



COG Operating L L C  
 Project: Lea County, NM (NAD27 NME)  
 Site: Sec. 7, T 19 S., R 32 E  
 Well: Spruce Goose Federal Com #3H  
 Wellbore: Wellbore #1  
 Plan: Plan#1 (Spruce Goose Federal Com #3H/Wellbore #1)  
 Patriot 2

WELL DETAILS: Spruce Goose Federal Com #3H

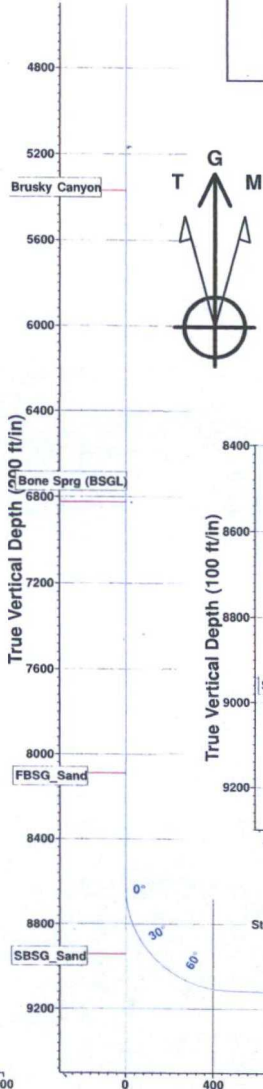
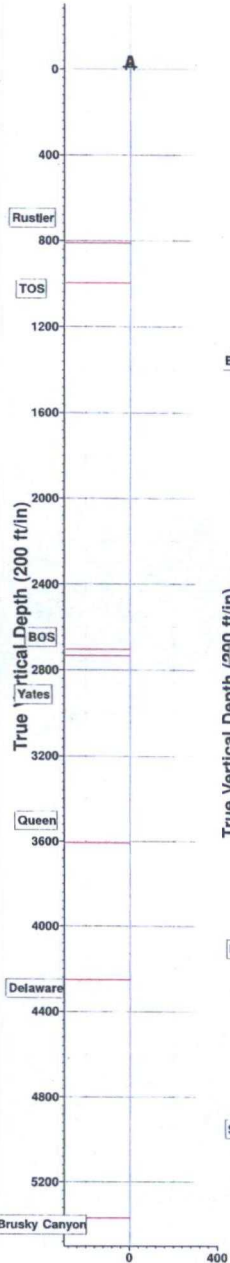
Ground Elevation:: 3623.70  
 RKB Elevation: KB=20' @ 3643.70ft (Patriot 2)  
 Rig Name: Patriot 2

Northing 610299.30 Easting 660072.20 Latitude 32° 40' 36.243 N Longitude 103° 48' 47.191 W

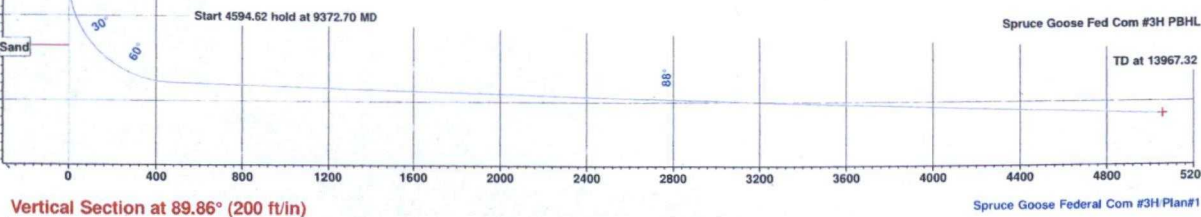
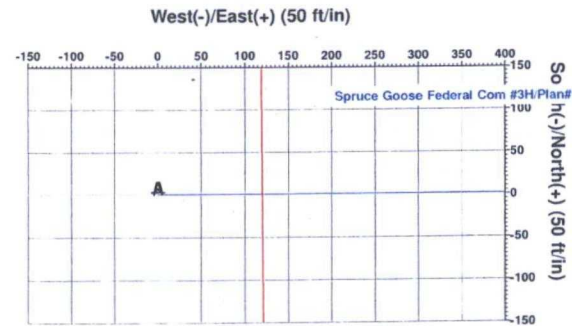
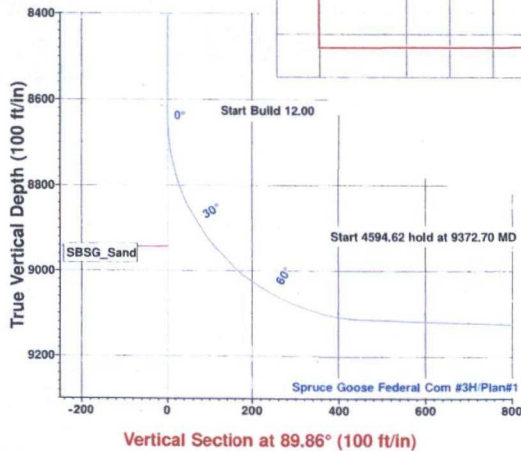
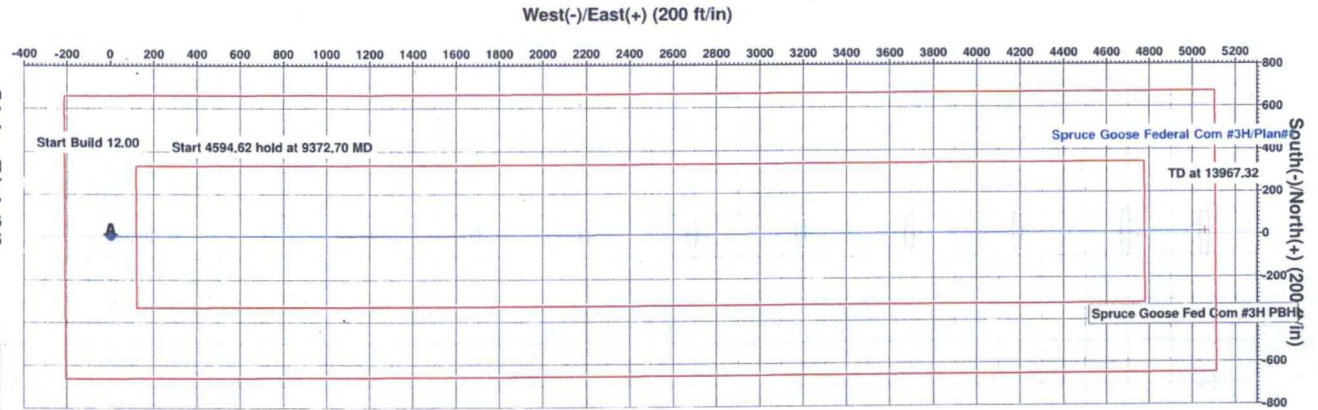


**Planned Section Details**

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	8637.77	0.00	0.00	8637.77	0.00	0.00	0.00	0.00	0.00	
3	9372.70	88.19	89.86	9115.00	1.11	462.40	12.00	89.86	462.40	Spruce Goose Fed Com #3H PBHL
4	13967.32	88.19	89.86	9260.00	12.10	5054.71	0.00	0.00	5054.72	Spruce Goose Fed Com #3H PBHL



Azimuths to Grid North  
 True North: -0.28°  
 Magnetic North: 6.92°  
 Magnetic Field  
 Strength: 48274.2snT  
 Dip Angle: 60.45°  
 Date: 7/18/2016  
 Model: IGRF2015



**FORMATION TOP DETAILS**

TVDPPath	MDPath	Formation	DipAngle	DipDir
813.70	813.70	Rustler	0.00	
898.70	998.70	TOS	0.00	
2733.70	2733.70	BOS	0.00	
2733.70	2733.70	Yates	0.00	
3608.70	3608.70	Queen	0.00	
4253.70	4253.70	Delaware	0.00	
5370.70	5370.70	Brusky Canyon	0.00	
6823.70	6823.70	Bone Sprg (BSGL)	0.00	
8093.70	8093.70	FBSG_Sand	0.00	
8943.70	8969.83	SBSG_Sand	0.00	

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



## **COG Operating L L C**

Lea County, NM (NAD27 NME)

Sec. 7, T 19 S. , R 32 E

Spruce Goose Federal Com #3H

Wellbore #1

Plan: Plan#1

## **Standard Survey Report**

18 July, 2016





Integrity Directional Services, LLC

Survey Report



<b>Company:</b>	COG Operating L L C	<b>Local Co-ordinate Reference:</b>	Well Spruce Goose Federal Com #3H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB=20' @ 3643.70ft (Patriot 2)
<b>Site:</b>	Sec. 7, T 19 S., R 32 E	<b>MD Reference:</b>	KB=20' @ 3643.70ft (Patriot 2)
<b>Well:</b>	Spruce Goose Federal Com #3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan#1	<b>Database:</b>	EDM 5000.1 Multi User Db

<b>Project</b>	Lea County, NM (NAD27 NME)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site</b>	Sec. 7, T 19 S., R 32 E				
<b>Site Position:</b>		<b>Northing:</b>	610,299.30 usft	<b>Latitude:</b>	32° 40' 36.243 N
<b>From:</b>	Map	<b>Easting:</b>	660,072.20 usft	<b>Longitude:</b>	103° 48' 47.191 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.28 °

<b>Well</b>	Spruce Goose Federal Com #3H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	610,299.30 usft	<b>Latitude:</b>	32° 40' 36.243 N
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	660,072.20 usft	<b>Longitude:</b>	103° 48' 47.191 W
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft	<b>Ground Level:</b>	3,623.70 ft	

<b>Wellbore</b>	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/18/2016	7.20	60.45	48,274

<b>Design</b>	Plan#1				
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<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00	

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	89.86

<b>Survey Tool Program</b>	Date 7/18/2016				
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From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	13,967.31	Plan#1 (Wellbore #1)	MWD	MWD - Standard

<b>Planned Survey</b>										
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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
813.70	0.00	0.00	813.70	0.00	0.00	0.00	0.00	0.00	0.00

Rustler



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Local Co-ordinate Reference: Well Spruce Goose Federal Com #3H  
 TVD Reference: KB=20' @ 3643.70ft (Patriot 2)  
 MD Reference: KB=20' @ 3643.70ft (Patriot 2)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
998.70	0.00	0.00	998.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOS</b>									
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
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,703.70	0.00	0.00	2,703.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>BOS</b>									
2,733.70	0.00	0.00	2,733.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>Yates</b>									
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,608.70	0.00	0.00	3,608.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>Queen</b>									
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,253.70	0.00	0.00	4,253.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>Delaware</b>									



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4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,370.70	0.00	0.00	5,370.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>Brusky Canyon</b>									
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,823.70	0.00	0.00	6,823.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>Bone Sprg (BSGL)</b>									
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,093.70	0.00	0.00	8,093.70	0.00	0.00	0.00	0.00	0.00	0.00
<b>FBSG_Sand</b>									



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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan#1	<b>Database:</b>	EDM 5000.1 Multi User Db

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,637.77	0.00	0.00	8,637.77	0.00	0.00	0.00	0.00	0.00	0.00
<b>Start Build 12.00</b>									
8,700.00	7.47	89.86	8,699.82	0.01	4.05	4.05	12.00	12.00	0.00
8,800.00	19.47	89.86	8,796.90	0.07	27.30	27.30	12.00	12.00	0.00
8,900.00	31.47	89.86	8,887.01	0.17	70.22	70.22	12.00	12.00	0.00
8,969.83	39.85	89.86	8,943.70	0.27	110.89	110.89	12.00	12.00	0.00
<b>SBSG_Sand</b>									
9,000.00	43.47	89.86	8,966.24	0.31	130.94	130.94	12.00	12.00	0.00
9,100.00	55.47	89.86	9,031.11	0.50	206.80	206.80	12.00	12.00	0.00
9,200.00	67.47	89.86	9,078.79	0.70	294.50	294.50	12.00	12.00	0.00
9,300.00	79.47	89.86	9,107.19	0.93	390.19	390.19	12.00	12.00	0.00
9,372.70	88.19	89.86	9,115.00	1.11	462.40	462.40	12.00	12.00	0.00
<b>Start 4594.62 hold at 9372.70 MD</b>									
9,400.00	88.19	89.86	9,115.86	1.17	489.68	489.68	0.00	0.00	0.00
9,500.00	88.19	89.86	9,119.02	1.41	589.63	589.63	0.00	0.00	0.00
9,600.00	88.19	89.86	9,122.17	1.65	689.58	689.58	0.00	0.00	0.00
9,700.00	88.19	89.86	9,125.33	1.89	789.53	789.53	0.00	0.00	0.00
9,800.00	88.19	89.86	9,128.48	2.13	889.48	889.48	0.00	0.00	0.00
9,900.00	88.19	89.86	9,131.64	2.37	989.43	989.43	0.00	0.00	0.00
10,000.00	88.19	89.86	9,134.80	2.61	1,089.38	1,089.38	0.00	0.00	0.00
10,100.00	88.19	89.86	9,137.95	2.85	1,189.33	1,189.33	0.00	0.00	0.00
10,200.00	88.19	89.86	9,141.11	3.09	1,289.28	1,289.28	0.00	0.00	0.00
10,300.00	88.19	89.86	9,144.26	3.33	1,389.23	1,389.23	0.00	0.00	0.00
10,400.00	88.19	89.86	9,147.42	3.56	1,489.18	1,489.19	0.00	0.00	0.00
10,500.00	88.19	89.86	9,150.57	3.80	1,589.13	1,589.14	0.00	0.00	0.00
10,600.00	88.19	89.86	9,153.73	4.04	1,689.08	1,689.09	0.00	0.00	0.00
10,700.00	88.19	89.86	9,156.89	4.28	1,789.03	1,789.04	0.00	0.00	0.00
10,800.00	88.19	89.86	9,160.04	4.52	1,888.98	1,888.99	0.00	0.00	0.00
10,900.00	88.19	89.86	9,163.20	4.76	1,988.93	1,988.94	0.00	0.00	0.00
11,000.00	88.19	89.86	9,166.35	5.00	2,088.88	2,088.89	0.00	0.00	0.00
11,100.00	88.19	89.86	9,169.51	5.24	2,188.83	2,188.84	0.00	0.00	0.00
11,200.00	88.19	89.86	9,172.67	5.48	2,288.78	2,288.79	0.00	0.00	0.00
11,300.00	88.19	89.86	9,175.82	5.72	2,388.73	2,388.74	0.00	0.00	0.00
11,400.00	88.19	89.86	9,178.98	5.96	2,488.68	2,488.69	0.00	0.00	0.00
11,500.00	88.19	89.86	9,182.13	6.20	2,588.63	2,588.64	0.00	0.00	0.00
11,600.00	88.19	89.86	9,185.29	6.44	2,688.58	2,688.59	0.00	0.00	0.00
11,700.00	88.19	89.86	9,188.45	6.68	2,788.53	2,788.54	0.00	0.00	0.00



**Company:** COG Operating L L C  
**Project:** Lea County, NM (NAD27 NME)  
**Site:** Sec. 7, T 19 S. , R 32 E  
**Well:** Spruce Goose Federal Com #3H  
**Wellbore:** Wellbore #1  
**Design:** Plan#1

**Local Co-ordinate Reference:** Well Spruce Goose Federal Com #3H  
**TVD Reference:** KB=20' @ 3643.70ft (Patriot 2)  
**MD Reference:** KB=20' @ 3643.70ft (Patriot 2)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Multi User Db

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,800.00	88.19	89.86	9,191.60	6.91	2,888.48	2,888.49	0.00	0.00	0.00
11,900.00	88.19	89.86	9,194.76	7.15	2,988.43	2,988.44	0.00	0.00	0.00
12,000.00	88.19	89.86	9,197.91	7.39	3,088.38	3,088.39	0.00	0.00	0.00
12,100.00	88.19	89.86	9,201.07	7.63	3,188.33	3,188.34	0.00	0.00	0.00
12,200.00	88.19	89.86	9,204.23	7.87	3,288.28	3,288.29	0.00	0.00	0.00
12,300.00	88.19	89.86	9,207.38	8.11	3,388.23	3,388.24	0.00	0.00	0.00
12,400.00	88.19	89.86	9,210.54	8.35	3,488.18	3,488.19	0.00	0.00	0.00
12,500.00	88.19	89.86	9,213.69	8.59	3,588.13	3,588.14	0.00	0.00	0.00
12,600.00	88.19	89.86	9,216.85	8.83	3,688.08	3,688.09	0.00	0.00	0.00
12,700.00	88.19	89.86	9,220.00	9.07	3,788.03	3,788.04	0.00	0.00	0.00
12,800.00	88.19	89.86	9,223.16	9.31	3,887.98	3,887.99	0.00	0.00	0.00
12,900.00	88.19	89.86	9,226.32	9.55	3,987.93	3,987.94	0.00	0.00	0.00
13,000.00	88.19	89.86	9,229.47	9.79	4,087.88	4,087.89	0.00	0.00	0.00
13,100.00	88.19	89.86	9,232.63	10.02	4,187.83	4,187.84	0.00	0.00	0.00
13,200.00	88.19	89.86	9,235.78	10.26	4,287.78	4,287.79	0.00	0.00	0.00
13,300.00	88.19	89.86	9,238.94	10.50	4,387.73	4,387.74	0.00	0.00	0.00
13,400.00	88.19	89.86	9,242.10	10.74	4,487.68	4,487.69	0.00	0.00	0.00
13,500.00	88.19	89.86	9,245.25	10.98	4,587.63	4,587.64	0.00	0.00	0.00
13,600.00	88.19	89.86	9,248.41	11.22	4,687.58	4,687.59	0.00	0.00	0.00
13,700.00	88.19	89.86	9,251.56	11.46	4,787.53	4,787.54	0.00	0.00	0.00
13,800.00	88.19	89.86	9,254.72	11.70	4,887.48	4,887.49	0.00	0.00	0.00
13,900.00	88.19	89.86	9,257.88	11.94	4,987.43	4,987.44	0.00	0.00	0.00
13,967.32	88.19	89.86	9,260.00	12.10	5,054.71	5,054.72	0.00	0.00	0.00

TD at 13967.32

**Design Targets**

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Spruce Goose Fed Cr - hit/miss target - Shape - Point	0.00	0.00	9,260.00	12.10	5,054.71	610,311.40	665,126.90	32° 40' 36.113 N	103° 47' 48.053 W



<b>Company:</b>	COG Operating L L C	<b>Local Co-ordinate Reference:</b>	Well Spruce Goose Federal Com #3H
<b>Project:</b>	Lea County, NM (NAD27 NME)	<b>TVD Reference:</b>	KB=20' @ 3643.70ft (Patriot 2)
<b>Site:</b>	Sec. 7, T 19 S. , R 32 E	<b>MD Reference:</b>	KB=20' @ 3643.70ft (Patriot 2)
<b>Well:</b>	Spruce Goose Federal Com #3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Plan#1	<b>Database:</b>	EDM 5000.1 Multi User Db

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
813.70	813.70	Rustler		0.00		
998.70	998.70	TOS		0.00		
2,703.70	2,703.70	BOS		0.00		
2,733.70	2,733.70	Yates		0.00		
3,608.70	3,608.70	Queen		0.00		
4,253.70	4,253.70	Delaware		0.00		
5,370.70	5,370.70	Brusky Canyon		0.00		
6,823.70	6,823.70	Bone Sprg (BSGL)		0.00		
8,093.70	8,093.70	FBSG_Sand		0.00		
8,969.83	8,943.70	SBSG_Sand		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
8638	8638	0	0	Start Build 12.00	
9373	9115	1	462	Start 4594.62 hold at 9372.70 MD	
13,967	9260	12	5055	TD at 13967.32	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_