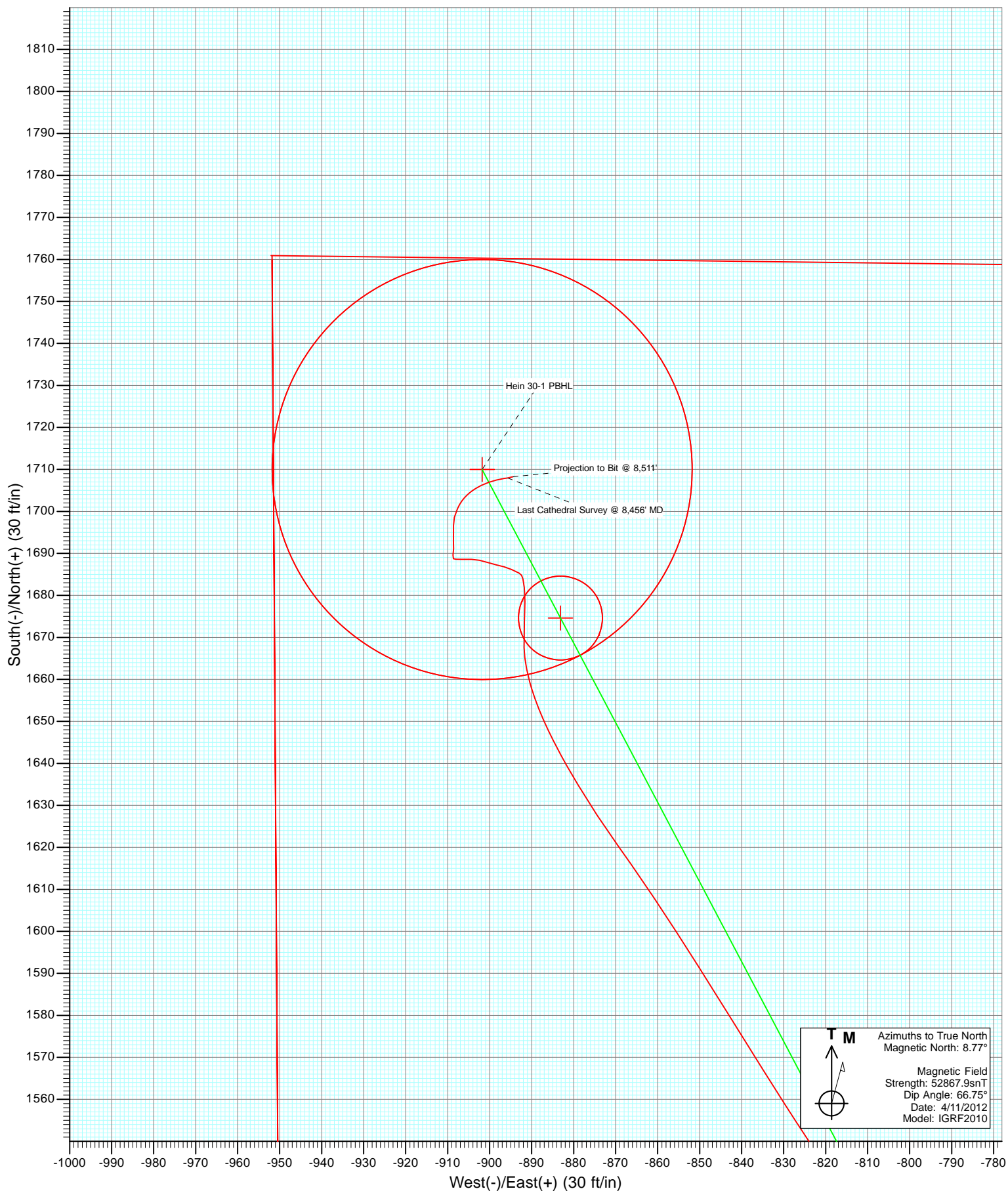


Azimuths to True North
Magnetic North: 8.77°

Magnetic Field
Strength: 52867.9snT
Dip Angle: 66.75°
Date: 4/11/2012
Model: IGRF2010

DD Hein 30-1 125279; 156755; DN 15' KB @ 4959.0ft (Xtreme 15) North American Datum 1983 Well Hein 30-1, True North						
Type	Target	Azimuth	Origin	Type	N/S	E/W
Target	Hein 30-1 PBHL	332.19	Slot	0.0	0.0	
Name	TVD	+N/-S	Latitude			Longitude
Hein 30-1 Drillers TGT	6000.0	1674.6	-883.1	40.087304		-104.848590
Hein 30-1 PBHL	8117.0	1710.0	-901.8	40.087401		-104.848657



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 30-1
Project:	DJ Wattenberg	TVD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Well:	Hein 30-1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	DJ Wattenberg		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S01N-67W-01-22 (Hein 5-1 Pad)			
Site Position:		Northing:	1,273,693.57 ft	Latitude:	40.082817
From:	Lat/Long	Easting:	3,183,160.75 ft	Longitude:	-104.845435
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.42 °

Well	Hein 30-1					
Well Position	+N/-S	0.0 ft	Northing:	1,273,653.48 ft	Latitude:	40.082707
	+E/-W	0.0 ft	Easting:	3,183,161.32 ft	Longitude:	-104.845434
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,944.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/11/2012	8.77	66.75	52,868

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	332.19	

Survey Program	Date	4/17/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
93.0	8,511.0	Survey #1 (DD)	MWD	Geolink MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
93.0	0.50	130.00	93.0	-0.3	0.3	-0.4	0.54	0.54		
186.0	0.30	333.70	186.0	-0.3	0.5	-0.5	0.84	-0.22		
279.0	1.40	348.10	279.0	1.0	0.2	0.8	1.20	1.18		
372.0	2.20	337.70	371.9	3.8	-0.7	3.7	0.93	0.86		
458.0	3.70	330.10	457.8	7.7	-2.7	8.1	1.80	1.74		
543.0	5.00	324.10	542.6	13.1	-6.3	14.5	1.62	1.53		
629.0	6.50	327.80	628.1	20.3	-11.1	23.1	1.80	1.74		
714.0	7.70	331.10	712.5	29.3	-16.4	33.6	1.49	1.41		
800.0	9.20	335.60	797.6	40.6	-22.0	46.2	1.90	1.74		
885.0	11.10	334.00	881.2	54.2	-28.4	61.2	2.26	2.24		
903.0	11.50	335.00	898.9	57.3	-29.9	64.7	2.47	2.22		
1,045.0	10.90	334.90	1,038.2	82.3	-41.6	92.2	0.42	-0.42		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 30-1
Project:	DJ Wattenberg	TVD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Well:	Hein 30-1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,131.0	14.00	337.60	1,122.1	99.3	-49.0	110.7	3.67	3.60	
1,216.0	17.60	340.50	1,203.9	120.9	-57.2	133.7	4.33	4.24	
1,302.0	20.60	340.00	1,285.2	147.4	-66.8	161.5	3.49	3.49	
1,388.0	22.40	340.70	1,365.2	177.1	-77.3	192.7	2.11	2.09	
1,473.0	24.10	337.40	1,443.3	208.4	-89.4	226.0	2.52	2.00	
1,558.0	25.00	334.30	1,520.6	240.6	-103.8	261.3	1.85	1.06	
1,644.0	26.80	330.90	1,598.0	273.9	-121.1	298.8	2.71	2.09	
1,730.0	26.60	330.60	1,674.8	307.7	-140.0	337.5	0.28	-0.23	
1,815.0	26.10	330.40	1,751.0	340.5	-158.6	375.2	0.60	-0.59	
1,900.0	26.10	330.30	1,827.3	373.0	-177.1	412.5	0.05	0.00	
1,986.0	25.40	329.70	1,904.8	405.4	-195.8	449.9	0.87	-0.81	
2,071.0	25.00	329.60	1,981.7	436.6	-214.1	486.0	0.47	-0.47	
2,157.0	24.20	329.70	2,059.9	467.5	-232.2	521.8	0.93	-0.93	
2,242.0	25.00	331.60	2,137.1	498.3	-249.5	557.2	1.32	0.94	
2,328.0	24.50	331.30	2,215.2	529.9	-266.7	593.2	0.60	-0.58	
2,413.0	23.70	330.90	2,292.8	560.3	-283.5	627.9	0.96	-0.94	
2,499.0	22.80	330.10	2,371.8	589.9	-300.2	661.8	1.11	-1.05	
2,584.0	23.20	327.40	2,450.1	618.3	-317.4	694.9	1.33	0.47	
2,670.0	24.00	325.40	2,528.9	646.9	-336.5	729.2	1.32	0.93	
2,755.0	25.00	327.40	2,606.3	676.3	-356.0	764.3	1.53	1.18	
2,841.0	26.20	329.40	2,683.8	707.9	-375.4	801.3	1.72	1.40	
2,926.0	24.80	329.00	2,760.5	739.4	-394.1	837.9	1.66	-1.65	
3,012.0	24.40	330.70	2,838.7	770.3	-412.1	873.6	0.95	-0.47	
3,098.0	24.40	334.20	2,917.0	801.8	-428.6	909.1	1.68	0.00	
3,183.0	23.50	334.50	2,994.7	832.9	-443.5	943.6	1.07	-1.06	
3,269.0	22.70	334.80	3,073.8	863.4	-457.9	977.3	0.94	-0.93	
3,354.0	22.90	335.80	3,152.2	893.3	-471.7	1,010.2	0.51	0.24	
3,440.0	23.90	335.60	3,231.1	924.5	-485.8	1,044.3	1.17	1.16	
3,525.0	24.60	332.40	3,308.6	955.8	-501.1	1,079.2	1.75	0.82	
3,611.0	23.60	332.30	3,387.1	986.9	-517.4	1,114.3	1.16	-1.16	
3,696.0	23.80	331.70	3,465.0	1,017.1	-533.4	1,148.5	0.37	0.24	
3,782.0	24.50	333.40	3,543.4	1,048.8	-549.6	1,183.7	1.15	0.81	
3,867.0	25.00	331.60	3,620.6	1,079.9	-566.1	1,219.2	1.06	0.59	
3,953.0	23.30	331.50	3,699.1	1,110.8	-582.8	1,254.4	1.98	-1.98	
4,038.0	24.00	333.40	3,777.0	1,141.0	-598.6	1,288.5	1.22	0.82	
4,124.0	23.70	332.10	3,855.6	1,172.0	-614.5	1,323.3	0.70	-0.35	
4,209.0	23.60	329.80	3,933.5	1,201.8	-631.0	1,357.4	1.09	-0.12	
4,295.0	24.90	332.90	4,011.9	1,232.8	-648.0	1,392.7	2.12	1.51	
4,380.0	22.90	333.10	4,089.6	1,263.4	-663.6	1,427.1	2.35	-2.35	
4,466.0	22.70	332.90	4,168.9	1,293.1	-678.7	1,460.4	0.25	-0.23	
4,551.0	23.40	330.40	4,247.1	1,322.4	-694.5	1,493.7	1.42	0.82	
4,637.0	24.10	332.50	4,325.8	1,352.8	-711.1	1,528.3	1.28	0.81	
4,722.0	23.90	332.60	4,403.5	1,383.5	-727.0	1,562.9	0.24	-0.24	
4,808.0	24.50	331.60	4,481.9	1,414.7	-743.5	1,598.2	0.84	0.70	
4,893.0	25.80	330.70	4,558.8	1,446.3	-760.9	1,634.3	1.59	1.53	
4,979.0	24.70	330.20	4,636.6	1,478.2	-779.0	1,670.9	1.30	-1.28	
5,064.0	24.10	328.20	4,714.0	1,508.4	-797.0	1,706.0	1.20	-0.71	
5,150.0	22.70	326.20	4,793.0	1,537.1	-815.5	1,740.0	1.87	-1.63	
5,236.0	20.00	327.70	4,873.0	1,563.3	-832.6	1,771.2	3.20	-3.14	
5,321.0	16.10	328.30	4,953.9	1,585.6	-846.5	1,797.5	4.59	-4.59	
5,407.0	13.40	326.50	5,037.0	1,604.1	-858.3	1,819.3	3.18	-3.14	
5,492.0	12.80	324.70	5,119.8	1,620.0	-869.2	1,838.4	0.85	-0.71	
5,578.0	11.20	329.00	5,203.9	1,634.9	-879.0	1,856.2	2.13	-1.86	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 30-1
Project:	DJ Wattenberg	TVD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Well:	Hein 30-1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,663.0	9.30	334.70	5,287.6	1,648.2	-886.2	1,871.3	2.53	-2.24	
5,749.0	6.70	345.00	5,372.7	1,659.4	-890.5	1,883.1	3.44	-3.02	
5,834.0	4.70	358.80	5,457.3	1,667.6	-891.8	1,891.1	2.84	-2.35	
5,920.0	3.40	3.90	5,543.1	1,673.7	-891.7	1,896.4	1.57	-1.51	
6,005.0	3.10	358.50	5,627.9	1,678.5	-891.6	1,900.6	0.50	-0.35	
6,091.0	1.40	355.10	5,713.9	1,681.9	-891.8	1,903.7	1.98	-1.98	
6,176.0	1.40	347.80	5,798.9	1,683.9	-892.1	1,905.6	0.21	0.00	
6,261.0	1.10	297.10	5,883.8	1,685.3	-893.0	1,907.3	1.30	-0.35	
6,347.0	1.50	294.60	5,969.8	1,686.2	-894.8	1,908.9	0.47	0.47	
6,432.0	1.10	284.30	6,054.8	1,686.8	-896.6	1,910.3	0.54	-0.47	
6,518.0	1.40	283.60	6,140.8	1,687.3	-898.4	1,911.5	0.35	0.35	
6,603.0	1.40	286.20	6,225.7	1,687.8	-900.4	1,912.9	0.07	0.00	
6,689.0	1.40	282.90	6,311.7	1,688.3	-902.4	1,914.4	0.09	0.00	
6,774.0	1.20	270.90	6,396.7	1,688.6	-904.3	1,915.5	0.40	-0.24	
6,860.0	2.10	269.90	6,482.6	1,688.6	-906.8	1,916.6	1.05	1.05	
6,945.0	0.40	298.80	6,567.6	1,688.7	-908.6	1,917.6	2.07	-2.00	
7,031.0	1.00	13.40	6,653.6	1,689.6	-908.7	1,918.4	1.13	0.70	
7,116.0	1.10	356.70	6,738.6	1,691.1	-908.6	1,919.7	0.38	0.12	
7,202.0	1.30	0.00	6,824.6	1,692.9	-908.6	1,921.3	0.25	0.23	
7,287.0	1.20	1.80	6,909.6	1,694.8	-908.6	1,923.0	0.13	-0.12	
7,372.0	1.30	358.30	6,994.5	1,696.7	-908.6	1,924.6	0.15	0.12	
7,458.0	1.30	14.20	7,080.5	1,698.6	-908.4	1,926.2	0.42	0.00	
7,543.0	1.20	26.60	7,165.5	1,700.3	-907.8	1,927.4	0.34	-0.12	
7,629.0	1.00	27.60	7,251.5	1,701.8	-907.0	1,928.4	0.23	-0.23	
7,714.0	1.00	37.20	7,336.5	1,703.0	-906.2	1,929.1	0.20	0.00	
7,800.0	0.90	50.60	7,422.5	1,704.0	-905.2	1,929.6	0.28	-0.12	
7,885.0	0.90	55.40	7,507.5	1,704.9	-904.2	1,929.8	0.09	0.00	
7,971.0	0.80	58.20	7,593.4	1,705.6	-903.1	1,929.9	0.13	-0.12	
8,056.0	0.90	63.70	7,678.4	1,706.2	-902.0	1,929.9	0.15	0.12	
8,142.0	0.80	72.10	7,764.4	1,706.6	-900.8	1,929.8	0.19	-0.12	
8,227.0	0.80	64.30	7,849.4	1,707.1	-899.7	1,929.7	0.13	0.00	
8,313.0	0.90	83.00	7,935.4	1,707.4	-898.5	1,929.4	0.34	0.12	
8,456.0	1.40	76.80	8,078.4	1,708.0	-895.7	1,928.6	0.36	0.35	Last Cathedral Survey @ 8,456' MD
8,511.0	1.40	76.80	8,133.4	1,708.3	-894.4	1,928.2	0.00	0.00	Projection to Bit @ 8,511'

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 30-1
Project:	DJ Wattenberg	TVD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	15' KB @ 4959.0ft (Xtreme 15)
Well:	Hein 30-1	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Hein 30-1 PBHL	0.00	0.42	8,117.0	1,710.0	-901.8	1,275,356.74	3,182,246.95	40.087401	-104.848657
- actual wellpath misses target center by 7.2ft at 8494.5ft MD (8116.8 TVD, 1708.2 N, -894.8 E)									
- Circle (radius 50.0)									
Hein 30-1 Drillers TGT	0.00	0.42	6,000.0	1,674.6	-883.1	1,275,321.52	3,182,265.85	40.087304	-104.848590
- actual wellpath misses target center by 17.1ft at 6376.9ft MD (5999.6 TVD, 1686.5 N, -895.5 E)									
- Circle (radius 10.0)									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
		(ft)	(ft)	Comment	
8,456.0	8,078.4	1,708.0	-895.7	Last Cathedral Survey @ 8,456' MD	
8,511.0	8,133.4	1,708.3	-894.4	Projection to Bit @ 8,511'	

Checked By: _____ Approved By: _____ Date: _____