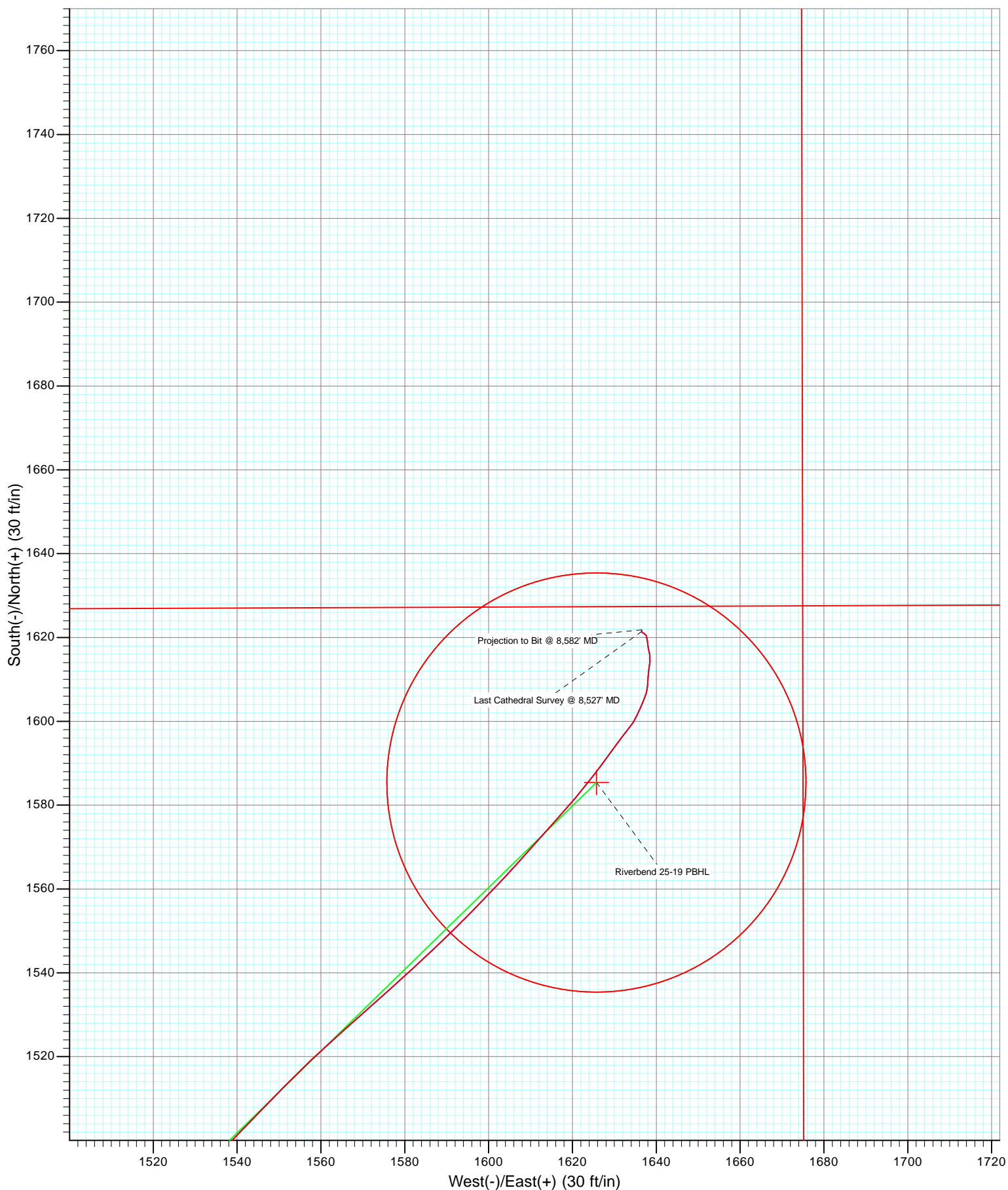


DD Riverbend 25-19 115xxx; LR KBE @ 4951.0ft (Xtreme 14) North American Datum 1983 Well Riverbend 25-19, True North							
Type Target	Target Riverbend 25-19 PBHL	Azimuth 45.72	Origin Type Slot	N/S 0.0	E/W 0.0	From TVD 0.0	
Name Riverbend 25-19 PBHL	TVD 8079.0	+N/-S 1585.4	+E/-W 1625.7	Latitude 40.036551	Longitude -104.820109		



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 25-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 25-19	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		SWSW Sec19-T1N-R66W (Riverbend 5)			
Site Position:		Northing:	1,255,233.31 ft	Latitude:	40.032027
From:	Lat/Long	Easting:	3,188,750.05 ft	Longitude:	-104.825962
Position Uncertainty:	0.0 ft	Slot Radius:	0.000 in	Grid Convergence:	0.44 °

Well	Riverbend 25-19					
Well Position	+N/-S	0.0 ft	Northing:	1,255,296.05 ft	Latitude:	40.032199
	+E/-W	0.0 ft	Easting:	3,188,762.73 ft	Longitude:	-104.825915
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,929.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/23/2011	8.84	66.74	52,910

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	45.72	

Survey Program	Date	9/6/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
78.0	8,582.0	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		
78.0	0.90	299.90	78.0	0.3	-0.5	-0.2	1.15	1.15		
171.0	0.90	346.70	171.0	1.4	-1.3	0.0	0.77	0.00		
265.0	2.70	33.20	264.9	4.0	-0.3	2.6	2.32	1.91		
358.0	4.70	39.70	357.7	8.7	3.3	8.5	2.19	2.15		
449.0	6.80	50.00	448.3	15.0	9.9	17.6	2.56	2.31		
538.0	8.70	49.40	536.5	22.8	19.0	29.5	2.14	2.13		
626.0	9.90	50.50	623.3	32.0	29.9	43.7	1.38	1.36		
716.0	11.80	47.70	711.7	43.1	42.7	60.6	2.19	2.11		
806.0	14.20	46.10	799.4	56.9	57.4	80.9	2.70	2.67		
893.0	16.40	46.00	883.3	72.9	74.0	103.8	2.53	2.53		
970.0	18.20	47.80	956.8	88.5	90.7	126.7	2.44	2.34		
1,051.0	17.90	49.00	1,033.8	105.2	109.5	151.8	0.59	-0.37		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 25-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 25-19	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
1,139.0	17.90	46.90	1,117.6	123.3	129.5	178.8	0.73	0.00	
1,228.0	18.50	46.40	1,202.1	142.3	149.7	206.6	0.70	0.67	
1,318.0	20.30	46.00	1,287.0	163.0	171.3	236.5	2.01	2.00	
1,406.0	21.30	44.40	1,369.3	185.1	193.5	267.7	1.31	1.14	
1,495.0	23.00	44.70	1,451.7	209.0	217.0	301.3	1.91	1.91	
1,582.0	25.30	43.50	1,531.1	234.5	241.8	336.9	2.70	2.64	
1,671.0	26.20	42.90	1,611.2	262.7	268.2	375.5	1.05	1.01	
1,761.0	26.80	43.50	1,691.8	292.0	295.7	415.6	0.73	0.67	
1,850.0	26.50	42.00	1,771.3	321.3	322.8	455.5	0.83	-0.34	
1,937.0	25.80	43.30	1,849.4	349.5	348.8	493.7	1.04	-0.80	
2,025.0	25.70	43.90	1,928.7	377.2	375.2	531.9	0.32	-0.11	
2,113.0	24.10	44.40	2,008.5	403.8	401.0	569.0	1.83	-1.82	
2,201.0	24.00	47.80	2,088.9	428.7	426.8	604.8	1.58	-0.11	
2,289.0	24.70	49.60	2,169.0	452.6	454.1	641.1	1.16	0.80	
2,377.0	25.70	46.50	2,248.7	477.6	481.9	678.5	1.88	1.14	
2,465.0	25.00	48.00	2,328.2	503.2	509.6	716.1	1.08	-0.80	
2,555.0	25.40	44.30	2,409.6	529.8	537.2	754.5	1.81	0.44	
2,644.0	25.20	43.00	2,490.1	557.3	563.4	792.5	0.66	-0.22	
2,733.0	26.20	43.70	2,570.3	585.3	589.9	831.0	1.17	1.12	
2,820.0	26.50	43.60	2,648.2	613.3	616.6	869.6	0.35	0.34	
2,910.0	25.70	42.80	2,729.1	642.1	643.7	909.2	0.97	-0.89	
2,999.0	24.50	44.40	2,809.7	669.5	669.7	946.9	1.55	-1.35	
3,089.0	21.50	45.90	2,892.5	694.3	694.6	982.0	3.40	-3.33	
3,177.0	21.00	48.50	2,974.5	716.0	718.0	1,013.9	1.21	-0.57	
3,265.0	22.90	48.10	3,056.1	737.9	742.6	1,046.8	2.17	2.16	
3,353.0	23.70	49.80	3,137.0	760.7	768.8	1,081.5	1.19	0.91	
3,440.0	24.00	49.70	3,216.5	783.4	795.7	1,116.6	0.35	0.34	
3,530.0	24.90	46.80	3,298.5	808.2	823.4	1,153.8	1.67	1.00	
3,619.0	25.40	47.30	3,379.0	834.0	851.1	1,191.6	0.61	0.56	
3,707.0	25.10	46.70	3,458.6	859.6	878.6	1,229.2	0.45	-0.34	
3,797.0	25.00	47.60	3,540.1	885.5	906.5	1,267.3	0.44	-0.11	
3,887.0	25.30	46.70	3,621.6	911.5	934.6	1,305.5	0.54	0.33	
3,975.0	24.90	45.70	3,701.3	937.4	961.5	1,342.8	0.66	-0.45	
4,063.0	25.20	46.40	3,781.0	963.2	988.3	1,380.1	0.48	0.34	
4,152.0	24.40	46.50	3,861.8	989.0	1,015.4	1,417.4	0.90	-0.90	
4,242.0	23.80	47.50	3,944.0	1,014.0	1,042.3	1,454.2	0.81	-0.67	
4,330.0	23.60	46.90	4,024.6	1,038.1	1,068.2	1,489.5	0.36	-0.23	
4,420.0	23.80	45.70	4,107.0	1,063.1	1,094.4	1,525.7	0.58	0.22	
4,509.0	23.70	44.80	4,188.4	1,088.3	1,119.8	1,561.5	0.42	-0.11	
4,599.0	23.70	45.50	4,270.8	1,113.8	1,145.5	1,597.7	0.31	0.00	
4,689.0	24.00	43.00	4,353.2	1,139.9	1,170.9	1,634.1	1.17	0.33	
4,776.0	24.30	43.80	4,432.5	1,165.7	1,195.3	1,669.6	0.51	0.34	
4,865.0	24.70	42.10	4,513.5	1,192.7	1,220.5	1,706.5	0.91	0.45	
4,952.0	24.70	44.60	4,592.6	1,219.2	1,245.4	1,742.8	1.20	0.00	
5,039.0	24.20	48.70	4,671.8	1,243.9	1,271.6	1,778.8	2.03	-0.57	
5,127.0	24.80	48.70	4,751.8	1,268.0	1,299.0	1,815.2	0.68	0.68	
5,215.0	26.00	47.60	4,831.3	1,293.2	1,327.1	1,852.9	1.47	1.36	
5,303.0	26.50	47.30	4,910.3	1,319.5	1,355.8	1,891.8	0.59	0.57	
5,393.0	25.20	47.20	4,991.3	1,346.1	1,384.6	1,931.1	1.45	-1.44	
5,479.0	25.00	46.60	5,069.1	1,371.0	1,411.2	1,967.5	0.38	-0.23	
5,569.0	23.00	45.80	5,151.4	1,396.4	1,437.6	2,004.2	2.25	-2.22	
5,658.0	21.20	45.50	5,233.8	1,419.8	1,461.6	2,037.6	2.03	-2.02	
5,745.0	19.80	43.60	5,315.3	1,441.5	1,483.0	2,068.1	1.78	-1.61	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 25-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 25-19	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
5,834.0	17.80	42.50	5,399.5	1,462.4	1,502.6	2,096.7	2.28	-2.25	
5,922.0	16.70	44.70	5,483.6	1,481.3	1,520.5	2,122.8	1.45	-1.25	
6,010.0	14.40	44.00	5,568.4	1,498.2	1,537.0	2,146.4	2.62	-2.61	
6,097.0	12.20	44.20	5,653.0	1,512.6	1,551.0	2,166.4	2.53	-2.53	
6,186.0	11.70	48.70	5,740.1	1,525.2	1,564.3	2,184.8	1.19	-0.56	
6,275.0	9.70	48.00	5,827.5	1,536.2	1,576.6	2,201.3	2.25	-2.25	
6,365.0	8.50	46.40	5,916.4	1,545.9	1,587.1	2,215.5	1.36	-1.33	
6,454.0	7.40	44.80	6,004.6	1,554.5	1,595.9	2,227.9	1.26	-1.24	
6,542.0	6.70	42.70	6,091.9	1,562.3	1,603.4	2,238.6	0.85	-0.80	
6,632.0	5.70	41.40	6,181.4	1,569.5	1,609.9	2,248.3	1.12	-1.11	
6,718.0	5.40	42.10	6,267.0	1,575.7	1,615.4	2,256.6	0.36	-0.35	
6,808.0	5.00	40.30	6,356.6	1,581.8	1,620.8	2,264.8	0.48	-0.44	
6,896.0	4.20	37.00	6,444.3	1,587.3	1,625.2	2,271.8	0.96	-0.91	
6,984.0	3.90	35.90	6,532.1	1,592.3	1,628.9	2,277.9	0.35	-0.34	
7,072.0	1.80	37.50	6,620.0	1,595.8	1,631.5	2,282.2	2.39	-2.39	
7,162.0	1.50	38.50	6,709.9	1,597.9	1,633.1	2,284.8	0.33	-0.33	
7,250.0	1.40	34.30	6,797.9	1,599.7	1,634.4	2,287.0	0.17	-0.11	
7,338.0	1.50	22.50	6,885.9	1,601.6	1,635.5	2,289.1	0.36	0.11	
7,427.0	1.30	26.70	6,974.8	1,603.6	1,636.4	2,291.1	0.25	-0.22	
7,517.0	1.20	18.10	7,064.8	1,605.4	1,637.1	2,292.9	0.24	-0.11	
7,607.0	0.70	21.10	7,154.8	1,606.8	1,637.6	2,294.3	0.56	-0.56	
7,694.0	1.50	4.40	7,241.8	1,608.5	1,637.9	2,295.6	0.98	0.92	
7,782.0	1.20	2.50	7,329.8	1,610.5	1,638.0	2,297.1	0.34	-0.34	
7,872.0	1.30	8.10	7,419.8	1,612.5	1,638.2	2,298.6	0.18	0.11	
7,961.0	1.00	7.40	7,508.8	1,614.3	1,638.5	2,300.0	0.34	-0.34	
8,048.0	1.10	351.90	7,595.7	1,615.8	1,638.4	2,301.1	0.34	0.11	
8,138.0	1.00	341.90	7,685.7	1,617.4	1,638.1	2,302.0	0.23	-0.11	
8,226.0	1.20	1.50	7,773.7	1,619.1	1,637.9	2,303.0	0.48	0.23	
8,314.0	0.70	329.20	7,861.7	1,620.5	1,637.6	2,303.8	0.81	-0.57	
8,402.0	0.40	278.80	7,949.7	1,621.0	1,637.0	2,303.7	0.62	-0.34	
8,492.0	0.30	328.70	8,039.7	1,621.2	1,636.6	2,303.6	0.34	-0.11	
8,527.0	0.40	351.69	8,074.7	1,621.4	1,636.5	2,303.7	0.49	0.29	Last Cathedral Survey @ 8,527' MD
8,582.0	0.40	351.70	8,129.7	1,621.8	1,636.5	2,303.9	0.00	0.00	Projection to Bit @ 8,582' MD

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 25-19
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4951.0ft (Xtreme 14)
Site:	SWSW Sec19-T1N-R66W (Riverbend 5)	MD Reference:	KBE @ 4951.0ft (Xtreme 14)
Well:	Riverbend 25-19	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Riverbend 25-19 PBHL	0.00	0.00	8,079.0	1,585.4	1,625.7	1,256,893.75	3,190,376.33	40.036551	-104.820109
- survey misses target center by 37.9ft at 8527.0ft MD (8074.7 TVD, 1621.4 N, 1636.5 E)									
- Circle (radius 50.0)									

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	Comment	
8,527.0	8,074.7	1,621.4	1,636.5	Last Cathedral Survey @ 8,527' MD	
8,582.0	8,129.7	1,621.8	1,636.5	Projection to Bit @ 8,582' MD	

Checked By: _____ Approved By: _____ Date: _____