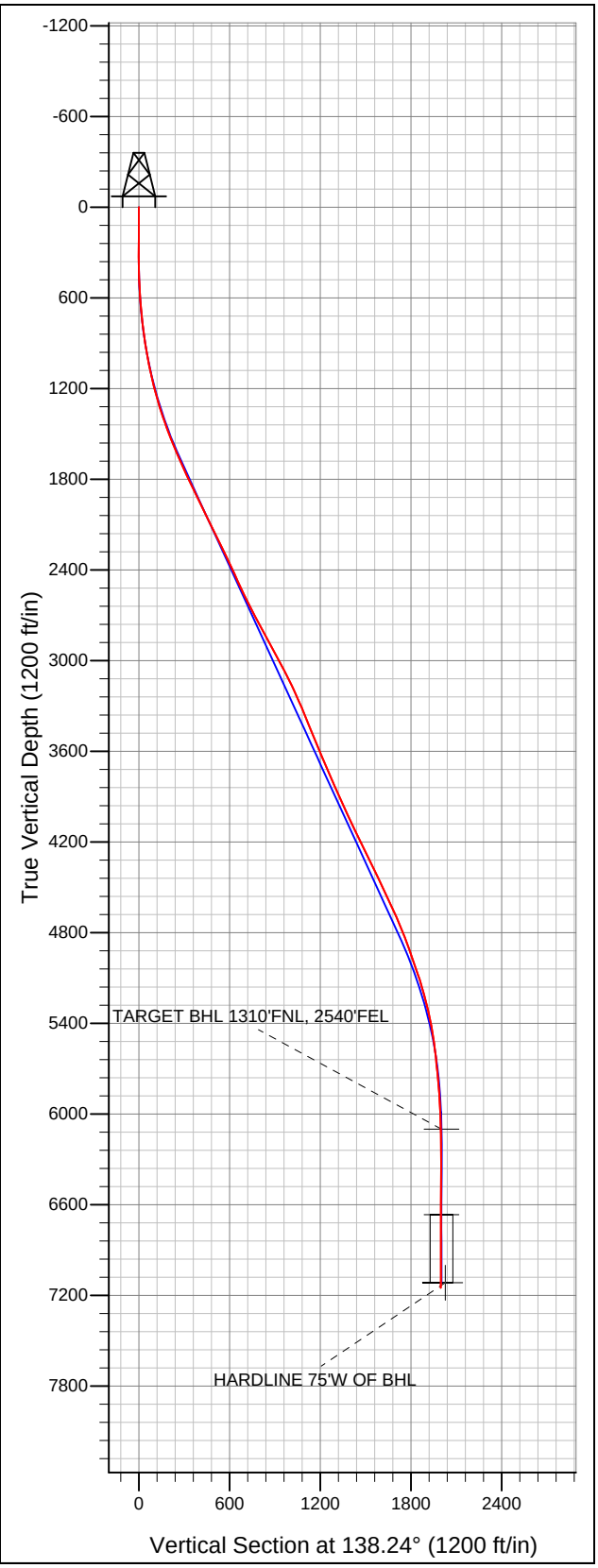
ENSIGN Directional

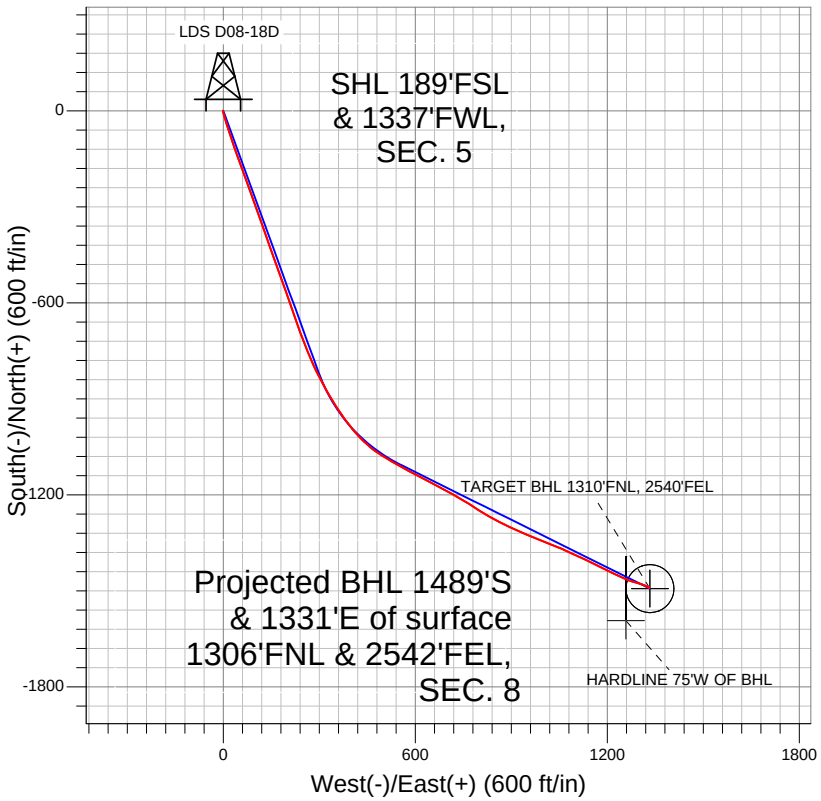
**Well Name: LDS D08-18D**

Surface Location: LDS D08-30D Pad Sec.5-T3N-R64W
North American Datum 1983 US State Plane 1983Colorado Northern Zone
Ground Elevation: 4753.0

| +N/-S | +E/-W | Northing | Easting | Latittude | Longitude | Slot |
|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 1334405.58 | 3256982.05 | 40.247680 | -104.579350 | |
| | | Original Well Elev | | WELL @ 4766.0ft (Original Well Elev) | | |




## NOBLE ENERGY INC WELD COUNTY CO




LEGEND

- Survey #1
- LDS D08-18D, Wellbore #1, Noble LDS D08-18D Plan #1 (3-06-12) V0
- Wellbore #1

# Final Survey Plot

Projected Final Survey -
7604'MD & 7150'TVD @ 1997'VS
0.50 deg Inc 16.90 deg AZ

Project: SEC.5-T3N-R64W
Site: LDS D08-30D Pad Sec.5-T3N-R64W
Well: LDS D08-18D
Plan: Wellbore #1

# NOBLE ENERGY INC WELD COUNTY CO

**SEC.5-T3N-R64W**
**LDS D08-30D Pad Sec.5-T3N-R64W**
**LDS D08-18D**

**Wellbore #1**

**Survey: Survey #1**

# Standard Survey Report

**21 March, 2012**

| | | | |
|---|---|---|---|
| **Company:** | NOBLE ENERGY INC WELD COUNTY CO | **Local Co-ordinate Reference:** | Well LDS D08-18D |
| **Project:** | SEC.5-T3N-R64W | **TVD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Site:** | LDS D08-30D Pad Sec.5-T3N-R64W | **MD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Well:** | LDS D08-18D | **North Reference:** | True |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | Landmark |

**Project** SEC.5-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** LDS D08-30D Pad Sec.5-T3N-R64W

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,334,405.07 ft | **Latitude:** | 40.247680 |
| **From:** | Lat/Long | **Easting:** | 3,256,931.80 ft | **Longitude:** | -104.579530 |
| **Position Uncertainty:** | 0.0 ft | **Slot Radius:** | " | **Grid Convergence:** | 0.59 ° |

**Well** LDS D08-18D

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 ft | **Northing:** | 1,334,405.58 ft | **Latitude:** | 40.247680 |
| | **+E/-W** | 0.0 ft | **Easting:** | 3,256,982.05 ft | **Longitude:** | -104.579350 |
| **Position Uncertainty** | | 0.0 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,753.0 ft |

**Wellbore** Wellbore #1

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 3/6/2012 | 8.65 | 66.93 | 52,995 |

**Design** Wellbore #1

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | 1.0 | **Phase:** | ACTUAL | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
|---|---|---|---|---|
| | 6,100.0 | 0.0 | 0.0 | 138.24 |

**Survey Program** **Date** 3/21/2012

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 78.0 | 7,604.0 | Survey #1 (Wellbore #1) | MWD | MWD - Standard |

**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 |
| 78.0 | 0.40 | 295.50 | 78.0 | 0.1 | -0.2 | -0.3 | 0.51 | 0.51 | 0.00 |
| 168.0 | 0.30 | 303.60 | 168.0 | 0.4 | -0.7 | -0.8 | 0.12 | -0.11 | 9.00 |
| 258.0 | 0.10 | 297.10 | 258.0 | 0.5 | -1.0 | -1.1 | 0.22 | -0.22 | -7.22 |
| 348.0 | 0.30 | 269.30 | 348.0 | 0.6 | -1.3 | -1.3 | 0.24 | 0.22 | -30.89 |
| 476.0 | 2.50 | 171.20 | 476.0 | -2.2 | -1.2 | 0.8 | 2.00 | 1.72 | -76.64 |
| 604.0 | 4.70 | 162.50 | 603.7 | -9.9 | 0.8 | 7.9 | 1.77 | 1.72 | -6.80 |
| 689.0 | 6.20 | 159.60 | 688.3 | -17.6 | 3.4 | 15.4 | 1.79 | 1.76 | -3.41 |
| 769.0 | 7.30 | 160.50 | 767.8 | -26.4 | 6.6 | 24.1 | 1.38 | 1.38 | 1.13 |
| 897.0 | 9.40 | 166.30 | 894.4 | -44.2 | 11.8 | 40.9 | 1.77 | 1.64 | 4.53 |
| 1,026.0 | 11.70 | 163.70 | 1,021.2 | -67.0 | 18.0 | 62.0 | 1.82 | 1.78 | -2.02 |
| 1,154.0 | 14.70 | 160.30 | 1,145.8 | -94.8 | 27.1 | 88.8 | 2.42 | 2.34 | -2.66 |
| 1,282.0 | 17.10 | 160.20 | 1,268.9 | -127.8 | 39.0 | 121.3 | 1.88 | 1.88 | -0.08 |

| | | | |
|---|---|---|---|
| **Company:** | NOBLE ENERGY INC WELD COUNTY CO | **Local Co-ordinate Reference:** | Well LDS D08-18D |
| **Project:** | SEC.5-T3N-R64W | **TVD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Site:** | LDS D08-30D Pad Sec.5-T3N-R64W | **MD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Well:** | LDS D08-18D | **North Reference:** | True |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | Landmark |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 1,411.0 | 20.00 | 160.00 | 1,391.2 | -166.4 | 52.9 | 159.4 | 2.25 | 2.25 | -0.16 |
| 1,539.0 | 23.10 | 160.30 | 1,510.2 | -210.6 | 68.9 | 203.0 | 2.42 | 2.42 | 0.23 |
| 1,668.0 | 24.30 | 159.60 | 1,628.3 | -259.3 | 86.7 | 251.1 | 0.96 | 0.93 | -0.54 |
| 1,796.0 | 27.00 | 161.20 | 1,743.7 | -311.5 | 105.2 | 302.4 | 2.18 | 2.11 | 1.25 |
| 1,924.0 | 27.00 | 159.80 | 1,857.8 | -366.3 | 124.6 | 356.2 | 0.50 | 0.00 | -1.09 |
| 2,053.0 | 27.40 | 160.50 | 1,972.5 | -421.7 | 144.7 | 410.9 | 0.40 | 0.31 | 0.54 |
| 2,181.0 | 28.30 | 161.30 | 2,085.7 | -478.2 | 164.2 | 466.1 | 0.76 | 0.70 | 0.63 |
| 2,310.0 | 28.80 | 160.30 | 2,199.0 | -536.4 | 184.5 | 523.0 | 0.54 | 0.39 | -0.78 |
| 2,438.0 | 26.90 | 159.80 | 2,312.2 | -592.7 | 204.9 | 578.5 | 1.50 | -1.48 | -0.39 |
| 2,566.0 | 26.50 | 160.30 | 2,426.5 | -646.7 | 224.5 | 631.9 | 0.36 | -0.31 | 0.39 |
| 2,695.0 | 26.90 | 160.90 | 2,541.8 | -701.4 | 243.8 | 685.5 | 0.37 | 0.31 | 0.47 |
| 2,823.0 | 28.60 | 157.50 | 2,655.0 | -757.1 | 265.0 | 741.2 | 1.81 | 1.33 | -2.66 |
| 2,952.0 | 28.90 | 154.20 | 2,768.1 | -813.7 | 290.3 | 800.3 | 1.25 | 0.23 | -2.56 |
| 3,080.0 | 29.80 | 150.70 | 2,879.7 | -869.2 | 319.4 | 861.1 | 1.51 | 0.70 | -2.73 |
| 3,208.0 | 28.10 | 147.50 | 2,991.7 | -922.4 | 351.1 | 921.9 | 1.80 | -1.33 | -2.50 |
| 3,337.0 | 27.30 | 142.90 | 3,106.0 | -971.6 | 385.3 | 981.4 | 1.77 | -0.62 | -3.57 |
| 3,465.0 | 24.40 | 137.50 | 3,221.2 | -1,014.6 | 420.9 | 1,037.1 | 2.92 | -2.27 | -4.22 |
| 3,594.0 | 22.40 | 129.90 | 3,339.6 | -1,050.0 | 457.8 | 1,088.1 | 2.80 | -1.55 | -5.89 |
| 3,722.0 | 23.00 | 121.70 | 3,457.7 | -1,078.8 | 497.8 | 1,136.2 | 2.51 | 0.47 | -6.41 |
| 3,850.0 | 24.40 | 118.70 | 3,574.9 | -1,104.6 | 542.2 | 1,185.1 | 1.44 | 1.09 | -2.34 |
| 3,979.0 | 23.70 | 118.30 | 3,692.7 | -1,129.7 | 588.4 | 1,234.6 | 0.56 | -0.54 | -0.31 |
| 4,107.0 | 25.90 | 118.00 | 3,808.9 | -1,155.0 | 635.8 | 1,285.0 | 1.72 | 1.72 | -0.23 |
| 4,236.0 | 26.10 | 118.50 | 3,924.8 | -1,181.8 | 685.6 | 1,338.1 | 0.23 | 0.16 | 0.39 |
| 4,364.0 | 25.30 | 119.60 | 4,040.2 | -1,208.7 | 734.1 | 1,390.6 | 0.73 | -0.63 | 0.86 |
| 4,492.0 | 27.30 | 122.00 | 4,154.9 | -1,237.8 | 782.8 | 1,444.7 | 1.77 | 1.56 | 1.88 |
| 4,621.0 | 27.40 | 120.40 | 4,269.5 | -1,268.5 | 833.5 | 1,501.3 | 0.58 | 0.08 | -1.24 |
| 4,749.0 | 27.30 | 116.20 | 4,383.2 | -1,296.4 | 885.2 | 1,556.6 | 1.51 | -0.08 | -3.28 |
| 4,878.0 | 28.10 | 112.70 | 4,497.4 | -1,321.1 | 939.8 | 1,611.4 | 1.41 | 0.62 | -2.71 |
| 5,006.0 | 26.90 | 111.30 | 4,611.0 | -1,343.3 | 994.6 | 1,664.4 | 1.06 | -0.94 | -1.09 |
| 5,134.0 | 26.10 | 112.70 | 4,725.5 | -1,364.7 | 1,047.5 | 1,715.7 | 0.79 | -0.63 | 1.09 |
| 5,236.0 | 22.80 | 115.00 | 4,818.3 | -1,381.7 | 1,086.2 | 1,754.1 | 3.37 | -3.24 | 2.25 |
| 5,391.0 | 20.20 | 115.30 | 4,962.5 | -1,405.8 | 1,137.6 | 1,806.3 | 1.68 | -1.68 | 0.19 |
| 5,520.0 | 20.40 | 116.10 | 5,083.5 | -1,425.2 | 1,177.9 | 1,847.7 | 0.27 | 0.16 | 0.62 |
| 5,648.0 | 16.20 | 116.90 | 5,205.0 | -1,443.1 | 1,213.9 | 1,885.0 | 3.29 | -3.28 | 0.63 |
| 5,776.0 | 14.00 | 114.50 | 5,328.6 | -1,457.6 | 1,243.9 | 1,915.8 | 1.79 | -1.72 | -1.88 |
| 5,905.0 | 10.60 | 109.70 | 5,454.6 | -1,468.1 | 1,269.3 | 1,940.5 | 2.75 | -2.64 | -3.72 |
| 6,033.0 | 8.50 | 104.50 | 5,580.9 | -1,474.5 | 1,289.5 | 1,958.7 | 1.77 | -1.64 | -4.06 |
| 6,162.0 | 6.10 | 108.00 | 5,708.8 | -1,479.0 | 1,305.3 | 1,972.5 | 1.89 | -1.86 | 2.71 |
| 6,290.0 | 5.20 | 115.50 | 5,836.2 | -1,483.6 | 1,317.0 | 1,983.8 | 0.91 | -0.70 | 5.86 |
| 6,418.0 | 3.30 | 117.60 | 5,963.8 | -1,487.8 | 1,325.5 | 1,992.6 | 1.49 | -1.48 | 1.64 |
| 6,547.0 | 0.70 | 132.40 | 6,092.7 | -1,490.0 | 1,329.4 | 1,996.8 | 2.04 | -2.02 | 11.47 |
| 6,554.3 | 0.68 | 132.86 | 6,100.0 | -1,490.1 | 1,329.4 | 1,996.9 | 0.33 | -0.32 | 6.30 |
| **TARGET BHL 1310'FNL, 2540'FEL** | | | | | | | | | |
| 6,675.0 | 0.30 | 150.90 | 6,220.7 | -1,490.8 | 1,330.1 | 1,997.9 | 0.33 | -0.31 | 14.95 |
| 6,804.0 | 0.20 | 188.10 | 6,349.7 | -1,491.4 | 1,330.2 | 1,998.4 | 0.14 | -0.08 | 28.84 |
| 6,932.0 | 0.20 | 212.20 | 6,477.7 | -1,491.8 | 1,330.1 | 1,998.6 | 0.07 | 0.00 | 18.83 |
| 7,060.0 | 0.10 | 309.40 | 6,605.7 | -1,491.9 | 1,329.9 | 1,998.6 | 0.18 | -0.08 | 75.94 |
| 7,120.3 | 0.09 | 334.40 | 6,666.0 | -1,491.8 | 1,329.8 | 1,998.5 | 0.07 | -0.02 | 41.47 |
| **TARGET CIRCLE 1310'FNL, 2540'FEL** | | | | | | | | | |
| 7,189.0 | 0.10 | 3.20 | 6,734.7 | -1,491.7 | 1,329.8 | 1,998.4 | 0.07 | 0.02 | 41.91 |
| 7,317.0 | 0.40 | 12.50 | 6,862.7 | -1,491.2 | 1,329.9 | 1,998.0 | 0.24 | 0.23 | 7.27 |
| 7,446.0 | 0.40 | 33.10 | 6,991.7 | -1,490.3 | 1,330.2 | 1,997.7 | 0.11 | 0.00 | 15.97 |
| 7,557.0 | 0.50 | 16.90 | 7,102.7 | -1,489.5 | 1,330.6 | 1,997.3 | 0.14 | 0.09 | -14.59 |
| **HARDLINE 75'W OF BHL** | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Company:** | NOBLE ENERGY INC WELD COUNTY CO | **Local Co-ordinate Reference:** | Well LDS D08-18D |
| **Project:** | SEC.5-T3N-R64W | **TVD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Site:** | LDS D08-30D Pad Sec.5-T3N-R64W | **MD Reference:** | WELL @ 4766.0ft (Original Well Elev) |
| **Well:** | LDS D08-18D | **North Reference:** | True |
| **Wellbore:** | Wellbore #1 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Wellbore #1 | **Database:** | Landmark |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 7,604.0 | 0.50 | 16.90 | 7,149.7 | -1,489.2 | 1,330.7 | 1,997.1 | 0.00 | 0.00 | 0.00 |

Checked By: _____ Approved By: _____ Date: _____