

ENSIGN

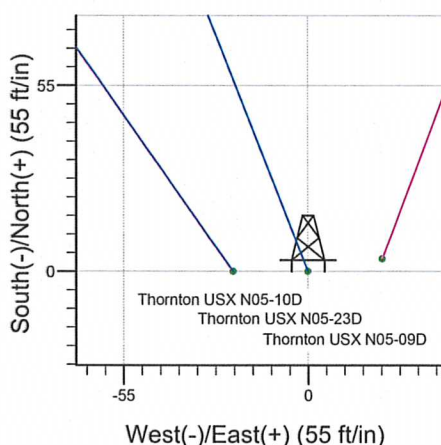
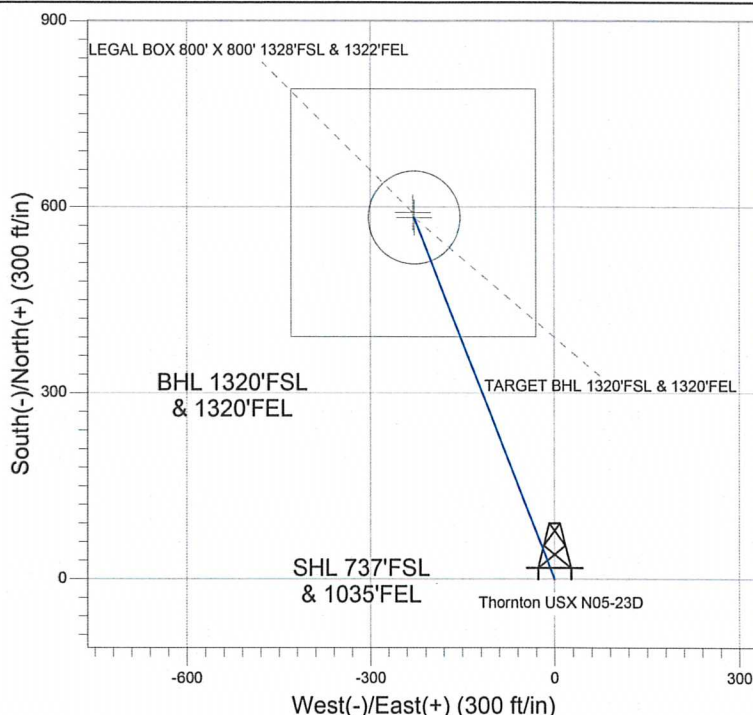
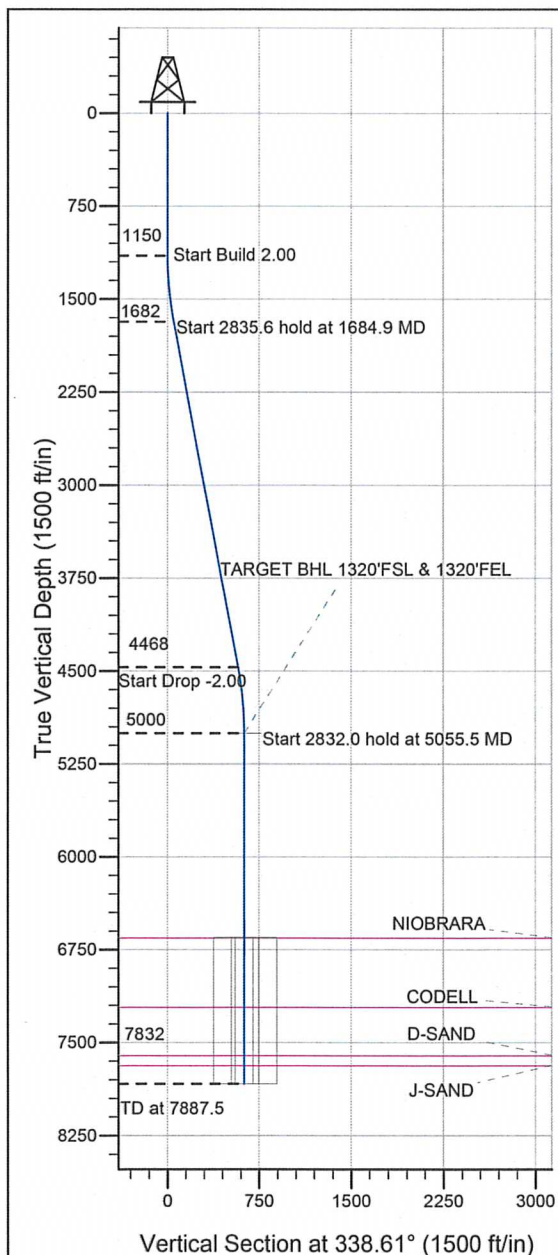
Directional

Well Name: Thornton USX N05-23D

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	1397692.20	3164090.16	40.423570	-104.910620	
		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 N05-23D
Noble Thornton USX N05-23D Plan #1 (1-30-12
8:17, February 01 2012



Azimuths to True North
Magnetic North: 8.86°
Magnetic Field
Strength: 53061.4snT
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 1320'FSL & 1320'FEL	5000.0	582.9	-228.3	40.425170	-104.911440	Point
LEGAL BOX 800' X 800' 1328'FSL & 1322'FEL	6652.0	590.9	-230.3	40.425192	-104.911447	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1320'FSL & 1320'FEL	6652.0	582.9	-228.3	40.425170	-104.911440	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	1150.0	0.00	0.00	1150.0	0.0	0.0	0.00	0.00	0.0	
3	1684.9	10.70	338.61	1681.8	46.4	-18.2	2.00	338.61	49.8	
4	4520.6	10.70	338.61	4468.2	536.5	-210.1	0.00	0.00	576.2	
5	5055.5	0.00	0.00	5000.0	582.9	-228.3	2.00	180.00	626.0	TARGET BHL 1320'FSL & 1320'FEL
6	7887.5	0.00	0.00	7832.0	582.9	-228.3	0.00	0.00	626.0	



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.5-T5N-R67W

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

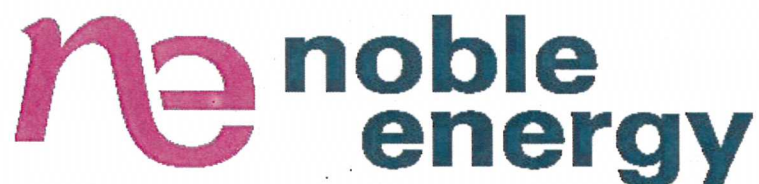
Thornton USX N05-23D

Wellbore #1

Plan: Noble Thornton USX N05-23D Plan #1 (1-30-12)

Standard Planning Report

01 February, 2012



Database:	Landmark	Local Co-ordinate Reference:	Well Thornton USX N05-23D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4896.0ft (Original Well Elev)
Project:	SEC.5-T5N-R67W	MD Reference:	WELL @ 4896.0ft (Original Well Elev)
Site:	Thornton USX N05-09D Pad SEC.5-T5N-R67W	North Reference:	True
Well:	Thornton USX N05-23D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Thornton USX N05-23D Plan #1 (1-30-1:		

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:	1,397,696.00 ft	Latitude:	40.423580
From:	Lat/Long	Easting:	3,164,112.40 ft	Longitude:	-104.910540
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.38 °

Well	Thornton USX N05-23D					
Well Position	+N/-S	-3.7 ft	Northing:	1,397,692.20 ft	Latitude:	40.423570
	+E/-W	-22.3 ft	Easting:	3,164,090.16 ft	Longitude:	-104.910620
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 N05-23D Plan #1 (1-30-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	338.61

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	
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,684.9	10.70	338.61	1,681.8	46.4	-18.2	2.00	2.00	0.00	338.61	
4,520.6	10.70	338.61	4,468.2	536.5	-210.1	0.00	0.00	0.00	0.00	
5,055.5	0.00	0.00	5,000.0	582.9	-228.3	2.00	-2.00	0.00	180.00	TARGET BHL 132C
7,887.5	0.00	0.00	7,832.0	582.9	-228.3	0.00	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 N05-23D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-23D Plan #1 (1-30-1)

Local Co-ordinate Reference: Well Thornton USX N05-23D
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
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.20	338.61	1,160.0	0.0	0.0	0.0	2.00	2.00	0.00
1,200.0	1.00	338.61	1,200.0	0.4	-0.2	0.4	2.00	2.00	0.00
1,240.0	1.80	338.61	1,240.0	1.3	-0.5	1.4	2.00	2.00	0.00
1,280.0	2.60	338.61	1,280.0	2.7	-1.1	2.9	2.00	2.00	0.00
1,320.0	3.40	338.61	1,319.9	4.7	-1.8	5.0	2.00	2.00	0.00
1,360.0	4.20	338.61	1,359.8	7.2	-2.8	7.7	2.00	2.00	0.00
1,400.0	5.00	338.61	1,399.7	10.2	-4.0	10.9	2.00	2.00	0.00
1,440.0	5.80	338.61	1,439.5	13.7	-5.3	14.7	2.00	2.00	0.00
1,480.0	6.60	338.61	1,479.3	17.7	-6.9	19.0	2.00	2.00	0.00
1,520.0	7.40	338.61	1,519.0	22.2	-8.7	23.9	2.00	2.00	0.00
1,560.0	8.20	338.61	1,558.6	27.3	-10.7	29.3	2.00	2.00	0.00
1,600.0	9.00	338.61	1,598.2	32.8	-12.9	35.3	2.00	2.00	0.00
1,640.0	9.80	338.61	1,637.6	38.9	-15.2	41.8	2.00	2.00	0.00
1,680.0	10.60	338.61	1,677.0	45.5	-17.8	48.9	2.00	2.00	0.00
1,684.9	10.70	338.61	1,681.8	46.4	-18.2	49.8	2.00	2.00	0.00
1,720.0	10.70	338.61	1,716.3	52.4	-20.5	56.3	0.00	0.00	0.00
1,760.0	10.70	338.61	1,755.6	59.3	-23.2	63.7	0.00	0.00	0.00
1,800.0	10.70	338.61	1,794.9	66.3	-26.0	71.2	0.00	0.00	0.00
1,840.0	10.70	338.61	1,834.2	73.2	-28.7	78.6	0.00	0.00	0.00
1,880.0	10.70	338.61	1,873.5	80.1	-31.4	86.0	0.00	0.00	0.00
1,920.0	10.70	338.61	1,912.8	87.0	-34.1	93.4	0.00	0.00	0.00
1,960.0	10.70	338.61	1,952.1	93.9	-36.8	100.9	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 N05-23D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-23D Plan #1 (1-30-1)

Local Co-ordinate Reference: Well Thornton USX N05-23D
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	10.70	338.61	1,991.4	100.8	-39.5	108.3	0.00	0.00	0.00
2,040.0	10.70	338.61	2,030.7	107.7	-42.2	115.7	0.00	0.00	0.00
2,080.0	10.70	338.61	2,070.0	114.7	-44.9	123.1	0.00	0.00	0.00
2,120.0	10.70	338.61	2,109.3	121.6	-47.6	130.6	0.00	0.00	0.00
2,160.0	10.70	338.61	2,148.6	128.5	-50.3	138.0	0.00	0.00	0.00
2,200.0	10.70	338.61	2,187.9	135.4	-53.0	145.4	0.00	0.00	0.00
2,240.0	10.70	338.61	2,227.2	142.3	-55.7	152.8	0.00	0.00	0.00
2,280.0	10.70	338.61	2,266.6	149.2	-58.4	160.3	0.00	0.00	0.00
2,320.0	10.70	338.61	2,305.9	156.1	-61.2	167.7	0.00	0.00	0.00
2,360.0	10.70	338.61	2,345.2	163.1	-63.9	175.1	0.00	0.00	0.00
2,400.0	10.70	338.61	2,384.5	170.0	-66.6	182.5	0.00	0.00	0.00
2,440.0	10.70	338.61	2,423.8	176.9	-69.3	190.0	0.00	0.00	0.00
2,480.0	10.70	338.61	2,463.1	183.8	-72.0	197.4	0.00	0.00	0.00
2,520.0	10.70	338.61	2,502.4	190.7	-74.7	204.8	0.00	0.00	0.00
2,560.0	10.70	338.61	2,541.7	197.6	-77.4	212.3	0.00	0.00	0.00
2,600.0	10.70	338.61	2,581.0	204.6	-80.1	219.7	0.00	0.00	0.00
2,640.0	10.70	338.61	2,620.3	211.5	-82.8	227.1	0.00	0.00	0.00
2,680.0	10.70	338.61	2,659.6	218.4	-85.5	234.5	0.00	0.00	0.00
2,720.0	10.70	338.61	2,698.9	225.3	-88.2	242.0	0.00	0.00	0.00
2,760.0	10.70	338.61	2,738.2	232.2	-90.9	249.4	0.00	0.00	0.00
2,800.0	10.70	338.61	2,777.5	239.1	-93.7	256.8	0.00	0.00	0.00
2,840.0	10.70	338.61	2,816.8	246.0	-96.4	264.2	0.00	0.00	0.00
2,880.0	10.70	338.61	2,856.1	253.0	-99.1	271.7	0.00	0.00	0.00
2,920.0	10.70	338.61	2,895.4	259.9	-101.8	279.1	0.00	0.00	0.00
2,960.0	10.70	338.61	2,934.7	266.8	-104.5	286.5	0.00	0.00	0.00
3,000.0	10.70	338.61	2,974.0	273.7	-107.2	293.9	0.00	0.00	0.00
3,040.0	10.70	338.61	3,013.3	280.6	-109.9	301.4	0.00	0.00	0.00
3,080.0	10.70	338.61	3,052.6	287.5	-112.6	308.8	0.00	0.00	0.00
3,120.0	10.70	338.61	3,091.9	294.4	-115.3	316.2	0.00	0.00	0.00
3,160.0	10.70	338.61	3,131.3	301.4	-118.0	323.6	0.00	0.00	0.00
3,200.0	10.70	338.61	3,170.6	308.3	-120.7	331.1	0.00	0.00	0.00
3,240.0	10.70	338.61	3,209.9	315.2	-123.4	338.5	0.00	0.00	0.00
3,280.0	10.70	338.61	3,249.2	322.1	-126.2	345.9	0.00	0.00	0.00
3,320.0	10.70	338.61	3,288.5	329.0	-128.9	353.3	0.00	0.00	0.00
3,360.0	10.70	338.61	3,327.8	335.9	-131.6	360.8	0.00	0.00	0.00
3,400.0	10.70	338.61	3,367.1	342.8	-134.3	368.2	0.00	0.00	0.00
3,440.0	10.70	338.61	3,406.4	349.8	-137.0	375.6	0.00	0.00	0.00
3,480.0	10.70	338.61	3,445.7	356.7	-139.7	383.1	0.00	0.00	0.00
3,520.0	10.70	338.61	3,485.0	363.6	-142.4	390.5	0.00	0.00	0.00
3,560.0	10.70	338.61	3,524.3	370.5	-145.1	397.9	0.00	0.00	0.00
3,600.0	10.70	338.61	3,563.6	377.4	-147.8	405.3	0.00	0.00	0.00
3,640.0	10.70	338.61	3,602.9	384.3	-150.5	412.8	0.00	0.00	0.00
3,680.0	10.70	338.61	3,642.2	391.2	-153.2	420.2	0.00	0.00	0.00
3,720.0	10.70	338.61	3,681.5	398.2	-155.9	427.6	0.00	0.00	0.00
3,760.0	10.70	338.61	3,720.8	405.1	-158.6	435.0	0.00	0.00	0.00
3,800.0	10.70	338.61	3,760.1	412.0	-161.4	442.5	0.00	0.00	0.00
3,840.0	10.70	338.61	3,799.4	418.9	-164.1	449.9	0.00	0.00	0.00
3,880.0	10.70	338.61	3,838.7	425.8	-166.8	457.3	0.00	0.00	0.00
3,920.0	10.70	338.61	3,878.0	432.7	-169.5	464.7	0.00	0.00	0.00
3,960.0	10.70	338.61	3,917.3	439.6	-172.2	472.2	0.00	0.00	0.00
4,000.0	10.70	338.61	3,956.6	446.6	-174.9	479.6	0.00	0.00	0.00
4,040.0	10.70	338.61	3,996.0	453.5	-177.6	487.0	0.00	0.00	0.00
4,080.0	10.70	338.61	4,035.3	460.4	-180.3	494.4	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 N05-23D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-23D Plan #1 (1-30-1:

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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	10.70	338.61	4,074.6	467.3	-183.0	501.9	0.00	0.00	0.00
4,160.0	10.70	338.61	4,113.9	474.2	-185.7	509.3	0.00	0.00	0.00
4,200.0	10.70	338.61	4,153.2	481.1	-188.4	516.7	0.00	0.00	0.00
4,240.0	10.70	338.61	4,192.5	488.0	-191.1	524.1	0.00	0.00	0.00
4,280.0	10.70	338.61	4,231.8	495.0	-193.9	531.6	0.00	0.00	0.00
4,320.0	10.70	338.61	4,271.1	501.9	-196.6	539.0	0.00	0.00	0.00
4,360.0	10.70	338.61	4,310.4	508.8	-199.3	546.4	0.00	0.00	0.00
4,400.0	10.70	338.61	4,349.7	515.7	-202.0	553.8	0.00	0.00	0.00
4,440.0	10.70	338.61	4,389.0	522.6	-204.7	561.3	0.00	0.00	0.00
4,480.0	10.70	338.61	4,428.3	529.5	-207.4	568.7	0.00	0.00	0.00
4,520.0	10.70	338.61	4,467.6	536.4	-210.1	576.1	0.00	0.00	0.00
4,520.6	10.70	338.61	4,468.2	536.5	-210.1	576.2	0.00	0.00	0.00
4,560.0	9.91	338.61	4,507.0	543.1	-212.7	583.3	2.00	-2.00	0.00
4,600.0	9.11	338.61	4,546.4	549.3	-215.1	589.9	2.00	-2.00	0.00
4,640.0	8.31	338.61	4,586.0	554.9	-217.3	596.0	2.00	-2.00	0.00
4,680.0	7.51	338.61	4,625.6	560.0	-219.3	601.5	2.00	-2.00	0.00
4,720.0	6.71	338.61	4,665.3	564.6	-221.1	606.4	2.00	-2.00	0.00
4,760.0	5.91	338.61	4,705.0	568.7	-222.8	610.8	2.00	-2.00	0.00
4,800.0	5.11	338.61	4,744.8	572.3	-224.2	614.6	2.00	-2.00	0.00
4,840.0	4.31	338.61	4,784.7	575.4	-225.3	617.9	2.00	-2.00	0.00
4,880.0	3.51	338.61	4,824.6	577.9	-226.3	620.7	2.00	-2.00	0.00
4,920.0	2.71	338.61	4,864.5	579.9	-227.1	622.8	2.00	-2.00	0.00
4,960.0	1.91	338.61	4,904.5	581.4	-227.7	624.4	2.00	-2.00	0.00
5,000.0	1.11	338.61	4,944.5	582.4	-228.1	625.5	2.00	-2.00	0.00
5,040.0	0.31	338.61	4,984.5	582.9	-228.3	626.0	2.00	-2.00	0.00
5,055.5	0.00	0.00	5,000.0	582.9	-228.3	626.0	2.00	-2.00	137.98
TARGET BHL 1320'FSL & 1320'FEL									
5,080.0	0.00	0.00	5,024.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,120.0	0.00	0.00	5,064.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,160.0	0.00	0.00	5,104.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,144.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,240.0	0.00	0.00	5,184.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,280.0	0.00	0.00	5,224.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,320.0	0.00	0.00	5,264.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,360.0	0.00	0.00	5,304.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,344.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,440.0	0.00	0.00	5,384.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,480.0	0.00	0.00	5,424.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,520.0	0.00	0.00	5,464.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,560.0	0.00	0.00	5,504.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,544.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,640.0	0.00	0.00	5,584.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,680.0	0.00	0.00	5,624.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,720.0	0.00	0.00	5,664.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,760.0	0.00	0.00	5,704.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,744.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,840.0	0.00	0.00	5,784.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,880.0	0.00	0.00	5,824.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,920.0	0.00	0.00	5,864.5	582.9	-228.3	626.0	0.00	0.00	0.00
5,960.0	0.00	0.00	5,904.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,944.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,040.0	0.00	0.00	5,984.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,080.0	0.00	0.00	6,024.5	582.9	-228.3	626.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Thornton USX N05-23D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4896.0ft (Original Well Elev)
Project:	SEC.5-T5N-R67W	MD Reference:	WELL @ 4896.0ft (Original Well Elev)
Site:	Thornton USX N05-09D Pad SEC.5-T5N-R67W	North Reference:	True
Well:	Thornton USX N05-23D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble Thornton USX N05-23D Plan #1 (1-30-1:		

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	6,064.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,160.0	0.00	0.00	6,104.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,144.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,240.0	0.00	0.00	6,184.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,280.0	0.00	0.00	6,224.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,320.0	0.00	0.00	6,264.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,360.0	0.00	0.00	6,304.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,344.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,440.0	0.00	0.00	6,384.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,480.0	0.00	0.00	6,424.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,520.0	0.00	0.00	6,464.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,560.0	0.00	0.00	6,504.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,544.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,640.0	0.00	0.00	6,584.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,680.0	0.00	0.00	6,624.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,707.5	0.00	0.00	6,652.0	582.9	-228.3	626.0	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 800' X 800' 1328'FSL & 1322'FEL - TARGET CIRCLE 1320'FSL & 1320'FEL									
6,720.0	0.00	0.00	6,664.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,760.0	0.00	0.00	6,704.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,744.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,840.0	0.00	0.00	6,784.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,880.0	0.00	0.00	6,824.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,920.0	0.00	0.00	6,864.5	582.9	-228.3	626.0	0.00	0.00	0.00
6,960.0	0.00	0.00	6,904.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,944.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,040.0	0.00	0.00	6,984.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,080.0	0.00	0.00	7,024.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,120.0	0.00	0.00	7,064.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,160.0	0.00	0.00	7,104.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,144.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,240.0	0.00	0.00	7,184.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,266.5	0.00	0.00	7,211.0	582.9	-228.3	626.0	0.00	0.00	0.00
CODELL									
7,280.0	0.00	0.00	7,224.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,320.0	0.00	0.00	7,264.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,360.0	0.00	0.00	7,304.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,344.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,440.0	0.00	0.00	7,384.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,480.0	0.00	0.00	7,424.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,520.0	0.00	0.00	7,464.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,560.0	0.00	0.00	7,504.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,544.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,640.0	0.00	0.00	7,584.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,656.5	0.00	0.00	7,601.0	582.9	-228.3	626.0	0.00	0.00	0.00
D-SAND									
7,680.0	0.00	0.00	7,624.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,720.0	0.00	0.00	7,664.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,737.5	0.00	0.00	7,682.0	582.9	-228.3	626.0	0.00	0.00	0.00
J-SAND									
7,760.0	0.00	0.00	7,704.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,744.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,840.0	0.00	0.00	7,784.5	582.9	-228.3	626.0	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 N05-23D
Wellbore: Wellbore #1
Design: Noble Thornton USX N05-23D Plan #1 (1-30-1:

Local Co-ordinate Reference: Well Thornton USX N05-23D
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)
7,880.0	0.00	0.00	7,824.5	582.9	-228.3	626.0	0.00	0.00	0.00
7,887.5	0.00	0.00	7,832.0	582.9	-228.3	626.0	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 1320'F - plan hits target center - Point	0.00	0.00	5,000.0	582.9	-228.3	1,398,273.56	3,163,857.99	40.425170	-104.911440
LEGAL BOX 800' X 80' - plan misses target center by 8.2ft at 6707.5ft MD (6652.0 TVD, 582.9 N, -228.3 E) - Rectangle (sides W400.0 H400.0 D1,180.0)	0.00	0.00	6,652.0	590.9	-230.3	1,398,281.53	3,163,855.94	40.425192	-104.911447
TARGET CIRCLE 132' - plan hits target center - Circle (radius 75.0)	0.00	0.00	6,652.0	582.9	-228.3	1,398,273.56	3,163,857.99	40.425170	-104.911440

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 (°)
6,707.5	6,652.0	NIOBRARA		0.00	
7,266.5	7,211.0	CODELL		0.00	
7,656.5	7,601.0	D-SAND		0.00	
7,737.5	7,682.0	J-SAND		0.00	