

CASING DETAILS

No casing data is available

FORMATION TOP DETAILS

No formation data is available



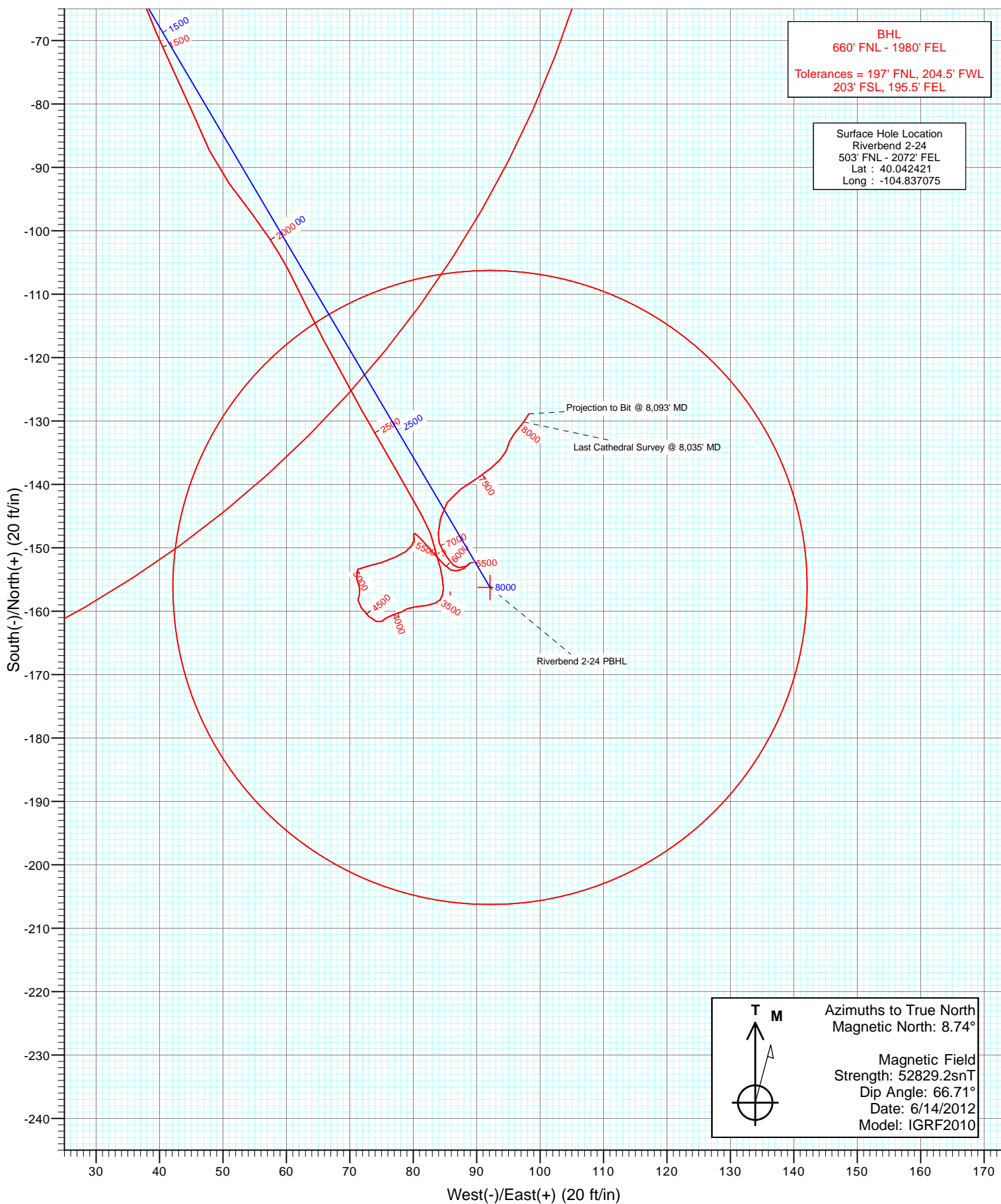
Azimuths to True North
Magnetic North: 8.74°

Magnetic Field
Strength: 52829.2snT
Dip Angle: 66.71°
Date: 6/14/2012
Model: IGRF2010

~~FINAL~~

Riverbend 2-24
125411; 176255; DN
15' @ 4940.0ft (Xtreme 14)
GL @ 4925.0
North American Datum 1983
Riverbend 2-24, True North

Type	Target	Azimuth	Origin Type	N/S	E/W	From TVD
Target	Riverbend 2-24 PBHL	149.48	Slot	0.0	0.0	0.0
		TVD	+N/-S	+E/-W	Latitude	Longitude
Legal Box 2		-10000.0	-158.9	85.8	40.041985	-104.836768
Riverbend 2-24 LB 2		-8090.0	-4723.6	2085.5	40.029454	-104.829628
Riverbend 2-24 PBHL		8090.0	-158.3	92.1	40.041992	-104.836746



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 2-24
Project:	DJ Wattenberg	TVD Reference:	KB=15' @ 4940.0ft (Xtreme 14)
Site:	NWNE Sec24-T1N-R67W (Riverbend 2-24)	MD Reference:	KB=15' @ 4940.0ft (Xtreme 14)
Well:	Riverbend 2-24	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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		NWNE Sec24-T1N-R67W (Riverbend 2-24)			
Site Position:		Northing:	1,258,980.36 ft	Latitude:	40.042378
From:	Lat/Long	Easting:	3,185,610.05 ft	Longitude:	-104.837075
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.43 °

Well	Riverbend 2-24					
Well Position	+N/-S	0.0 ft	Northing:	1,258,996.00 ft	Latitude:	40.042421
	+E/-W	0.0 ft	Easting:	3,185,609.94 ft	Longitude:	-104.837075
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,925.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/14/2012	8.74	66.71	52,829

Design	FINAL				
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	149.48	

Survey Program	Date	7/16/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
264.0	8,093.0	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	Legal Box 2 - Riverbend 2-24 LB 2	
264.0	0.60	297.70	264.0	0.6	-1.2	-1.2	0.23	0.23		
358.0	0.10	298.30	358.0	0.9	-1.7	-1.7	0.53	-0.53		
448.0	1.00	149.50	448.0	0.3	-1.4	-0.9	1.21	1.00		
537.0	2.00	143.50	537.0	-1.6	-0.1	1.4	1.14	1.12		
627.0	3.80	141.50	626.8	-5.2	2.7	5.9	2.00	2.00		
716.0	4.90	145.80	715.6	-10.7	6.7	12.6	1.29	1.24		
805.0	6.00	149.70	804.2	-17.9	11.2	21.1	1.30	1.24		
893.0	5.90	154.30	891.7	-25.9	15.4	30.2	0.55	-0.11		
935.0	5.80	155.60	933.5	-29.8	17.3	34.4	0.40	-0.24		
1,034.0	5.70	156.70	1,032.0	-38.9	21.3	44.3	0.15	-0.10		
1,122.0	5.30	137.60	1,119.6	-45.9	25.7	52.6	2.12	-0.45		
1,210.0	4.00	144.70	1,207.3	-51.4	30.3	59.6	1.61	-1.48		

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Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 2-24
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Site:	NWNE Sec24-T1N-R67W (Riverbend 2-24)	MD Reference:	KB=15' @ 4940.0ft (Xtreme 14)
Well:	Riverbend 2-24	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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
1,296.0	3.90	144.50	1,293.1	-56.2	33.7	65.5	0.12	-0.12	
1,384.0	4.70	158.20	1,380.8	-62.0	36.8	72.1	1.47	0.91	
1,472.0	4.70	157.50	1,468.6	-68.7	39.5	79.2	0.07	0.00	
1,560.0	4.70	154.20	1,556.3	-75.2	42.4	86.4	0.31	0.00	
1,648.0	4.20	156.60	1,644.0	-81.4	45.3	93.2	0.61	-0.57	
1,737.0	4.00	155.80	1,732.8	-87.3	47.8	99.5	0.23	-0.22	
1,826.0	3.90	142.40	1,821.6	-92.5	51.0	105.6	1.04	-0.11	
1,914.0	3.60	143.50	1,909.4	-97.1	54.4	111.3	0.35	-0.34	
2,003.0	3.10	146.30	1,998.2	-101.3	57.4	116.5	0.59	-0.56	
2,092.0	4.10	151.30	2,087.0	-106.1	60.3	122.0	1.18	1.12	
2,181.0	3.80	156.20	2,175.8	-111.6	63.0	128.2	0.51	-0.34	
2,268.0	4.40	150.20	2,262.6	-117.2	65.8	134.4	0.85	0.69	
2,357.0	4.20	152.80	2,351.4	-123.0	69.0	141.0	0.31	-0.22	
2,445.0	3.80	150.20	2,439.1	-128.4	71.9	147.2	0.50	-0.45	
2,534.0	3.60	149.70	2,528.0	-133.4	74.8	152.9	0.23	-0.22	
2,623.0	3.00	150.70	2,616.8	-137.8	77.4	158.0	0.68	-0.67	
2,712.0	2.50	150.10	2,705.7	-141.5	79.5	162.3	0.56	-0.56	
2,802.0	2.40	150.90	2,795.6	-144.9	81.4	166.1	0.12	-0.11	
2,890.0	1.80	159.40	2,883.6	-147.8	82.8	169.3	0.77	-0.68	
2,980.0	1.50	169.60	2,973.5	-150.3	83.5	171.8	0.47	-0.33	
3,069.0	0.80	156.10	3,062.5	-152.0	83.9	173.5	0.84	-0.79	
3,156.0	0.90	170.00	3,149.5	-153.2	84.3	174.8	0.26	0.11	
3,244.0	1.20	169.20	3,237.5	-154.8	84.6	176.3	0.34	0.34	
3,332.0	0.80	178.60	3,325.5	-156.3	84.8	177.7	0.49	-0.45	
3,421.0	0.60	199.60	3,414.5	-157.4	84.6	178.6	0.36	-0.22	
3,509.0	0.60	211.90	3,502.5	-158.2	84.2	179.1	0.15	0.00	
3,597.0	0.70	255.10	3,590.4	-158.7	83.5	179.1	0.55	0.11	
3,686.0	1.10	255.40	3,679.4	-159.1	82.1	178.7	0.45	0.45	
3,774.0	1.40	269.00	3,767.4	-159.3	80.2	178.0	0.48	0.34	
3,863.0	0.40	204.90	3,856.4	-159.6	79.0	177.6	1.43	-1.12	
3,951.0	0.70	256.60	3,944.4	-160.0	78.4	177.6	0.63	0.34	
4,039.0	0.90	245.40	4,032.4	-160.4	77.2	177.4	0.29	0.23	
4,128.0	0.60	251.40	4,121.4	-160.9	76.1	177.2	0.35	-0.34	
4,216.0	0.30	224.10	4,209.4	-161.2	75.5	177.2	0.41	-0.34	
4,304.0	0.40	225.90	4,297.4	-161.6	75.1	177.3	0.11	0.11	
4,392.0	0.90	283.50	4,385.4	-161.6	74.3	176.9	0.87	0.57	
4,480.0	1.10	317.70	4,473.4	-160.8	73.0	175.6	0.70	0.23	
4,568.0	1.30	320.00	4,561.3	-159.4	71.8	173.8	0.23	0.23	
4,655.0	0.60	14.80	4,648.3	-158.2	71.3	172.5	1.23	-0.80	
4,744.0	0.60	15.70	4,737.3	-157.4	71.5	171.9	0.01	0.00	
4,831.0	0.70	351.00	4,824.3	-156.4	71.6	171.1	0.34	0.11	
4,918.0	1.50	339.70	4,911.3	-154.8	71.1	169.5	0.95	0.92	
5,008.0	0.80	62.20	5,001.3	-153.4	71.2	168.3	1.78	-0.78	
5,096.0	1.50	78.30	5,089.3	-152.9	72.9	168.7	0.87	0.80	
5,184.0	1.50	71.00	5,177.2	-152.3	75.1	169.3	0.22	0.00	
5,271.0	1.40	66.80	5,264.2	-151.5	77.2	169.7	0.17	-0.11	
5,359.0	1.00	54.40	5,352.2	-150.6	78.8	169.8	0.54	-0.45	
5,447.0	0.70	34.30	5,440.2	-149.7	79.7	169.5	0.48	-0.34	
5,536.0	0.60	19.20	5,529.2	-148.8	80.2	168.9	0.22	-0.11	
5,625.0	0.70	332.30	5,618.2	-147.9	80.1	168.1	0.59	0.11	
5,714.0	0.70	124.40	5,707.2	-147.7	80.3	168.0	1.53	0.00	
5,804.0	2.00	138.40	5,797.1	-149.2	81.8	170.1	1.48	1.44	
5,893.0	1.50	138.80	5,886.1	-151.3	83.6	172.7	0.56	-0.56	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Riverbend 2-24
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Site:	NWNE Sec24-T1N-R67W (Riverbend 2-24)	MD Reference:	KB=15' @ 4940.0ft (Xtreme 14)
Well:	Riverbend 2-24	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	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
5,983.0	1.00	134.60	5,976.1	-152.7	84.9	174.7	0.56	-0.56	
6,071.0	0.70	116.10	6,064.1	-153.5	85.9	175.8	0.46	-0.34	
6,159.0	0.40	76.20	6,152.1	-153.6	86.7	176.4	0.53	-0.34	
6,247.0	0.40	82.00	6,240.1	-153.5	87.3	176.6	0.05	0.00	
6,336.0	0.60	60.10	6,329.1	-153.2	88.0	176.7	0.31	0.22	
6,423.0	0.70	35.50	6,416.1	-152.6	88.7	176.5	0.34	0.11	
6,512.0	0.30	182.10	6,505.1	-152.4	89.0	176.5	1.08	-0.45	
6,602.0	0.90	247.00	6,595.1	-152.9	88.4	176.6	0.91	0.67	
6,689.0	0.70	271.10	6,682.0	-153.1	87.2	176.2	0.44	-0.23	
6,777.0	0.70	319.30	6,770.0	-152.7	86.3	175.4	0.65	0.00	
6,865.0	0.90	322.80	6,858.0	-151.8	85.6	174.2	0.23	0.23	
6,953.0	1.10	328.50	6,946.0	-150.5	84.7	172.7	0.25	0.23	
7,039.0	0.80	344.60	7,032.0	-149.2	84.1	171.3	0.46	-0.35	
7,129.0	1.20	1.00	7,122.0	-147.7	84.0	169.8	0.54	0.44	
7,218.0	1.80	14.00	7,211.0	-145.4	84.3	168.1	0.77	0.67	
7,305.0	1.80	30.90	7,297.9	-142.9	85.4	166.4	0.61	0.00	
7,392.0	2.20	56.20	7,384.9	-140.8	87.4	165.7	1.10	0.46	
7,480.0	2.00	56.60	7,472.8	-139.0	90.1	165.5	0.23	-0.23	
7,568.0	1.50	50.10	7,560.8	-137.4	92.3	165.2	0.61	-0.57	
7,657.0	1.10	43.30	7,649.7	-136.0	93.8	164.8	0.48	-0.45	
7,745.0	1.00	24.20	7,737.7	-134.7	94.7	164.1	0.41	-0.11	
7,833.0	0.90	12.30	7,825.7	-133.3	95.1	163.2	0.25	-0.11	
7,922.0	1.10	45.00	7,914.7	-132.1	95.9	162.5	0.67	0.22	
8,035.0	1.40	34.80	8,027.7	-130.2	97.4	161.6	0.33	0.27	Last Cathedral Survey @ 8,035' MD
8,093.0	1.60	28.70	8,085.7	-128.9	98.2	160.9	0.44	0.34	Projection to Bit @ 8,093' MD - Riverbend 2-24 F

Targets										
Target Name										
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting			
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	Latitude	Longitude	
Legal Box 2	0.00	0.00	-10,000.0	-158.9	85.8	1,258,837.77	3,185,696.96	40.041985	-104.836768	
- survey misses target center by 10001.6ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Rectangle (sides W400.0 H400.0 D0.0)										
Riverbend 2-24 LB 2	0.00	0.00	-8,090.0	-4,723.6	2,085.5	1,254,288.17	3,187,730.66	40.029454	-104.829628	
- survey misses target center by 9597.4ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Rectangle (sides W400.0 H400.0 D0.0)										
Riverbend 2-24 PBHL	0.00	0.00	8,090.0	-156.3	92.1	1,258,840.44	3,185,703.22	40.041992	-104.836746	
- survey misses target center by 28.4ft at 8093.0ft MD (8085.7 TVD, -128.9 N, 98.2 E)										
- Circle (radius 50.0)										

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
8,035.0	8,027.7	-130.2	97.4	Last Cathedral Survey @ 8,035' MD	
8,093.0	8,085.7	-128.9	98.2	Projection to Bit @ 8,093' MD	

Checked By: _____ Approved By: _____ Date: _____