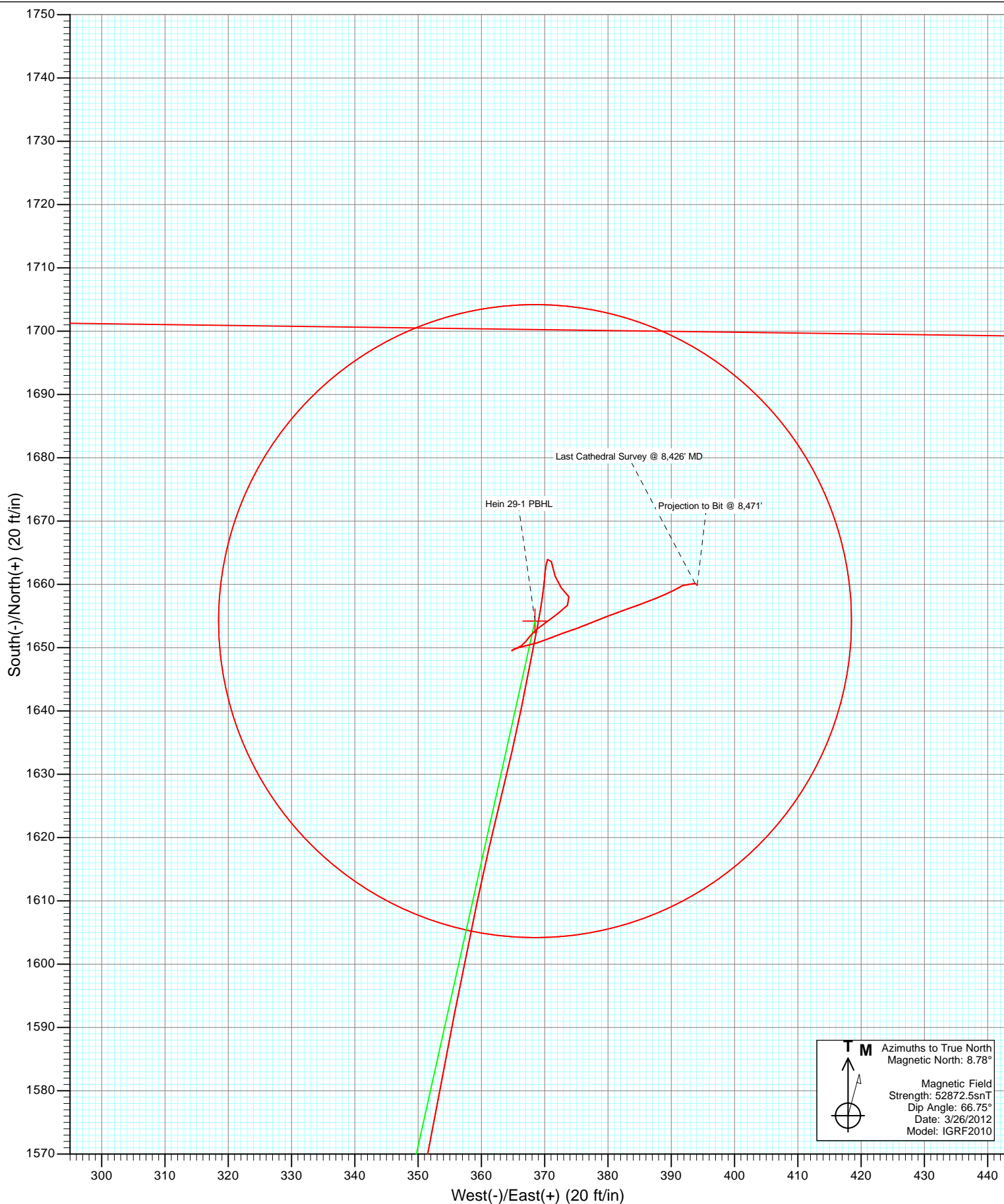


Azimuths to True North
Magnetic North: 8.78°

Magnetic Field
Strength: 52872.5nT
Dip Angle: 66.75°
Date: 3/26/2012
Model: IGRF2010

DD Hein 29-1 125253 156255; LR WELL @ 4959.0ft (Xtreme 15) North American Datum 1983 Well Hein 29-1, True North							
Type Target	Target Hein 29-1 PBHL	Azimuth 12.56	Origin Type Slot	N/S 0.0	E/W 0.0	From TVD 0.0	
Name Hein 29-1 PBHL	TVD 8117.0	+N/-S 1654.2	+E/-W 368.5	Latitude 40.087358	Longitude -104.844118		



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 29-1
Project:	DJ Wattenberg	TVD Reference:	WELL @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	WELL @ 4959.0ft (Xtreme 15)
Well:	Hein 29-1	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 29-1					
Well Position	+N/-S	0.0 ft	Northing:	1,273,693.55 ft	Latitude:	40.082817
	+E/-W	0.0 ft	Easting:	3,183,160.75 ft	Longitude:	-104.845435
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	3/26/2012	8.77	66.75	52,873

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	12.56	

Survey Program	Date	4/19/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
91.0	8,471.0	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		
91.0	0.60	312.30	91.0	0.3	-0.4	0.2	0.66	0.66		
153.0	0.90	16.60	153.0	1.0	-0.5	0.9	1.35	0.48		
215.0	2.40	20.70	215.0	2.7	0.1	2.7	2.43	2.42		
277.0	3.80	27.10	276.9	5.7	1.5	5.9	2.32	2.26		
369.0	4.90	17.10	368.6	12.2	4.1	12.8	1.45	1.20		
459.0	5.70	19.70	458.2	20.1	6.7	21.1	0.93	0.89		
543.0	6.20	17.50	541.8	28.3	9.5	29.7	0.65	0.60		
628.0	6.80	15.40	626.2	37.6	12.2	39.3	0.76	0.71		
714.0	7.80	15.40	711.5	48.1	15.1	50.2	1.16	1.16		
799.0	9.00	16.00	795.6	60.1	18.5	62.6	1.42	1.41		
885.0	10.70	20.40	880.3	74.0	23.1	77.3	2.16	1.98		
912.0	11.60	21.30	906.8	78.9	25.0	82.4	3.39	3.33		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 29-1
Project:	DJ Wattenberg	TVD Reference:	WELL @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	WELL @ 4959.0ft (Xtreme 15)
Well:	Hein 29-1	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
991.0	12.30	21.10	984.1	94.1	30.9	98.6	0.89	0.89	
1,077.0	13.70	20.90	1,067.9	112.2	37.8	117.7	1.63	1.63	
1,162.0	15.40	16.60	1,150.2	132.4	44.6	138.9	2.37	2.00	
1,248.0	16.80	14.00	1,232.8	155.4	50.9	162.8	1.83	1.63	
1,333.0	19.30	13.20	1,313.6	181.0	57.1	189.1	2.96	2.94	
1,419.0	21.40	11.60	1,394.3	210.2	63.5	219.0	2.53	2.44	
1,504.0	24.60	9.80	1,472.5	242.9	69.6	252.2	3.85	3.76	
1,590.0	26.30	9.00	1,550.1	279.3	75.6	289.1	2.02	1.98	
1,675.0	28.30	9.00	1,625.7	317.8	81.7	328.0	2.35	2.35	
1,761.0	28.70	9.20	1,701.2	358.3	88.2	369.0	0.48	0.47	
1,847.0	28.30	10.10	1,776.8	398.8	95.1	409.9	0.68	-0.47	
1,932.0	27.80	10.40	1,851.8	438.1	102.2	449.9	0.61	-0.59	
2,017.0	27.20	8.30	1,927.2	476.8	108.6	489.1	1.34	-0.71	
2,103.0	26.90	9.70	2,003.8	515.5	114.7	528.1	0.82	-0.35	
2,189.0	26.00	12.50	2,080.8	553.1	122.1	566.4	1.79	-1.05	
2,274.0	25.10	10.40	2,157.5	589.0	129.4	603.0	1.50	-1.06	
2,360.0	23.30	11.20	2,236.0	623.6	136.0	638.2	2.13	-2.09	
2,445.0	22.50	12.90	2,314.3	656.0	142.9	671.3	1.22	-0.94	
2,531.0	21.80	14.50	2,393.9	687.5	150.5	703.7	1.07	-0.81	
2,616.0	21.80	15.50	2,472.8	717.9	158.7	735.3	0.44	0.00	
2,702.0	22.40	17.60	2,552.5	748.9	167.9	767.5	1.15	0.70	
2,787.0	22.80	14.70	2,631.0	780.3	177.0	800.1	1.39	0.47	
2,873.0	23.60	12.90	2,710.0	813.2	185.1	834.0	1.24	0.93	
2,958.0	26.40	10.90	2,787.1	848.4	192.4	869.9	3.44	3.29	
3,044.0	26.20	9.10	2,864.2	885.9	199.1	908.0	0.96	-0.23	
3,129.0	26.30	10.00	2,940.4	923.0	205.3	945.5	0.48	0.12	
3,215.0	25.40	10.90	3,017.8	959.8	212.1	983.0	1.14	-1.05	
3,300.0	25.60	9.30	3,094.5	995.9	218.5	1,019.5	0.84	0.24	
3,386.0	24.90	13.40	3,172.3	1,031.8	225.7	1,056.2	2.19	-0.81	
3,471.0	24.10	15.00	3,249.7	1,066.0	234.3	1,091.4	1.22	-0.94	
3,557.0	24.30	14.50	3,328.1	1,100.1	243.3	1,126.7	0.33	0.23	
3,642.0	24.00	12.90	3,405.7	1,133.9	251.6	1,161.4	0.85	-0.35	
3,728.0	23.60	10.00	3,484.3	1,167.9	258.5	1,196.1	1.44	-0.47	
3,813.0	24.30	10.80	3,562.0	1,201.8	264.7	1,230.6	0.91	0.82	
3,899.0	23.60	13.10	3,640.6	1,235.9	271.9	1,265.5	1.36	-0.81	
3,984.0	24.50	13.20	3,718.2	1,269.7	279.8	1,300.1	1.06	1.06	
4,070.0	24.90	13.50	3,796.4	1,304.6	288.1	1,336.1	0.49	0.47	
4,155.0	24.00	14.10	3,873.8	1,338.8	296.5	1,371.2	1.10	-1.06	
4,241.0	24.80	13.10	3,952.1	1,373.3	304.8	1,406.8	1.05	0.93	
4,326.0	24.40	15.60	4,029.4	1,407.6	313.6	1,442.1	1.31	-0.47	
4,412.0	22.50	13.60	4,108.3	1,440.7	322.2	1,476.3	2.40	-2.21	
4,497.0	20.10	14.30	4,187.4	1,470.7	329.7	1,507.2	2.84	-2.82	
4,583.0	19.10	12.30	4,268.5	1,498.8	336.3	1,536.0	1.40	-1.16	
4,668.0	17.90	12.00	4,349.1	1,525.1	342.0	1,563.0	1.42	-1.41	
4,754.0	16.30	12.60	4,431.3	1,549.8	347.4	1,588.3	1.87	-1.86	
4,839.0	14.40	10.40	4,513.2	1,571.9	351.9	1,610.8	2.34	-2.24	
4,925.0	13.10	11.20	4,596.8	1,591.9	355.7	1,631.2	1.53	-1.51	
5,010.0	12.00	11.90	4,679.7	1,610.0	359.4	1,649.7	1.31	-1.29	
5,096.0	10.60	14.00	4,764.1	1,626.5	363.2	1,666.5	1.70	-1.63	
5,181.0	8.90	11.20	4,847.8	1,640.5	366.3	1,680.9	2.08	-2.00	
5,267.0	7.10	11.20	4,933.0	1,652.2	368.6	1,692.9	2.09	-2.09	
5,353.0	3.70	4.60	5,018.6	1,660.2	369.9	1,700.9	4.01	-3.95	
5,438.0	1.40	19.10	5,103.5	1,663.9	370.5	1,704.7	2.79	-2.71	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 29-1
Project:	DJ Wattenberg	TVD Reference:	WELL @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	WELL @ 4959.0ft (Xtreme 15)
Well:	Hein 29-1	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
5,523.0	1.80	168.40	5,188.5	1,663.6	371.1	1,704.5	3.63	0.47	
5,609.0	1.40	161.40	5,274.5	1,661.3	371.7	1,702.4	0.52	-0.47	
5,695.0	1.40	144.20	5,360.4	1,659.4	372.6	1,700.8	0.49	0.00	
5,780.0	1.10	132.70	5,445.4	1,658.0	373.8	1,699.7	0.46	-0.35	
5,866.0	1.50	227.00	5,531.4	1,656.7	373.6	1,698.3	2.24	0.47	
5,951.0	1.30	231.40	5,616.4	1,655.4	372.1	1,696.7	0.27	-0.24	
6,037.0	1.20	235.00	5,702.3	1,654.2	370.6	1,695.2	0.15	-0.12	
6,123.0	1.10	232.70	5,788.3	1,653.2	369.2	1,693.9	0.13	-0.12	
6,208.0	0.70	221.80	5,873.3	1,652.3	368.2	1,692.9	0.51	-0.47	
6,294.0	0.50	220.90	5,959.3	1,651.7	367.6	1,692.1	0.23	-0.23	
6,379.0	0.70	217.60	6,044.3	1,651.0	367.0	1,691.3	0.24	0.24	
6,465.0	0.60	236.40	6,130.3	1,650.3	366.3	1,690.5	0.27	-0.12	
6,550.0	0.30	253.60	6,215.3	1,650.0	365.7	1,690.0	0.38	-0.35	
6,636.0	0.50	244.30	6,301.3	1,649.8	365.2	1,689.7	0.24	0.23	
6,721.0	0.10	198.80	6,386.3	1,649.5	364.8	1,689.4	0.51	-0.47	
6,807.0	0.10	41.00	6,472.3	1,649.5	364.8	1,689.4	0.23	0.00	
6,892.0	0.30	58.20	6,557.3	1,649.7	365.1	1,689.6	0.24	0.24	
6,978.0	0.70	73.40	6,643.3	1,650.0	365.8	1,690.0	0.49	0.47	
7,063.0	1.00	74.30	6,728.3	1,650.3	367.0	1,690.6	0.35	0.35	
7,149.0	1.20	79.40	6,814.3	1,650.7	368.6	1,691.3	0.26	0.23	
7,234.0	1.70	63.90	6,899.2	1,651.4	370.6	1,692.5	0.74	0.59	
7,320.0	1.60	74.10	6,985.2	1,652.3	372.9	1,693.8	0.36	-0.12	
7,405.0	1.50	68.70	7,070.2	1,653.0	375.1	1,695.0	0.21	-0.12	
7,491.0	1.10	67.60	7,156.2	1,653.7	376.9	1,696.1	0.47	-0.47	
7,576.0	1.40	69.30	7,241.1	1,654.4	378.6	1,697.2	0.36	0.35	
7,662.0	1.20	66.20	7,327.1	1,655.2	380.4	1,698.3	0.25	-0.23	
7,747.0	1.20	74.90	7,412.1	1,655.7	382.1	1,699.2	0.21	0.00	
7,833.0	1.30	67.20	7,498.1	1,656.4	383.9	1,700.2	0.23	0.12	
7,918.0	1.20	68.60	7,583.1	1,657.1	385.6	1,701.3	0.12	-0.12	
8,004.0	1.30	72.00	7,669.0	1,657.7	387.3	1,702.3	0.14	0.12	
8,090.0	1.10	61.30	7,755.0	1,658.4	389.0	1,703.3	0.35	-0.23	
8,175.0	1.10	66.80	7,840.0	1,659.1	390.5	1,704.3	0.12	0.00	
8,261.0	1.00	57.30	7,926.0	1,659.8	391.9	1,705.3	0.23	-0.12	
8,426.0	0.60	122.50	8,091.0	1,660.1	393.8	1,706.0	0.56	-0.24	Last Cathedral Survey @ 8,426' MD
8,471.0	0.49	140.80	8,136.0	1,659.9	394.1	1,705.9	0.45	-0.24	Projection to Bit @ 8,471'

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Hein 29-1
Project:	DJ Wattenberg	TVD Reference:	WELL @ 4959.0ft (Xtreme 15)
Site:	S01N-67W-01-22 (Hein 5-1 Pad)	MD Reference:	WELL @ 4959.0ft (Xtreme 15)
Well:	Hein 29-1	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 29-1 PBHL	0.00	0.42	8,117.0	1,654.2	368.5	1,275,350.44	3,183,517.02	40.087358	-104.844118
- survey misses target center by 26.2ft at 8451.9ft MD (8116.9 TVD, 1660.0 N, 394.0 E)									
- Circle (radius 50.0)									

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)	Comment	
8,426.0	8,091.0	1,660.1	393.8	Last Cathedral Survey @ 8,426' MD	
8,471.0	8,136.0	1,659.9	394.1	Projection to Bit @ 8,471'	

Checked By: _____ Approved By: _____ Date: _____