

ENSIGN

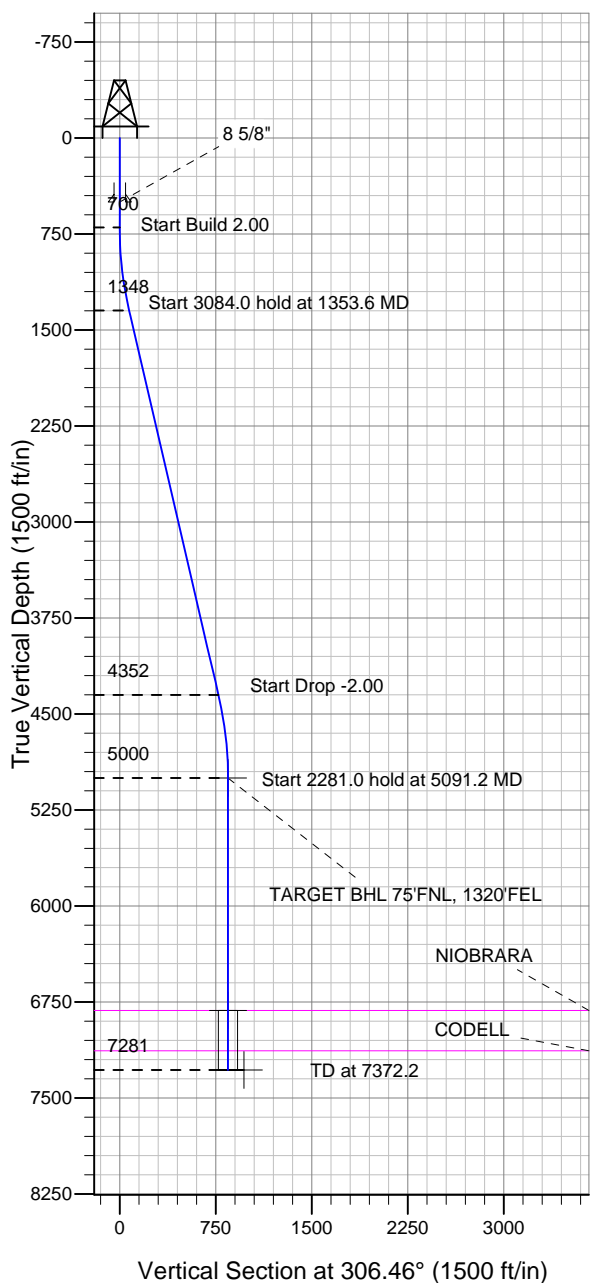
Directional

Well Name: Willmann PC G16-27D

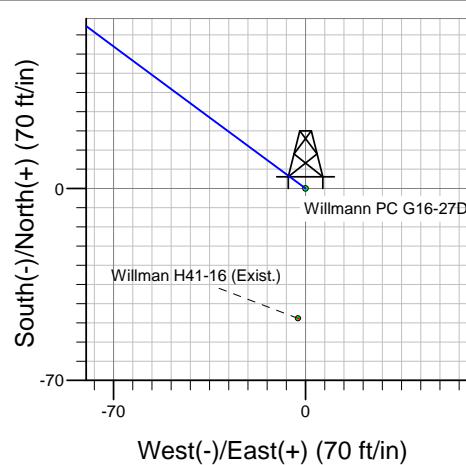
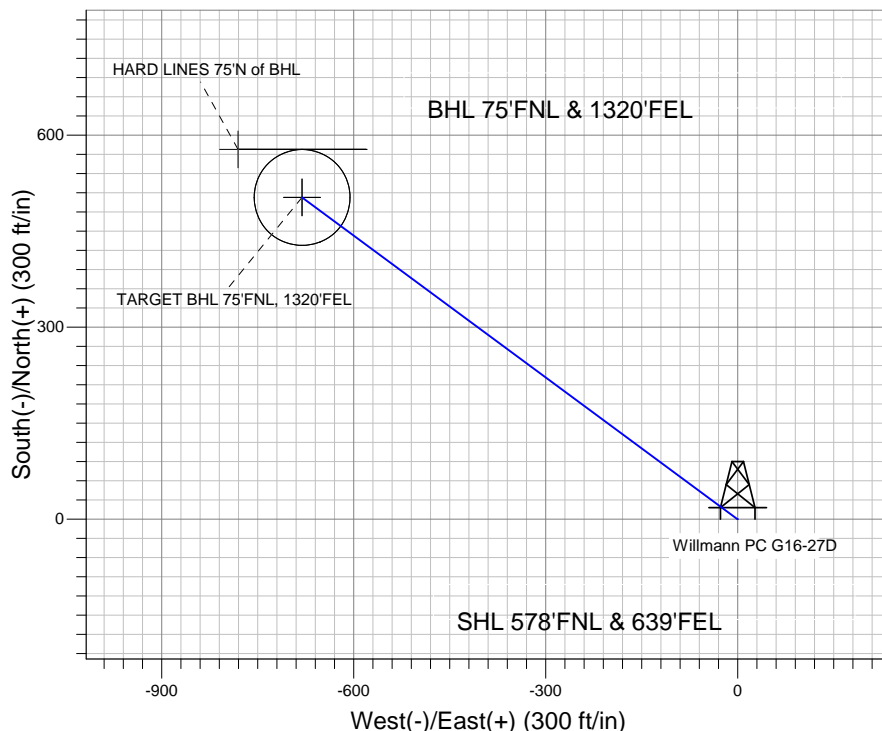
Surface Location: Willmann PC G16-27D Pad Sec.16-T4N-R65W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4738.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1359842.70 3233979.56 40° 19' 5.268 N 104° 39' 39.204 W
Original Well Elev WELL @ 4751.0ft (Original Well Elev)



NOBLE ENERGY INC WELD COUNTY CO



Willmann PC G16-27D Pad Sec.16-T4N-R65W
Willmann PC G16-27D
Noble Willmann PC G16-27D Plan #1 (1-24-11)
6:58, January 27 2011



Azimuths to True North
Magnetic North: 8.81°

Magnetic Field
Strength: 53162.7nT
Dip Angle: 67.02°
Date: 1/24/2011
Model: IGRF200510

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 75'FNL, 1320'FEL	5000.0	502.8	-680.4	40° 19' 10.236 N	104° 39' 47.988 W	Point
TARGET CIRCLE 75'FNL & 1320'FEL	6816.0	502.8	-680.4	40° 19' 10.236 N	104° 39' 47.988 W	Circle (Radius: 75.0)
HARD LINES 75'N of BHL	7281.0	577.8	-780.4	40° 19' 10.978 N	104° 39' 49.279 W	Polygon

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	1353.6	13.07	306.46	1347.9	44.1	-59.7	2.00	306.46	74.2	
4	4437.6	13.07	306.46	4352.1	458.7	-620.7	0.00	0.00	771.8	
5	5091.2	0.00	0.00	5000.0	502.8	-680.4	2.00	180.00	846.0	TARGET BHL 75'FNL, 1320'FEL
6	7372.2	0.00	0.00	7281.0	502.8	-680.4	0.00	0.00	846.0	



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.16-T4N-R65W

Willmann PC G16-27D Pad Sec.16-T4N-R65W

Willmann PC G16-27D

Wellbore #1

Plan: Noble Willmann PC G16-27D Plan #1 (1-24-11)

Standard Planning Report

27 January, 2011



Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Project	SEC.16-T4N-R65W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Willmann PC G16-27D Pad Sec.16-T4N-R65W											
Site Position:						Northing:			1,359,842.72 ft			Latitude:			40° 19' 5.268 N		
From:			Lat/Long			Easting:			3,233,979.56 ft			Longitude:			104° 39' 39.204 W		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.54 °		

Well	Willmann PC G16-27D					
Well Position	+N-S	0.0 ft	Northing:	1,359,842.70 ft	Latitude:	40° 19' 5.268 N
	+E-W	0.0 ft	Easting:	3,233,979.56 ft	Longitude:	104° 39' 39.204 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,738.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	1/24/2011	8.81	67.02	53,163

Design	Noble Willmann PC G16-27D Plan #1 (1-24-11)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	306.46

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,353.6	13.07	306.46	1,347.9	44.1	-59.7	2.00	2.00	0.00	306.46	
4,437.6	13.07	306.46	4,352.1	458.7	-620.7	0.00	0.00	0.00	0.00	
5,091.2	0.00	0.00	5,000.0	502.8	-680.4	2.00	-2.00	0.00	180.00	TARGET BHL 75'FI
7,372.2	0.00	0.00	7,281.0	502.8	-680.4	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.40	306.46	720.0	0.0	-0.1	0.1	2.00	2.00	0.00
760.0	1.20	306.46	760.0	0.4	-0.5	0.6	2.00	2.00	0.00
800.0	2.00	306.46	800.0	1.0	-1.4	1.7	2.00	2.00	0.00
840.0	2.80	306.46	839.9	2.0	-2.8	3.4	2.00	2.00	0.00
880.0	3.60	306.46	879.9	3.4	-4.5	5.7	2.00	2.00	0.00
920.0	4.40	306.46	919.8	5.0	-6.8	8.4	2.00	2.00	0.00
960.0	5.20	306.46	959.6	7.0	-9.5	11.8	2.00	2.00	0.00
1,000.0	6.00	306.46	999.5	9.3	-12.6	15.7	2.00	2.00	0.00
1,040.0	6.80	306.46	1,039.2	12.0	-16.2	20.2	2.00	2.00	0.00
1,080.0	7.60	306.46	1,078.9	15.0	-20.2	25.2	2.00	2.00	0.00
1,120.0	8.40	306.46	1,118.5	18.3	-24.7	30.7	2.00	2.00	0.00
1,160.0	9.20	306.46	1,158.0	21.9	-29.6	36.9	2.00	2.00	0.00
1,200.0	10.00	306.46	1,197.5	25.9	-35.0	43.5	2.00	2.00	0.00
1,240.0	10.80	306.46	1,236.8	30.2	-40.8	50.7	2.00	2.00	0.00
1,280.0	11.60	306.46	1,276.0	34.8	-47.1	58.5	2.00	2.00	0.00
1,320.0	12.40	306.46	1,315.2	39.7	-53.7	66.8	2.00	2.00	0.00
1,353.6	13.07	306.46	1,347.9	44.1	-59.7	74.2	2.00	2.00	0.00
1,360.0	13.07	306.46	1,354.2	45.0	-60.9	75.7	0.00	0.00	0.00
1,400.0	13.07	306.46	1,393.1	50.4	-68.1	84.7	0.00	0.00	0.00
1,440.0	13.07	306.46	1,432.1	55.7	-75.4	93.8	0.00	0.00	0.00
1,480.0	13.07	306.46	1,471.1	61.1	-82.7	102.8	0.00	0.00	0.00
1,520.0	13.07	306.46	1,510.0	66.5	-90.0	111.9	0.00	0.00	0.00
1,560.0	13.07	306.46	1,549.0	71.9	-97.2	120.9	0.00	0.00	0.00
1,600.0	13.07	306.46	1,588.0	77.2	-104.5	130.0	0.00	0.00	0.00
1,640.0	13.07	306.46	1,626.9	82.6	-111.8	139.0	0.00	0.00	0.00
1,680.0	13.07	306.46	1,665.9	88.0	-119.1	148.1	0.00	0.00	0.00
1,720.0	13.07	306.46	1,704.8	93.4	-126.4	157.1	0.00	0.00	0.00
1,760.0	13.07	306.46	1,743.8	98.7	-133.6	166.2	0.00	0.00	0.00
1,800.0	13.07	306.46	1,782.8	104.1	-140.9	175.2	0.00	0.00	0.00
1,840.0	13.07	306.46	1,821.7	109.5	-148.2	184.2	0.00	0.00	0.00
1,880.0	13.07	306.46	1,860.7	114.9	-155.5	193.3	0.00	0.00	0.00
1,920.0	13.07	306.46	1,899.7	120.2	-162.7	202.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,960.0	13.07	306.46	1,938.6	125.6	-170.0	211.4	0.00	0.00	0.00	
2,000.0	13.07	306.46	1,977.6	131.0	-177.3	220.4	0.00	0.00	0.00	
2,040.0	13.07	306.46	2,016.6	136.4	-184.6	229.5	0.00	0.00	0.00	
2,080.0	13.07	306.46	2,055.5	141.8	-191.8	238.5	0.00	0.00	0.00	
2,120.0	13.07	306.46	2,094.5	147.1	-199.1	247.6	0.00	0.00	0.00	
2,160.0	13.07	306.46	2,133.4	152.5	-206.4	256.6	0.00	0.00	0.00	
2,200.0	13.07	306.46	2,172.4	157.9	-213.7	265.7	0.00	0.00	0.00	
2,240.0	13.07	306.46	2,211.4	163.3	-220.9	274.7	0.00	0.00	0.00	
2,280.0	13.07	306.46	2,250.3	168.6	-228.2	283.8	0.00	0.00	0.00	
2,320.0	13.07	306.46	2,289.3	174.0	-235.5	292.8	0.00	0.00	0.00	
2,360.0	13.07	306.46	2,328.3	179.4	-242.8	301.9	0.00	0.00	0.00	
2,400.0	13.07	306.46	2,367.2	184.8	-250.0	310.9	0.00	0.00	0.00	
2,440.0	13.07	306.46	2,406.2	190.1	-257.3	320.0	0.00	0.00	0.00	
2,480.0	13.07	306.46	2,445.2	195.5	-264.6	329.0	0.00	0.00	0.00	
2,520.0	13.07	306.46	2,484.1	200.9	-271.9	338.0	0.00	0.00	0.00	
2,560.0	13.07	306.46	2,523.1	206.3	-279.2	347.1	0.00	0.00	0.00	
2,600.0	13.07	306.46	2,562.0	211.7	-286.4	356.1	0.00	0.00	0.00	
2,640.0	13.07	306.46	2,601.0	217.0	-293.7	365.2	0.00	0.00	0.00	
2,680.0	13.07	306.46	2,640.0	222.4	-301.0	374.2	0.00	0.00	0.00	
2,720.0	13.07	306.46	2,678.9	227.8	-308.3	383.3	0.00	0.00	0.00	
2,760.0	13.07	306.46	2,717.9	233.2	-315.5	392.3	0.00	0.00	0.00	
2,800.0	13.07	306.46	2,756.9	238.5	-322.8	401.4	0.00	0.00	0.00	
2,840.0	13.07	306.46	2,795.8	243.9	-330.1	410.4	0.00	0.00	0.00	
2,880.0	13.07	306.46	2,834.8	249.3	-337.4	419.5	0.00	0.00	0.00	
2,920.0	13.07	306.46	2,873.8	254.7	-344.6	428.5	0.00	0.00	0.00	
2,960.0	13.07	306.46	2,912.7	260.0	-351.9	437.6	0.00	0.00	0.00	
3,000.0	13.07	306.46	2,951.7	265.4	-359.2	446.6	0.00	0.00	0.00	
3,040.0	13.07	306.46	2,990.6	270.8	-366.5	455.7	0.00	0.00	0.00	
3,080.0	13.07	306.46	3,029.6	276.2	-373.7	464.7	0.00	0.00	0.00	
3,120.0	13.07	306.46	3,068.6	281.5	-381.0	473.8	0.00	0.00	0.00	
3,160.0	13.07	306.46	3,107.5	286.9	-388.3	482.8	0.00	0.00	0.00	
3,200.0	13.07	306.46	3,146.5	292.3	-395.6	491.8	0.00	0.00	0.00	
3,240.0	13.07	306.46	3,185.5	297.7	-402.8	500.9	0.00	0.00	0.00	
3,280.0	13.07	306.46	3,224.4	303.1	-410.1	509.9	0.00	0.00	0.00	
3,320.0	13.07	306.46	3,263.4	308.4	-417.4	519.0	0.00	0.00	0.00	
3,360.0	13.07	306.46	3,302.4	313.8	-424.7	528.0	0.00	0.00	0.00	
3,400.0	13.07	306.46	3,341.3	319.2	-432.0	537.1	0.00	0.00	0.00	
3,440.0	13.07	306.46	3,380.3	324.6	-439.2	546.1	0.00	0.00	0.00	
3,480.0	13.07	306.46	3,419.2	329.9	-446.5	555.2	0.00	0.00	0.00	
3,520.0	13.07	306.46	3,458.2	335.3	-453.8	564.2	0.00	0.00	0.00	
3,560.0	13.07	306.46	3,497.2	340.7	-461.1	573.3	0.00	0.00	0.00	
3,600.0	13.07	306.46	3,536.1	346.1	-468.3	582.3	0.00	0.00	0.00	
3,640.0	13.07	306.46	3,575.1	351.4	-475.6	591.4	0.00	0.00	0.00	
3,680.0	13.07	306.46	3,614.1	356.8	-482.9	600.4	0.00	0.00	0.00	
3,720.0	13.07	306.46	3,653.0	362.2	-490.2	609.5	0.00	0.00	0.00	
3,760.0	13.07	306.46	3,692.0	367.6	-497.4	618.5	0.00	0.00	0.00	
3,800.0	13.07	306.46	3,730.9	372.9	-504.7	627.6	0.00	0.00	0.00	
3,840.0	13.07	306.46	3,769.9	378.3	-512.0	636.6	0.00	0.00	0.00	
3,880.0	13.07	306.46	3,808.9	383.7	-519.3	645.6	0.00	0.00	0.00	
3,920.0	13.07	306.46	3,847.8	389.1	-526.5	654.7	0.00	0.00	0.00	
3,960.0	13.07	306.46	3,886.8	394.5	-533.8	663.7	0.00	0.00	0.00	
4,000.0	13.07	306.46	3,925.8	399.8	-541.1	672.8	0.00	0.00	0.00	
4,040.0	13.07	306.46	3,964.7	405.2	-548.4	681.8	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,080.0	13.07	306.46	4,003.7	410.6	-555.6	690.9	0.00	0.00	0.00
4,120.0	13.07	306.46	4,042.7	416.0	-562.9	699.9	0.00	0.00	0.00
4,160.0	13.07	306.46	4,081.6	421.3	-570.2	709.0	0.00	0.00	0.00
4,200.0	13.07	306.46	4,120.6	426.7	-577.5	718.0	0.00	0.00	0.00
4,240.0	13.07	306.46	4,159.5	432.1	-584.7	727.1	0.00	0.00	0.00
4,280.0	13.07	306.46	4,198.5	437.5	-592.0	736.1	0.00	0.00	0.00
4,320.0	13.07	306.46	4,237.5	442.8	-599.3	745.2	0.00	0.00	0.00
4,360.0	13.07	306.46	4,276.4	448.2	-606.6	754.2	0.00	0.00	0.00
4,400.0	13.07	306.46	4,315.4	453.6	-613.9	763.3	0.00	0.00	0.00
4,437.6	13.07	306.46	4,352.1	458.7	-620.7	771.8	0.00	0.00	0.00
4,440.0	13.02	306.46	4,354.4	459.0	-621.1	772.3	2.00	-2.00	0.00
4,480.0	12.22	306.46	4,393.4	464.2	-628.2	781.0	2.00	-2.00	0.00
4,520.0	11.42	306.46	4,432.5	469.0	-634.8	789.2	2.00	-2.00	0.00
4,560.0	10.62	306.46	4,471.8	473.6	-640.9	796.9	2.00	-2.00	0.00
4,600.0	9.82	306.46	4,511.2	477.8	-646.6	804.0	2.00	-2.00	0.00
4,640.0	9.02	306.46	4,550.6	481.7	-651.9	810.5	2.00	-2.00	0.00
4,680.0	8.22	306.46	4,590.2	485.3	-656.7	816.5	2.00	-2.00	0.00
4,720.0	7.42	306.46	4,629.8	488.5	-661.1	822.0	2.00	-2.00	0.00
4,760.0	6.62	306.46	4,669.5	491.4	-665.0	826.9	2.00	-2.00	0.00
4,800.0	5.82	306.46	4,709.3	494.0	-668.5	831.2	2.00	-2.00	0.00
4,840.0	5.02	306.46	4,749.1	496.2	-671.5	835.0	2.00	-2.00	0.00
4,880.0	4.22	306.46	4,789.0	498.1	-674.1	838.2	2.00	-2.00	0.00
4,920.0	3.42	306.46	4,828.9	499.7	-676.3	840.9	2.00	-2.00	0.00
4,960.0	2.62	306.46	4,868.8	501.0	-678.0	843.0	2.00	-2.00	0.00
5,000.0	1.82	306.46	4,908.8	501.9	-679.2	844.6	2.00	-2.00	0.00
5,040.0	1.02	306.46	4,948.8	502.5	-680.0	845.5	2.00	-2.00	0.00
5,080.0	0.22	306.46	4,988.8	502.8	-680.4	846.0	2.00	-2.00	0.00
5,091.2	0.00	0.00	5,000.0	502.8	-680.4	846.0	2.00	-2.00	476.79
TARGET BHL 75°FNL, 1320°FEL									
5,120.0	0.00	0.00	5,028.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,160.0	0.00	0.00	5,068.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,108.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,240.0	0.00	0.00	5,148.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,280.0	0.00	0.00	5,188.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,320.0	0.00	0.00	5,228.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,360.0	0.00	0.00	5,268.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,308.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,440.0	0.00	0.00	5,348.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,480.0	0.00	0.00	5,388.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,520.0	0.00	0.00	5,428.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,560.0	0.00	0.00	5,468.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,508.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,640.0	0.00	0.00	5,548.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,680.0	0.00	0.00	5,588.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,720.0	0.00	0.00	5,628.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,760.0	0.00	0.00	5,668.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,708.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,840.0	0.00	0.00	5,748.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,880.0	0.00	0.00	5,788.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,920.0	0.00	0.00	5,828.8	502.8	-680.4	846.0	0.00	0.00	0.00
5,960.0	0.00	0.00	5,868.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,908.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,040.0	0.00	0.00	5,948.8	502.8	-680.4	846.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,080.0	0.00	0.00	5,988.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,120.0	0.00	0.00	6,028.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,160.0	0.00	0.00	6,068.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,108.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,240.0	0.00	0.00	6,148.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,280.0	0.00	0.00	6,188.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,320.0	0.00	0.00	6,228.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,360.0	0.00	0.00	6,268.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,308.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,440.0	0.00	0.00	6,348.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,480.0	0.00	0.00	6,388.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,520.0	0.00	0.00	6,428.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,560.0	0.00	0.00	6,468.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,508.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,640.0	0.00	0.00	6,548.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,680.0	0.00	0.00	6,588.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,720.0	0.00	0.00	6,628.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,760.0	0.00	0.00	6,668.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,708.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,840.0	0.00	0.00	6,748.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,880.0	0.00	0.00	6,788.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,907.2	0.00	0.00	6,816.0	502.8	-680.4	846.0	0.00	0.00	0.00
NIOBRARA - TARGET CIRCLE 75'FNL & 1320'FEL									
6,920.0	0.00	0.00	6,828.8	502.8	-680.4	846.0	0.00	0.00	0.00
6,960.0	0.00	0.00	6,868.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,908.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,040.0	0.00	0.00	6,948.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,080.0	0.00	0.00	6,988.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,120.0	0.00	0.00	7,028.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,160.0	0.00	0.00	7,068.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,108.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,222.2	0.00	0.00	7,131.0	502.8	-680.4	846.0	0.00	0.00	0.00
CODELL									
7,240.0	0.00	0.00	7,148.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,280.0	0.00	0.00	7,188.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,320.0	0.00	0.00	7,228.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,360.0	0.00	0.00	7,268.8	502.8	-680.4	846.0	0.00	0.00	0.00
7,372.2	0.00	0.00	7,281.0	502.8	-680.4	846.0	0.00	0.00	0.00
HARD LINES 75'N of BHL									

Database:	Landmark	Local Co-ordinate Reference:	Well Willmann PC G16-27D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4751.0ft (Original Well Elev)
Project:	SEC.16-T4N-R65W	MD Reference:	WELL @ 4751.0ft (Original Well Elev)
Site:	Willmann PC G16-27D Pad Sec.16-T4N-R65W	North Reference:	True
Well:	Willmann PC G16-27D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Willmann PC G16-27D Plan #1 (1-24-11)		

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
TARGET CIRCLE 75' - plan hits target center - Circle (radius 75.0)	0.00	0.00	6,816.0	502.8	-680.4	1,360,338.99	3,233,294.46	40° 19' 10.236 N	104° 39' 47.988 W
TARGET BHL 75'FNL - plan hits target center - Point	0.00	0.00	5,000.0	502.8	-680.4	1,360,338.99	3,233,294.46	40° 19' 10.236 N	104° 39' 47.988 W
HARD LINES 75'N of - plan misses target center by 125.0ft at 7372.2ft MD (7281.0 TVD, 502.8 N, -680.4 E) - Polygon	0.00	0.00	7,281.0	577.8	-780.4	1,360,413.08	3,233,193.76	40° 19' 10.978 N	104° 39' 49.279 W
Point 1			7,281.0	0.0	0.0	1,360,413.08	3,233,193.76		
Point 2			7,281.0	0.0	200.0	1,360,414.98	3,233,393.74		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
500.0	500.0	8 5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,907.2	6,816.0	NIOBRARA		0.00		
7,222.2	7,131.0	CODELL		0.00		