



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 34, T 25 S. , R 33 E
Well: Columbus Fee 2H
Wellbore: Wellbore #1
Plan: Plan #1 (Columbus Fee 2H /Wellbore #1)
Scan Freedom

30-025-42822



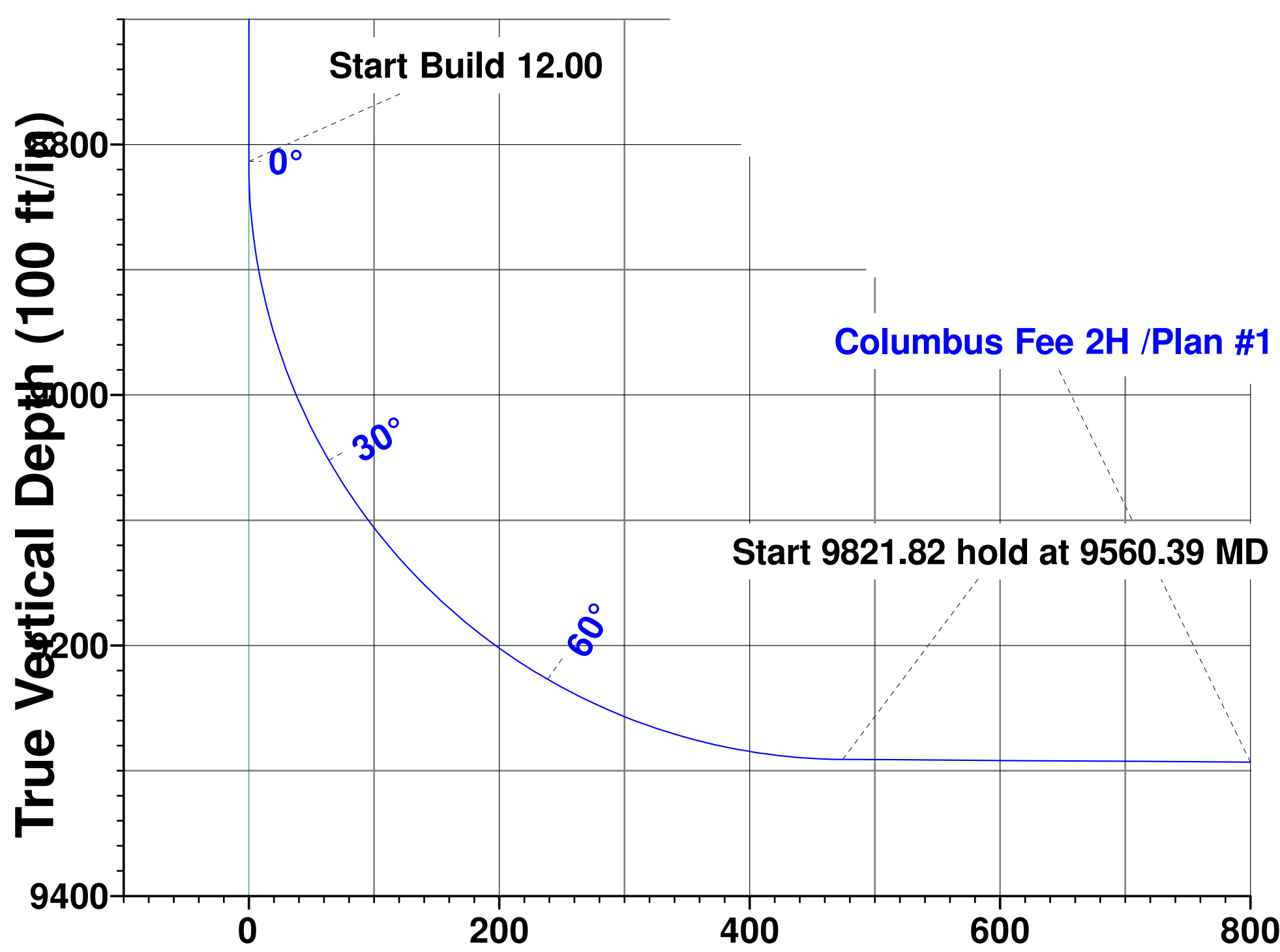
WELL DETAILS: Columbus Fee 2H

Ground Elevation:: 3327.00
RKB Elevation: KB=26' @ 3353.00ft (Scan Freedom)
Rig Name: Scan Freedom

Northing	Easting	Latitude	Longitude
398623.80	739904.90	32° 5' 36.830 N	103° 33' 31.161 W

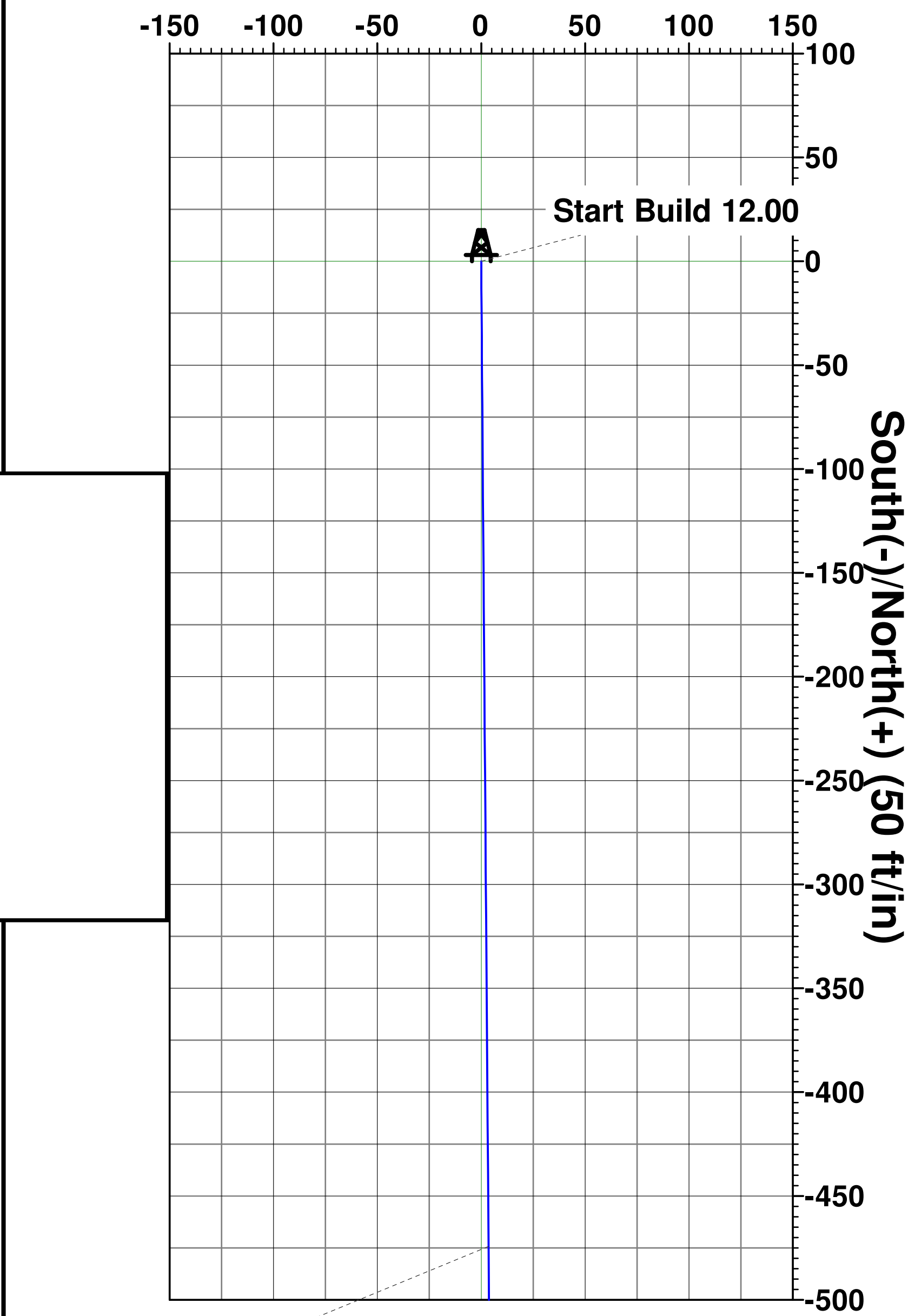
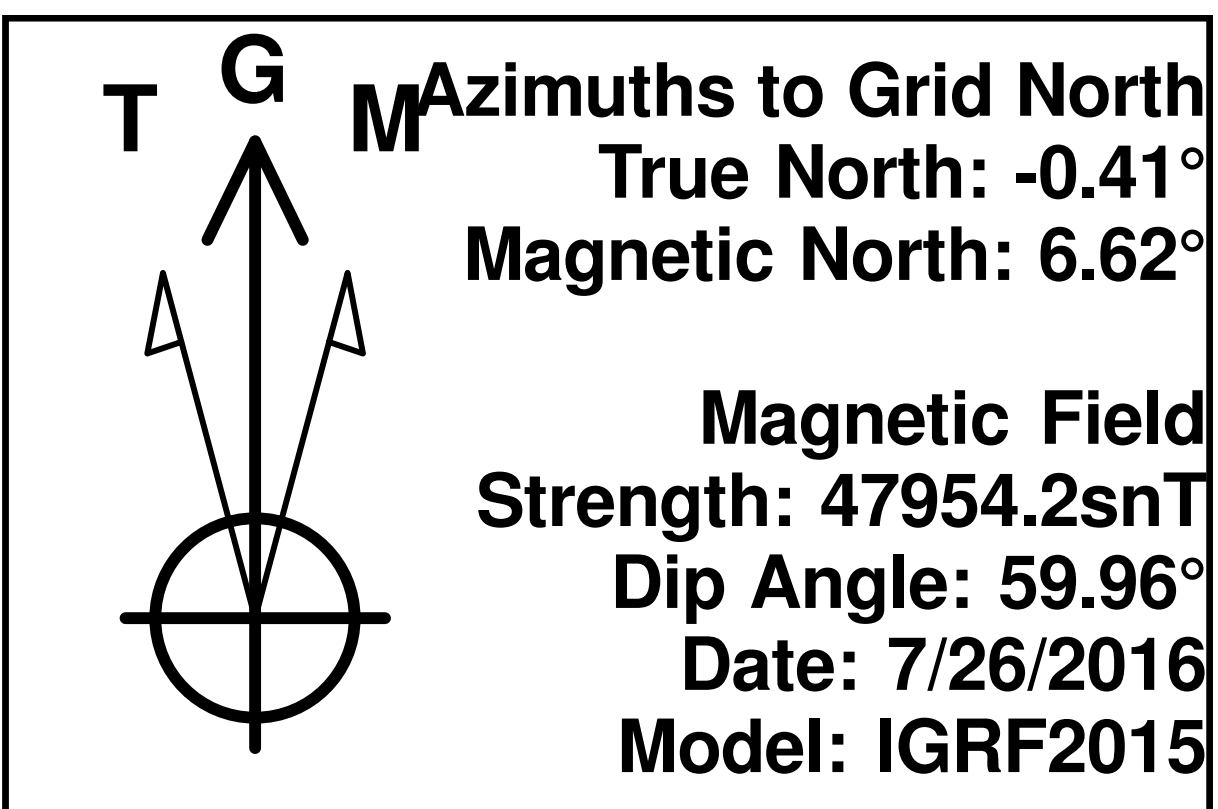
Section Details

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	8813.54	0.00	0.00	8813.54	0.00	0.00	0.00	0.00	0.00
3	9560.39	89.62	179.57	9291.00	-474.29	3.54	12.00	179.57	474.31
4	19382.20	89.62	179.57	9356.00	-10295.62	76.80	0.00	0.00	10295.91

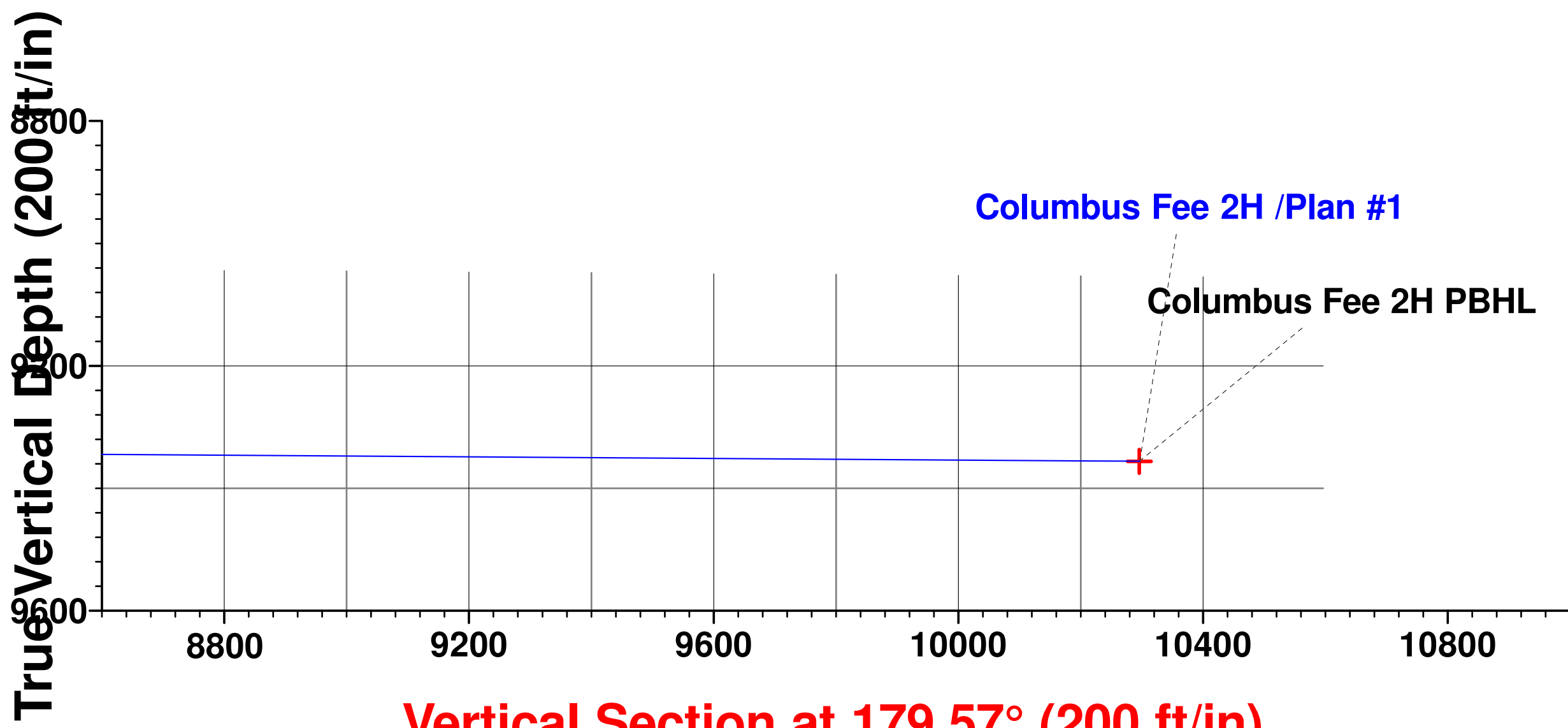


Vertical Section at 179.57° (100 ft/in)

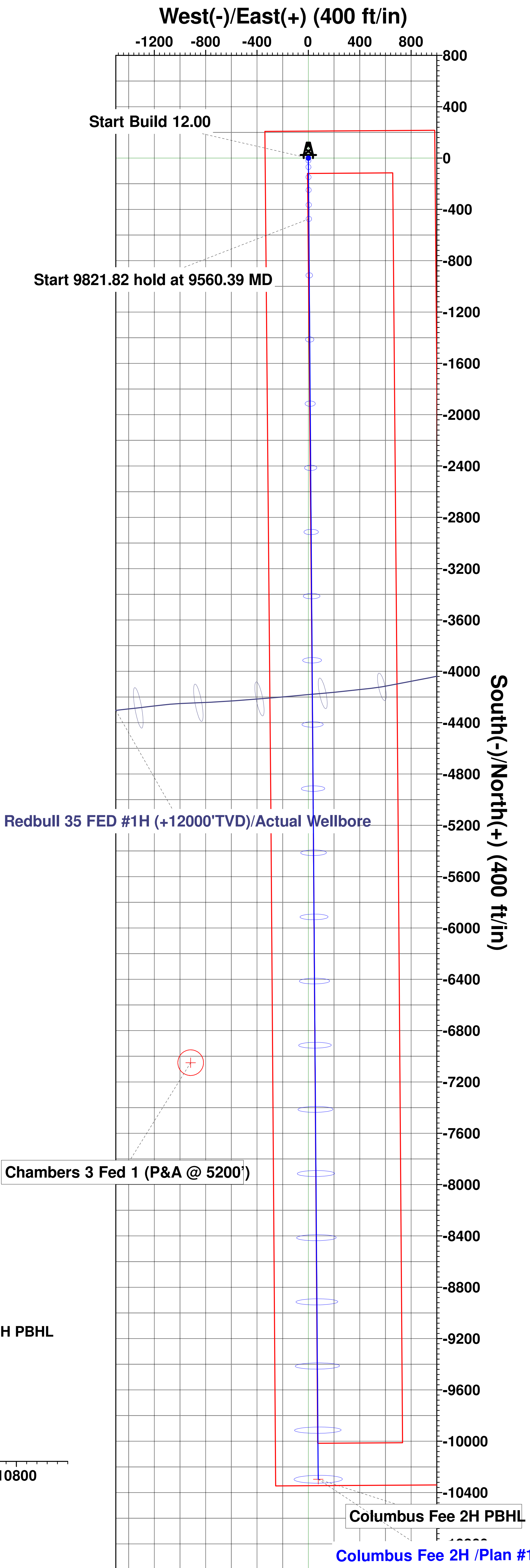
PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



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



Vertical Section at 179.57° (200 ft/in)



Columbus Fee 2H PBHL
Columbus Fee 2H /Plan #1



COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 34, T 25 S. , R 33 E

Columbus Fee 2H

Wellbore #1

Plan: Plan #1

Standard Survey Report

26 July, 2016





Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Columbus Fee 2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Site:	Sec. 34, T 25 S. , R 33 E	MD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Well:	Columbus Fee 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

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. 34, T 25 S. , R 33 E		
Site Position:		Northing:	398,623.80 usft
From:	Map	Easting:	739,904.90 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 5' 36.830 N
		Longitude:	103° 33' 31.161 W
		Grid Convergence:	0.41 °

Well	Columbus Fee 2H		
Well Position	+N/-S	0.00 ft	Northing: 398,623.80 usft
	+E/-W	0.00 ft	Easting: 739,904.90 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 5' 36.830 N
		Longitude:	103° 33' 31.161 W
		Ground Level:	3,327.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/26/2016	7.04	59.96	47,954

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	179.57	

Survey Tool Program	Date	7/26/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	19,382.06	Plan #1 (Wellbore #1)	MWD	MWD - Standard	

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)	
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:	Columbus Fee 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	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)
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
2,800.00	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
3,700.00	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
4,300.00	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



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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
6,900.00	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
8,100.00	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
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,813.55	0.00	0.00	8,813.55	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 12.00									
8,900.00	10.37	179.57	8,899.53	-7.81	0.06	7.81	12.00	12.00	0.00
9,000.00	22.37	179.57	8,995.30	-35.94	0.27	35.95	12.00	12.00	0.00
9,100.00	34.37	179.57	9,083.12	-83.38	0.62	83.38	12.00	12.00	0.00
9,200.00	46.37	179.57	9,159.17	-148.04	1.10	148.04	12.00	12.00	0.00
9,300.00	58.37	179.57	9,220.10	-227.09	1.69	227.10	12.00	12.00	0.00
9,400.00	70.37	179.57	9,263.27	-317.09	2.37	317.10	12.00	12.00	0.00



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9,500.00	82.37	179.57	9,286.79	-414.10	3.09	414.11	12.00	12.00	0.00
9,560.39	89.62	179.57	9,291.00	-474.29	3.54	474.31	12.00	12.00	0.00
Start 9821.82 hold at 9560.39 MD									
9,600.00	89.62	179.57	9,291.26	-513.90	3.83	513.92	0.00	0.00	0.00
9,700.00	89.62	179.57	9,291.92	-613.90	4.58	613.92	0.00	0.00	0.00
9,800.00	89.62	179.57	9,292.59	-713.89	5.33	713.91	0.00	0.00	0.00
9,900.00	89.62	179.57	9,293.25	-813.89	6.07	813.91	0.00	0.00	0.00
10,000.00	89.62	179.57	9,293.91	-913.88	6.82	913.91	0.00	0.00	0.00
10,100.00	89.62	179.57	9,294.57	-1,013.88	7.56	1,013.91	0.00	0.00	0.00
10,200.00	89.62	179.57	9,295.23	-1,113.87	8.31	1,113.91	0.00	0.00	0.00
10,300.00	89.62	179.57	9,295.90	-1,213.87	9.05	1,213.90	0.00	0.00	0.00
10,400.00	89.62	179.57	9,296.56	-1,313.86	9.80	1,313.90	0.00	0.00	0.00
10,500.00	89.62	179.57	9,297.22	-1,413.86	10.55	1,413.90	0.00	0.00	0.00
10,600.00	89.62	179.57	9,297.88	-1,513.85	11.29	1,513.90	0.00	0.00	0.00
10,700.00	89.62	179.57	9,298.54	-1,613.85	12.04	1,613.89	0.00	0.00	0.00
10,800.00	89.62	179.57	9,299.20	-1,713.84	12.78	1,713.89	0.00	0.00	0.00
10,900.00	89.62	179.57	9,299.87	-1,813.84	13.53	1,813.89	0.00	0.00	0.00
11,000.00	89.62	179.57	9,300.53	-1,913.83	14.28	1,913.89	0.00	0.00	0.00
11,100.00	89.62	179.57	9,301.19	-2,013.83	15.02	2,013.89	0.00	0.00	0.00
11,200.00	89.62	179.57	9,301.85	-2,113.82	15.77	2,113.88	0.00	0.00	0.00
11,300.00	89.62	179.57	9,302.51	-2,213.82	16.51	2,213.88	0.00	0.00	0.00
11,400.00	89.62	179.57	9,303.17	-2,313.81	17.26	2,313.88	0.00	0.00	0.00
11,500.00	89.62	179.57	9,303.84	-2,413.81	18.01	2,413.88	0.00	0.00	0.00
11,600.00	89.62	179.57	9,304.50	-2,513.80	18.75	2,513.87	0.00	0.00	0.00
11,700.00	89.62	179.57	9,305.16	-2,613.80	19.50	2,613.87	0.00	0.00	0.00
11,800.00	89.62	179.57	9,305.82	-2,713.79	20.24	2,713.87	0.00	0.00	0.00
11,900.00	89.62	179.57	9,306.48	-2,813.79	20.99	2,813.87	0.00	0.00	0.00
12,000.00	89.62	179.57	9,307.15	-2,913.78	21.74	2,913.87	0.00	0.00	0.00
12,100.00	89.62	179.57	9,307.81	-3,013.78	22.48	3,013.86	0.00	0.00	0.00
12,200.00	89.62	179.57	9,308.47	-3,113.77	23.23	3,113.86	0.00	0.00	0.00
12,300.00	89.62	179.57	9,309.13	-3,213.77	23.97	3,213.86	0.00	0.00	0.00
12,400.00	89.62	179.57	9,309.79	-3,313.77	24.72	3,313.86	0.00	0.00	0.00
12,500.00	89.62	179.57	9,310.45	-3,413.76	25.46	3,413.86	0.00	0.00	0.00
12,600.00	89.62	179.57	9,311.12	-3,513.76	26.21	3,513.85	0.00	0.00	0.00
12,700.00	89.62	179.57	9,311.78	-3,613.75	26.96	3,613.85	0.00	0.00	0.00
12,800.00	89.62	179.57	9,312.44	-3,713.75	27.70	3,713.85	0.00	0.00	0.00
12,900.00	89.62	179.57	9,313.10	-3,813.74	28.45	3,813.85	0.00	0.00	0.00
13,000.00	89.62	179.57	9,313.76	-3,913.74	29.19	3,913.84	0.00	0.00	0.00
13,100.00	89.62	179.57	9,314.43	-4,013.73	29.94	4,013.84	0.00	0.00	0.00
13,200.00	89.62	179.57	9,315.09	-4,113.73	30.69	4,113.84	0.00	0.00	0.00
13,300.00	89.62	179.57	9,315.75	-4,213.72	31.43	4,213.84	0.00	0.00	0.00
13,400.00	89.62	179.57	9,316.41	-4,313.72	32.18	4,313.84	0.00	0.00	0.00
13,500.00	89.62	179.57	9,317.07	-4,413.71	32.92	4,413.83	0.00	0.00	0.00
13,600.00	89.62	179.57	9,317.73	-4,513.71	33.67	4,513.83	0.00	0.00	0.00



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Columbus Fee 2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Site:	Sec. 34, T 25 S. , R 33 E	MD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Well:	Columbus Fee 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	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)
13,700.00	89.62	179.57	9,318.40	-4,613.70	34.42	4,613.83	0.00	0.00	0.00
13,800.00	89.62	179.57	9,319.06	-4,713.70	35.16	4,713.83	0.00	0.00	0.00
13,900.00	89.62	179.57	9,319.72	-4,813.69	35.91	4,813.82	0.00	0.00	0.00
14,000.00	89.62	179.57	9,320.38	-4,913.69	36.65	4,913.82	0.00	0.00	0.00
14,100.00	89.62	179.57	9,321.04	-5,013.68	37.40	5,013.82	0.00	0.00	0.00
14,200.00	89.62	179.57	9,321.70	-5,113.68	38.15	5,113.82	0.00	0.00	0.00
14,300.00	89.62	179.57	9,322.37	-5,213.67	38.89	5,213.82	0.00	0.00	0.00
14,400.00	89.62	179.57	9,323.03	-5,313.67	39.64	5,313.81	0.00	0.00	0.00
14,500.00	89.62	179.57	9,323.69	-5,413.66	40.38	5,413.81	0.00	0.00	0.00
14,600.00	89.62	179.57	9,324.35	-5,513.66	41.13	5,513.81	0.00	0.00	0.00
14,700.00	89.62	179.57	9,325.01	-5,613.65	41.88	5,613.81	0.00	0.00	0.00
14,800.00	89.62	179.57	9,325.68	-5,713.65	42.62	5,713.80	0.00	0.00	0.00
14,900.00	89.62	179.57	9,326.34	-5,813.64	43.37	5,813.80	0.00	0.00	0.00
15,000.00	89.62	179.57	9,327.00	-5,913.64	44.11	5,913.80	0.00	0.00	0.00
15,100.00	89.62	179.57	9,327.66	-6,013.63	44.86	6,013.80	0.00	0.00	0.00
15,200.00	89.62	179.57	9,328.32	-6,113.63	45.60	6,113.80	0.00	0.00	0.00
15,300.00	89.62	179.57	9,328.98	-6,213.62	46.35	6,213.79	0.00	0.00	0.00
15,400.00	89.62	179.57	9,329.65	-6,313.62	47.10	6,313.79	0.00	0.00	0.00
15,500.00	89.62	179.57	9,330.31	-6,413.61	47.84	6,413.79	0.00	0.00	0.00
15,600.00	89.62	179.57	9,330.97	-6,513.61	48.59	6,513.79	0.00	0.00	0.00
15,700.00	89.62	179.57	9,331.63	-6,613.60	49.33	6,613.79	0.00	0.00	0.00
15,800.00	89.62	179.57	9,332.29	-6,713.60	50.08	6,713.78	0.00	0.00	0.00
15,900.00	89.62	179.57	9,332.96	-6,813.59	50.83	6,813.78	0.00	0.00	0.00
16,000.00	89.62	179.57	9,333.62	-6,913.59	51.57	6,913.78	0.00	0.00	0.00
16,100.00	89.62	179.57	9,334.28	-7,013.58	52.32	7,013.78	0.00	0.00	0.00
16,200.00	89.62	179.57	9,334.94	-7,113.58	53.06	7,113.77	0.00	0.00	0.00
16,300.00	89.62	179.57	9,335.60	-7,213.57	53.81	7,213.77	0.00	0.00	0.00
16,400.00	89.62	179.57	9,336.26	-7,313.57	54.56	7,313.77	0.00	0.00	0.00
16,500.00	89.62	179.57	9,336.93	-7,413.56	55.30	7,413.77	0.00	0.00	0.00
16,600.00	89.62	179.57	9,337.59	-7,513.56	56.05	7,513.77	0.00	0.00	0.00
16,700.00	89.62	179.57	9,338.25	-7,613.55	56.79	7,613.76	0.00	0.00	0.00
16,800.00	89.62	179.57	9,338.91	-7,713.55	57.54	7,713.76	0.00	0.00	0.00
16,900.00	89.62	179.57	9,339.57	-7,813.54	58.29	7,813.76	0.00	0.00	0.00
17,000.00	89.62	179.57	9,340.24	-7,913.54	59.03	7,913.76	0.00	0.00	0.00
17,100.00	89.62	179.57	9,340.90	-8,013.53	59.78	8,013.75	0.00	0.00	0.00
17,200.00	89.62	179.57	9,341.56	-8,113.53	60.52	8,113.75	0.00	0.00	0.00
17,300.00	89.62	179.57	9,342.22	-8,213.52	61.27	8,213.75	0.00	0.00	0.00
17,400.00	89.62	179.57	9,342.88	-8,313.52	62.01	8,313.75	0.00	0.00	0.00
17,500.00	89.62	179.57	9,343.54	-8,413.51	62.76	8,413.75	0.00	0.00	0.00
17,600.00	89.62	179.57	9,344.21	-8,513.51	63.51	8,513.74	0.00	0.00	0.00
17,700.00	89.62	179.57	9,344.87	-8,613.50	64.25	8,613.74	0.00	0.00	0.00
17,800.00	89.62	179.57	9,345.53	-8,713.50	65.00	8,713.74	0.00	0.00	0.00
17,900.00	89.62	179.57	9,346.19	-8,813.49	65.74	8,813.74	0.00	0.00	0.00



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Columbus Fee 2H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Site:	Sec. 34, T 25 S. , R 33 E	MD Reference:	KB=26' @ 3353.00ft (Scan Freedom)
Well:	Columbus Fee 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	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)
18,000.00	89.62	179.57	9,346.85	-8,913.49	66.49	8,913.73	0.00	0.00	0.00
18,100.00	89.62	179.57	9,347.51	-9,013.48	67.24	9,013.73	0.00	0.00	0.00
18,200.00	89.62	179.57	9,348.18	-9,113.48	67.98	9,113.73	0.00	0.00	0.00
18,300.00	89.62	179.57	9,348.84	-9,213.47	68.73	9,213.73	0.00	0.00	0.00
18,400.00	89.62	179.57	9,349.50	-9,313.47	69.47	9,313.73	0.00	0.00	0.00
18,500.00	89.62	179.57	9,350.16	-9,413.46	70.22	9,413.72	0.00	0.00	0.00
18,600.00	89.62	179.57	9,350.82	-9,513.46	70.97	9,513.72	0.00	0.00	0.00
18,700.00	89.62	179.57	9,351.49	-9,613.45	71.71	9,613.72	0.00	0.00	0.00
18,800.00	89.62	179.57	9,352.15	-9,713.45	72.46	9,713.72	0.00	0.00	0.00
18,900.00	89.62	179.57	9,352.81	-9,813.44	73.20	9,813.72	0.00	0.00	0.00
19,000.00	89.62	179.57	9,353.47	-9,913.44	73.95	9,913.71	0.00	0.00	0.00
19,100.00	89.62	179.57	9,354.13	-10,013.43	74.70	10,013.71	0.00	0.00	0.00
19,200.00	89.62	179.57	9,354.79	-10,113.43	75.44	10,113.71	0.00	0.00	0.00
19,300.00	89.62	179.57	9,355.46	-10,213.42	76.19	10,213.71	0.00	0.00	0.00
19,382.20	89.62	179.57	9,356.00	-10,295.62	76.80	10,295.91	0.00	0.00	0.00
TD at 19382.20									

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Chambers 3 Fed 1 (P - plan misses target center by 7108.97ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E) - Circle (radius 100.00)	0.00	0.00	0.00	-7,049.61	-916.81	391,574.20	738,988.09	32° 4' 27.134 N	103° 33' 42.404 W
Columbus Fee 2H PB - plan hits target center - Point	0.00	0.00	9,356.00	-10,295.62	76.80	388,328.20	739,981.70	32° 3' 54.942 N	103° 33' 31.128 W

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8814	8814	0	0	Start Build 12.00
9560	9291	-474	4	Start 9821.82 hold at 9560.39 MD
19,382	9356	-10,296	77	TD at 19382.20

Checked By: _____ Approved By: _____ Date: _____