

CONCHO

COG OPERATING LLC

LEA COUNTY, NM
AVALON SHALE
WINDWARD FEDERAL #9H

OWB

Plan: PWP0

HOBBS OCD

FEB 06 2017

RECEIVED

Standard Planning Report

01 September, 2016



COG Operating LLC

Planning Report

Database:	EDM_Users	Local Co-ordinate Reference:	Well WINDWARD FEDERAL #9H
Company:	COG OPERATING LLC	TVD Reference:	RKB=3551+26 @ 3577.0usft (McVay 8)
Project:	LEA COUNTY, NM	MD Reference:	RKB=3551+26 @ 3577.0usft (McVay 8)
Site:	AVALON SHALE	North Reference:	Grid
Well:	WINDWARD FEDERAL #9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP0		

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		AVALON SHALE			
Site Position:		Northing:	419,780.50 usft	Latitude:	32° 9' 6.058 N
From:	Map	Easting:	741,734.30 usft	Longitude:	103° 33' 8.114 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	WINDWARD FEDERAL #9H					
Well Position	+N/-S	15,407.9 usft	Northing:	435,188.40 usft	Latitude:	32° 11' 41.711 N
	+E/-W	-49,289.9 usft	Easting:	692,444.40 usft	Longitude:	103° 42' 40.392 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,551.0 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	8/29/2016	7.12	60.01	47,978

Design	PWP0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	181.85

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	
8,727.5	0.00	0.01	8,727.5	0.0	0.0	0.00	0.00	0.00	0.01	
9,477.6	90.00	208.50	9,205.0	-419.6	-227.8	12.00	12.00	0.00	208.50	
10,200.6	90.06	179.58	9,204.6	-1,113.7	-401.4	4.00	0.01	-4.00	-89.88	
19,394.7	90.06	179.58	9,195.0	-10,307.5	-333.5	0.00	0.00	0.00	0.00	PBHL-Windward



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Site:	AVALON SHALE	North Reference:	Grid
Well:	WINDWARD FEDERAL #9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP0		

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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 Site: AVALON SHALE
 Well: WINDWARD FEDERAL #9H
 Wellbore: OWB
 Design: PWP0

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 MD Reference: RKB=3551+26 @ 3577.0usft (McVay 8)
 North Reference: Grid
 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)
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
8,727.5	0.00	0.01	8,727.5	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	8.70	208.50	8,799.7	-4.8	-2.6	4.9	12.00	12.00	0.00
8,900.0	20.70	208.50	8,896.3	-27.1	-14.7	27.5	12.00	12.00	0.00
9,000.0	32.70	208.50	8,985.4	-66.5	-36.1	67.6	12.00	12.00	0.00
9,100.0	44.70	208.50	9,063.4	-121.3	-65.9	123.4	12.00	12.00	0.00
9,200.0	56.70	208.50	9,126.6	-189.2	-102.7	192.4	12.00	12.00	0.00
9,300.0	68.69	208.50	9,172.4	-267.2	-145.1	271.7	12.00	12.00	0.00
9,400.0	80.69	208.50	9,198.7	-351.8	-191.0	357.8	12.00	12.00	0.00
9,477.6	90.00	208.50	9,205.0	-419.6	-227.8	426.8	12.00	12.00	0.00
9,500.0	90.00	207.60	9,205.0	-439.4	-238.4	446.9	4.00	0.01	-4.00
9,600.0	90.01	203.60	9,205.0	-529.6	-281.6	538.4	4.00	0.01	-4.00
9,700.0	90.02	199.60	9,205.0	-622.6	-318.4	632.5	4.00	0.01	-4.00
9,800.0	90.03	195.60	9,204.9	-717.9	-348.6	728.8	4.00	0.01	-4.00
9,900.0	90.04	191.60	9,204.9	-815.0	-372.2	826.6	4.00	0.01	-4.00
10,000.0	90.04	187.60	9,204.8	-913.6	-388.8	925.7	4.00	0.01	-4.00
10,100.0	90.05	183.60	9,204.7	-1,013.1	-398.6	1,025.5	4.00	0.01	-4.00
10,200.0	90.06	179.60	9,204.6	-1,113.1	-401.4	1,125.5	4.00	0.01	-4.00
10,200.6	90.06	179.58	9,204.6	-1,113.7	-401.4	1,126.1	4.00	0.01	-4.00
10,300.0	90.06	179.58	9,204.5	-1,213.1	-400.7	1,225.4	0.00	0.00	0.00
10,400.0	90.06	179.58	9,204.4	-1,313.1	-399.9	1,325.3	0.00	0.00	0.00



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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)
10,500.0	90.06	179.58	9,204.3	-1,413.1	-399.2	1,425.2	0.00	0.00	0.00
10,600.0	90.06	179.58	9,204.2	-1,513.0	-398.4	1,525.1	0.00	0.00	0.00
10,700.0	90.06	179.58	9,204.1	-1,613.0	-397.7	1,625.1	0.00	0.00	0.00
10,800.0	90.06	179.58	9,204.0	-1,713.0	-397.0	1,725.0	0.00	0.00	0.00
10,900.0	90.06	179.58	9,203.9	-1,813.0	-396.2	1,824.9	0.00	0.00	0.00
11,000.0	90.06	179.58	9,203.8	-1,913.0	-395.5	1,924.8	0.00	0.00	0.00
11,100.0	90.06	179.58	9,203.7	-2,013.0	-394.7	2,024.7	0.00	0.00	0.00
11,200.0	90.06	179.58	9,203.6	-2,113.0	-394.0	2,124.7	0.00	0.00	0.00
11,300.0	90.06	179.58	9,203.5	-2,213.0	-393.3	2,224.6	0.00	0.00	0.00
11,400.0	90.06	179.58	9,203.4	-2,313.0	-392.5	2,324.5	0.00	0.00	0.00
11,500.0	90.06	179.58	9,203.3	-2,413.0	-391.8	2,424.4	0.00	0.00	0.00
11,600.0	90.06	179.58	9,203.2	-2,513.0	-391.1	2,524.4	0.00	0.00	0.00
11,700.0	90.06	179.58	9,203.0	-2,613.0	-390.3	2,624.3	0.00	0.00	0.00
11,800.0	90.06	179.58	9,202.9	-2,713.0	-389.6	2,724.2	0.00	0.00	0.00
11,900.0	90.06	179.58	9,202.8	-2,813.0	-388.8	2,824.1	0.00	0.00	0.00
12,000.0	90.06	179.58	9,202.7	-2,913.0	-388.1	2,924.0	0.00	0.00	0.00
12,100.0	90.06	179.58	9,202.6	-3,013.0	-387.4	3,024.0	0.00	0.00	0.00
12,200.0	90.06	179.58	9,202.5	-3,113.0	-386.6	3,123.9	0.00	0.00	0.00
12,300.0	90.06	179.58	9,202.4	-3,213.0	-385.9	3,223.8	0.00	0.00	0.00
12,400.0	90.06	179.58	9,202.3	-3,313.0	-385.1	3,323.7	0.00	0.00	0.00
12,500.0	90.06	179.58	9,202.2	-3,413.0	-384.4	3,423.6	0.00	0.00	0.00
12,600.0	90.06	179.58	9,202.1	-3,513.0	-383.7	3,523.6	0.00	0.00	0.00
12,700.0	90.06	179.58	9,202.0	-3,613.0	-382.9	3,623.5	0.00	0.00	0.00
12,800.0	90.06	179.58	9,201.9	-3,713.0	-382.2	3,723.4	0.00	0.00	0.00
12,900.0	90.06	179.58	9,201.8	-3,813.0	-381.5	3,823.3	0.00	0.00	0.00
13,000.0	90.06	179.58	9,201.7	-3,913.0	-380.7	3,923.2	0.00	0.00	0.00
13,100.0	90.06	179.58	9,201.6	-4,013.0	-380.0	4,023.2	0.00	0.00	0.00
13,200.0	90.06	179.58	9,201.5	-4,113.0	-379.2	4,123.1	0.00	0.00	0.00
13,300.0	90.06	179.58	9,201.4	-4,213.0	-378.5	4,223.0	0.00	0.00	0.00
13,400.0	90.06	179.58	9,201.3	-4,313.0	-377.8	4,322.9	0.00	0.00	0.00
13,500.0	90.06	179.58	9,201.2	-4,413.0	-377.0	4,422.9	0.00	0.00	0.00
13,600.0	90.06	179.58	9,201.1	-4,513.0	-376.3	4,522.8	0.00	0.00	0.00
13,700.0	90.06	179.58	9,201.0	-4,613.0	-375.5	4,622.7	0.00	0.00	0.00
13,800.0	90.06	179.58	9,200.8	-4,713.0	-374.8	4,722.6	0.00	0.00	0.00
13,900.0	90.06	179.58	9,200.7	-4,813.0	-374.1	4,822.5	0.00	0.00	0.00
14,000.0	90.06	179.58	9,200.6	-4,913.0	-373.3	4,922.5	0.00	0.00	0.00
14,100.0	90.06	179.58	9,200.5	-5,013.0	-372.6	5,022.4	0.00	0.00	0.00
14,200.0	90.06	179.58	9,200.4	-5,112.9	-371.9	5,122.3	0.00	0.00	0.00
14,300.0	90.06	179.58	9,200.3	-5,212.9	-371.1	5,222.2	0.00	0.00	0.00
14,400.0	90.06	179.58	9,200.2	-5,312.9	-370.4	5,322.1	0.00	0.00	0.00
14,500.0	90.06	179.58	9,200.1	-5,412.9	-369.6	5,422.1	0.00	0.00	0.00
14,600.0	90.06	179.58	9,200.0	-5,512.9	-368.9	5,522.0	0.00	0.00	0.00
14,700.0	90.06	179.58	9,199.9	-5,612.9	-368.2	5,621.9	0.00	0.00	0.00
14,800.0	90.06	179.58	9,199.8	-5,712.9	-367.4	5,721.8	0.00	0.00	0.00
14,900.0	90.06	179.58	9,199.7	-5,812.9	-366.7	5,821.7	0.00	0.00	0.00
15,000.0	90.06	179.58	9,199.6	-5,912.9	-365.9	5,921.7	0.00	0.00	0.00
15,100.0	90.06	179.58	9,199.5	-6,012.9	-365.2	6,021.6	0.00	0.00	0.00
15,200.0	90.06	179.58	9,199.4	-6,112.9	-364.5	6,121.5	0.00	0.00	0.00
15,300.0	90.06	179.58	9,199.3	-6,212.9	-363.7	6,221.4	0.00	0.00	0.00
15,400.0	90.06	179.58	9,199.2	-6,312.9	-363.0	6,321.4	0.00	0.00	0.00
15,500.0	90.06	179.58	9,199.1	-6,412.9	-362.3	6,421.3	0.00	0.00	0.00
15,600.0	90.06	179.58	9,199.0	-6,512.9	-361.5	6,521.2	0.00	0.00	0.00
15,700.0	90.06	179.58	9,198.9	-6,612.9	-360.8	6,621.1	0.00	0.00	0.00
15,800.0	90.06	179.58	9,198.8	-6,712.9	-360.0	6,721.0	0.00	0.00	0.00



COG Operating LLC

Planning Report

Database: EDM_Users
 Company: COG OPERATING LLC
 Project: LEA COUNTY, NM
 Site: AVALON SHALE
 Well: WINDWARD FEDERAL #9H
 Wellbore: OWB
 Design: PWP0

Local Co-ordinate Reference: Well WINDWARD FEDERAL #9H
 TVD Reference: RKB=3551+26 @ 3577.0usft (McVay 8)
 MD Reference: RKB=3551+26 @ 3577.0usft (McVay 8)
 North Reference: Grid
 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)
15,900.0	90.06	179.58	9,198.7	-6,812.9	-359.3	6,821.0	0.00	0.00	0.00
16,000.0	90.06	179.58	9,198.5	-6,912.9	-358.6	6,920.9	0.00	0.00	0.00
16,100.0	90.06	179.58	9,198.4	-7,012.9	-357.8	7,020.8	0.00	0.00	0.00
16,200.0	90.06	179.58	9,198.3	-7,112.9	-357.1	7,120.7	0.00	0.00	0.00
16,300.0	90.06	179.58	9,198.2	-7,212.9	-356.4	7,220.6	0.00	0.00	0.00
16,400.0	90.06	179.58	9,198.1	-7,312.9	-355.6	7,320.6	0.00	0.00	0.00
16,500.0	90.06	179.58	9,198.0	-7,412.9	-354.9	7,420.5	0.00	0.00	0.00
16,600.0	90.06	179.58	9,197.9	-7,512.9	-354.1	7,520.4	0.00	0.00	0.00
16,700.0	90.06	179.58	9,197.8	-7,612.9	-353.4	7,620.3	0.00	0.00	0.00
16,800.0	90.06	179.58	9,197.7	-7,712.9	-352.7	7,720.2	0.00	0.00	0.00
16,900.0	90.06	179.58	9,197.6	-7,812.9	-351.9	7,820.2	0.00	0.00	0.00
17,000.0	90.06	179.58	9,197.5	-7,912.9	-351.2	7,920.1	0.00	0.00	0.00
17,100.0	90.06	179.58	9,197.4	-8,012.9	-350.4	8,020.0	0.00	0.00	0.00
17,200.0	90.06	179.58	9,197.3	-8,112.9	-349.7	8,119.9	0.00	0.00	0.00
17,300.0	90.06	179.58	9,197.2	-8,212.9	-349.0	8,219.9	0.00	0.00	0.00
17,400.0	90.06	179.58	9,197.1	-8,312.9	-348.2	8,319.8	0.00	0.00	0.00
17,500.0	90.06	179.58	9,197.0	-8,412.9	-347.5	8,419.7	0.00	0.00	0.00
17,600.0	90.06	179.58	9,196.9	-8,512.9	-346.8	8,519.6	0.00	0.00	0.00
17,700.0	90.06	179.58	9,196.8	-8,612.9	-346.0	8,619.5	0.00	0.00	0.00
17,800.0	90.06	179.58	9,196.7	-8,712.8	-345.3	8,719.5	0.00	0.00	0.00
17,900.0	90.06	179.58	9,196.6	-8,812.8	-344.5	8,819.4	0.00	0.00	0.00
18,000.0	90.06	179.58	9,196.5	-8,912.8	-343.8	8,919.3	0.00	0.00	0.00
18,100.0	90.06	179.58	9,196.4	-9,012.8	-343.1	9,019.2	0.00	0.00	0.00
18,200.0	90.06	179.58	9,196.2	-9,112.8	-342.3	9,119.1	0.00	0.00	0.00
18,300.0	90.06	179.58	9,196.1	-9,212.8	-341.6	9,219.1	0.00	0.00	0.00
18,400.0	90.06	179.58	9,196.0	-9,312.8	-340.8	9,319.0	0.00	0.00	0.00
18,500.0	90.06	179.58	9,195.9	-9,412.8	-340.1	9,418.9	0.00	0.00	0.00
18,600.0	90.06	179.58	9,195.8	-9,512.8	-339.4	9,518.8	0.00	0.00	0.00
18,700.0	90.06	179.58	9,195.7	-9,612.8	-338.6	9,618.7	0.00	0.00	0.00
18,800.0	90.06	179.58	9,195.6	-9,712.8	-337.9	9,718.7	0.00	0.00	0.00
18,900.0	90.06	179.58	9,195.5	-9,812.8	-337.2	9,818.6	0.00	0.00	0.00
19,000.0	90.06	179.58	9,195.4	-9,912.8	-336.4	9,918.5	0.00	0.00	0.00
19,100.0	90.06	179.58	9,195.3	-10,012.8	-335.7	10,018.4	0.00	0.00	0.00
19,200.0	90.06	179.58	9,195.2	-10,112.8	-334.9	10,118.4	0.00	0.00	0.00
19,300.0	90.06	179.58	9,195.1	-10,212.8	-334.2	10,218.3	0.00	0.00	0.00
19,394.7	90.06	179.58	9,195.0	-10,307.5	-333.5	10,312.9	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
PBHL-Windward	0.00	0.00	9,195.0	-10,307.5	-333.5	424,880.90	692,110.90	32° 9' 59.728 N	103° 42' 44.965 W
- hit/miss target									
- Shape									
- plan hits target center									
- Point									



COG Operating LLC

Planning Report

Database: EDM_Users
Company: COG OPERATING LLC
Project: LEA COUNTY, NM
Site: AVALON SHALE
Well: WINDWARD FEDERAL #9H
Wellbore: OWB
Design: PWP0

Local Co-ordinate Reference: Well WINDWARD FEDERAL #9H
TVD Reference: RKB=3551+26 @ 3577.0usft (McVay 8)
MD Reference: RKB=3551+26 @ 3577.0usft (McVay 8)
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)	
8,727.5	8,727.5	0.0	0.0	Start Build 12.00
9,477.6	9,205.0	-419.6	-227.8	Start DLS 4.00 TFO -89.88
10,200.6	9,204.6	-1,113.7	-401.4	Start 9194.1 hold at 10200.6 MD
19,394.7	9,195.0	-10,307.5	-333.5	TD at 19394.7



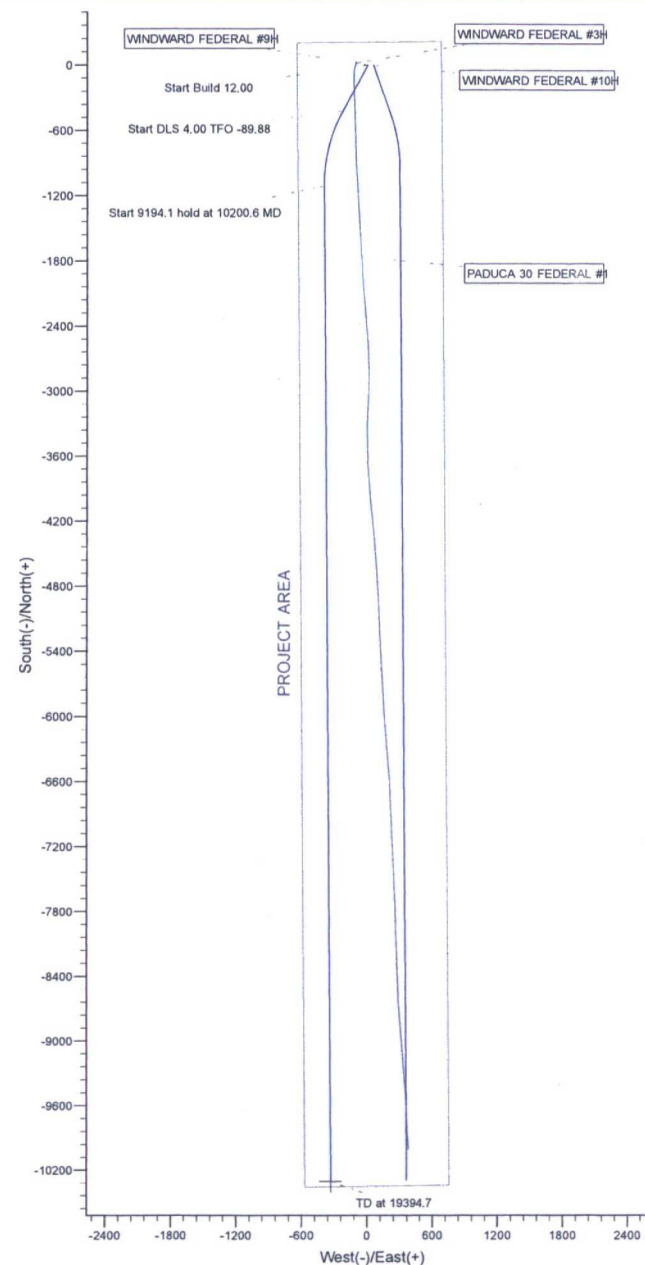
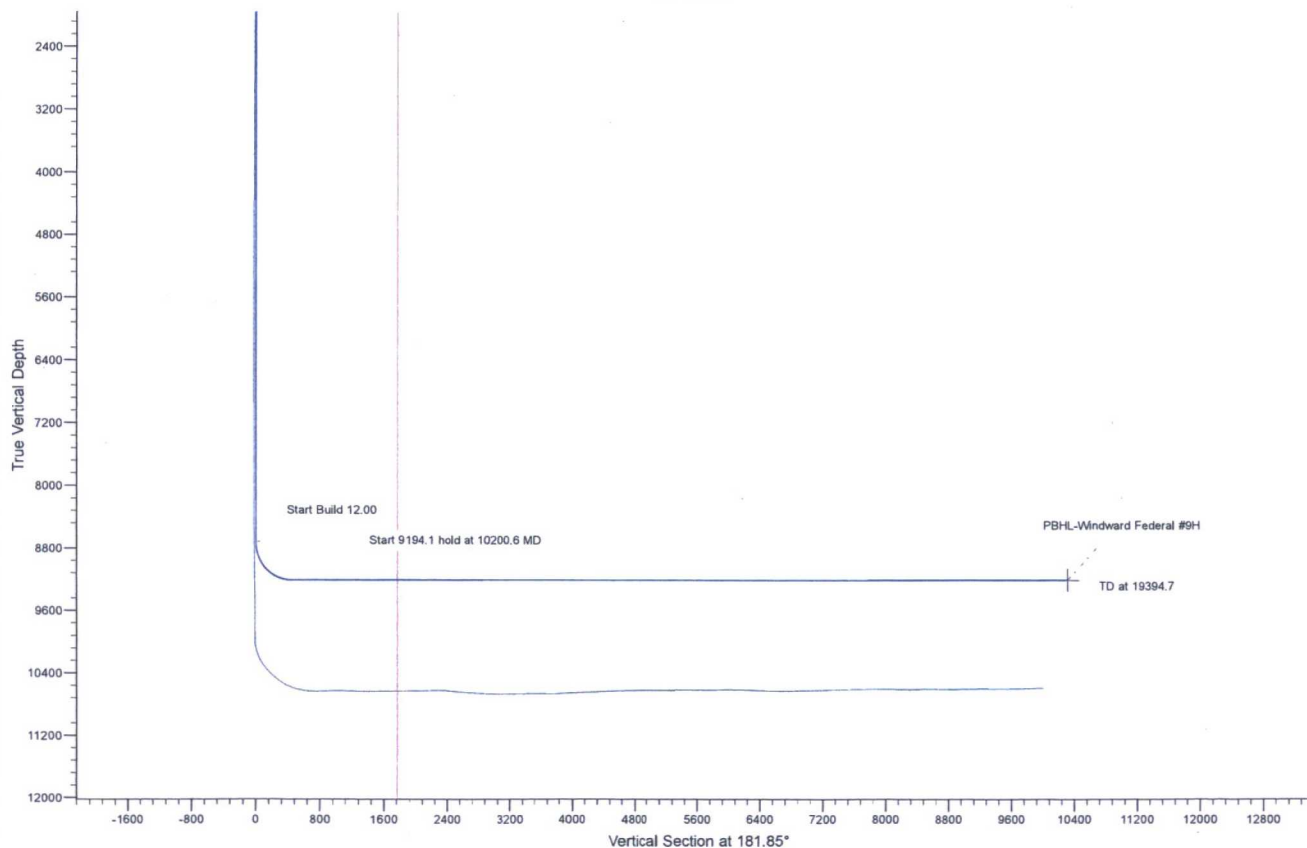
WELL DETAILS: **WINDWARD FEDERAL #9H**

Ground Level: 3551.0
 Northing 435188.40 Easting 692444.40 Latitude 32° 11' 41.711 N Longitude 103° 42' 40.392 W

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	8727.5	0.00	0.00	8727.5	0.0	0.0	0.00	0.00	0.0	Start Build 12.00
3	9477.6	90.00	208.50	9205.0	-419.6	-227.8	12.00	208.50	426.8	Start DLS 4.00 TFO -89.88
4	10200.6	90.06	179.58	9204.6	-1113.7	-401.4	4.00	-89.88	1126.1	Start 9194.1 hold at 10200.6 MD
5	19394.7	90.06	179.58	9195.0	-10307.5	-333.5	0.00	0.00	10312.9	TD at 19394.7

LEGEND

- WINDWARD FEDERAL #3H, OWB, ACTUAL WELLPATH V0
- WINDWARD FEDERAL #10H, OWB, PWP0 V0
- PADUCA 30 FEDERAL #1, OWB, ACTUAL WELLPATH V0
- PWP0





WELL DETAILS: **WINDWARD FEDERAL #9H**

Northing: 435188.40
 Easting: 692444.40
 Ground Level: 3551.0
 Latitude: 32° 11' 41.711 N
 Longitude: 103° 42' 40.392 W

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	8727.5	0.00	0.00	8727.5	0.0	0.0	0.00	0.00	0.0	Start Build 12.00
3	9477.6	90.00	208.50	9205.0	-419.6	-227.8	12.00	208.50	426.8	Start DLS 4.00 TFO -89.88
4	10200.6	90.06	179.58	9204.6	-1113.7	-401.4	4.00	-89.88	1126.1	Start 9194.1 hold at 10200.6 MD
5	19394.7	90.06	179.58	9195.0	-10307.5	-333.5	0.00	0.00	10312.9	TD at 19394.7

LEGEND

- WINDWARD FEDERAL #3H, OWB, ACTUAL WELLPATH V0
- WINDWARD FEDERAL #10H, OWB, PWP0 V0
- PADUCA 30 FEDERAL #1, OWB, ACUTUAL WELLPATH V0
- PWP0

