,408.34	0.00	0.00	0.00
18,000.00	91.17	359.54	10,538.51	7,499.20	389.80	7,508.22	0.00	0.00	0.00
18,100.00	91.17	359.54	10,536.46	7,599.17	389.01	7,608.11	0.00	0.00	0.00
18,200.00	91.17	359.54	10,534.42	7,699.15	388.21	7,708.00	0.00	0.00	0.00
18,300.00	91.17	359.54	10,532.38	7,799.13	387.42	7,807.89	0.00	0.00	0.00
18,400.00	91.17	359.54	10,530.33	7,899.10	386.62	7,907.77	0.00	0.00	0.00
18,500.00	91.17	359.54	10,528.29	7,999.08	385.83	8,007.66	0.00	0.00	0.00
18,600.00	91.17	359.54	10,526.24	8,099.05	385.03	8,107.55	0.00	0.00	0.00
18,700.00	91.17	359.54	10,524.20	8,199.03	384.23	8,207.44	0.00	0.00	0.00
18,800.00	91.17	359.54	10,522.15	8,299.01	383.44	8,307.33	0.00	0.00	0.00
18,900.00	91.17	359.54	10,520.11	8,398.98	382.64	8,407.21	0.00	0.00	0.00
19,000.00	91.17	359.54	10,518.06	8,498.96	381.85	8,507.10	0.00	0.00	0.00
19,100.00	91.17	359.54	10,516.02	8,598.93	381.05	8,606.99	0.00	0.00	0.00
19,200.00	91.17	359.54	10,513.97	8,698.91	380.25	8,706.88	0.00	0.00	0.00
19,300.00	91.17	359.54	10,511.93	8,798.89	379.46	8,806.76	0.00	0.00	0.00
19,400.00	91.17	359.54	10,509.89	8,898.86	378.66	8,906.65	0.00	0.00	0.00
19,500.00	91.17	359.54	10,507.84	8,998.84	377.87	9,006.54	0.00	0.00	0.00
19,600.00	91.17	359.54	10,505.80	9,098.81	377.07	9,106.43	0.00	0.00	0.00
19,700.00	91.17	359.54	10,503.75	9,198.79	376.27	9,206.31	0.00	0.00	0.00
19,800.00	91.17	359.54	10,501.71	9,298.77	375.48	9,306.20	0.00	0.00	0.00
19,900.00	91.17	359.54	10,499.66	9,398.74	374.68	9,406.09	0.00	0.00	0.00
20,000.00	91.17	359.54	10,497.62	9,498.72	373.89	9,505.98	0.00	0.00	0.00
20,100.00	91.17	359.54	10,495.57	9,598.69	373.09	9,605.86	0.00	0.00	0.00
20,200.00	91.17	359.54	10,493.53	9,698.67	372.30	9,705.75	0.00	0.00	0.00
20,300.00	91.17	359.54	10,491.48	9,798.65	371.50	9,805.64	0.00	0.00	0.00
20,400.00	91.17	359.54	10,489.44	9,898.62	370.70	9,905.53	0.00	0.00	0.00
20,500.00	91.17	359.54	10,487.40	9,998.60	369.91	10,005.41	0.00	0.00	0.00
20,600.00	91.17	359.54	10,485.35	10,098.57	369.11	10,105.30	0.00	0.00	0.00
20,700.00	91.17	359.54	10,483.31	10,198.55	368.32	10,205.19	0.00	0.00	0.00
20,800.00	91.17	359.54	10,481.26	10,298.52	367.52	10,305.08	0.00	0.00	0.00
20,873.49	91.17	359.54	10,479.76	10,372.00	366.93	10,378.49	0.00	0.00	0.00
Huckleberry State Com 505H LTP									
20,900.00	91.17	359.54	10,479.22	10,398.50	366.72	10,404.96	0.00	0.00	0.00
21,000.00	91.17	359.54	10,477.17	10,498.48	365.93	10,504.85	0.00	0.00	0.00
21,003.52	91.17	359.54	10,477.10	10,502.00	365.90	10,508.37	0.00	0.00	0.00
TD at 21003.52 - Huckleberry State Com 505H BHL									

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 505H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3742.10usft (Scandril Freedom)
Well:	Huckleberry State Com 505H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

Design Targets										
Target Name										
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
Huckleberry State Col	0.00	0.00	10,477.1 0	10,502.00	365.90	541,166.00	737,488.80		32.48542	-103.56315
- plan hits target center										
- Point										
Huckleberry State Col	0.00	0.00	10,479.7 6	10,372.00	367.00	541,036.00	737,489.90		32.48506	-103.56315
- plan misses target center by 0.07usft at 20873.49usft MD (10479.76 TVD, 10372.00 N, 366.93 E)										
- Point										
Huckleberry State Col	0.00	0.00	10,682.1 0	477.80	445.70	531,141.80	737,568.60		32.45787	-103.56313
- plan hits target center										
- Point										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,802.10	1,802.10	Rustler		0.00		
1,896.10	1,896.10	TOS		0.00		
3,537.53	3,536.10	BOS / Tansill		0.00		
3,732.83	3,731.10	Yates		0.00		
3,800.93	3,799.10	Seven Rivers		0.00		
3,959.17	3,957.10	Capitan Reef		0.00		
5,358.32	5,354.10	Base of Reef (BLCN)				
5,809.01	5,804.10	CYCN				
7,228.19	7,221.10	BYCN				
8,816.62	8,807.10	Bone Spring (BSGL)				
9,265.31	9,255.10	U Avalon Sh				
9,405.52	9,395.10	L Avalon Sh				
9,905.29	9,894.10	B Avalon Sh				
10,063.53	10,052.10	FBSG_sand				
10,686.32	10,602.10	SBSG_sand				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
2500	2500	0	0	Start Build 2.00	
2659	2659	0	4	Start 7557.71 hold at 2658.64 MD	
10,216	10,205	-10	423	Start DLS 12.00 TFO -91.69	
10,977	10,682	478	446	Start 10026.61 hold at 10976.91 MD	
21,004	10,477	10,502	366	TD at 21003.52	

Checked By: _____ Approved By: _____ Date: _____