

ENSIGN

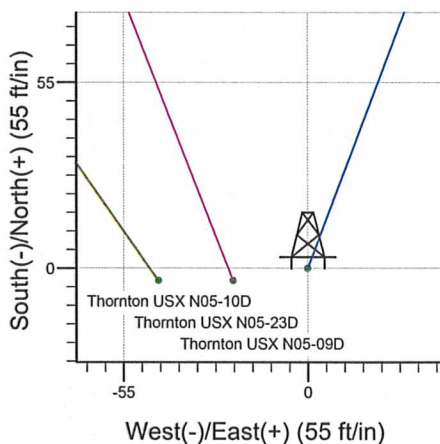
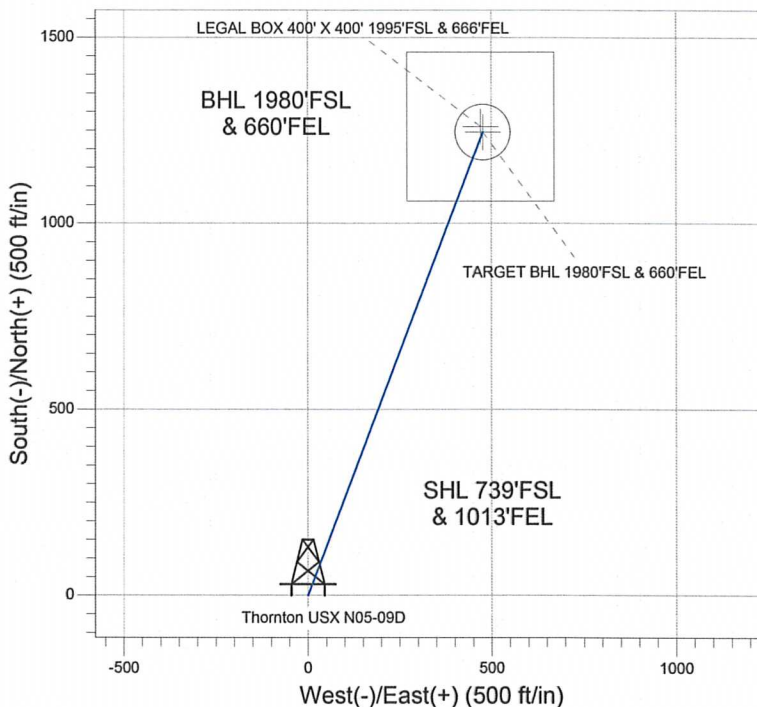
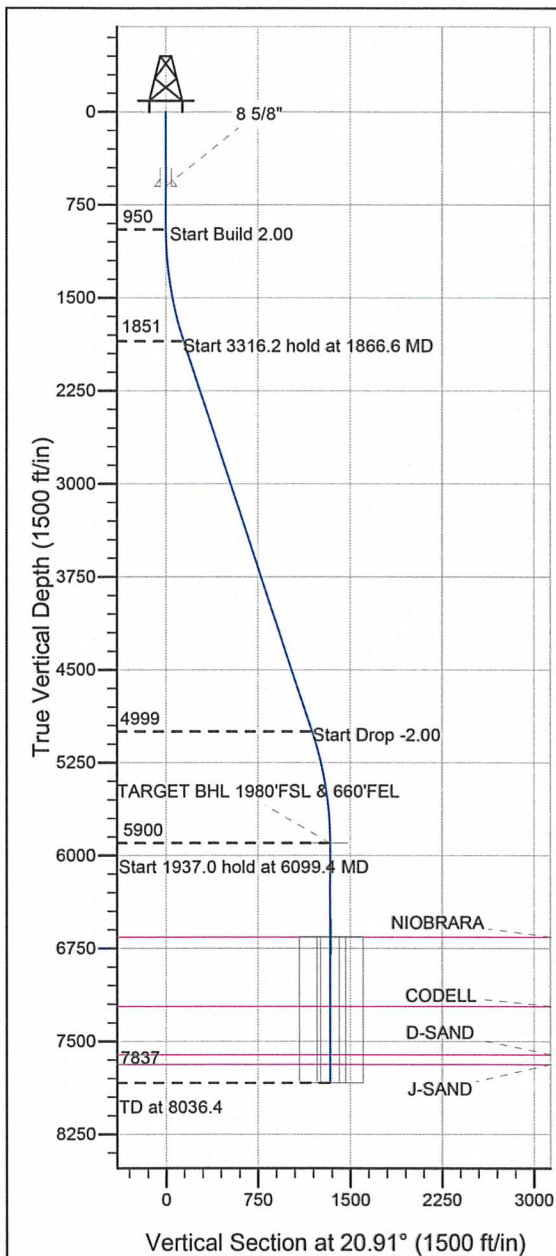
Directional

Well Name: Thornton USX N05-09D

Surface Location: Thornton USX N05-09D Pad SEC.5-T5N-R67W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4883.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1397695.99	3164112.40	40.423580	-104.910540	
		Original Well Elev	WELL @ 4896.0ft (Original Well Elev)			

NOBLE ENERGY INC WELD COUNTY CO



Thornton USX N05-09D Pad SEC.5-T5N-R67W
Thornton USX N05-09D
Noble Thornton USX N05-09D Plan #1 (1-30-12
7:47, February 01 2012



Azimuths to True North
Magnetic North: 8.86°
Magnetic Field
Strength: 53061.5snT
Dip Angle: 67.02°
Date: 1/30/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1980'FSL & 660'FEL	5900.0	1246.0	476.1	40.427000	-104.908830	Point
LEGAL BOX 400' X 400' 1995'FSL & 666'FEL	6657.0	1260.9	470.1	40.427041	-104.908851	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1980'FSL & 660'FEL	6657.0	1246.0	476.1	40.427000	-104.908830	Circle (Radius: 75.0)

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	950.0	0.00	0.00	950.0	0.0	0.0	0.00	0.00	0.0	
3	1866.6	18.33	20.91	1851.1	135.8	51.9	2.00	20.91	145.4	
4	5182.8	18.33	20.91	4998.9	1110.1	424.2	0.00	0.00	1188.4	
5	6099.4	0.00	0.00	5900.0	1246.0	476.1	2.00	180.00	1333.8	TARGET BHL 1980'FSL & 660'FEL
6	8036.4	0.00	0.00	7837.0	1246.0	476.1	0.00	0.00	1333.8	



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.5-T5N-R67W

Thornton USX N05-09D Pad SEC.5-T5N-R67W

Thornton USX N05-09D

Wellbore #1

Plan: Noble Thornton USX N05-09D Plan #1 (1-30-12)

Standard Planning Report

01 February, 2012



Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
 SEC.5-T5N-R67W
Well: Thornton USX N05-09D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-09D Plan #1 (1-30-1:

Local Co-ordinate Reference: Well Thornton USX N05-09D
TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	SEC.5-T5N-R67W, Weld County, CO		
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	Thornton USX N05-09D Pad SEC.5-T5N-R67W				
Site Position:		Northing:	1,397,696.00ft	Latitude:	40.423580
From:	Lat/Long	Easting:	3,164,112.40ft	Longitude:	-104.910540
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.38 °

Well	Thornton USX N05-09D					
Well Position	+N/-S	0.0 ft	Northing:	1,397,695.99 ft	Latitude:	40.423580
	+E/-W	0.0 ft	Easting:	3,164,112.40 ft	Longitude:	-104.910540
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,883.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/30/2012	8.86	67.02	53,061

Design Noble Thornton USX N05-09D Plan #1 (1-30-12)

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	20.91

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	
950.0	0.00	0.00	950.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,866.6	18.33	20.91	1,851.1	135.8	51.9	2.00	2.00	0.00	20.91	
5,182.8	18.33	20.91	4,998.9	1,110.1	424.2	0.00	0.00	0.00	0.00	
6,099.4	0.00	0.00	5,900.0	1,246.0	476.1	2.00	-2.00	0.00	180.00	TARGET BHL 198C
8,036.4	0.00	0.00	7,837.0	1,246.0	476.1	0.00	0.00	0.00	0.00	

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Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
SEC.5-T5N-R67W
Well: Thornton USX N05-09D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-09D Plan #1 (1-30-1)

Local Co-ordinate Reference: Well Thornton USX N05-09D
TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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
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
8 5/8"									
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
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.20	20.91	960.0	0.0	0.0	0.0	2.00	2.00	0.00
1,000.0	1.00	20.91	1,000.0	0.4	0.2	0.4	2.00	2.00	0.00
1,040.0	1.80	20.91	1,040.0	1.3	0.5	1.4	2.00	2.00	0.00
1,080.0	2.60	20.91	1,080.0	2.8	1.1	2.9	2.00	2.00	0.00
1,120.0	3.40	20.91	1,119.9	4.7	1.8	5.0	2.00	2.00	0.00
1,160.0	4.20	20.91	1,159.8	7.2	2.7	7.7	2.00	2.00	0.00
1,200.0	5.00	20.91	1,199.7	10.2	3.9	10.9	2.00	2.00	0.00
1,240.0	5.80	20.91	1,239.5	13.7	5.2	14.7	2.00	2.00	0.00
1,280.0	6.60	20.91	1,279.3	17.7	6.8	19.0	2.00	2.00	0.00
1,320.0	7.40	20.91	1,319.0	22.3	8.5	23.9	2.00	2.00	0.00
1,360.0	8.20	20.91	1,358.6	27.4	10.5	29.3	2.00	2.00	0.00
1,400.0	9.00	20.91	1,398.2	32.9	12.6	35.3	2.00	2.00	0.00
1,440.0	9.80	20.91	1,437.6	39.0	14.9	41.8	2.00	2.00	0.00
1,480.0	10.60	20.91	1,477.0	45.7	17.4	48.9	2.00	2.00	0.00
1,520.0	11.40	20.91	1,516.2	52.8	20.2	56.5	2.00	2.00	0.00
1,560.0	12.20	20.91	1,555.4	60.4	23.1	64.7	2.00	2.00	0.00
1,600.0	13.00	20.91	1,594.4	68.6	26.2	73.4	2.00	2.00	0.00
1,640.0	13.80	20.91	1,633.3	77.2	29.5	82.7	2.00	2.00	0.00
1,680.0	14.60	20.91	1,672.1	86.4	33.0	92.5	2.00	2.00	0.00
1,720.0	15.40	20.91	1,710.8	96.1	36.7	102.9	2.00	2.00	0.00
1,760.0	16.20	20.91	1,749.3	106.3	40.6	113.7	2.00	2.00	0.00
1,800.0	17.00	20.91	1,787.6	116.9	44.7	125.2	2.00	2.00	0.00
1,840.0	17.80	20.91	1,825.8	128.1	48.9	137.1	2.00	2.00	0.00
1,866.6	18.33	20.91	1,851.1	135.8	51.9	145.4	2.00	2.00	0.00
1,880.0	18.33	20.91	1,863.8	139.7	53.4	149.6	0.00	0.00	0.00
1,920.0	18.33	20.91	1,901.7	151.5	57.9	162.2	0.00	0.00	0.00
1,960.0	18.33	20.91	1,939.7	163.3	62.4	174.8	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
 SEC.5-T5N-R67W
Well: Thornton USX N05-09D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-09D Plan #1 (1-30-1:

Local Co-ordinate Reference: Well Thornton USX N05-09D
TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
2,000.0	18.33	20.91	1,977.7	175.0	66.9	187.3	0.00	0.00	0.00
2,040.0	18.33	20.91	2,015.6	186.8	71.4	199.9	0.00	0.00	0.00
2,080.0	18.33	20.91	2,053.6	198.5	75.9	212.5	0.00	0.00	0.00
2,120.0	18.33	20.91	2,091.6	210.3	80.3	225.1	0.00	0.00	0.00
2,160.0	18.33	20.91	2,129.6	222.0	84.8	237.7	0.00	0.00	0.00
2,200.0	18.33	20.91	2,167.5	233.8	89.3	250.3	0.00	0.00	0.00
2,240.0	18.33	20.91	2,205.5	245.5	93.8	262.8	0.00	0.00	0.00
2,280.0	18.33	20.91	2,243.5	257.3	98.3	275.4	0.00	0.00	0.00
2,320.0	18.33	20.91	2,281.4	269.0	102.8	288.0	0.00	0.00	0.00
2,360.0	18.33	20.91	2,319.4	280.8	107.3	300.6	0.00	0.00	0.00
2,400.0	18.33	20.91	2,357.4	292.5	111.8	313.2	0.00	0.00	0.00
2,440.0	18.33	20.91	2,395.3	304.3	116.3	325.7	0.00	0.00	0.00
2,480.0	18.33	20.91	2,433.3	316.0	120.8	338.3	0.00	0.00	0.00
2,520.0	18.33	20.91	2,471.3	327.8	125.2	350.9	0.00	0.00	0.00
2,560.0	18.33	20.91	2,509.2	339.5	129.7	363.5	0.00	0.00	0.00
2,600.0	18.33	20.91	2,547.2	351.3	134.2	376.1	0.00	0.00	0.00
2,640.0	18.33	20.91	2,585.2	363.0	138.7	388.6	0.00	0.00	0.00
2,680.0	18.33	20.91	2,623.2	374.8	143.2	401.2	0.00	0.00	0.00
2,720.0	18.33	20.91	2,661.1	386.5	147.7	413.8	0.00	0.00	0.00
2,760.0	18.33	20.91	2,699.1	398.3	152.2	426.4	0.00	0.00	0.00
2,800.0	18.33	20.91	2,737.1	410.1	156.7	439.0	0.00	0.00	0.00
2,840.0	18.33	20.91	2,775.0	421.8	161.2	451.6	0.00	0.00	0.00
2,880.0	18.33	20.91	2,813.0	433.6	165.7	464.1	0.00	0.00	0.00
2,920.0	18.33	20.91	2,851.0	445.3	170.2	476.7	0.00	0.00	0.00
2,960.0	18.33	20.91	2,888.9	457.1	174.6	489.3	0.00	0.00	0.00
3,000.0	18.33	20.91	2,926.9	468.8	179.1	501.9	0.00	0.00	0.00
3,040.0	18.33	20.91	2,964.9	480.6	183.6	514.5	0.00	0.00	0.00
3,080.0	18.33	20.91	3,002.9	492.3	188.1	527.0	0.00	0.00	0.00
3,120.0	18.33	20.91	3,040.8	504.1	192.6	539.6	0.00	0.00	0.00
3,160.0	18.33	20.91	3,078.8	515.8	197.1	552.2	0.00	0.00	0.00
3,200.0	18.33	20.91	3,116.8	527.6	201.6	564.8	0.00	0.00	0.00
3,240.0	18.33	20.91	3,154.7	539.3	206.1	577.4	0.00	0.00	0.00
3,280.0	18.33	20.91	3,192.7	551.1	210.6	589.9	0.00	0.00	0.00
3,320.0	18.33	20.91	3,230.7	562.8	215.1	602.5	0.00	0.00	0.00
3,360.0	18.33	20.91	3,268.6	574.6	219.5	615.1	0.00	0.00	0.00
3,400.0	18.33	20.91	3,306.6	586.3	224.0	627.7	0.00	0.00	0.00
3,440.0	18.33	20.91	3,344.6	598.1	228.5	640.3	0.00	0.00	0.00
3,480.0	18.33	20.91	3,382.6	609.8	233.0	652.8	0.00	0.00	0.00
3,520.0	18.33	20.91	3,420.5	621.6	237.5	665.4	0.00	0.00	0.00
3,560.0	18.33	20.91	3,458.5	633.4	242.0	678.0	0.00	0.00	0.00
3,600.0	18.33	20.91	3,496.5	645.1	246.5	690.6	0.00	0.00	0.00
3,640.0	18.33	20.91	3,534.4	656.9	251.0	703.2	0.00	0.00	0.00
3,680.0	18.33	20.91	3,572.4	668.6	255.5	715.8	0.00	0.00	0.00
3,720.0	18.33	20.91	3,610.4	680.4	260.0	728.3	0.00	0.00	0.00
3,760.0	18.33	20.91	3,648.3	692.1	264.5	740.9	0.00	0.00	0.00
3,800.0	18.33	20.91	3,686.3	703.9	268.9	753.5	0.00	0.00	0.00
3,840.0	18.33	20.91	3,724.3	715.6	273.4	766.1	0.00	0.00	0.00
3,880.0	18.33	20.91	3,762.3	727.4	277.9	778.7	0.00	0.00	0.00
3,920.0	18.33	20.91	3,800.2	739.1	282.4	791.2	0.00	0.00	0.00
3,960.0	18.33	20.91	3,838.2	750.9	286.9	803.8	0.00	0.00	0.00
4,000.0	18.33	20.91	3,876.2	762.6	291.4	816.4	0.00	0.00	0.00
4,040.0	18.33	20.91	3,914.1	774.4	295.9	829.0	0.00	0.00	0.00
4,080.0	18.33	20.91	3,952.1	786.1	300.4	841.6	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
SEC.5-T5N-R67W
Well: Thornton USX N05-09D
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TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
4,120.0	18.33	20.91	3,990.1	797.9	304.9	854.1	0.00	0.00	0.00
4,160.0	18.33	20.91	4,028.0	809.6	309.4	866.7	0.00	0.00	0.00
4,200.0	18.33	20.91	4,066.0	821.4	313.9	879.3	0.00	0.00	0.00
4,240.0	18.33	20.91	4,104.0	833.1	318.3	891.9	0.00	0.00	0.00
4,280.0	18.33	20.91	4,142.0	844.9	322.8	904.5	0.00	0.00	0.00
4,320.0	18.33	20.91	4,179.9	856.6	327.3	917.1	0.00	0.00	0.00
4,360.0	18.33	20.91	4,217.9	868.4	331.8	929.6	0.00	0.00	0.00
4,400.0	18.33	20.91	4,255.9	880.2	336.3	942.2	0.00	0.00	0.00
4,440.0	18.33	20.91	4,293.8	891.9	340.8	954.8	0.00	0.00	0.00
4,480.0	18.33	20.91	4,331.8	903.7	345.3	967.4	0.00	0.00	0.00
4,520.0	18.33	20.91	4,369.8	915.4	349.8	980.0	0.00	0.00	0.00
4,560.0	18.33	20.91	4,407.7	927.2	354.3	992.5	0.00	0.00	0.00
4,600.0	18.33	20.91	4,445.7	938.9	358.8	1,005.1	0.00	0.00	0.00
4,640.0	18.33	20.91	4,483.7	950.7	363.2	1,017.7	0.00	0.00	0.00
4,680.0	18.33	20.91	4,521.7	962.4	367.7	1,030.3	0.00	0.00	0.00
4,720.0	18.33	20.91	4,559.6	974.2	372.2	1,042.9	0.00	0.00	0.00
4,760.0	18.33	20.91	4,597.6	985.9	376.7	1,055.4	0.00	0.00	0.00
4,800.0	18.33	20.91	4,635.6	997.7	381.2	1,068.0	0.00	0.00	0.00
4,840.0	18.33	20.91	4,673.5	1,009.4	385.7	1,080.6	0.00	0.00	0.00
4,880.0	18.33	20.91	4,711.5	1,021.2	390.2	1,093.2	0.00	0.00	0.00
4,920.0	18.33	20.91	4,749.5	1,032.9	394.7	1,105.8	0.00	0.00	0.00
4,960.0	18.33	20.91	4,787.4	1,044.7	399.2	1,118.4	0.00	0.00	0.00
5,000.0	18.33	20.91	4,825.4	1,056.4	403.7	1,130.9	0.00	0.00	0.00
5,040.0	18.33	20.91	4,863.4	1,068.2	408.2	1,143.5	0.00	0.00	0.00
5,080.0	18.33	20.91	4,901.4	1,079.9	412.6	1,156.1	0.00	0.00	0.00
5,120.0	18.33	20.91	4,939.3	1,091.7	417.1	1,168.7	0.00	0.00	0.00
5,160.0	18.33	20.91	4,977.3	1,103.4	421.6	1,181.3	0.00	0.00	0.00
5,182.8	18.33	20.91	4,998.9	1,110.1	424.2	1,188.4	0.00	0.00	0.00
5,200.0	17.99	20.91	5,015.3	1,115.2	426.1	1,193.8	2.00	-2.00	0.00
5,240.0	17.19	20.91	5,053.4	1,126.4	430.4	1,205.9	2.00	-2.00	0.00
5,280.0	16.39	20.91	5,091.7	1,137.2	434.5	1,217.4	2.00	-2.00	0.00
5,320.0	15.59	20.91	5,130.2	1,147.5	438.5	1,228.4	2.00	-2.00	0.00
5,360.0	14.79	20.91	5,168.8	1,157.3	442.2	1,238.9	2.00	-2.00	0.00
5,400.0	13.99	20.91	5,207.5	1,166.6	445.8	1,248.9	2.00	-2.00	0.00
5,440.0	13.19	20.91	5,246.4	1,175.4	449.1	1,258.3	2.00	-2.00	0.00
5,480.0	12.39	20.91	5,285.4	1,183.7	452.3	1,267.1	2.00	-2.00	0.00
5,520.0	11.59	20.91	5,324.5	1,191.4	455.2	1,275.4	2.00	-2.00	0.00
5,560.0	10.79	20.91	5,363.8	1,198.7	458.0	1,283.2	2.00	-2.00	0.00
5,600.0	9.99	20.91	5,403.1	1,205.4	460.6	1,290.4	2.00	-2.00	0.00
5,640.0	9.19	20.91	5,442.5	1,211.6	463.0	1,297.1	2.00	-2.00	0.00
5,680.0	8.39	20.91	5,482.1	1,217.3	465.1	1,303.2	2.00	-2.00	0.00
5,720.0	7.59	20.91	5,521.7	1,222.5	467.1	1,308.7	2.00	-2.00	0.00
5,760.0	6.79	20.91	5,561.4	1,227.2	468.9	1,313.7	2.00	-2.00	0.00
5,800.0	5.99	20.91	5,601.1	1,231.4	470.5	1,318.2	2.00	-2.00	0.00
5,840.0	5.19	20.91	5,640.9	1,235.0	471.9	1,322.1	2.00	-2.00	0.00
5,880.0	4.39	20.91	5,680.8	1,238.1	473.1	1,325.4	2.00	-2.00	0.00
5,920.0	3.59	20.91	5,720.7	1,240.7	474.1	1,328.2	2.00	-2.00	0.00
5,960.0	2.79	20.91	5,760.6	1,242.8	474.9	1,330.4	2.00	-2.00	0.00
6,000.0	1.99	20.91	5,800.6	1,244.4	475.5	1,332.1	2.00	-2.00	0.00
6,040.0	1.19	20.91	5,840.6	1,245.4	475.9	1,333.2	2.00	-2.00	0.00
6,080.0	0.39	20.91	5,880.6	1,245.9	476.1	1,333.8	2.00	-2.00	0.00
6,099.4	0.00	0.00	5,900.0	1,246.0	476.1	1,333.8	2.00	-2.00	0.00

TARGET BHL 1980'FSL & 660'FEL

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
 SEC.5-T5N-R67W
Well: Thornton USX N05-09D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-09D Plan #1 (1-30-1:

Local Co-ordinate Reference: Well Thornton USX N05-09D
TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
6,120.0	0.00	0.00	5,920.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,160.0	0.00	0.00	5,960.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,000.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,240.0	0.00	0.00	6,040.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,280.0	0.00	0.00	6,080.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,320.0	0.00	0.00	6,120.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,360.0	0.00	0.00	6,160.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,200.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,440.0	0.00	0.00	6,240.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,480.0	0.00	0.00	6,280.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,520.0	0.00	0.00	6,320.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,560.0	0.00	0.00	6,360.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,400.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,640.0	0.00	0.00	6,440.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,680.0	0.00	0.00	6,480.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,720.0	0.00	0.00	6,520.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,760.0	0.00	0.00	6,560.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,600.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,840.0	0.00	0.00	6,640.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,856.4	0.00	0.00	6,657.0	1,246.0	476.1	1,333.8	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 400' X 400' 1995'FSL & 666'FEL - TARGET CIRCLE 1980'FSL & 660'FEL									
6,880.0	0.00	0.00	6,680.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,920.0	0.00	0.00	6,720.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
6,960.0	0.00	0.00	6,760.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,800.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,040.0	0.00	0.00	6,840.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,080.0	0.00	0.00	6,880.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,120.0	0.00	0.00	6,920.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,160.0	0.00	0.00	6,960.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,000.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,240.0	0.00	0.00	7,040.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,280.0	0.00	0.00	7,080.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,320.0	0.00	0.00	7,120.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,360.0	0.00	0.00	7,160.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,200.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,415.4	0.00	0.00	7,216.0	1,246.0	476.1	1,333.8	0.00	0.00	0.00
CODELL									
7,440.0	0.00	0.00	7,240.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,480.0	0.00	0.00	7,280.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,520.0	0.00	0.00	7,320.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,560.0	0.00	0.00	7,360.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,600.0	0.00	0.00	7,400.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,640.0	0.00	0.00	7,440.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,680.0	0.00	0.00	7,480.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,720.0	0.00	0.00	7,520.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,760.0	0.00	0.00	7,560.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,600.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,805.4	0.00	0.00	7,606.0	1,246.0	476.1	1,333.8	0.00	0.00	0.00
D-SAND									
7,840.0	0.00	0.00	7,640.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,880.0	0.00	0.00	7,680.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,886.4	0.00	0.00	7,687.0	1,246.0	476.1	1,333.8	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.5-T5N-R67W
Site: Thornton USX N05-09D Pad
 SEC.5-T5N-R67W
Well: Thornton USX N05-09D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-09D Plan #1 (1-30-1)

Local Co-ordinate Reference: Well Thornton USX N05-09D
TVD Reference: WELL @ 4896.0ft (Original Well Elev)
MD Reference: WELL @ 4896.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
J-SAND									
7,920.0	0.00	0.00	7,720.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
7,960.0	0.00	0.00	7,760.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
8,000.0	0.00	0.00	7,800.6	1,246.0	476.1	1,333.8	0.00	0.00	0.00
8,036.4	0.00	0.00	7,837.0	1,246.0	476.1	1,333.8	0.00	0.00	0.00

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 BHL 1980'F - plan hits target center - Point	0.00	0.00	5,900.0	1,246.0	476.1	1,398,945.04	3,164,580.17	40.427000	-104.908830
LEGAL BOX 400' X 400' - plan misses target center by 16.1ft at 6856.4ft MD (6657.0 TVD, 1246.0 N, 476.1 E) - Rectangle (sides W400.0 H400.0 D1,180.0)	0.00	0.00	6,657.0	1,260.9	470.1	1,398,959.99	3,164,574.12	40.427041	-104.908851
TARGET CIRCLE 19ft - plan hits target center - Circle (radius 75.0)	0.00	0.00	6,657.0	1,246.0	476.1	1,398,945.04	3,164,580.17	40.427000	-104.908830

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
600.0	600.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,856.4	6,657.0	NIOBRARA		0.00	
7,415.4	7,216.0	CODELL		0.00	
7,805.4	7,606.0	D-SAND		0.00	
7,886.4	7,687.0	J-SAND		0.00	