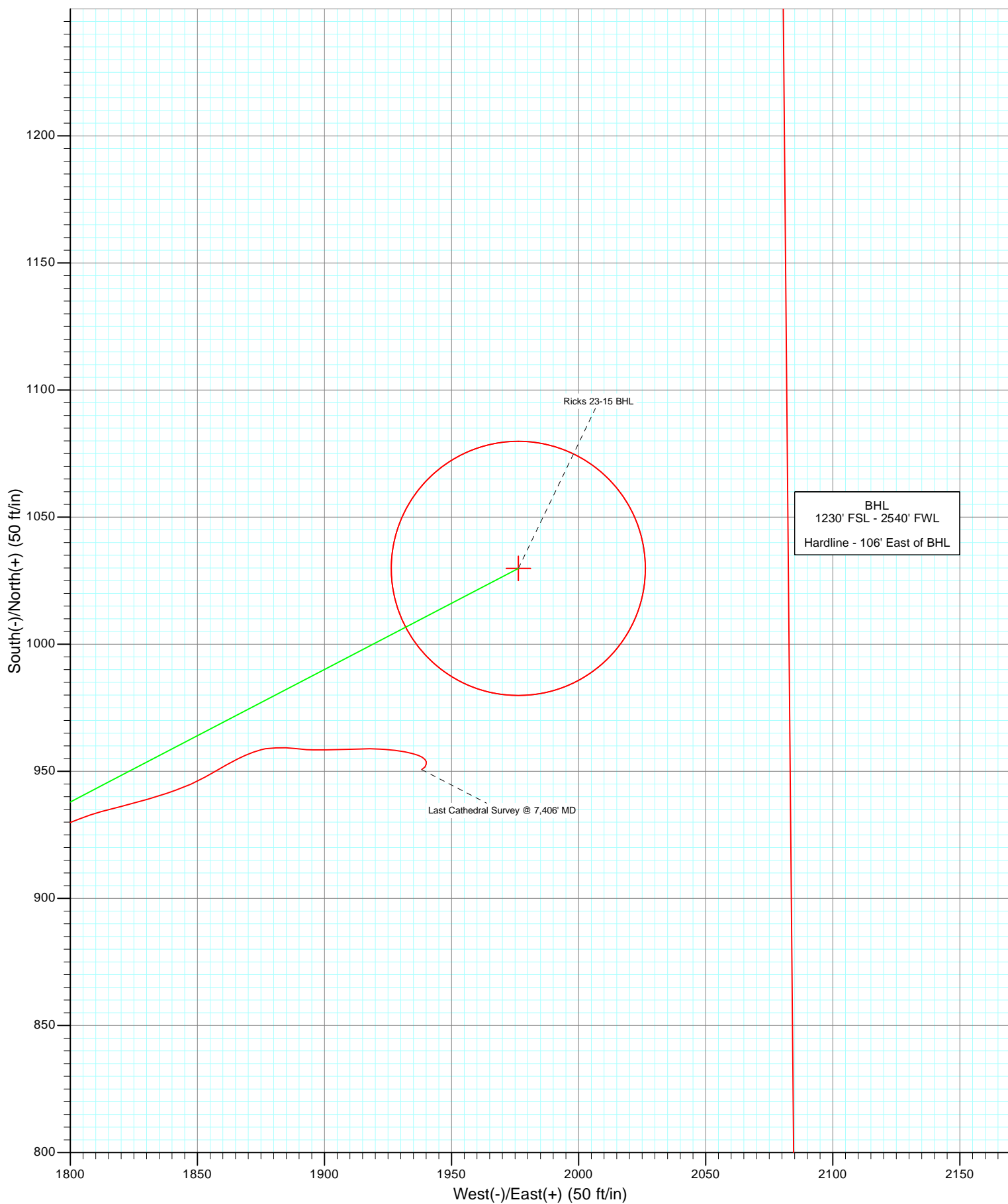


Azimuths to Grid North
True North: -0.54°
Magnetic North: 8.22°

Magnetic Field
Strength: 52983.6snT
Dip Angle: 66.85°
Date: 8/16/2011
Model: IGRF2010

DD Ricks 23-15 115320, 97657; BH KBE @ 4897.0ft (Xtreme 14) North American Datum 1983 Well Ricks 23-15, Grid North					
Type	Target	Azimuth	Origin Type	N/S	E/W
User	No Target (Freehand)	62.48	Slot	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Ricks 23-15 TGT	6380.0	1029.8	1976.3	40.134764	-104.650506
Ricks 23-15 BHL	7765.0	1029.8	1976.3	40.134764	-104.650506



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Ricks 23-15
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4897.0ft (Xtreme 14)
Site:	SWSW Sec15-2N-R65W (Ricks)	MD Reference:	KBE @ 4897.0ft (Xtreme 14)
Well:	Ricks 23-15	North Reference:	Grid
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 Sec15-2N-R65W (Ricks)			
Site Position:		Northing:	1,292,048.25 ft	Latitude:	40.131989
From:	Lat/Long	Easting:	3,235,497.23 ft	Longitude:	-104.657780
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.54 °

Well	Ricks 23-15					
Well Position	+N/-S	0.0 ft	Northing:	1,292,048.65 ft	Latitude:	40.131989
	+E/-W	0.0 ft	Easting:	3,235,545.04 ft	Longitude:	-104.657609
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,875.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/16/2011	8.76	66.85	52,984

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	62.48	

Survey Program	Date	8/22/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
59.0	7,406.0	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		
59.0	1.10	272.16	59.0	0.0	-0.6	-0.5	1.86	1.86		
153.0	0.80	354.06	153.0	0.7	-1.5	-1.0	1.35	-0.32		
246.0	2.50	49.36	245.9	2.7	-0.1	1.2	2.31	1.83		
339.0	4.60	54.06	338.8	6.2	4.5	6.8	2.28	2.26		
416.0	5.40	57.16	415.5	10.0	10.0	13.5	1.10	1.04		
504.0	7.80	59.06	502.9	15.3	18.6	23.6	2.74	2.73		
594.0	10.20	62.76	591.8	22.1	31.0	37.7	2.74	2.67		
682.0	12.50	65.26	678.0	29.6	46.5	55.0	2.67	2.61		
772.0	13.80	63.46	765.7	38.5	65.0	75.4	1.51	1.44		
861.0	16.10	61.96	851.7	49.0	85.4	98.4	2.62	2.58		
890.0	15.80	62.46	879.5	52.8	92.4	106.4	1.14	-1.03		
934.0	15.60	63.16	921.9	58.2	103.0	118.3	0.63	-0.45		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Ricks 23-15
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4897.0ft (Xtreme 14)
Site:	SWSW Sec15-2N-R65W (Ricks)	MD Reference:	KBE @ 4897.0ft (Xtreme 14)
Well:	Ricks 23-15	North Reference:	Grid
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
1,021.0	15.90	64.16	1,005.6	68.7	124.2	141.9	0.47	0.34	
1,109.0	18.10	64.56	1,089.8	79.8	147.4	167.6	2.50	2.50	
1,198.0	19.30	61.36	1,174.1	92.8	172.8	196.1	1.77	1.35	
1,286.0	20.10	63.86	1,256.9	106.4	199.1	225.8	1.32	0.91	
1,376.0	23.20	61.96	1,340.6	121.6	228.6	259.0	3.53	3.44	
1,463.0	24.70	63.56	1,420.1	137.7	260.0	294.3	1.88	1.72	
1,551.0	26.40	62.76	1,499.5	154.9	293.9	332.2	1.97	1.93	
1,641.0	25.80	62.26	1,580.3	173.2	329.0	371.8	0.71	-0.67	
1,730.0	25.40	61.16	1,660.6	191.4	362.9	410.3	0.70	-0.45	
1,818.0	23.70	61.36	1,740.6	209.0	394.9	446.8	1.93	-1.93	
1,905.0	24.20	61.96	1,820.1	225.7	426.0	482.1	0.64	0.57	
1,995.0	23.10	60.56	1,902.6	243.1	457.7	518.2	1.37	-1.22	
2,084.0	24.80	61.16	1,983.9	260.7	489.2	554.3	1.93	1.91	
2,174.0	23.80	61.86	2,065.9	278.4	521.8	591.4	1.16	-1.11	
2,263.0	22.80	64.76	2,147.7	294.2	553.2	626.6	1.71	-1.12	
2,351.0	23.20	66.36	2,228.7	308.4	584.5	660.9	0.84	0.45	
2,439.0	23.20	68.96	2,309.6	321.6	616.6	695.4	1.16	0.00	
2,527.0	25.60	65.66	2,389.7	335.6	650.1	731.6	3.14	2.73	
2,617.0	26.00	63.66	2,470.7	352.4	685.5	770.8	1.06	0.44	
2,706.0	24.20	64.06	2,551.3	369.0	719.4	808.5	2.03	-2.02	
2,796.0	24.00	62.06	2,633.5	385.7	752.1	845.2	0.93	-0.22	
2,882.0	23.60	64.16	2,712.2	401.4	783.1	879.9	1.09	-0.47	
2,972.0	24.60	61.66	2,794.3	418.1	815.8	916.7	1.59	1.11	
3,061.0	27.70	61.56	2,874.2	436.8	850.3	955.9	3.48	3.48	
3,151.0	27.90	61.96	2,953.8	456.7	887.2	997.9	0.30	0.22	
3,240.0	25.10	62.56	3,033.4	475.2	922.4	1,037.6	3.16	-3.15	
3,328.0	24.50	64.26	3,113.3	491.7	955.4	1,074.5	1.06	-0.68	
3,417.0	24.60	66.66	3,194.3	507.0	989.0	1,111.4	1.13	0.11	
3,503.0	23.90	64.86	3,272.7	521.5	1,021.2	1,146.7	1.18	-0.81	
3,591.0	24.90	64.16	3,352.8	537.2	1,054.0	1,183.0	1.18	1.14	
3,681.0	23.60	62.76	3,434.9	553.7	1,087.1	1,219.9	1.58	-1.44	
3,770.0	21.30	61.16	3,517.1	569.6	1,117.1	1,253.9	2.67	-2.58	
3,858.0	21.60	60.26	3,599.1	585.4	1,145.2	1,286.1	0.51	0.34	
3,944.0	21.40	65.36	3,679.1	599.8	1,173.2	1,317.6	2.19	-0.23	
4,033.0	21.80	65.86	3,761.8	613.3	1,203.0	1,350.3	0.49	0.45	
4,121.0	22.80	65.36	3,843.2	627.1	1,233.4	1,383.6	1.16	1.14	
4,211.0	23.20	65.76	3,926.1	641.7	1,265.4	1,418.7	0.48	0.44	
4,299.0	24.20	61.96	4,006.7	657.3	1,297.2	1,454.1	2.07	1.14	
4,389.0	27.30	59.86	4,087.7	676.3	1,331.3	1,493.2	3.59	3.44	
4,478.0	26.10	59.86	4,167.2	696.4	1,365.9	1,533.1	1.35	-1.35	
4,564.0	24.70	57.66	4,244.9	715.5	1,397.4	1,569.9	1.96	-1.63	
4,652.0	23.60	64.06	4,325.2	733.1	1,428.8	1,605.8	3.23	-1.25	
4,742.0	25.00	61.56	4,407.3	750.0	1,461.7	1,642.9	1.93	1.56	
4,831.0	26.20	65.16	4,487.5	767.2	1,496.1	1,681.3	2.21	1.35	
4,919.0	25.80	64.16	4,566.6	783.7	1,531.0	1,719.9	0.67	-0.45	
5,008.0	26.20	65.66	4,646.6	800.3	1,566.3	1,758.8	0.86	0.45	
5,098.0	24.20	62.76	4,728.0	816.9	1,600.8	1,797.1	2.61	-2.22	
5,187.0	22.10	62.86	4,809.9	832.9	1,631.9	1,832.1	2.36	-2.36	
5,277.0	19.90	55.96	4,893.9	849.2	1,659.7	1,864.3	3.67	-2.44	
5,366.0	19.10	60.26	4,977.8	864.9	1,684.9	1,893.9	1.85	-0.90	
5,455.0	18.60	62.26	5,062.0	878.7	1,710.1	1,922.6	0.92	-0.56	
5,545.0	20.00	59.36	5,147.0	893.3	1,736.0	1,952.3	1.88	1.56	
5,632.0	16.10	56.66	5,229.7	907.5	1,758.9	1,979.2	4.58	-4.48	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Ricks 23-15
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4897.0ft (Xtreme 14)
Site:	SWSW Sec15-2N-R65W (Ricks)	MD Reference:	KBE @ 4897.0ft (Xtreme 14)
Well:	Ricks 23-15	North Reference:	Grid
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
5,722.0	13.20	59.16	5,316.7	919.6	1,778.2	2,001.9	3.30	-3.22	
5,809.0	12.10	68.76	5,401.6	928.0	1,795.2	2,020.9	2.72	-1.26	
5,852.0	12.00	68.56	5,443.7	931.3	1,803.6	2,029.8	0.25	-0.23	
5,897.0	11.60	74.96	5,487.7	934.2	1,812.3	2,038.9	3.04	-0.89	
5,942.0	10.50	75.76	5,531.9	936.3	1,820.6	2,047.3	2.47	-2.44	
5,987.0	10.20	74.36	5,576.2	938.4	1,828.4	2,055.2	0.87	-0.67	
6,031.0	8.60	71.36	5,619.6	940.5	1,835.3	2,062.2	3.80	-3.64	
6,076.0	8.10	72.06	5,664.1	942.6	1,841.5	2,068.7	1.13	-1.11	
6,121.0	8.30	65.46	5,708.6	944.9	1,847.5	2,075.0	2.14	0.44	
6,164.0	7.90	60.96	5,751.2	947.6	1,852.9	2,081.1	1.74	-0.93	
6,209.0	7.60	59.66	5,795.8	950.6	1,858.2	2,087.2	0.77	-0.67	
6,254.0	7.00	61.36	5,840.4	953.5	1,863.1	2,092.9	1.42	-1.33	
6,298.0	6.60	66.86	5,884.1	955.7	1,867.8	2,098.1	1.74	-0.91	
6,343.0	6.20	67.76	5,928.9	957.7	1,872.4	2,103.1	0.92	-0.89	
6,388.0	5.40	82.36	5,973.6	958.9	1,876.8	2,107.5	3.72	-1.78	
6,433.0	5.10	87.86	6,018.4	959.2	1,880.9	2,111.3	1.30	-0.67	
6,477.0	5.30	90.46	6,062.3	959.3	1,884.9	2,114.8	0.70	0.45	
6,522.0	5.20	99.46	6,107.1	958.9	1,889.0	2,118.3	1.84	-0.22	
6,567.0	5.20	91.86	6,151.9	958.5	1,893.0	2,121.7	1.53	0.00	
6,610.0	6.00	90.76	6,194.7	958.4	1,897.2	2,125.4	1.88	1.86	
6,655.0	5.90	88.46	6,239.4	958.5	1,901.9	2,129.5	0.57	-0.22	
6,700.0	4.90	87.96	6,284.2	958.6	1,906.1	2,133.4	2.22	-2.22	
6,744.0	4.90	91.76	6,328.1	958.6	1,909.9	2,136.7	0.74	0.00	
6,788.0	5.30	84.06	6,371.9	958.8	1,913.8	2,140.2	1.80	0.91	
6,831.0	5.70	92.66	6,414.7	958.9	1,917.9	2,143.9	2.13	0.93	
6,876.0	5.00	90.56	6,459.5	958.7	1,922.1	2,147.6	1.62	-1.56	
6,920.0	4.30	98.26	6,503.4	958.5	1,925.6	2,150.6	2.13	-1.59	
6,965.0	3.60	95.36	6,548.3	958.1	1,928.7	2,153.2	1.62	-1.56	
7,010.0	3.60	102.06	6,593.2	957.7	1,931.5	2,155.4	0.93	0.00	
7,055.0	2.60	102.66	6,638.1	957.2	1,933.9	2,157.3	2.22	-2.22	
7,098.0	2.20	107.16	6,681.1	956.7	1,935.6	2,158.6	1.03	-0.93	
7,143.0	2.10	109.36	6,726.0	956.2	1,937.2	2,159.8	0.29	-0.22	
7,186.0	1.90	125.36	6,769.0	955.5	1,938.5	2,160.7	1.37	-0.47	
7,231.0	1.60	133.26	6,814.0	954.6	1,939.6	2,161.2	0.85	-0.67	
7,274.0	1.20	175.96	6,857.0	953.8	1,940.1	2,161.2	2.52	-0.93	
7,318.0	1.50	188.56	6,901.0	952.8	1,940.0	2,160.7	0.96	0.68	
7,361.0	1.50	214.96	6,944.0	951.7	1,939.6	2,159.9	1.59	0.00	
7,406.0	2.90	239.45	6,988.9	950.7	1,938.3	2,158.2	3.68	3.11	Last Cathedral Survey @ 7,406' MD

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Ricks 23-15
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4897.0ft (Xtreme 14)
Site:	SWSW Sec15-2N-R65W (Ricks)	MD Reference:	KBE @ 4897.0ft (Xtreme 14)
Well:	Ricks 23-15	North Reference:	Grid
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									
Ricks 23-15 BHL	0.00	359.45	7,765.0	1,029.8	1,976.3	1,293,078.48	3,237,521.35	40.134764	-104.650506
- actual wellpath misses target center by 781.0ft at 7406.0ft MD (6988.9 TVD, 950.7 N, 1938.3 E)									
- Circle (radius 50.0)									
Ricks 23-15 TGT	0.00	359.45	6,380.0	1,029.8	1,976.3	1,293,078.48	3,237,521.35	40.134764	-104.650506
- actual wellpath misses target center by 93.9ft at 6802.2ft MD (6386.1 TVD, 958.9 N, 1915.1 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)	Comment	
7,406.0	6,988.9	950.7	1,938.3	Last Cathedral Survey @ 7,406' MD	

Checked By: _____ Approved By: _____ Date: _____