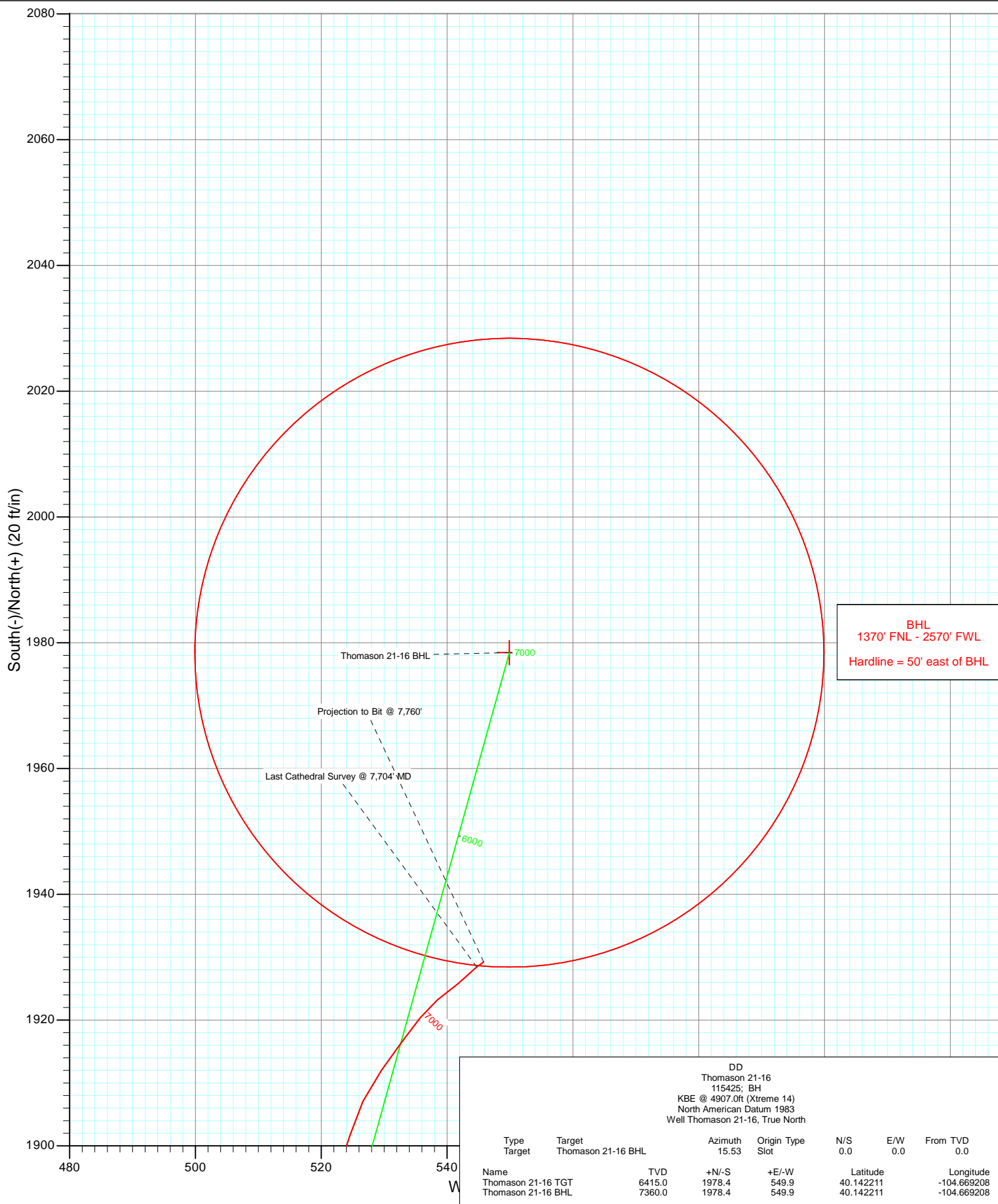


Azimuths to True North
Magnetic North: 8.75°

Magnetic Field
Strength: 52972.5snT
Dip Angle: 66.84°
Date: 9/27/2011
Model: IGRF2010

DD Thomason 21-16 115425; BH KBE @ 4907.0ft (Xtreme 14) North American Datum 1983 Well Thomason 21-16, True North						
Type	Target	Azimuth	Origin Type	N/S	E/W	From TVD
Target	Thomason 21-16 BHL	15.53	Slot	0.0	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Thomason 21-16 TGT	6415.0	1978.4	549.9	40.142211	-104.669208	
Thomason 21-16 BHL	7360.0	1978.4	549.9	40.142211	-104.669208	



Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Thomason 21-16
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4907.0ft (Xtreme 14)
Site:	S16-T2N-R65W (Thomason 6 pad)	MD Reference:	KBE @ 4907.0ft (Xtreme 14)
Well:	Thomason 21-16	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		S16-T2N-R65W (Thomason 6 pad)			
Site Position:		Northing:	1,293,758.15 ft	Latitude:	40.136780
From:	Lat/Long	Easting:	3,231,735.68 ft	Longitude:	-104.671175
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.54 °

Well	Thomason 21-16					
Well Position	+N/-S	0.0 ft	Northing:	1,293,758.14 ft	Latitude:	40.136780
	+E/-W	0.0 ft	Easting:	3,231,735.68 ft	Longitude:	-104.671175
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,885.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/27/2011	8.75	66.84	52,972

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	15.53	

Survey Program	Date	11/2/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
86.0	7,760.0	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		
86.0	0.70	15.70	86.0	0.5	0.1	0.5	0.81	0.81		
122.0	0.60	20.50	122.0	0.9	0.3	0.9	0.32	-0.28		
153.0	0.40	17.90	153.0	1.1	0.4	1.2	0.65	-0.65		
179.0	0.80	28.10	179.0	1.4	0.5	1.5	1.59	1.54		
210.0	1.50	39.00	210.0	1.9	0.8	2.1	2.36	2.26		
241.0	1.30	18.80	241.0	2.5	1.2	2.8	1.71	-0.65		
272.0	1.60	24.50	272.0	3.3	1.5	3.6	1.07	0.97		
303.0	1.80	35.80	303.0	4.1	2.0	4.4	1.26	0.65		
335.0	1.90	34.00	334.9	4.9	2.5	5.4	0.36	0.31		
367.0	2.40	32.00	366.9	5.9	3.2	6.6	1.58	1.56		
412.0	2.30	27.00	411.9	7.5	4.1	8.3	0.51	-0.22		
457.0	3.10	26.90	456.8	9.4	5.1	10.4	1.78	1.78		

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Thomason 21-16
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4907.0ft (Xtreme 14)
Site:	S16-T2N-R65W (Thomason 6 pad)	MD Reference:	KBE @ 4907.0ft (Xtreme 14)
Well:	Thomason 21-16	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
502.0	3.60	24.70	501.8	11.8	6.2	13.0	1.15	1.11	
546.0	3.60	19.60	545.7	14.3	7.2	15.8	0.73	0.00	
591.0	4.20	22.20	590.6	17.2	8.3	18.8	1.39	1.33	
636.0	4.60	13.40	635.4	20.5	9.4	22.2	1.74	0.89	
680.0	5.20	12.60	679.3	24.1	10.2	26.0	1.37	1.36	
725.0	5.70	12.70	724.1	28.3	11.2	30.3	1.11	1.11	
768.0	6.40	9.20	766.8	32.8	12.0	34.8	1.84	1.63	
813.0	6.80	11.00	811.5	37.8	12.9	39.9	1.00	0.89	
858.0	7.10	10.90	856.2	43.2	14.0	45.4	0.67	0.67	
907.0	8.10	10.70	904.8	49.6	15.2	51.8	2.04	2.04	
1,011.0	7.20	9.50	1,007.8	63.2	17.6	65.6	0.88	-0.87	
1,100.0	9.50	11.30	1,095.9	75.9	20.0	78.5	2.60	2.58	
1,190.0	11.10	18.50	1,184.4	91.4	24.2	94.5	2.28	1.78	
1,278.0	12.80	15.80	1,270.5	108.8	29.5	112.7	2.03	1.93	
1,366.0	14.60	15.40	1,356.0	128.9	35.1	133.6	2.05	2.05	
1,455.0	17.00	17.50	1,441.7	152.1	42.0	157.8	2.77	2.70	
1,543.0	18.80	14.40	1,525.4	178.1	49.4	184.8	2.31	2.05	
1,631.0	20.90	16.70	1,608.2	206.9	57.4	214.7	2.55	2.39	
1,719.0	22.70	12.60	1,689.9	238.5	65.7	247.4	2.68	2.05	
1,808.0	24.20	16.50	1,771.5	272.8	74.6	282.8	2.42	1.69	
1,898.0	23.20	13.20	1,853.9	307.7	83.9	318.9	1.85	-1.11	
1,987.0	24.00	11.70	1,935.5	342.5	91.5	354.5	1.12	0.90	
2,077.0	23.40	15.30	2,017.9	377.7	100.0	390.6	1.74	-0.67	
2,165.0	23.60	15.70	2,098.6	411.5	109.4	425.7	0.29	0.23	
2,254.0	24.10	15.30	2,180.0	446.1	119.0	461.7	0.59	0.56	
2,342.0	24.40	12.70	2,260.2	481.2	127.7	497.8	1.26	0.34	
2,430.0	24.30	15.20	2,340.4	516.4	136.5	534.1	1.18	-0.11	
2,519.0	24.30	15.50	2,421.5	551.7	146.1	570.7	0.14	0.00	
2,607.0	24.60	15.10	2,501.6	586.9	155.8	607.1	0.39	0.34	
2,697.0	24.60	13.30	2,583.5	623.2	164.9	644.6	0.83	0.00	
2,786.0	24.20	14.60	2,664.5	658.9	173.8	681.3	0.75	-0.45	
2,875.0	22.70	16.50	2,746.2	693.0	183.3	716.8	1.89	-1.69	
2,963.0	23.90	20.60	2,827.0	726.0	194.4	751.5	2.29	1.36	
3,050.0	25.30	22.30	2,906.1	759.7	207.6	787.5	1.80	1.61	
3,138.0	25.00	17.50	2,985.8	794.8	220.4	824.8	2.34	-0.34	
3,228.0	25.20	17.50	3,067.3	831.2	231.8	862.9	0.22	0.22	
3,315.0	26.30	12.90	3,145.6	867.7	241.7	900.7	2.62	1.26	
3,405.0	27.20	12.30	3,226.0	907.2	250.5	941.1	1.04	1.00	
3,493.0	26.00	15.20	3,304.7	945.5	259.9	980.5	2.01	-1.36	
3,581.0	24.90	17.30	3,384.1	981.8	270.5	1,018.3	1.62	-1.25	
3,669.0	23.80	15.00	3,464.3	1,016.6	280.6	1,054.6	1.65	-1.25	
3,758.0	23.00	18.90	3,546.0	1,050.4	290.8	1,089.9	1.96	-0.90	
3,846.0	22.90	16.40	3,627.0	1,083.1	301.2	1,124.2	1.11	-0.11	
3,934.0	24.20	16.30	3,707.7	1,116.8	311.1	1,159.4	1.48	1.48	
4,023.0	22.50	18.20	3,789.4	1,150.5	321.6	1,194.6	2.09	-1.91	
4,112.0	22.00	21.50	3,871.8	1,182.2	333.0	1,228.2	1.51	-0.56	
4,201.0	23.30	21.10	3,953.9	1,214.1	345.5	1,262.3	1.47	1.46	
4,245.0	24.90	19.80	3,994.1	1,231.0	351.7	1,280.2	3.83	3.64	
4,289.0	26.90	18.70	4,033.7	1,249.1	358.1	1,299.4	4.67	4.55	
4,334.0	28.50	18.30	4,073.5	1,269.0	364.7	1,320.3	3.58	3.56	
4,422.0	29.90	16.00	4,150.3	1,310.0	377.3	1,363.2	2.04	1.59	
4,510.0	27.80	18.90	4,227.4	1,350.5	390.0	1,405.6	2.87	-2.39	
4,599.0	26.40	13.10	4,306.7	1,389.4	401.2	1,446.1	3.36	-1.57	

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Thomason 21-16
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4907.0ft (Xtreme 14)
Site:	S16-T2N-R65W (Thomason 6 pad)	MD Reference:	KBE @ 4907.0ft (Xtreme 14)
Well:	Thomason 21-16	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
4,689.0	25.60	10.90	4,387.5	1,428.0	409.5	1,485.5	1.39	-0.89	
4,775.0	24.00	13.00	4,465.6	1,463.3	416.9	1,521.5	2.12	-1.86	
4,864.0	22.30	13.60	4,547.4	1,497.3	424.9	1,556.4	1.93	-1.91	
4,951.0	20.80	12.80	4,628.4	1,528.4	432.2	1,588.4	1.76	-1.72	
5,038.0	19.70	16.40	4,710.0	1,557.6	439.8	1,618.4	1.91	-1.26	
5,126.0	17.70	19.60	4,793.3	1,584.4	448.5	1,646.6	2.55	-2.27	
5,215.0	16.30	21.20	4,878.4	1,608.8	457.5	1,672.6	1.66	-1.57	
5,303.0	15.20	21.10	4,963.1	1,631.1	466.2	1,696.3	1.25	-1.25	
5,390.0	15.40	17.20	5,047.1	1,652.7	473.7	1,719.2	1.20	0.23	
5,479.0	13.50	16.70	5,133.2	1,674.0	480.2	1,741.4	2.14	-2.13	
5,569.0	12.00	17.10	5,221.0	1,693.0	485.9	1,761.3	1.67	-1.67	
5,656.0	11.10	12.80	5,306.3	1,709.8	490.4	1,778.7	1.43	-1.03	
5,744.0	11.30	17.50	5,392.6	1,726.3	494.9	1,795.8	1.06	0.23	
5,832.0	9.40	16.80	5,479.1	1,741.4	499.6	1,811.6	2.16	-2.16	
5,921.0	9.80	8.00	5,566.9	1,755.8	502.7	1,826.3	1.71	0.45	
6,011.0	8.90	13.50	5,655.7	1,770.2	505.4	1,840.9	1.41	-1.00	
6,100.0	10.20	8.00	5,743.5	1,784.7	508.1	1,855.6	1.78	1.46	
6,188.0	9.10	2.50	5,830.2	1,799.4	509.5	1,870.1	1.63	-1.25	
6,277.0	10.40	11.10	5,917.9	1,814.3	511.4	1,885.0	2.19	1.46	
6,365.0	9.80	5.70	6,004.6	1,829.5	513.7	1,900.3	1.27	-0.68	
6,455.0	9.00	1.50	6,093.4	1,844.2	514.6	1,914.6	1.17	-0.89	
6,543.0	8.00	4.50	6,180.4	1,857.2	515.3	1,927.3	1.24	-1.14	
6,629.0	7.70	4.70	6,265.6	1,868.9	516.2	1,938.9	0.35	-0.35	
6,718.0	6.30	16.70	6,353.9	1,879.5	518.1	1,949.6	2.27	-1.57	
6,808.0	4.80	14.30	6,443.5	1,887.9	520.4	1,958.3	1.69	-1.67	
6,897.0	4.80	17.50	6,532.2	1,895.0	522.5	1,965.7	0.30	0.00	
6,986.0	4.00	17.50	6,620.9	1,901.6	524.5	1,972.6	0.90	-0.90	
7,073.0	3.80	24.20	6,707.7	1,907.1	526.6	1,978.4	0.57	-0.23	
7,160.0	3.80	37.50	6,794.6	1,912.0	529.6	1,984.0	1.01	0.00	
7,248.0	3.40	34.00	6,882.4	1,916.5	532.8	1,989.2	0.52	-0.45	
7,338.0	2.80	40.80	6,972.2	1,920.3	535.7	1,993.7	0.78	-0.67	
7,514.0	2.00	56.70	7,148.1	1,925.3	541.1	1,999.9	0.59	-0.45	
7,546.0	1.40	46.10	7,180.1	1,925.9	541.9	2,000.6	2.11	-1.87	
7,691.0	1.40	50.00	7,325.0	1,928.2	544.5	2,003.6	0.07	0.00	
7,704.0	1.40	53.00	7,338.0	1,928.4	544.7	2,003.9	0.56	0.00	Last Cathedral Survey @ 7,704' MD
7,760.0	1.40	53.00	7,394.0	1,929.2	545.8	2,005.0	0.00	0.00	Projection to Bit @ 7,760'

Cathedral Energy Services

Survey Report

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Thomason 21-16
Project:	DJ Wattenberg	TVD Reference:	KBE @ 4907.0ft (Xtreme 14)
Site:	S16-T2N-R65W (Thomason 6 pad)	MD Reference:	KBE @ 4907.0ft (Xtreme 14)
Well:	Thomason 21-16	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									
Thomason 21-16 TGT	0.00	0.00	6,415.0	1,978.4	549.9	1,295,741.61	3,232,267.08	40.142211	-104.669208
- survey misses target center by 97.3ft at 6788.8ft MD (6424.4 TVD, 1886.3 N, 520.0 E)									
- Point									
Thomason 21-16 BHL	0.00	0.00	7,360.0	1,978.4	549.9	1,295,741.61	3,232,267.08	40.142211	-104.669208
- survey misses target center by 54.9ft at 7704.0ft MD (7338.0 TVD, 1928.4 N, 544.7 E)									
- Circle (radius 50.0)									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
7,704.0	7,338.0	1,928.4	544.7	Last Cathedral Survey @ 7,704' MD
7,760.0	7,394.0	1,929.2	545.8	Projection to Bit @ 7,760'

Checked By: _____ Approved By: _____ Date: _____