

ENSIGN

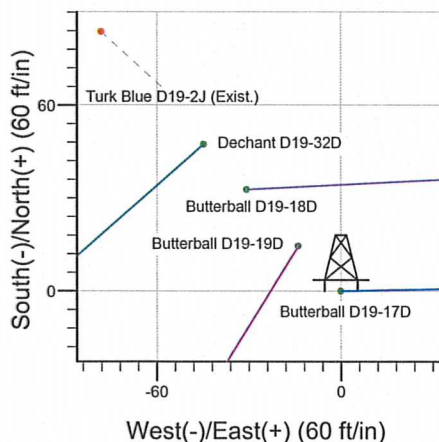
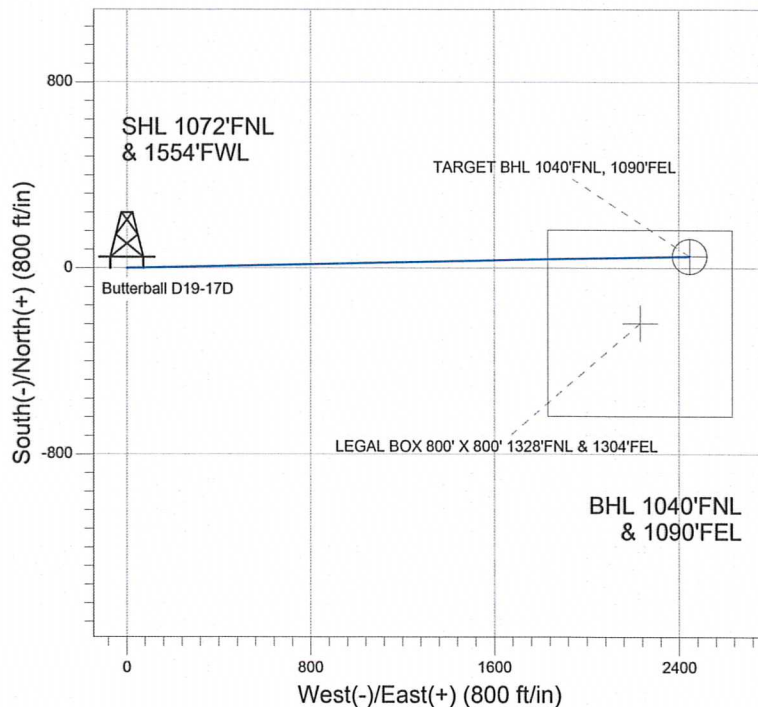
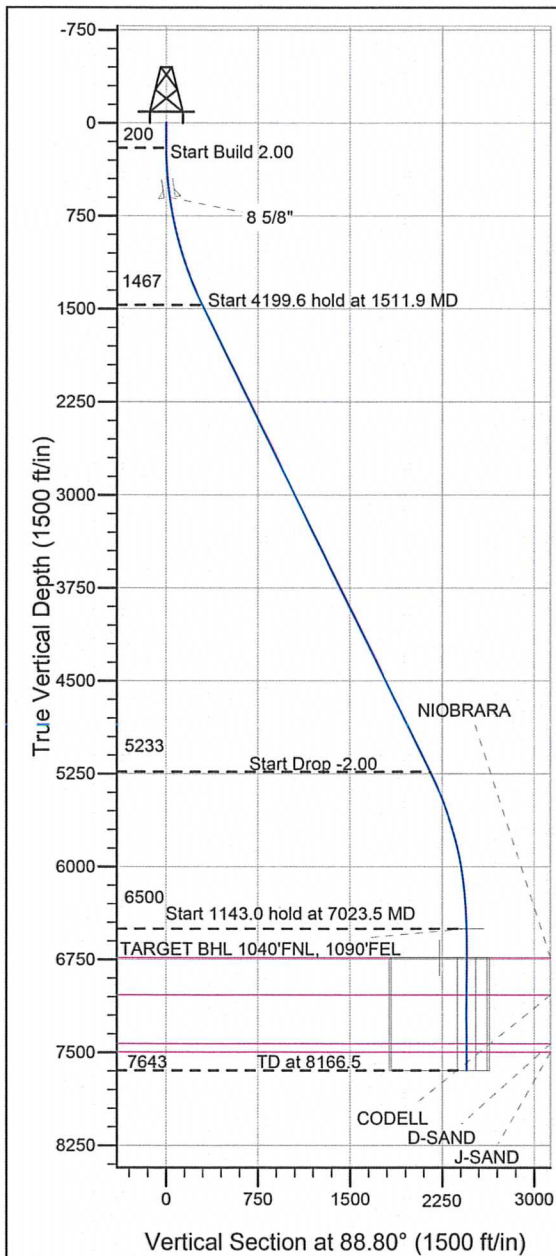
Directional

Well Name: Butterball D19-17D

Surface Location: Butterball D19-17D Pad Sec.19-T3N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4790.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1322464.94	3252143.12	40.215040	-104.597120	
		Original Well Elev	WELL @ 4803.0ft (Original Well Elev)			

NOBLE ENERGY INC WELD COUNTY CO



Butterball D19-17D Pad Sec.19-T3N-R64W
Butterball D19-17D
Noble Butterball D19-17D Plan #1 (2-15-12)
13:50, February 22 2012



Azimuths to True North
Magnetic North: 8.67°
Magnetic Field
Strength: 52981.8snT
Dip Angle: 66.91°
Date: 2/15/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1040'FNL, 1090'FEL	6500.0	51.1	2446.5	40.215180	-104.588360	Point
LEGAL BOX 800' X 800' 1328'FNL & 1304'FEL	6734.0	-236.9	2232.5	40.214389	-104.589126	Rectangle (Sides: L800.0 W800.0)
TARGET CIRCLE 1040'FNL & 1090'FEL	6734.0	51.1	2446.5	40.215180	-104.588360	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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1511.9	26.24	88.80	1466.5	6.2	295.1	2.00	88.80	295.2	
4	5711.6	26.24	88.80	5233.5	45.0	2151.4	0.00	0.00	2151.9	
5	7023.5	0.00	0.00	6500.0	51.1	2446.5	2.00	180.00	2447.0	TARGET BHL 1040'FNL, 1090'FEL
6	8166.5	0.00	0.00	7643.0	51.1	2446.5	0.00	0.00	2447.0	



NOBLE ENERGY INC WELD COUNTY CO

SEC.19-T3N-R64W

Butterball D19-17D Pad Sec.19-T3N-R64W

Butterball D19-17D

Wellbore #1

Plan: Noble Butterball D19-17D Plan #1 (2-15-12)

Standard Planning Report

22 February, 2012



Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Well: Butterball D19-17D
Wellbore: Wellbore #1
Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	SEC.19-T3N-R64W, 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	Butterball D19-17D Pad Sec.19-T3N-R64W				
Site Position:		Northing:	1,322,464.95ft	Latitude:	40.215040
From:	Lat/Long	Easting:	3,252,143.12ft	Longitude:	-104.597120
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.58 °

Well	Butterball D19-17D					
Well Position	+N/-S	0.0 ft	Northing:	1,322,464.94 ft	Latitude:	40.215040
	+E/-W	0.0 ft	Easting:	3,252,143.12 ft	Longitude:	-104.597120
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,790.0 ft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/15/2012	8.67	66.91	52,982

Design	Noble Butterball D19-17D Plan #1 (2-15-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	88.80

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,511.9	26.24	88.80	1,466.5	6.2	295.1	2.00	2.00	0.00	88.80	
5,711.6	26.24	88.80	5,233.5	45.0	2,151.4	0.00	0.00	0.00	0.00	
7,023.5	0.00	0.00	6,500.0	51.1	2,446.5	2.00	-2.00	0.00	180.00	TARGET BHL 104C
8,166.5	0.00	0.00	7,643.0	51.1	2,446.5	0.00	0.00	0.00	0.00	

Database: Landmark
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Project: SEC.19-T3N-R64W
Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Well: Butterball D19-17D
Wellbore: Wellbore #1
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Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (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	0.80	88.80	240.0	0.0	0.3	0.3	2.00	2.00	0.00
280.0	1.60	88.80	280.0	0.0	1.1	1.1	2.00	2.00	0.00
320.0	2.40	88.80	320.0	0.1	2.5	2.5	2.00	2.00	0.00
360.0	3.20	88.80	359.9	0.1	4.5	4.5	2.00	2.00	0.00
400.0	4.00	88.80	399.8	0.1	7.0	7.0	2.00	2.00	0.00
440.0	4.80	88.80	439.7	0.2	10.0	10.0	2.00	2.00	0.00
480.0	5.60	88.80	479.6	0.3	13.7	13.7	2.00	2.00	0.00
520.0	6.40	88.80	519.3	0.4	17.8	17.9	2.00	2.00	0.00
560.0	7.20	88.80	559.1	0.5	22.6	22.6	2.00	2.00	0.00
600.0	8.00	88.80	598.7	0.6	27.9	27.9	2.00	2.00	0.00
601.3	8.03	88.80	600.0	0.6	28.1	28.1	2.00	2.00	0.00
8 5/8"									
640.0	8.80	88.80	638.3	0.7	33.7	33.7	2.00	2.00	0.00
680.0	9.60	88.80	677.8	0.8	40.1	40.1	2.00	2.00	0.00
720.0	10.40	88.80	717.1	1.0	47.1	47.1	2.00	2.00	0.00
760.0	11.20	88.80	756.4	1.1	54.5	54.6	2.00	2.00	0.00
800.0	12.00	88.80	795.6	1.3	62.6	62.6	2.00	2.00	0.00
840.0	12.80	88.80	834.7	1.5	71.2	71.2	2.00	2.00	0.00
880.0	13.60	88.80	873.6	1.7	80.3	80.3	2.00	2.00	0.00
920.0	14.40	88.80	912.4	1.9	90.0	90.0	2.00	2.00	0.00
960.0	15.20	88.80	951.1	2.1	100.2	100.2	2.00	2.00	0.00
1,000.0	16.00	88.80	989.6	2.3	111.0	111.0	2.00	2.00	0.00
1,040.0	16.80	88.80	1,028.0	2.6	122.2	122.3	2.00	2.00	0.00
1,080.0	17.60	88.80	1,066.2	2.8	134.1	134.1	2.00	2.00	0.00
1,120.0	18.40	88.80	1,104.3	3.1	146.4	146.5	2.00	2.00	0.00
1,160.0	19.20	88.80	1,142.1	3.3	159.3	159.3	2.00	2.00	0.00
1,200.0	20.00	88.80	1,179.8	3.6	172.7	172.8	2.00	2.00	0.00
1,240.0	20.80	88.80	1,217.3	3.9	186.7	186.7	2.00	2.00	0.00
1,280.0	21.60	88.80	1,254.6	4.2	201.1	201.2	2.00	2.00	0.00
1,320.0	22.40	88.80	1,291.7	4.5	216.1	216.2	2.00	2.00	0.00
1,360.0	23.20	88.80	1,328.6	4.8	231.6	231.7	2.00	2.00	0.00
1,400.0	24.00	88.80	1,365.2	5.2	247.6	247.7	2.00	2.00	0.00
1,440.0	24.80	88.80	1,401.6	5.5	264.1	264.2	2.00	2.00	0.00
1,480.0	25.60	88.80	1,437.8	5.9	281.2	281.2	2.00	2.00	0.00
1,511.9	26.24	88.80	1,466.5	6.2	295.1	295.2	2.00	2.00	0.00
1,520.0	26.24	88.80	1,473.8	6.2	298.7	298.8	0.00	0.00	0.00
1,560.0	26.24	88.80	1,509.7	6.6	316.4	316.4	0.00	0.00	0.00
1,600.0	26.24	88.80	1,545.5	7.0	334.0	334.1	0.00	0.00	0.00
1,640.0	26.24	88.80	1,581.4	7.4	351.7	351.8	0.00	0.00	0.00
1,680.0	26.24	88.80	1,617.3	7.7	369.4	369.5	0.00	0.00	0.00
1,720.0	26.24	88.80	1,653.2	8.1	387.1	387.2	0.00	0.00	0.00
1,760.0	26.24	88.80	1,689.1	8.5	404.8	404.9	0.00	0.00	0.00
1,800.0	26.24	88.80	1,724.9	8.8	422.5	422.5	0.00	0.00	0.00
1,840.0	26.24	88.80	1,760.8	9.2	440.1	440.2	0.00	0.00	0.00
1,880.0	26.24	88.80	1,796.7	9.6	457.8	457.9	0.00	0.00	0.00
1,920.0	26.24	88.80	1,832.6	9.9	475.5	475.6	0.00	0.00	0.00
1,960.0	26.24	88.80	1,868.5	10.3	493.2	493.3	0.00	0.00	0.00
2,000.0	26.24	88.80	1,904.3	10.7	510.9	511.0	0.00	0.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Well: Butterball D19-17D
Wellbore: Wellbore #1
Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Butterball D19-17D
WELL @ 4803.0ft (Original Well Elev)
WELL @ 4803.0ft (Original Well Elev)
True
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)
2,040.0	26.24	88.80	1,940.2	11.0	528.5	528.6	0.00	0.00	0.00
2,080.0	26.24	88.80	1,976.1	11.4	546.2	546.3	0.00	0.00	0.00
2,120.0	26.24	88.80	2,012.0	11.8	563.9	564.0	0.00	0.00	0.00
2,160.0	26.24	88.80	2,047.8	12.2	581.6	581.7	0.00	0.00	0.00
2,200.0	26.24	88.80	2,083.7	12.5	599.3	599.4	0.00	0.00	0.00
2,240.0	26.24	88.80	2,119.6	12.9	616.9	617.1	0.00	0.00	0.00
2,280.0	26.24	88.80	2,155.5	13.3	634.6	634.8	0.00	0.00	0.00
2,320.0	26.24	88.80	2,191.4	13.6	652.3	652.4	0.00	0.00	0.00
2,360.0	26.24	88.80	2,227.2	14.0	670.0	670.1	0.00	0.00	0.00
2,400.0	26.24	88.80	2,263.1	14.4	687.7	687.8	0.00	0.00	0.00
2,440.0	26.24	88.80	2,299.0	14.7	705.3	705.5	0.00	0.00	0.00
2,480.0	26.24	88.80	2,334.9	15.1	723.0	723.2	0.00	0.00	0.00
2,520.0	26.24	88.80	2,370.8	15.5	740.7	740.9	0.00	0.00	0.00
2,560.0	26.24	88.80	2,406.6	15.8	758.4	758.5	0.00	0.00	0.00
2,600.0	26.24	88.80	2,442.5	16.2	776.1	776.2	0.00	0.00	0.00
2,640.0	26.24	88.80	2,478.4	16.6	793.7	793.9	0.00	0.00	0.00
2,680.0	26.24	88.80	2,514.3	17.0	811.4	811.6	0.00	0.00	0.00
2,720.0	26.24	88.80	2,550.1	17.3	829.1	829.3	0.00	0.00	0.00
2,760.0	26.24	88.80	2,586.0	17.7	846.8	847.0	0.00	0.00	0.00
2,800.0	26.24	88.80	2,621.9	18.1	864.5	864.6	0.00	0.00	0.00
2,840.0	26.24	88.80	2,657.8	18.4	882.1	882.3	0.00	0.00	0.00
2,880.0	26.24	88.80	2,693.7	18.8	899.8	900.0	0.00	0.00	0.00
2,920.0	26.24	88.80	2,729.5	19.2	917.5	917.7	0.00	0.00	0.00
2,960.0	26.24	88.80	2,765.4	19.5	935.2	935.4	0.00	0.00	0.00
3,000.0	26.24	88.80	2,801.3	19.9	952.9	953.1	0.00	0.00	0.00
3,040.0	26.24	88.80	2,837.2	20.3	970.5	970.8	0.00	0.00	0.00
3,080.0	26.24	88.80	2,873.1	20.7	988.2	988.4	0.00	0.00	0.00
3,120.0	26.24	88.80	2,908.9	21.0	1,005.9	1,006.1	0.00	0.00	0.00
3,160.0	26.24	88.80	2,944.8	21.4	1,023.6	1,023.8	0.00	0.00	0.00
3,200.0	26.24	88.80	2,980.7	21.8	1,041.3	1,041.5	0.00	0.00	0.00
3,240.0	26.24	88.80	3,016.6	22.1	1,058.9	1,059.2	0.00	0.00	0.00
3,280.0	26.24	88.80	3,052.4	22.5	1,076.6	1,076.9	0.00	0.00	0.00
3,320.0	26.24	88.80	3,088.3	22.9	1,094.3	1,094.5	0.00	0.00	0.00
3,360.0	26.24	88.80	3,124.2	23.2	1,112.0	1,112.2	0.00	0.00	0.00
3,400.0	26.24	88.80	3,160.1	23.6	1,129.7	1,129.9	0.00	0.00	0.00
3,440.0	26.24	88.80	3,196.0	24.0	1,147.3	1,147.6	0.00	0.00	0.00
3,480.0	26.24	88.80	3,231.8	24.3	1,165.0	1,165.3	0.00	0.00	0.00
3,520.0	26.24	88.80	3,267.7	24.7	1,182.7	1,183.0	0.00	0.00	0.00
3,560.0	26.24	88.80	3,303.6	25.1	1,200.4	1,200.7	0.00	0.00	0.00
3,600.0	26.24	88.80	3,339.5	25.5	1,218.1	1,218.3	0.00	0.00	0.00
3,640.0	26.24	88.80	3,375.4	25.8	1,235.7	1,236.0	0.00	0.00	0.00
3,680.0	26.24	88.80	3,411.2	26.2	1,253.4	1,253.7	0.00	0.00	0.00
3,720.0	26.24	88.80	3,447.1	26.6	1,271.1	1,271.4	0.00	0.00	0.00
3,760.0	26.24	88.80	3,483.0	26.9	1,288.8	1,289.1	0.00	0.00	0.00
3,800.0	26.24	88.80	3,518.9	27.3	1,306.5	1,306.8	0.00	0.00	0.00
3,840.0	26.24	88.80	3,554.7	27.7	1,324.2	1,324.4	0.00	0.00	0.00
3,880.0	26.24	88.80	3,590.6	28.0	1,341.8	1,342.1	0.00	0.00	0.00
3,920.0	26.24	88.80	3,626.5	28.4	1,359.5	1,359.8	0.00	0.00	0.00
3,960.0	26.24	88.80	3,662.4	28.8	1,377.2	1,377.5	0.00	0.00	0.00
4,000.0	26.24	88.80	3,698.3	29.1	1,394.9	1,395.2	0.00	0.00	0.00
4,040.0	26.24	88.80	3,734.1	29.5	1,412.6	1,412.9	0.00	0.00	0.00
4,080.0	26.24	88.80	3,770.0	29.9	1,430.2	1,430.5	0.00	0.00	0.00
4,120.0	26.24	88.80	3,805.9	30.3	1,447.9	1,448.2	0.00	0.00	0.00
4,160.0	26.24	88.80	3,841.8	30.6	1,465.6	1,465.9	0.00	0.00	0.00

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WELL @ 4803.0ft (Original Well Elev)
WELL @ 4803.0ft (Original Well Elev)
True
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)
4,200.0	26.24	88.80	3,877.7	31.0	1,483.3	1,483.6	0.00	0.00	0.00
4,240.0	26.24	88.80	3,913.5	31.4	1,501.0	1,501.3	0.00	0.00	0.00
4,280.0	26.24	88.80	3,949.4	31.7	1,518.6	1,519.0	0.00	0.00	0.00
4,320.0	26.24	88.80	3,985.3	32.1	1,536.3	1,536.7	0.00	0.00	0.00
4,360.0	26.24	88.80	4,021.2	32.5	1,554.0	1,554.3	0.00	0.00	0.00
4,400.0	26.24	88.80	4,057.0	32.8	1,571.7	1,572.0	0.00	0.00	0.00
4,440.0	26.24	88.80	4,092.9	33.2	1,589.4	1,589.7	0.00	0.00	0.00
4,480.0	26.24	88.80	4,128.8	33.6	1,607.0	1,607.4	0.00	0.00	0.00
4,520.0	26.24	88.80	4,164.7	34.0	1,624.7	1,625.1	0.00	0.00	0.00
4,560.0	26.24	88.80	4,200.6	34.3	1,642.4	1,642.8	0.00	0.00	0.00
4,600.0	26.24	88.80	4,236.4	34.7	1,660.1	1,660.4	0.00	0.00	0.00
4,640.0	26.24	88.80	4,272.3	35.1	1,677.8	1,678.1	0.00	0.00	0.00
4,680.0	26.24	88.80	4,308.2	35.4	1,695.4	1,695.8	0.00	0.00	0.00
4,720.0	26.24	88.80	4,344.1	35.8	1,713.1	1,713.5	0.00	0.00	0.00
4,760.0	26.24	88.80	4,379.9	36.2	1,730.8	1,731.2	0.00	0.00	0.00
4,800.0	26.24	88.80	4,415.8	36.5	1,748.5	1,748.9	0.00	0.00	0.00
4,840.0	26.24	88.80	4,451.7	36.9	1,766.2	1,766.5	0.00	0.00	0.00
4,880.0	26.24	88.80	4,487.6	37.3	1,783.8	1,784.2	0.00	0.00	0.00
4,920.0	26.24	88.80	4,523.5	37.6	1,801.5	1,801.9	0.00	0.00	0.00
4,960.0	26.24	88.80	4,559.3	38.0	1,819.2	1,819.6	0.00	0.00	0.00
5,000.0	26.24	88.80	4,595.2	38.4	1,836.9	1,837.3	0.00	0.00	0.00
5,040.0	26.24	88.80	4,631.1	38.8	1,854.6	1,855.0	0.00	0.00	0.00
5,080.0	26.24	88.80	4,667.0	39.1	1,872.2	1,872.7	0.00	0.00	0.00
5,120.0	26.24	88.80	4,702.9	39.5	1,889.9	1,890.3	0.00	0.00	0.00
5,160.0	26.24	88.80	4,738.7	39.9	1,907.6	1,908.0	0.00	0.00	0.00
5,200.0	26.24	88.80	4,774.6	40.2	1,925.3	1,925.7	0.00	0.00	0.00
5,240.0	26.24	88.80	4,810.5	40.6	1,943.0	1,943.4	0.00	0.00	0.00
5,280.0	26.24	88.80	4,846.4	41.0	1,960.6	1,961.1	0.00	0.00	0.00
5,320.0	26.24	88.80	4,882.2	41.3	1,978.3	1,978.8	0.00	0.00	0.00
5,360.0	26.24	88.80	4,918.1	41.7	1,996.0	1,996.4	0.00	0.00	0.00
5,400.0	26.24	88.80	4,954.0	42.1	2,013.7	2,014.1	0.00	0.00	0.00
5,440.0	26.24	88.80	4,989.9	42.5	2,031.4	2,031.8	0.00	0.00	0.00
5,480.0	26.24	88.80	5,025.8	42.8	2,049.0	2,049.5	0.00	0.00	0.00
5,520.0	26.24	88.80	5,061.6	43.2	2,066.7	2,067.2	0.00	0.00	0.00
5,560.0	26.24	88.80	5,097.5	43.6	2,084.4	2,084.9	0.00	0.00	0.00
5,600.0	26.24	88.80	5,133.4	43.9	2,102.1	2,102.5	0.00	0.00	0.00
5,640.0	26.24	88.80	5,169.3	44.3	2,119.8	2,120.2	0.00	0.00	0.00
5,680.0	26.24	88.80	5,205.2	44.7	2,137.4	2,137.9	0.00	0.00	0.00
5,711.6	26.24	88.80	5,233.5	45.0	2,151.4	2,151.9	0.00	0.00	0.00
5,720.0	26.07	88.80	5,241.0	45.0	2,155.1	2,155.6	2.00	-2.00	0.00
5,760.0	25.27	88.80	5,277.1	45.4	2,172.4	2,172.9	2.00	-2.00	0.00
5,800.0	24.47	88.80	5,313.4	45.8	2,189.3	2,189.7	2.00	-2.00	0.00
5,840.0	23.67	88.80	5,349.9	46.1	2,205.6	2,206.1	2.00	-2.00	0.00
5,880.0	22.87	88.80	5,386.6	46.4	2,221.4	2,221.9	2.00	-2.00	0.00
5,920.0	22.07	88.80	5,423.6	46.7	2,236.7	2,237.1	2.00	-2.00	0.00
5,960.0	21.27	88.80	5,460.8	47.1	2,251.4	2,251.9	2.00	-2.00	0.00
6,000.0	20.47	88.80	5,498.2	47.3	2,265.7	2,266.2	2.00	-2.00	0.00
6,040.0	19.67	88.80	5,535.7	47.6	2,279.4	2,279.9	2.00	-2.00	0.00
6,080.0	18.87	88.80	5,573.5	47.9	2,292.6	2,293.1	2.00	-2.00	0.00
6,120.0	18.07	88.80	5,611.4	48.2	2,305.3	2,305.8	2.00	-2.00	0.00
6,160.0	17.27	88.80	5,649.5	48.4	2,317.4	2,317.9	2.00	-2.00	0.00
6,200.0	16.47	88.80	5,687.8	48.7	2,329.0	2,329.5	2.00	-2.00	0.00
6,240.0	15.67	88.80	5,726.3	48.9	2,340.1	2,340.6	2.00	-2.00	0.00
6,280.0	14.87	88.80	5,764.8	49.1	2,350.6	2,351.1	2.00	-2.00	0.00

Database: Landmark
Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.19-T3N-R64W
Site: Butterball D19-17D Pad Sec.19-T3N-R64W
Well: Butterball D19-17D
Wellbore: Wellbore #1
Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (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)
6,320.0	14.07	88.80	5,803.6	49.3	2,360.6	2,361.1	2.00	-2.00	0.00
6,360.0	13.27	88.80	5,842.4	49.5	2,370.0	2,370.6	2.00	-2.00	0.00
6,400.0	12.47	88.80	5,881.4	49.7	2,379.0	2,379.5	2.00	-2.00	0.00
6,440.0	11.67	88.80	5,920.6	49.9	2,387.3	2,387.8	2.00	-2.00	0.00
6,480.0	10.87	88.80	5,959.8	50.1	2,395.1	2,395.7	2.00	-2.00	0.00
6,520.0	10.07	88.80	5,999.1	50.2	2,402.4	2,402.9	2.00	-2.00	0.00
6,560.0	9.27	88.80	6,038.5	50.3	2,409.1	2,409.6	2.00	-2.00	0.00
6,600.0	8.47	88.80	6,078.1	50.5	2,415.3	2,415.8	2.00	-2.00	0.00
6,640.0	7.67	88.80	6,117.7	50.6	2,420.9	2,421.4	2.00	-2.00	0.00
6,680.0	6.87	88.80	6,157.4	50.7	2,426.0	2,426.5	2.00	-2.00	0.00
6,720.0	6.07	88.80	6,197.1	50.8	2,430.5	2,431.0	2.00	-2.00	0.00
6,760.0	5.27	88.80	6,236.9	50.9	2,434.4	2,434.9	2.00	-2.00	0.00
6,800.0	4.47	88.80	6,276.8	50.9	2,437.8	2,438.3	2.00	-2.00	0.00
6,840.0	3.67	88.80	6,316.7	51.0	2,440.6	2,441.2	2.00	-2.00	0.00
6,880.0	2.87	88.80	6,356.6	51.1	2,442.9	2,443.5	2.00	-2.00	0.00
6,920.0	2.07	88.80	6,396.6	51.1	2,444.6	2,445.2	2.00	-2.00	0.00
6,960.0	1.27	88.80	6,436.5	51.1	2,445.8	2,446.3	2.00	-2.00	0.00
7,000.0	0.47	88.80	6,476.5	51.1	2,446.4	2,446.9	2.00	-2.00	0.00
7,023.5	0.00	0.00	6,500.0	51.1	2,446.5	2,447.0	2.00	-2.00	0.00
TARGET BHL 1040'FNL, 1090'FEL									
7,040.0	0.00	0.00	6,516.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,080.0	0.00	0.00	6,556.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,120.0	0.00	0.00	6,596.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,160.0	0.00	0.00	6,636.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,676.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,240.0	0.00	0.00	6,716.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,257.5	0.00	0.00	6,734.0	51.1	2,446.5	2,447.0	0.00	0.00	0.00
NIOBRARA - TARGET CIRCLE 1040'FNL & 1090'FEL - LEGAL BOX 800' X 800' 1328'FNL & 1304'FEL									
7,280.0	0.00	0.00	6,756.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,320.0	0.00	0.00	6,796.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,360.0	0.00	0.00	6,836.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,400.0	0.00	0.00	6,876.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,440.0	0.00	0.00	6,916.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,480.0	0.00	0.00	6,956.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,520.0	0.00	0.00	6,996.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,557.5	0.00	0.00	7,034.0	51.1	2,446.5	2,447.0	0.00	0.00	0.00
CODELL									
7,560.0	0.00	0.00	7,036.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,076.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,640.0	0.00	0.00	7,116.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,680.0	0.00	0.00	7,156.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,720.0	0.00	0.00	7,196.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,760.0	0.00	0.00	7,236.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,276.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,840.0	0.00	0.00	7,316.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,880.0	0.00	0.00	7,356.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,920.0	0.00	0.00	7,396.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
7,951.5	0.00	0.00	7,428.0	51.1	2,446.5	2,447.0	0.00	0.00	0.00
D-SAND									
7,960.0	0.00	0.00	7,436.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
8,000.0	0.00	0.00	7,476.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
8,016.5	0.00	0.00	7,493.0	51.1	2,446.5	2,447.0	0.00	0.00	0.00
J-SAND									
8,040.0	0.00	0.00	7,516.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00

Database: Landmark
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Project: SEC.19-T3N-R64W
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Wellbore: Wellbore #1
Design: Noble Butterball D19-17D Plan #1 (2-15-12)

Local Co-ordinate Reference: Well Butterball D19-17D
TVD Reference: WELL @ 4803.0ft (Original Well Elev)
MD Reference: WELL @ 4803.0ft (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)
8,080.0	0.00	0.00	7,556.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
8,120.0	0.00	0.00	7,596.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
8,160.0	0.00	0.00	7,636.5	51.1	2,446.5	2,447.0	0.00	0.00	0.00
8,166.5	0.00	0.00	7,643.0	51.1	2,446.5	2,447.0	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 1040'F - plan hits target center - Point	0.00	0.00	6,500.0	51.1	2,446.5	1,322,540.97	3,254,588.88	40.215180	-104.588360
TARGET CIRCLE 104 - plan hits target center - Circle (radius 75.0)	0.00	0.00	6,734.0	51.1	2,446.5	1,322,540.97	3,254,588.88	40.215180	-104.588360
LEGAL BOX 800' X 800' - plan misses target center by 358.8ft at 7257.5ft MD (6734.0 TVD, 51.1 N, 2446.5 E) - Rectangle (sides W800.0 H800.0 D909.0)	0.00	0.00	6,734.0	-236.9	2,232.5	1,322,250.80	3,254,377.82	40.214389	-104.589126

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
601.3	600.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,257.5	6,734.0	NIOBRARA		0.00	
7,557.5	7,034.0	CODELL		0.00	
7,951.5	7,428.0	D-SAND		0.00	
8,016.5	7,493.0	J-SAND		0.00	