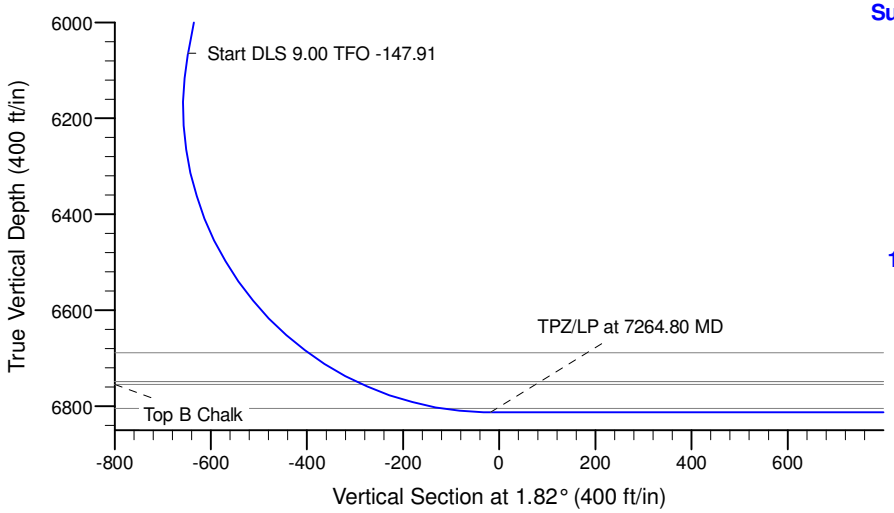
Project: Mustang
Site: D Section 29
Well: Guttersen D29-770
Wellbore: Guttersen D29-770
Design: Prelim - Rev 1

# Northern Region - DJ Basin

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

SECTION DETAILS

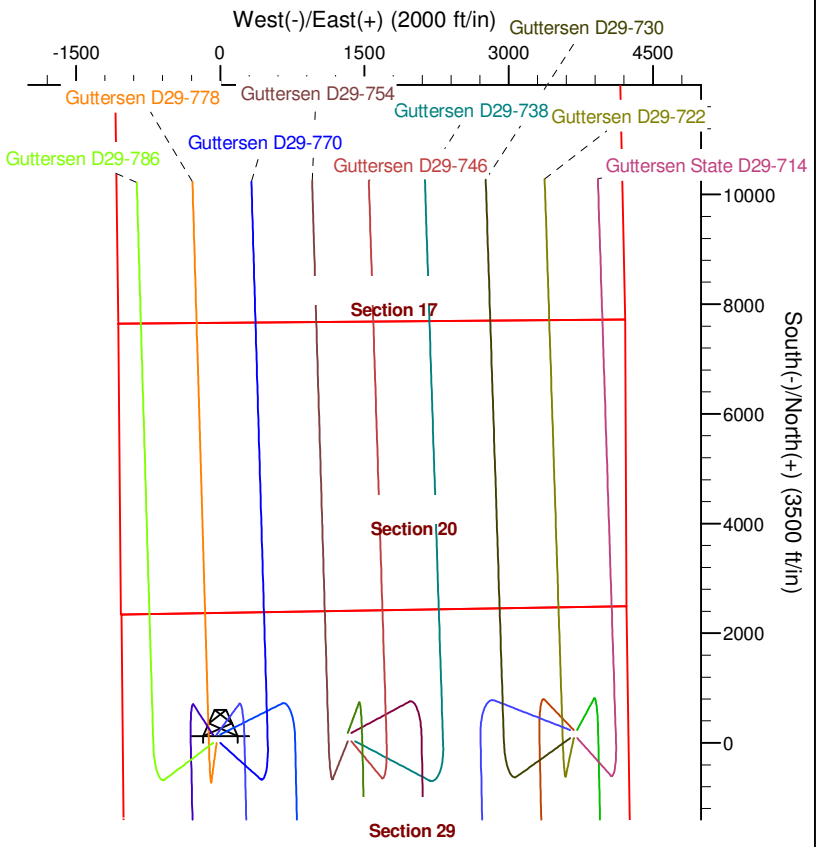
| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 2200.00 | 0.00 | 0.00 | 2200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3 | 2821.44 | 12.43 | 147.56 | 2816.58 | -56.66 | 36.01 | 2.00 | 147.56 | -55.49 | |
| 4 | 6147.28 | 12.43 | 147.56 | 6064.48 | -660.79 | 419.97 | 0.00 | 0.00 | -647.14 | |
| 5 | 7264.80 | 90.00 | 359.05 | 6813.00 | -33.63 | 495.69 | 9.00 | -147.91 | -17.90 | GUTTERSEN D29-770 TPZ |
| 6 | 17536.90 | 90.00 | 359.05 | 6813.00 | 10237.04 | 324.65 | 0.00 | 0.00 | 10242.19 | GUTTERSEN D29-770 BHL |

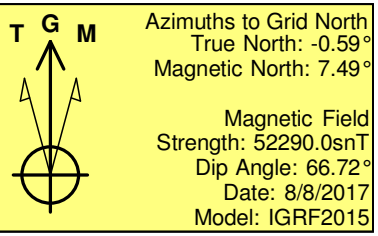



**Surface: 2356' FNL,1010' FWL, Sec.29**

**TPZ: 2400' FNL, 1512' FWL, Sec.29**

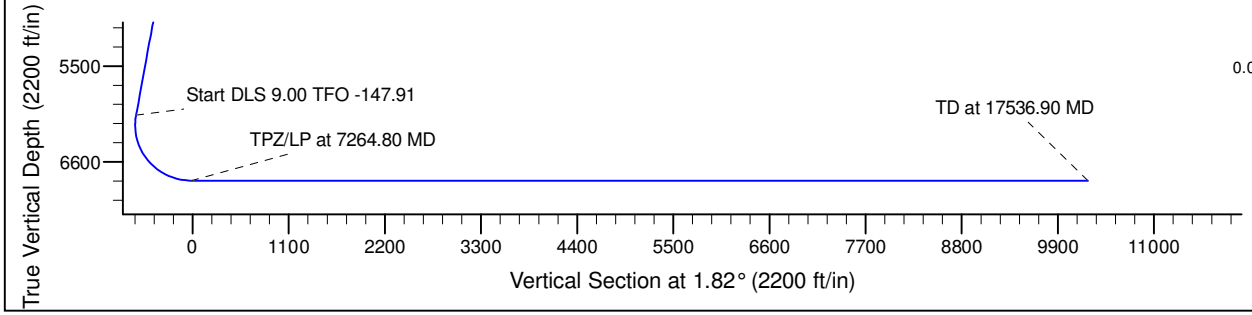
**BHL: 2565' FSL, 1401' FWL, Sec.17**




Azimuths to Grid North
True North: -0.59°
Magnetic North: 7.49°

Magnetic Field
Strength: 52290.0snT
Dip Angle: 66.72°
Date: 8/8/2017
Model: IGRF2015




WELL DETAILS: Guttersen D29-770

| | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|
| 0.00 | 1315949.08 | 3256723.35 | 40.1970250 | -104.5809620 |

4780.00

Plan: Prelim - Rev 1 (Guttersen D29-770/Guttersen D29-770)

Created By: Colby Baxter Date: 9:57, April 09 2018

Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____

# Northern Region - DJ Basin

**Mustang**
**D Section 29**
**Guttersen D29-770**

**Guttersen D29-770**

**Plan: Prelim - Rev 1**

# Standard Survey Report

**09 April, 2018**

# Noble Energy, Inc.

## Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

| **Project** | Mustang, Weld County Colorado | | |
|---|---|---|---|
| **Map System:** | US State Plane 1983 | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | North American Datum 1983 | | |
| **Map Zone:** | Colorado Northern Zone | | |

| **Site** | D Section 29 | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 1,313,628.85 usft | **Latitude:** | 40.1907138 |
| **From:** | Map | **Easting:** | 3,254,683.41 usft | **Longitude:** | -104.5883496 |
| **Position Uncertainty:** | 0.00 ft | **Slot Radius:** | 13.200 in | **Grid Convergence:** | 0.59 ° |

| **Well** | Guttersen D29-770 | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.00 ft | **Northing:** | 1,315,949.08 usft | **Latitude:** | 40.1970250 |
| | **+E/-W** | 0.00 ft | **Easting:** | 3,256,723.35 usft | **Longitude:** | -104.5809620 |
| **Position Uncertainty** | | 0.00 ft | **Wellhead Elevation:** | ft | **Ground Level:** | 4,780.00 ft |

| **Wellbore** | Guttersen D29-770 | | | | |
|---|---|---|---|---|---|
| **Magnetics** | **Model Name** | **Sample Date** | **Declination (°)** | **Dip Angle (°)** | **Field Strength (nT)** |
| | IGRF2015 | 8/8/2017 | 8.08 | 66.72 | 52,289.99610538 |

| **Design** | Prelim - Rev 1 | | | | |
|---|---|---|---|---|---|
| **Audit Notes:** | | | | | |
| **Version:** | | **Phase:** | PLAN | **Tie On Depth:** | 0.00 |
| **Vertical Section:** | **Depth From (TVD) (ft)** | **+N/-S (ft)** | **+E/-W (ft)** | **Direction (°)** | |
| | 0.00 | 0.00 | 0.00 | 1.82 | |

**Survey Tool Program** **Date** 4/9/2018

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 17,536.90 | Prelim - Rev 1 (Guttersen D29-770) | 2_MWD+IFR1+MS | A008Mb: IFR dec & multi-station analysis |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# Noble Energy, Inc.

## Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 2.00 | 147.56 | 2,299.98 | -1.47 | 0.94 | -1.44 | 2.00 | 2.00 | 0.00 |
| 2,400.00 | 4.00 | 147.56 | 2,399.84 | -5.89 | 3.74 | -5.77 | 2.00 | 2.00 | 0.00 |
| 2,500.00 | 6.00 | 147.56 | 2,499.45 | -13.24 | 8.42 | -12.97 | 2.00 | 2.00 | 0.00 |
| 2,600.00 | 8.00 | 147.56 | 2,598.70 | -23.53 | 14.95 | -23.04 | 2.00 | 2.00 | 0.00 |
| 2,700.00 | 10.00 | 147.56 | 2,697.47 | -36.73 | 23.35 | -35.97 | 2.00 | 2.00 | 0.00 |
| 2,800.00 | 12.00 | 147.56 | 2,795.62 | -52.83 | 33.58 | -51.74 | 2.00 | 2.00 | 0.00 |
| 2,821.44 | 12.43 | 147.56 | 2,816.58 | -56.66 | 36.01 | -55.49 | 2.00 | 2.00 | 0.00 |
| 2,900.00 | 12.43 | 147.56 | 2,893.30 | -70.93 | 45.08 | -69.47 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 12.43 | 147.56 | 2,990.95 | -89.10 | 56.63 | -87.26 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 12.43 | 147.56 | 3,088.61 | -107.26 | 68.17 | -105.05 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 12.43 | 147.56 | 3,186.27 | -125.43 | 79.72 | -122.84 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 12.43 | 147.56 | 3,283.92 | -143.59 | 91.26 | -140.63 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 12.43 | 147.56 | 3,381.58 | -161.76 | 102.80 | -158.42 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 12.43 | 147.56 | 3,479.24 | -179.92 | 114.35 | -176.20 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 12.43 | 147.56 | 3,576.89 | -198.08 | 125.89 | -193.99 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 12.43 | 147.56 | 3,674.55 | -216.25 | 137.44 | -211.78 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 12.43 | 147.56 | 3,772.20 | -234.41 | 148.98 | -229.57 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 12.43 | 147.56 | 3,869.86 | -252.58 | 160.53 | -247.36 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 12.43 | 147.56 | 3,967.52 | -270.74 | 172.07 | -265.15 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 12.43 | 147.56 | 4,065.17 | -288.91 | 183.62 | -282.94 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 12.43 | 147.56 | 4,162.83 | -307.07 | 195.16 | -300.73 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 12.43 | 147.56 | 4,260.49 | -325.24 | 206.71 | -318.52 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 12.43 | 147.56 | 4,358.14 | -343.40 | 218.25 | -336.31 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 12.43 | 147.56 | 4,455.80 | -361.56 | 229.80 | -354.10 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 12.43 | 147.56 | 4,553.46 | -379.73 | 241.34 | -371.89 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 12.43 | 147.56 | 4,651.11 | -397.89 | 252.88 | -389.68 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 12.43 | 147.56 | 4,748.77 | -416.06 | 264.43 | -407.47 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 12.43 | 147.56 | 4,846.42 | -434.22 | 275.97 | -425.26 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 12.43 | 147.56 | 4,944.08 | -452.39 | 287.52 | -443.05 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 12.43 | 147.56 | 5,041.74 | -470.55 | 299.06 | -460.84 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 12.43 | 147.56 | 5,139.39 | -488.72 | 310.61 | -478.63 | 0.00 | 0.00 | 0.00 |

# Noble Energy, Inc.

## Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 5,300.00 | 12.43 | 147.56 | 5,237.05 | -506.88 | 322.15 | -496.41 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 12.43 | 147.56 | 5,334.71 | -525.05 | 333.70 | -514.20 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 12.43 | 147.56 | 5,432.36 | -543.21 | 345.24 | -531.99 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 12.43 | 147.56 | 5,530.02 | -561.37 | 356.79 | -549.78 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 12.43 | 147.56 | 5,627.68 | -579.54 | 368.33 | -567.57 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 12.43 | 147.56 | 5,725.33 | -597.70 | 379.87 | -585.36 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 12.43 | 147.56 | 5,822.99 | -615.87 | 391.42 | -603.15 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 12.43 | 147.56 | 5,920.65 | -634.03 | 402.96 | -620.94 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 12.43 | 147.56 | 6,018.30 | -652.20 | 414.51 | -638.73 | 0.00 | 0.00 | 0.00 |
| 6,147.28 | 12.43 | 147.56 | 6,064.48 | -660.79 | 419.97 | -647.14 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 8.77 | 130.82 | 6,116.30 | -668.21 | 426.06 | -654.36 | 9.00 | -6.93 | -31.76 |
| 6,300.00 | 7.29 | 63.21 | 6,215.51 | -670.34 | 437.51 | -656.13 | 9.00 | -1.49 | -67.60 |
| 6,400.00 | 13.80 | 26.98 | 6,313.87 | -656.82 | 448.61 | -642.27 | 9.00 | 6.52 | -36.23 |
| 6,500.00 | 22.12 | 15.50 | 6,408.94 | -627.99 | 459.07 | -613.12 | 9.00 | 8.32 | -11.49 |
| 6,600.00 | 30.81 | 10.17 | 6,498.39 | -584.55 | 468.65 | -569.40 | 9.00 | 8.69 | -5.32 |
| 6,700.00 | 39.63 | 7.04 | 6,580.01 | -527.58 | 477.10 | -512.19 | 9.00 | 8.82 | -3.14 |
| 6,800.00 | 48.50 | 4.89 | 6,651.80 | -458.47 | 484.21 | -442.89 | 9.00 | 8.88 | -2.15 |
| 6,900.00 | 57.41 | 3.27 | 6,711.98 | -378.94 | 489.81 | -363.22 | 9.00 | 8.91 | -1.62 |
| 7,000.00 | 66.33 | 1.94 | 6,759.08 | -290.93 | 493.77 | -275.13 | 9.00 | 8.92 | -1.33 |
| 7,100.00 | 75.27 | 0.78 | 6,791.93 | -196.61 | 495.98 | -180.79 | 9.00 | 8.93 | -1.16 |
| 7,200.00 | 84.21 | 359.72 | 6,809.73 | -98.31 | 496.39 | -82.53 | 9.00 | 8.94 | -1.07 |
| 7,264.80 | 90.00 | 359.05 | 6,813.00 | -33.63 | 495.69 | -17.90 | 9.00 | 8.94 | -1.03 |
| 7,300.00 | 90.00 | 359.05 | 6,813.00 | 1.57 | 495.11 | 17.26 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 90.00 | 359.05 | 6,813.00 | 101.55 | 493.44 | 117.14 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 90.00 | 359.05 | 6,813.00 | 201.54 | 491.78 | 217.03 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 90.00 | 359.05 | 6,813.00 | 301.53 | 490.11 | 316.91 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 90.00 | 359.05 | 6,813.00 | 401.51 | 488.45 | 416.79 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 90.00 | 359.05 | 6,813.00 | 501.50 | 486.78 | 516.68 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 90.00 | 359.05 | 6,813.00 | 601.48 | 485.12 | 616.56 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 90.00 | 359.05 | 6,813.00 | 701.47 | 483.45 | 716.44 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 90.00 | 359.05 | 6,813.00 | 801.46 | 481.79 | 816.32 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 90.00 | 359.05 | 6,813.00 | 901.44 | 480.12 | 916.21 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 90.00 | 359.05 | 6,813.00 | 1,001.43 | 478.46 | 1,016.09 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 90.00 | 359.05 | 6,813.00 | 1,101.41 | 476.79 | 1,115.97 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 90.00 | 359.05 | 6,813.00 | 1,201.40 | 475.13 | 1,215.86 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 90.00 | 359.05 | 6,813.00 | 1,301.39 | 473.46 | 1,315.74 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 90.00 | 359.05 | 6,813.00 | 1,401.37 | 471.80 | 1,415.62 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.00 | 359.05 | 6,813.00 | 1,501.36 | 470.13 | 1,515.51 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.00 | 359.05 | 6,813.00 | 1,601.35 | 468.46 | 1,615.39 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.00 | 359.05 | 6,813.00 | 1,701.33 | 466.80 | 1,715.27 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.00 | 359.05 | 6,813.00 | 1,801.32 | 465.13 | 1,815.16 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.00 | 359.05 | 6,813.00 | 1,901.30 | 463.47 | 1,915.04 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.00 | 359.05 | 6,813.00 | 2,001.29 | 461.80 | 2,014.92 | 0.00 | 0.00 | 0.00 |

# Noble Energy, Inc.

## Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 9,400.00 | 90.00 | 359.05 | 6,813.00 | 2,101.28 | 460.14 | 2,114.81 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.00 | 359.05 | 6,813.00 | 2,201.26 | 458.47 | 2,214.69 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.00 | 359.05 | 6,813.00 | 2,301.25 | 456.81 | 2,314.57 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.00 | 359.05 | 6,813.00 | 2,401.23 | 455.14 | 2,414.45 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.00 | 359.05 | 6,813.00 | 2,501.22 | 453.48 | 2,514.34 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.00 | 359.05 | 6,813.00 | 2,601.21 | 451.81 | 2,614.22 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.00 | 359.05 | 6,813.00 | 2,701.19 | 450.15 | 2,714.10 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.00 | 359.05 | 6,813.00 | 2,801.18 | 448.48 | 2,813.99 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.00 | 359.05 | 6,813.00 | 2,901.17 | 446.82 | 2,913.87 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.00 | 359.05 | 6,813.00 | 3,001.15 | 445.15 | 3,013.75 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.00 | 359.05 | 6,813.00 | 3,101.14 | 443.49 | 3,113.64 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.00 | 359.05 | 6,813.00 | 3,201.12 | 441.82 | 3,213.52 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 90.00 | 359.05 | 6,813.00 | 3,301.11 | 440.16 | 3,313.40 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.00 | 359.05 | 6,813.00 | 3,401.10 | 438.49 | 3,413.29 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.00 | 359.05 | 6,813.00 | 3,501.08 | 436.83 | 3,513.17 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.00 | 359.05 | 6,813.00 | 3,601.07 | 435.16 | 3,613.05 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.00 | 359.05 | 6,813.00 | 3,701.05 | 433.50 | 3,712.94 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.00 | 359.05 | 6,813.00 | 3,801.04 | 431.83 | 3,812.82 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.00 | 359.05 | 6,813.00 | 3,901.03 | 430.17 | 3,912.70 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.00 | 359.05 | 6,813.00 | 4,001.01 | 428.50 | 4,012.58 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 90.00 | 359.05 | 6,813.00 | 4,101.00 | 426.84 | 4,112.47 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 90.00 | 359.05 | 6,813.00 | 4,200.98 | 425.17 | 4,212.35 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 90.00 | 359.05 | 6,813.00 | 4,300.97 | 423.51 | 4,312.23 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 90.00 | 359.05 | 6,813.00 | 4,400.96 | 421.84 | 4,412.12 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 90.00 | 359.05 | 6,813.00 | 4,500.94 | 420.18 | 4,512.00 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 90.00 | 359.05 | 6,813.00 | 4,600.93 | 418.51 | 4,611.88 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 90.00 | 359.05 | 6,813.00 | 4,700.92 | 416.85 | 4,711.77 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 90.00 | 359.05 | 6,813.00 | 4,800.90 | 415.18 | 4,811.65 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 90.00 | 359.05 | 6,813.00 | 4,900.89 | 413.52 | 4,911.53 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 90.00 | 359.05 | 6,813.00 | 5,000.87 | 411.85 | 5,011.42 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 90.00 | 359.05 | 6,813.00 | 5,100.86 | 410.19 | 5,111.30 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 90.00 | 359.05 | 6,813.00 | 5,200.85 | 408.52 | 5,211.18 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 90.00 | 359.05 | 6,813.00 | 5,300.83 | 406.86 | 5,311.07 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 90.00 | 359.05 | 6,813.00 | 5,400.82 | 405.19 | 5,410.95 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 90.00 | 359.05 | 6,813.00 | 5,500.80 | 403.53 | 5,510.83 | 0.00 | 0.00 | 0.00 |
| 12,900.00 | 90.00 | 359.05 | 6,813.00 | 5,600.79 | 401.86 | 5,610.71 | 0.00 | 0.00 | 0.00 |
| 13,000.00 | 90.00 | 359.05 | 6,813.00 | 5,700.78 | 400.20 | 5,710.60 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 90.00 | 359.05 | 6,813.00 | 5,800.76 | 398.53 | 5,810.48 | 0.00 | 0.00 | 0.00 |
| 13,200.00 | 90.00 | 359.05 | 6,813.00 | 5,900.75 | 396.87 | 5,910.36 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 90.00 | 359.05 | 6,813.00 | 6,000.74 | 395.20 | 6,010.25 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 90.00 | 359.05 | 6,813.00 | 6,100.72 | 393.54 | 6,110.13 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 90.00 | 359.05 | 6,813.00 | 6,200.71 | 391.87 | 6,210.01 | 0.00 | 0.00 | 0.00 |
| 13,600.00 | 90.00 | 359.05 | 6,813.00 | 6,300.69 | 390.21 | 6,309.90 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

**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) |
|---|---|---|---|---|---|---|---|---|---|
| 13,700.00 | 90.00 | 359.05 | 6,813.00 | 6,400.68 | 388.54 | 6,409.78 | 0.00 | 0.00 | 0.00 |
| 13,800.00 | 90.00 | 359.05 | 6,813.00 | 6,500.67 | 386.88 | 6,509.66 | 0.00 | 0.00 | 0.00 |
| 13,900.00 | 90.00 | 359.05 | 6,813.00 | 6,600.65 | 385.21 | 6,609.55 | 0.00 | 0.00 | 0.00 |
| 14,000.00 | 90.00 | 359.05 | 6,813.00 | 6,700.64 | 383.55 | 6,709.43 | 0.00 | 0.00 | 0.00 |
| 14,100.00 | 90.00 | 359.05 | 6,813.00 | 6,800.62 | 381.88 | 6,809.31 | 0.00 | 0.00 | 0.00 |
| 14,200.00 | 90.00 | 359.05 | 6,813.00 | 6,900.61 | 380.22 | 6,909.20 | 0.00 | 0.00 | 0.00 |
| 14,300.00 | 90.00 | 359.05 | 6,813.00 | 7,000.60 | 378.55 | 7,009.08 | 0.00 | 0.00 | 0.00 |
| 14,400.00 | 90.00 | 359.05 | 6,813.00 | 7,100.58 | 376.89 | 7,108.96 | 0.00 | 0.00 | 0.00 |
| 14,500.00 | 90.00 | 359.05 | 6,813.00 | 7,200.57 | 375.22 | 7,208.84 | 0.00 | 0.00 | 0.00 |
| 14,600.00 | 90.00 | 359.05 | 6,813.00 | 7,300.56 | 373.56 | 7,308.73 | 0.00 | 0.00 | 0.00 |
| 14,700.00 | 90.00 | 359.05 | 6,813.00 | 7,400.54 | 371.89 | 7,408.61 | 0.00 | 0.00 | 0.00 |
| 14,800.00 | 90.00 | 359.05 | 6,813.00 | 7,500.53 | 370.23 | 7,508.49 | 0.00 | 0.00 | 0.00 |
| 14,900.00 | 90.00 | 359.05 | 6,813.00 | 7,600.51 | 368.56 | 7,608.38 | 0.00 | 0.00 | 0.00 |
| 15,000.00 | 90.00 | 359.05 | 6,813.00 | 7,700.50 | 366.90 | 7,708.26 | 0.00 | 0.00 | 0.00 |
| 15,100.00 | 90.00 | 359.05 | 6,813.00 | 7,800.49 | 365.23 | 7,808.14 | 0.00 | 0.00 | 0.00 |
| 15,200.00 | 90.00 | 359.05 | 6,813.00 | 7,900.47 | 363.57 | 7,908.03 | 0.00 | 0.00 | 0.00 |
| 15,300.00 | 90.00 | 359.05 | 6,813.00 | 8,000.46 | 361.90 | 8,007.91 | 0.00 | 0.00 | 0.00 |
| 15,400.00 | 90.00 | 359.05 | 6,813.00 | 8,100.44 | 360.24 | 8,107.79 | 0.00 | 0.00 | 0.00 |
| 15,500.00 | 90.00 | 359.05 | 6,813.00 | 8,200.43 | 358.57 | 8,207.68 | 0.00 | 0.00 | 0.00 |
| 15,600.00 | 90.00 | 359.05 | 6,813.00 | 8,300.42 | 356.91 | 8,307.56 | 0.00 | 0.00 | 0.00 |
| 15,700.00 | 90.00 | 359.05 | 6,813.00 | 8,400.40 | 355.24 | 8,407.44 | 0.00 | 0.00 | 0.00 |
| 15,800.00 | 90.00 | 359.05 | 6,813.00 | 8,500.39 | 353.57 | 8,507.32 | 0.00 | 0.00 | 0.00 |
| 15,900.00 | 90.00 | 359.05 | 6,813.00 | 8,600.38 | 351.91 | 8,607.21 | 0.00 | 0.00 | 0.00 |
| 16,000.00 | 90.00 | 359.05 | 6,813.00 | 8,700.36 | 350.24 | 8,707.09 | 0.00 | 0.00 | 0.00 |
| 16,100.00 | 90.00 | 359.05 | 6,813.00 | 8,800.35 | 348.58 | 8,806.97 | 0.00 | 0.00 | 0.00 |
| 16,200.00 | 90.00 | 359.05 | 6,813.00 | 8,900.33 | 346.91 | 8,906.86 | 0.00 | 0.00 | 0.00 |
| 16,300.00 | 90.00 | 359.05 | 6,813.00 | 9,000.32 | 345.25 | 9,006.74 | 0.00 | 0.00 | 0.00 |
| 16,400.00 | 90.00 | 359.05 | 6,813.00 | 9,100.31 | 343.58 | 9,106.62 | 0.00 | 0.00 | 0.00 |
| 16,500.00 | 90.00 | 359.05 | 6,813.00 | 9,200.29 | 341.92 | 9,206.51 | 0.00 | 0.00 | 0.00 |
| 16,600.00 | 90.00 | 359.05 | 6,813.00 | 9,300.28 | 340.25 | 9,306.39 | 0.00 | 0.00 | 0.00 |
| 16,700.00 | 90.00 | 359.05 | 6,813.00 | 9,400.26 | 338.59 | 9,406.27 | 0.00 | 0.00 | 0.00 |
| 16,800.00 | 90.00 | 359.05 | 6,813.00 | 9,500.25 | 336.92 | 9,506.16 | 0.00 | 0.00 | 0.00 |
| 16,900.00 | 90.00 | 359.05 | 6,813.00 | 9,600.24 | 335.26 | 9,606.04 | 0.00 | 0.00 | 0.00 |
| 17,000.00 | 90.00 | 359.05 | 6,813.00 | 9,700.22 | 333.59 | 9,705.92 | 0.00 | 0.00 | 0.00 |
| 17,100.00 | 90.00 | 359.05 | 6,813.00 | 9,800.21 | 331.93 | 9,805.81 | 0.00 | 0.00 | 0.00 |
| 17,200.00 | 90.00 | 359.05 | 6,813.00 | 9,900.19 | 330.26 | 9,905.69 | 0.00 | 0.00 | 0.00 |
| 17,300.00 | 90.00 | 359.05 | 6,813.00 | 10,000.18 | 328.60 | 10,005.57 | 0.00 | 0.00 | 0.00 |
| 17,400.00 | 90.00 | 359.05 | 6,813.00 | 10,100.17 | 326.93 | 10,105.45 | 0.00 | 0.00 | 0.00 |
| 17,500.00 | 90.00 | 359.05 | 6,813.00 | 10,200.15 | 325.27 | 10,205.34 | 0.00 | 0.00 | 0.00 |
| 17,536.90 | 90.00 | 359.05 | 6,813.00 | 10,237.05 | 324.65 | 10,242.19 | 0.00 | 0.00 | 0.00 |

# Noble Energy, Inc.

## Survey Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Well:** | Guttersen D29-770 | **North Reference:** | Grid |
| **Wellbore:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Prelim - Rev 1 | **Database:** | EDMP |

**Design Targets**

| Target Name<br>- hit/miss target<br>- Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| GUTTERSEN D29-770 I<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 6,813.00 | 10,237.05 | 324.65 | 1,326,186.11 | 3,257,048.00 | 40.2251160 | -104.5794194 |
| GUTTERSEN D29-770 -<br>- plan hits target center<br>- Point | 0.00 | 0.00 | 6,813.00 | -33.63 | 495.69 | 1,315,915.45 | 3,257,219.04 | 40.1969186 | -104.5791888 |

**Formations**

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 579.00 | 579.00 | Pierre | | | |
| 669.00 | 669.00 | Upper Pierre Aquifer Top | | | |
| 1,567.00 | 1,567.00 | Upper Pierre Aquifer Base | | | |
| 3,802.86 | 3,775.00 | Parkman | | | |
| 4,169.45 | 4,133.00 | Sussex | | | |
| 4,964.08 | 4,909.00 | Shannon | | | |
| 6,018.80 | 5,939.00 | Teepee Buttes | | | |
| 6,859.32 | 6,689.00 | Sharon Springs | | | |
| 6,975.92 | 6,749.00 | Top A Chalk | | | |
| 6,975.92 | 6,749.00 | Top A Marl | | | |
| 6,990.02 | 6,755.00 | Top B Chalk | | | |
| 7,163.43 | 6,805.00 | Top B Marl | | | |

**Plan Annotations**

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | Local Coordinates +E/-W (ft) | Comment |
|---|---|---|---|---|
| 2200 | 2200 | 0 | 0 | Start Build 2.00 |
| 6147 | 6064 | -57 | 36 | Start DLS 9.00 TFO -147.91 |
| 7265 | 6813 | -661 | 420 | TPZ/LP at 7264.80 MD |
| 17,537 | 6813 | -34 | 496 | TD at 17536.90 MD |

Checked By: _____ Approved By: _____ Date: _____

# Northern Region - DJ Basin

**Mustang**
**D Section 29**
**Guttersen D29-770**

**Guttersen D29-770**
**Prelim - Rev 1**

# Anticollision Summary Report

**09 April, 2018**

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Reference** Prelim - Rev 1

| | | | |
|---|---|---|---|
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | Stations | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 10,000.00 ft | **Error Surface:** | Pedal Curve |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 4/9/2018

| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 17,536.90 | Prelim - Rev 1 (Guttersen D29-770) | 2_MWD+IFR1+MS | A008Mb: IFR dec & multi-station analysis |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 16 | | | | | | |
| Diggin State D 16-07 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,781.00 | 7,086.01 | 6,860.08 | 31.365 | CC, ES, SF |
| Diggin State D 16-19J (PR) - Wellbore #1 - No Surveys | 17,536.90 | 6,740.00 | 5,331.10 | 5,108.59 | 23.959 | CC, ES, SF |
| Guttersen ST D 15-32 (SI) - Wellbore #1 - Gyro Surveys | 17,300.00 | 17,300.00 | 9,030.18 | 8,881.12 | 60.581 | ES, SF |
| Guttersen ST D 15-32 (SI) - Wellbore #1 - Gyro Surveys | 17,505.77 | 6,800.00 | 9,027.95 | 8,913.87 | 79.133 | CC |
| Guttersen ST D 16-21 (SI) - Wellbore #1 - Gyro Surveys | 17,512.24 | 6,747.72 | 6,548.80 | 6,434.82 | 57.455 | CC |
| Guttersen ST D 16-21 (SI) - Wellbore #1 - Gyro Surveys | 17,536.90 | 6,747.62 | 6,548.84 | 6,434.66 | 57.355 | ES, SF |
| Guttersen ST D 16-22D (SI) - Wellbore #1 - MWD Surve | 17,536.90 | 6,864.45 | 7,737.79 | 7,621.51 | 66.546 | CC, ES, SF |
| Guttersen ST D 16-33 (SI) - Wellbore #1 - No Surveys | 16,450.64 | 6,755.00 | 3,870.37 | 3,653.09 | 17.813 | CC |
| Guttersen ST D 16-33 (SI) - Wellbore #1 - No Surveys | 16,500.00 | 6,755.00 | 3,870.68 | 3,653.00 | 17.781 | ES |
| Guttersen ST D 16-33 (SI) - Wellbore #1 - No Surveys | 16,900.00 | 6,755.00 | 3,896.37 | 3,675.90 | 17.673 | SF |
| Guttersen State D 15-31 (PR) - Wellbore #1 - Gyro Surve | 17,536.90 | 6,773.67 | 9,129.32 | 9,016.70 | 81.062 | CC, ES, SF |
| Guttersen State D 16-18 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,755.00 | 6,656.13 | 6,432.68 | 29.788 | CC, ES, SF |
| Guttersen State D 16-20 (SI) - Wellbore #1 - Gyro Survey | 17,536.90 | 6,831.24 | 5,171.92 | 5,057.52 | 45.211 | CC, ES, SF |
| Guttersen State D 16-27 (PR) - Wellbore #1 - No Survey | 17,536.90 | 6,751.00 | 8,182.82 | 7,961.33 | 36.945 | CC, ES, SF |
| Guttersen State D 16-31 (PR) - Wellbore #1 - No Survey | 17,536.90 | 6,751.00 | 4,301.22 | 4,080.39 | 19.478 | CC, ES, SF |
| Guttersen State D 16-32D (SI) - Wellbore #1 - MWD Sur | 17,536.90 | 6,951.81 | 3,960.63 | 3,838.65 | 32.469 | CC, ES, SF |
| Guttersen State D16-63-1HN - Original Drilling - Original | 15,960.67 | 11,243.02 | 4,374.24 | 4,268.42 | 41.334 | CC |
| Guttersen State D16-63-1HN - Original Drilling - Original | 16,000.00 | 11,243.02 | 4,374.42 | 4,268.22 | 41.189 | ES |
| Guttersen State D16-63-1HN - Original Drilling - Original | 17,536.90 | 11,243.02 | 4,649.57 | 4,514.91 | 34.530 | SF |
| Guttersen State D16-65-1HN - Original Drilling - Original | 17,271.45 | 11,090.02 | 4,541.75 | 4,425.94 | 39.217 | CC |
| Guttersen State D16-65-1HN - Original Drilling - Original | 17,300.00 | 11,090.02 | 4,541.84 | 4,425.76 | 39.129 | ES |
| Guttersen State D16-65-1HN - Original Drilling - Original | 17,536.90 | 11,090.02 | 4,549.50 | 4,430.72 | 38.303 | SF |
| Spike ST GWS D 16-01 (SI) - Wellbore #1 - Gyro Survey | 17,536.90 | 6,765.26 | 8,797.52 | 8,686.17 | 79.010 | CC, ES, SF |
| Spike ST GWS D 16-02 (P&A) - Wellbore #1 - Gyro Surv | 17,536.90 | 6,766.43 | 7,344.66 | 7,217.13 | 57.592 | CC, ES, SF |
| Spike ST GWS D 16-03 (PR) - Wellbore #1 - No Surveys | 17,536.90 | 6,749.00 | 6,207.94 | 5,987.38 | 28.146 | CC, ES, SF |
| Spike ST GWS D 16-04 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,744.00 | 4,997.98 | 4,780.34 | 22.964 | CC, ES, SF |
| Spike ST GWS D 16-05 (PR) - Wellbore #1 - Gyro Surve | 17,536.90 | 6,765.16 | 4,538.45 | 4,425.51 | 40.186 | CC, ES, SF |
| Spike ST GWS D 16-06 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,757.00 | 5,889.62 | 5,664.57 | 26.170 | CC, ES, SF |
| Spike ST GWS D 16-08 (PR) - Wellbore #1 - Gyro Surve | 17,536.90 | 6,834.23 | 8,687.15 | 8,573.08 | 76.156 | CC, ES, SF |
| Spike ST GWS D 16-12 (PA) - Wellbore #1 - Gyro Surve | 17,154.42 | 6,773.28 | 4,365.67 | 4,254.44 | 39.251 | CC |
| Spike ST GWS D 16-12 (PA) - Wellbore #1 - Gyro Surve | 17,200.00 | 6,772.78 | 4,365.90 | 4,254.31 | 39.124 | ES |
| Spike ST GWS D 16-12 (PA) - Wellbore #1 - Gyro Surve | 17,536.90 | 6,769.23 | 4,382.39 | 4,268.34 | 38.425 | SF |
| Spike State D16-99HZ - Original Drilling - Original Drilling | 16,444.75 | 11,150.02 | 4,442.21 | 4,332.28 | 40.411 | CC |
| Spike State D16-99HZ - Original Drilling - Original Drilling | 16,500.00 | 11,150.02 | 4,442.55 | 4,332.08 | 40.215 | ES |
| Spike State D16-99HZ - Original Drilling - Original Drilling | 17,536.90 | 11,150.02 | 4,574.49 | 4,446.43 | 35.722 | SF |
| Spike State GWS D 16-7J (PR) - Wellbore #1 - No Surve | 17,536.90 | 6,774.00 | 7,952.90 | 7,728.34 | 35.416 | CC, ES, SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 17 | | | | | | |
| Butterball D19-27D - Wellbore #1 - Gyro Surveys | 15,123.22 | 7,016.03 | 2,728.07 | 2,630.22 | 27.880 | CC, ES |
| Butterball D19-27D - Wellbore #1 - Gyro Surveys | 15,600.00 | 7,012.03 | 2,769.41 | 2,669.04 | 27.592 | SF |
| Guttersen State D16-33 (SI) - Wellbore #1 - No Surveys | 16,450.64 | 6,755.00 | 3,870.37 | 3,729.24 | 27.424 | CC |
| Guttersen State D16-33 (SI) - Wellbore #1 - No Surveys | 16,500.00 | 6,755.00 | 3,870.68 | 3,729.15 | 27.349 | ES |
| Guttersen State D16-33 (SI) - Wellbore #1 - No Surveys | 17,000.00 | 6,755.00 | 3,909.16 | 3,764.28 | 26.981 | SF |
| HSR LDS 6-17 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,753.00 | 848.84 | 741.82 | 7.932 | CC, ES, SF |
| HSR LDS B5-17 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,754.00 | 1,156.11 | 1,036.17 | 9.639 | CC, ES, SF |
| HSR Mike Gutteresen 16-17X (SI) - Wellbore #1 - No Su | 15,538.38 | 6,760.00 | 3,168.88 | 3,034.85 | 23.643 | CC, ES |
| HSR Mike Gutteresen 16-17X (SI) - Wellbore #1 - No Su | 15,900.00 | 6,760.00 | 3,189.45 | 3,052.89 | 23.355 | SF |
| HSR Weeks 10-17 - Wellbore #1 - Gyro Surveys | 16,943.87 | 6,700.00 | 1,861.48 | 1,752.09 | 17.016 | CC, ES |
| HSR Weeks 10-17 - Wellbore #1 - Gyro Surveys | 17,100.00 | 6,700.00 | 1,868.02 | 1,757.54 | 16.909 | SF |
| HSR Weeks 15-17 (SI) - Wellbore #1 - No Surveys | 15,643.23 | 6,758.00 | 1,881.32 | 1,746.49 | 13.953 | CC, ES |
| HSR Weeks 15-17 (SI) - Wellbore #1 - No Surveys | 15,800.00 | 6,758.00 | 1,887.84 | 1,751.91 | 13.888 | SF |
| HSR Weeks 9-17 - Wellbore #1 - Gyro Surveys | 16,996.86 | 6,763.12 | 2,981.62 | 2,872.02 | 27.203 | CC |
| HSR Weeks 9-17 - Wellbore #1 - Gyro Surveys | 17,000.00 | 6,763.12 | 2,981.63 | 2,871.99 | 27.196 | ES |
| HSR Weeks 9-17 - Wellbore #1 - Gyro Surveys | 17,400.00 | 6,762.90 | 3,008.75 | 2,896.50 | 26.804 | SF |
| HSR-LDS 3-17 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,748.00 | 2,115.86 | 2,024.76 | 23.227 | CC, ES, SF |
| HSR-LDS 4-17 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,750.00 | 2,037.84 | 1,936.45 | 20.100 | CC, ES, SF |
| LDS 18-17 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,753.00 | 1,410.08 | 1,322.65 | 16.128 | CC, ES, SF |
| LDS D17-13 - Wellbore #1 - Gyro Surveys | 15,329.98 | 6,809.21 | 1,063.08 | 965.89 | 10.938 | CC, ES |
| LDS D17-13 - Wellbore #1 - Gyro Surveys | 15,400.00 | 6,810.93 | 1,065.38 | 967.88 | 10.927 | SF |
| LDS D17-18 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,751.00 | 2,010.78 | 1,886.99 | 16.243 | CC, ES, SF |
| LDS D17-20 - Wellbore #1 - No Surveys | 17,465.96 | 6,759.00 | 76.00 | -73.19 | 0.509 | Level 1, CC, ES, SF |
| LDS D17-21 - Wellbore #1 - No Surveys | 17,407.80 | 6,755.00 | 1,068.50 | 919.81 | 7.186 | CC, ES, SF |
| LDS D17-22 (SI) - Wellbore #1 - No Surveys | 17,536.90 | 6,750.00 | 2,492.61 | 2,343.45 | 16.711 | CC, ES, SF |
| LDS D17-24D - Wellbore #1 - LDS D17-24D - As Drilled | 16,371.53 | 6,893.39 | 1,149.49 | 1,038.39 | 10.346 | CC, ES |
| LDS D17-24D - Wellbore #1 - LDS D17-24D - As Drilled | 16,400.00 | 6,893.06 | 1,149.84 | 1,038.52 | 10.329 | SF |
| LDS D17-25D - Wellbore #1 - LDS D17-25D - As Drilled | 16,636.60 | 7,000.16 | 93.28 | -18.90 | 0.832 | Level 1, CC, ES, SF |
| LDS D17-31D - LDS D17-31D - LDS D17-31D - As Drille | 17,536.90 | 6,996.68 | 2,014.84 | 1,918.06 | 20.819 | CC, ES, SF |
| LDS D17-32D - LDS D17-32D - LDS D17-32D - As Drille | 17,536.90 | 6,804.93 | 1,498.42 | 1,386.11 | 13.341 | CC, ES, SF |
| LDS D17-33 - LDS D17-33 - LDS D17-33 - As Drilled | 16,400.73 | 6,776.96 | 1,244.23 | 1,138.92 | 11.814 | CC, ES |
| LDS D17-33 - LDS D17-33 - LDS D17-33 - As Drilled | 16,500.00 | 6,776.31 | 1,248.18 | 1,142.44 | 11.804 | SF |
| LDS D17-7 - Wellbore #1 - No Surveys | 17,536.90 | 6,749.00 | 1,925.52 | 1,782.95 | 13.506 | CC, ES, SF |
| LDS D20-29D - Wellbore #1 - LDS D20-29D - As Drilled | 14,811.88 | 6,946.64 | 121.73 | 27.37 | 1.290 | Level 3, CC, ES, SF |
| LDS D20-30D - Wellbore #1 - LDS D20-30D - As Drilled | 14,855.61 | 6,836.06 | 1,557.24 | 1,463.60 | 16.630 | CC, ES |
| LDS D20-30D - Wellbore #1 - LDS D20-30D - As Drilled | 14,900.00 | 6,835.80 | 1,557.87 | 1,464.01 | 16.597 | SF |
| LDS RED D17-11 (SI) - Wellbore #1 - No Surveys | 16,960.75 | 6,756.00 | 728.67 | 583.51 | 5.020 | CC, ES |
| LDS RED D17-11 (SI) - Wellbore #1 - No Surveys | 17,000.00 | 6,756.00 | 729.73 | 584.30 | 5.018 | SF |
| LDS Red D17-12 - Wellbore #1 - No Surveys | 17,163.48 | 6,759.00 | 925.67 | 778.88 | 6.306 | CC, ES |
| LDS Red D17-12 - Wellbore #1 - No Surveys | 17,200.00 | 6,759.00 | 926.39 | 779.42 | 6.303 | SF |
| LDS Red D17-14X (SI) - Wellbore #1 - No Surveys | 15,786.44 | 6,760.00 | 759.88 | 623.92 | 5.589 | CC, ES |
| LDS Red D17-14X (SI) - Wellbore #1 - No Surveys | 15,800.00 | 6,760.00 | 760.00 | 623.92 | 5.585 | SF |
| LDS Red D17-3J - Wellbore #1 - Gyro Surveys | 16,009.84 | 6,762.97 | 497.18 | 395.03 | 4.867 | CC, ES, SF |
| LDS White D17-1 - Wellbore #1 - Gyro Surveys | 17,536.90 | 6,719.03 | 3,811.52 | 3,711.35 | 38.050 | CC, ES, SF |
| LDS White D17-2 - Wellbore #1 - No Surveys | 17,536.90 | 6,746.00 | 2,809.66 | 2,687.13 | 22.930 | CC, ES, SF |
| LDS White D17-8 - Wellbore #1 - No Surveys | 17,536.90 | 6,744.00 | 3,200.51 | 3,053.34 | 21.747 | CC, ES, SF |
| Thomson D20-31D - Wellbore #1 - Gyro Surveys | 13,549.31 | 7,037.17 | 1,593.05 | 1,494.73 | 16.202 | CC, ES |
| Thomson D20-31D - Wellbore #1 - Gyro Surveys | 13,600.00 | 7,033.69 | 1,593.86 | 1,495.43 | 16.193 | SF |
| Weeks 20-17 (SI) - Wellbore #1 - Gyro Surveys | 16,208.31 | 6,747.55 | 2,393.06 | 2,289.36 | 23.075 | CC, ES |
| Weeks 20-17 (SI) - Wellbore #1 - Gyro Surveys | 16,500.00 | 6,747.61 | 2,410.78 | 2,305.16 | 22.825 | SF |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 18 | | | | | | |
| Horton D18-20D - Horton D18-20D - Horton D18-20D - A | 17,528.98 | 7,025.86 | 5,183.19 | 5,051.42 | 39.333 | CC |
| Horton D18-20D - Horton D18-20D - Horton D18-20D - A | 17,536.90 | 7,025.76 | 5,183.20 | 5,051.27 | 39.289 | ES, SF |
| Horton D18-22D - Horton D18-22D - Horton D18-22D - A | 17,475.40 | 6,918.76 | 2,689.72 | 2,570.97 | 22.650 | CC, ES |
| Horton D18-22D - Horton D18-22D - Horton D18-22D - A | 17,536.90 | 6,918.48 | 2,690.42 | 2,571.43 | 22.609 | SF |
| LSWD 1 - LSWD 1 - LSWD 1 - As Drilled | 17,536.90 | 6,808.00 | 4,844.29 | 4,702.50 | 34.166 | CC, ES, SF |
| Mick D18-03 - Mick D18-03 - Mick D18-03 - As Drilled | 17,536.90 | 6,755.21 | 5,005.72 | 4,899.76 | 47.240 | CC, ES, SF |
| Mick D18-04 - Wellbore #1 - Wellbore #1- As Drilled | 17,536.90 | 6,751.80 | 6,390.50 | 6,280.98 | 58.352 | CC, ES, SF |
| Mick D18-05 - Wellbore #1 - Wellbore #1- As Drilled | 17,536.90 | 6,599.59 | 6,038.48 | 5,925.76 | 53.570 | CC, ES, SF |
| Mick D18-06 - Mick D18-06 - Mick D18-06 - As Drilled | 17,536.90 | 6,658.05 | 4,593.52 | 4,481.20 | 40.896 | CC, ES, SF |
| Mick D18-11 - Mick D18-11 - Mick D18-11 - As Drilled | 16,741.98 | 6,694.42 | 4,672.11 | 4,564.51 | 43.423 | CC |
| Mick D18-11 - Mick D18-11 - Mick D18-11 - As Drilled | 16,800.00 | 6,695.85 | 4,672.47 | 4,564.43 | 43.248 | ES |
| Mick D18-11 - Mick D18-11 - Mick D18-11 - As Drilled | 17,536.90 | 6,712.69 | 4,739.21 | 4,626.61 | 42.089 | SF |
| Mick D18-12 - Wellbore #1 - Wellbore #1- As Drilled | 16,933.60 | 6,648.03 | 5,782.82 | 5,673.91 | 53.094 | CC |
| Mick D18-12 - Wellbore #1 - Wellbore #1- As Drilled | 17,000.00 | 6,647.77 | 5,783.20 | 5,673.78 | 52.853 | ES |
| Mick D18-12 - Wellbore #1 - Wellbore #1- As Drilled | 17,536.90 | 6,645.60 | 5,814.21 | 5,701.09 | 51.401 | SF |
| Mick D18-13 - Wellbore #1 - Wellbore #1- As Drilled | 15,695.61 | 6,928.91 | 5,869.61 | 5,769.24 | 58.482 | CC |
| Mick D18-13 - Wellbore #1 - Wellbore #1- As Drilled | 15,700.00 | 6,928.89 | 5,869.61 | 5,769.21 | 58.463 | ES |
| Mick D18-13 - Wellbore #1 - Wellbore #1- As Drilled | 17,200.00 | 6,921.79 | 6,059.33 | 5,949.99 | 55.421 | SF |
| Mick D18-14 - Mick D18-14 - Mick D18-14 - As Drilled | 15,595.36 | 6,685.33 | 4,664.88 | 4,566.32 | 47.327 | CC |
| Mick D18-14 - Mick D18-14 - Mick D18-14 - As Drilled | 15,600.00 | 6,685.34 | 4,664.88 | 4,566.28 | 47.310 | ES |
| Mick D18-14 - Mick D18-14 - Mick D18-14 - As Drilled | 16,600.00 | 6,686.63 | 4,771.84 | 4,667.32 | 45.654 | SF |
| Mick D18-19 - Mick D18-19 - Mick D18-19 - As Drilled | 17,536.90 | 6,677.94 | 5,379.54 | 5,268.98 | 48.655 | CC, ES, SF |
| Mick D18-25 - Mick D18-25 - Mick D18-25 - As Drilled | 16,223.02 | 6,695.19 | 5,185.72 | 5,082.13 | 50.062 | CC |
| Mick D18-25 - Mick D18-25 - Mick D18-25 - As Drilled | 16,300.00 | 6,695.21 | 5,186.29 | 5,082.13 | 49.790 | ES |
| Mick D18-25 - Mick D18-25 - Mick D18-25 - As Drilled | 17,300.00 | 6,695.39 | 5,296.37 | 5,186.23 | 48.087 | SF |
| Scooter D18-02 - Scooter D18-02 - Scooter D18-02 - As | 17,536.90 | 6,843.06 | 3,983.99 | 3,879.80 | 38.240 | CC, ES, SF |
| Scooter D18-07 - Scooter D18-07 - Scooter D18-07 - As | 17,536.90 | 6,830.22 | 3,503.91 | 3,390.72 | 30.957 | CC, ES, SF |
| Scooter D18-10 - Scooter D18-10 - Scooter D18-10 - As | 16,747.56 | 6,764.86 | 3,411.28 | 3,303.33 | 31.601 | CC, ES |
| Scooter D18-10 - Scooter D18-10 - Scooter D18-10 - As | 17,200.00 | 6,761.02 | 3,441.15 | 3,330.50 | 31.101 | SF |
| Scooter D18-15 - Scooter D18-15 - Scooter D18-15 - As | 15,599.22 | 6,857.99 | 3,307.58 | 3,208.21 | 33.285 | CC |
| Scooter D18-15 - Scooter D18-15 - Scooter D18-15 - As | 15,600.00 | 6,857.98 | 3,307.58 | 3,208.20 | 33.284 | ES |
| Scooter D18-15 - Scooter D18-15 - Scooter D18-15 - As | 16,100.00 | 6,847.87 | 3,345.26 | 3,243.02 | 32.720 | SF |
| Scooter D18-16 - Scooter D18-16 - Scooter D18-16 - As | 15,637.32 | 6,764.00 | 2,055.95 | 1,921.12 | 15.248 | CC, ES |
| Scooter D18-16 - Scooter D18-16 - Scooter D18-16 - As | 15,800.00 | 6,764.00 | 2,062.38 | 1,926.59 | 15.188 | SF |
| Scooter D18-17 JI - Scooter D18-17 JI - Scooter D18-17 | 17,536.90 | 6,905.69 | 2,974.85 | 2,866.54 | 27.465 | CC, ES, SF |
| Scooter D18-1JI - Scooter D18-1JI - Scooter D18-1JI - A | 17,536.90 | 7,102.55 | 2,638.77 | 2,507.52 | 20.105 | CC, ES, SF |
| Scooter D18-4J - Scooter D18-4J - Scooter D18-4J - As | 16,491.38 | 6,693.29 | 2,413.20 | 2,307.64 | 22.861 | CC |
| Scooter D18-4J - Scooter D18-4J - Scooter D18-4J - As | 16,500.00 | 6,693.19 | 2,413.22 | 2,307.60 | 22.848 | ES |
| Scooter D18-4J - Scooter D18-4J - Scooter D18-4J - As | 16,700.00 | 6,691.02 | 2,422.20 | 2,315.39 | 22.678 | SF |
| Scooter D18-78-1HN - Original Drilling - Original Drilling - | 17,536.90 | 6,822.00 | 6,071.14 | 5,967.28 | 58.451 | CC, ES, SF |
| Scooter D18-78-1HN - Original Drilling - ST01 - Original D | 15,500.00 | 11,299.80 | 5,510.62 | 5,356.24 | 35.696 | SF |
| Scooter D18-78-1HN - Original Drilling - ST01 - Original D | 16,780.39 | 10,022.00 | 5,492.79 | 5,349.94 | 38.454 | CC |
| Scooter D18-78-1HN - Original Drilling - ST01 - Original D | 16,800.00 | 10,022.00 | 5,492.82 | 5,349.82 | 38.411 | ES |
| Scooter D18-79-1HN - Original Drilling - Original Drilling - | 15,500.00 | 11,253.23 | 6,166.63 | 6,011.84 | 39.839 | SF |
| Scooter D18-79-1HN - Original Drilling - Original Drilling - | 17,536.90 | 9,170.00 | 6,141.55 | 6,004.82 | 44.918 | CC, ES |
| Scooter D18-79HN - Original Drilling - Original Drilling - A | 16,800.00 | 16,800.00 | 6,571.80 | 6,320.26 | 26.127 | ES, SF |
| Scooter D18-79HN - Original Drilling - Original Drilling - A | 17,536.90 | 9,276.62 | 6,555.44 | 6,418.91 | 48.014 | CC |
| Scooter D18-8JI - Scooter D18-8JI - Scooter D18-8JI - A | 17,536.90 | 7,029.66 | 2,169.46 | 2,045.60 | 17.515 | CC, ES, SF |
| Scooter D18-9JI - Scooter D18-9JI - Scooter D18-9JI - A | 17,092.88 | 6,784.69 | 1,909.02 | 1,796.24 | 16.927 | CC |
| Scooter D18-9JI - Scooter D18-9JI - Scooter D18-9JI - A | 17,100.00 | 6,784.67 | 1,909.04 | 1,796.22 | 16.921 | ES |
| Scooter D18-9JI - Scooter D18-9JI - Scooter D18-9JI - A | 17,200.00 | 6,784.35 | 1,912.03 | 1,798.76 | 16.880 | SF |
| Shianne D18-29D - Shianne D18-29D - Shianne D18-29D | 17,536.90 | 6,839.76 | 5,797.02 | 5,690.73 | 54.539 | CC, ES, SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 19 | | | | | | |
| Butterball 13-19 - Butterball 13-19 - Butterball 13-19 - As | 11,709.95 | 6,871.22 | 5,834.21 | 5,763.97 | 83.062 | CC, ES |
| Butterball 13-19 - Butterball 13-19 - Butterball 13-19 - As | 13,700.00 | 6,900.00 | 6,164.19 | 6,082.36 | 75.334 | SF |
| Butterball 14-19 - Butterball 14-19 - Butterball 14-19 - As | 10,363.07 | 6,958.04 | 5,753.43 | 5,691.72 | 93.241 | CC |
| Butterball 14-19 - Butterball 14-19 - Butterball 14-19 - As | 10,400.00 | 6,958.15 | 5,753.55 | 5,691.62 | 92.905 | ES |
| Butterball 14-19 - Butterball 14-19 - Butterball 14-19 - As | 12,600.00 | 6,963.85 | 6,172.98 | 6,099.12 | 83.573 | SF |
| Butterball 23-19 - Butterball 23-19 - Butterball 23-19 - As | 11,647.26 | 6,812.77 | 4,681.85 | 4,612.29 | 67.305 | CC |
| Butterball 23-19 - Butterball 23-19 - Butterball 23-19 - As | 11,700.00 | 6,813.17 | 4,682.15 | 4,612.23 | 66.968 | ES |
| Butterball 23-19 - Butterball 23-19 - Butterball 23-19 - As | 13,000.00 | 6,823.72 | 4,873.35 | 4,796.07 | 63.053 | SF |
| Butterball B04-19 - Butterball B04-19 - Butterball B04-19 | 11,025.32 | 6,833.47 | 6,298.29 | 6,232.90 | 96.320 | CC |
| Butterball B04-19 - Butterball B04-19 - Butterball B04-19 | 11,100.00 | 6,832.82 | 6,298.74 | 6,232.86 | 95.620 | ES |
| Butterball B04-19 - Butterball B04-19 - Butterball B04-19 | 13,500.00 | 6,808.04 | 6,766.97 | 6,687.71 | 85.380 | SF |
| Butterball D18-75HN - Original Drilling - Original Drilling - | 15,228.57 | 6,895.00 | 3,955.00 | 3,858.18 | 40.850 | CC |
| Butterball D18-75HN - Original Drilling - Original Drilling - | 17,400.00 | 9,049.00 | 3,959.31 | 3,820.05 | 28.431 | ES |
| Butterball D18-75HN - Original Drilling - Original Drilling - | 17,536.90 | 9,147.52 | 3,961.96 | 3,820.08 | 27.924 | SF |
| Butterball D19-17D - Butterball D19-17D - Butterball D19 | 13,919.13 | 7,370.12 | 2,520.75 | 2,430.36 | 27.889 | CC, ES |
| Butterball D19-17D - Butterball D19-17D - Butterball D19 | 15,600.00 | 7,385.49 | 3,029.73 | 2,886.70 | 21.183 | SF |
| Butterball D19-18D - Butterball D19-18D - Butterball D19 | 13,944.25 | 6,853.26 | 4,281.97 | 4,195.37 | 49.449 | CC |
| Butterball D19-18D - Butterball D19-18D - Butterball D19 | 14,000.00 | 6,853.20 | 4,282.33 | 4,195.34 | 49.227 | ES |
| Butterball D19-18D - Butterball D19-18D - Butterball D19 | 15,000.00 | 6,852.01 | 4,410.20 | 4,317.25 | 47.448 | SF |
| Butterball D19-19D - Butterball D19-19D - Butterball D19 | 13,380.67 | 6,893.66 | 5,296.76 | 5,212.41 | 62.793 | CC |
| Butterball D19-19D - Butterball D19-19D - Butterball D19 | 13,400.00 | 6,893.70 | 5,296.80 | 5,212.31 | 62.695 | ES |
| Butterball D19-19D - Butterball D19-19D - Butterball D19 | 14,700.00 | 6,896.24 | 5,458.60 | 5,366.87 | 59.509 | SF |
| Butterball D19-20D - Butterball D19-20D - Butterball D19 | 12,407.60 | 6,988.56 | 5,177.99 | 5,100.93 | 67.189 | CC, ES |
| Butterball D19-20D - Butterball D19-20D - Butterball D19 | 14,200.00 | 6,998.41 | 5,479.44 | 5,389.55 | 60.960 | SF |
| Butterball D19-22D - Wellbore #1 - Wellbore #1 - As Drill | 12,402.08 | 6,867.62 | 2,796.65 | 2,719.45 | 36.228 | CC, ES |
| Butterball D19-22D - Wellbore #1 - Wellbore #1 - As Drill | 12,700.00 | 6,870.03 | 2,812.47 | 2,734.00 | 35.839 | SF |
| Butterball D19-75HN - Original Drilling - Original Drilling - | 12,700.00 | 12,700.00 | 3,770.36 | 3,622.16 | 25.442 | SF |
| Butterball D19-75HN - Original Drilling - Original Drilling - | 14,539.20 | 6,634.59 | 3,688.92 | 3,599.92 | 41.449 | CC, ES |
| Butterball D24-19 - Butterball D24-19 - Butterball D24-19 | 10,406.50 | 6,852.60 | 4,701.32 | 4,639.83 | 76.455 | CC, ES |
| Butterball D24-19 - Butterball D24-19 - Butterball D24-19 | 11,900.00 | 6,862.57 | 4,932.83 | 4,863.24 | 70.879 | SF |
| Butterball H24-69HN - Original Drilling - Original Drilling - | 15,046.50 | 6,326.00 | 3,313.36 | 3,221.66 | 36.134 | CC, ES |
| Butterball H24-69HN - Original Drilling - Original Drilling - | 15,600.00 | 6,326.00 | 3,359.27 | 3,264.42 | 35.419 | SF |
| Champlin 366 Amoco F 1 - Wellbore #1 - Wellbore #1 - A | 11,292.77 | 6,780.84 | 2,819.45 | 2,752.45 | 42.082 | CC |
| Champlin 366 Amoco F 1 - Wellbore #1 - Wellbore #1 - A | 11,300.00 | 6,780.84 | 2,819.45 | 2,752.41 | 42.053 | ES |
| Champlin 366 Amoco F 1 - Wellbore #1 - Wellbore #1 - A | 11,800.00 | 6,781.11 | 2,864.71 | 2,794.92 | 41.050 | SF |
| Dechant D19-32D - Dechant D19-32D - Dechant D19-32 | 12,291.20 | 7,476.92 | 6,637.27 | 6,518.46 | 55.865 | CC, ES |
| Dechant D19-32D - Dechant D19-32D - Dechant D19-32 | 14,700.00 | 14,700.00 | 7,057.64 | 6,864.31 | 36.506 | SF |
| Graznak 01-19 - Graznak 01-19 - Graznak 01-19 - As Dr | 10,972.77 | 6,786.00 | 5,549.30 | 5,448.77 | 55.200 | CC |
| Graznak 01-19 - Graznak 01-19 - Graznak 01-19 - As Dr | 11,000.00 | 6,786.00 | 5,549.37 | 5,448.66 | 55.105 | ES |
| Graznak 01-19 - Graznak 01-19 - Graznak 01-19 - As Dr | 12,500.00 | 6,786.00 | 5,755.62 | 5,646.13 | 52.569 | SF |
| Higgins D19-720 - Original Drilling - Original Drilling - As | 14,865.74 | 6,831.64 | 2,124.26 | 2,034.95 | 23.786 | CC, ES |
| Higgins D19-720 - Original Drilling - Original Drilling - As | 15,100.00 | 6,833.18 | 2,137.13 | 2,046.53 | 23.586 | SF |
| Higgins D19-720 - Sidetrack Curve/Horizontal - ST01 - A | 14,801.22 | 6,861.00 | 2,111.18 | 2,022.36 | 23.769 | CC, ES |
| Higgins D19-720 - Sidetrack Curve/Horizontal - ST01 - A | 15,000.00 | 6,827.01 | 2,120.15 | 2,030.21 | 23.572 | SF |
| Independence D18-712 - Independence D18-712 - Plan 1 | 17,536.90 | 10,009.57 | 1,546.00 | 1,418.41 | 12.117 | CC, ES, SF |
| Independence D18-717 - Independence D18-717 - Plan 1 | 17,536.90 | 9,780.05 | 1,910.25 | 1,784.43 | 15.182 | CC, ES, SF |
| Independence D18-725 - Independence D18-725 - Plan 1 | 17,536.90 | 9,830.77 | 2,451.23 | 2,325.56 | 19.505 | CC, ES, SF |
| Independence D18-732 - Independence D18-732 - Plan 1 | 17,536.90 | 9,804.64 | 2,882.26 | 2,756.44 | 22.908 | CC, ES, SF |
| Independence D18-739 - Independence D18-739 - Plan 1 | 14,392.79 | 6,337.08 | 3,209.60 | 3,121.72 | 36.522 | CC |
| Independence D18-739 - Independence D18-739 - Plan 1 | 17,536.90 | 9,903.05 | 3,242.90 | 3,116.92 | 25.741 | ES, SF |
| Independence D18-744 - Independence D18-744 - Plan 1 | 14,365.77 | 6,019.13 | 3,557.65 | 3,471.33 | 41.216 | CC |
| Independence D18-744 - Independence D18-744 - Plan 1 | 14,400.00 | 6,017.56 | 3,557.81 | 3,471.25 | 41.100 | ES |
| Independence D18-744 - Independence D18-744 - Plan 1 | 17,536.90 | 9,935.24 | 3,638.99 | 3,512.69 | 28.814 | SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 19 | | | | | | |
| Independence D18-759 - Independence D18-759 - Plan 1 | 17,536.90 | 9,771.63 | 4,334.69 | 4,208.95 | 34.474 | CC, ES, SF |
| Independence D18-767 - Independence D18-767 - Plan 1 | 17,536.90 | 9,765.33 | 4,904.08 | 4,778.67 | 39.105 | CC, ES, SF |
| Independence D30-711 - Independence D30-711 - Plan 1 | 14,981.81 | 7,505.00 | 1,501.60 | 1,404.38 | 15.445 | CC |
| Independence D30-711 - Independence D30-711 - Plan 1 | 15,000.00 | 7,489.97 | 1,501.62 | 1,404.28 | 15.426 | ES |
| Independence D30-711 - Independence D30-711 - Plan 1 | 15,300.00 | 7,264.79 | 1,509.68 | 1,410.65 | 15.244 | SF |
| Independence D30-718 - Independence D30-718 - Plan 1 | 15,035.46 | 7,298.39 | 1,870.07 | 1,773.73 | 19.411 | CC |
| Independence D30-718 - Independence D30-718 - Plan 1 | 15,100.00 | 7,250.00 | 1,870.34 | 1,773.58 | 19.330 | ES |
| Independence D30-718 - Independence D30-718 - Plan 1 | 15,400.00 | 7,050.00 | 1,881.52 | 1,783.13 | 19.124 | SF |
| Independence D30-724 - Independence D30-724 - Plan 1 | 15,133.41 | 7,083.58 | 2,320.94 | 2,224.76 | 24.133 | CC |
| Independence D30-724 - Independence D30-724 - Plan 1 | 15,200.00 | 7,031.61 | 2,321.19 | 2,224.60 | 24.032 | ES |
| Independence D30-724 - Independence D30-724 - Plan 1 | 15,600.00 | 6,800.00 | 2,340.21 | 2,241.57 | 23.725 | SF |
| Independence D30-731 - Independence D30-731 - Plan 1 | 15,371.78 | 6,792.71 | 2,664.07 | 2,566.68 | 27.355 | CC |
| Independence D30-731 - Independence D30-731 - Plan 1 | 15,400.00 | 6,776.13 | 2,664.16 | 2,566.61 | 27.312 | ES |
| Independence D30-731 - Independence D30-731 - Plan 1 | 15,700.00 | 6,650.00 | 2,678.01 | 2,578.95 | 27.034 | SF |
| Independence D30-737 - Independence D30-737 - Plan 1 | 14,900.00 | 14,900.00 | 3,167.45 | 3,066.46 | 31.363 | SF |
| Independence D30-737 - Independence D30-737 - Plan 1 | 15,532.03 | 6,483.21 | 3,121.29 | 3,023.52 | 31.924 | CC, ES |
| Independence D30-743 - Independence D30-743 - Plan 1 | 15,516.80 | 6,224.25 | 3,427.24 | 3,330.67 | 35.489 | CC, ES |
| Independence D30-743 - Independence D30-743 - Plan 1 | 16,100.00 | 6,312.54 | 3,474.48 | 3,373.78 | 34.504 | SF |
| Independence D30-758 - Independence D30-758 - Plan 1 | 14,969.00 | 7,312.39 | 4,391.09 | 4,295.72 | 46.046 | CC |
| Independence D30-758 - Independence D30-758 - Plan 1 | 15,000.00 | 7,300.00 | 4,391.14 | 4,295.55 | 45.937 | ES |
| Independence D30-758 - Independence D30-758 - Plan 1 | 16,300.00 | 6,784.71 | 4,506.77 | 4,403.61 | 43.685 | SF |
| Independence D30-765 - Independence D30-765 - Plan 1 | 15,371.74 | 6,989.12 | 4,813.44 | 4,715.05 | 48.922 | CC |
| Independence D30-765 - Independence D30-765 - Plan 1 | 15,400.00 | 6,972.61 | 4,813.49 | 4,714.92 | 48.835 | ES |
| Independence D30-765 - Independence D30-765 - Plan 1 | 16,500.00 | 6,700.00 | 4,920.38 | 4,815.75 | 47.028 | SF |
| Independence D30-770 - Independence D30-770 - Plan 1 | 15,000.00 | 15,000.00 | 5,213.01 | 5,108.57 | 49.917 | SF |
| Independence D30-770 - Independence D30-770 - Plan 1 | 15,499.88 | 6,564.45 | 5,197.17 | 5,099.21 | 53.052 | CC |
| Independence D30-770 - Independence D30-770 - Plan 1 | 15,500.00 | 6,564.41 | 5,197.17 | 5,099.21 | 53.052 | ES |
| Independence D30-777 - Independence D30-777 - Plan 1 | 15,489.02 | 6,090.83 | 5,540.30 | 5,444.25 | 57.681 | CC |
| Independence D30-777 - Independence D30-777 - Plan 1 | 15,500.00 | 6,106.48 | 5,540.31 | 5,444.12 | 57.592 | ES |
| Independence D30-777 - Independence D30-777 - Plan 1 | 16,900.00 | 6,300.00 | 5,709.33 | 5,603.53 | 53.964 | SF |
| Independence State D30-784 - Independence State D30 | 15,291.27 | 5,407.25 | 5,880.17 | 5,788.85 | 64.396 | CC |
| Independence State D30-784 - Independence State D30 | 15,300.00 | 5,409.37 | 5,880.17 | 5,788.78 | 64.340 | ES |
| Independence State D30-784 - Independence State D30 | 17,300.00 | 5,904.80 | 6,194.62 | 6,088.70 | 58.486 | SF |
| LDS White D19-10 - LDS White D19-10 - LDS White D19 | 11,738.59 | 6,801.58 | 3,627.05 | 3,556.89 | 51.699 | CC, ES |
| LDS White D19-10 - LDS White D19-10 - LDS White D19 | 12,600.00 | 6,802.21 | 3,727.93 | 3,652.97 | 49.732 | SF |
| LDS White D19-15 - LDS White D19-15 - LDS White D19 | 10,325.78 | 6,754.85 | 3,573.10 | 3,512.56 | 59.022 | CC, ES |
| LDS White D19-15 - LDS White D19-15 - LDS White D19 | 11,200.00 | 6,755.80 | 3,678.49 | 3,613.31 | 56.434 | SF |
| LDS White D19-16 - Wellbore #1 - Wellbore #1 - As Drill | 10,347.85 | 6,780.75 | 2,283.80 | 2,223.02 | 37.576 | CC, ES |
| LDS White D19-16 - Wellbore #1 - Wellbore #1 - As Drill | 10,700.00 | 6,781.31 | 2,310.79 | 2,248.20 | 36.920 | SF |
| Mile High 02-19 - Wellbore #1 - Wellbore #1 - As Drilled | 13,320.53 | 6,795.31 | 3,099.15 | 3,017.51 | 37.957 | CC, ES |
| Mile High 02-19 - Wellbore #1 - Wellbore #1 - As Drilled | 13,800.00 | 6,795.17 | 3,136.02 | 3,051.56 | 37.130 | SF |
| Sean D19-09 - Wellbore #1 - Wellbore #1 - As Drilled | 11,813.05 | 6,776.00 | 1,952.05 | 1,769.45 | 10.690 | CC, ES |
| Sean D19-09 - Wellbore #1 - Wellbore #1 - As Drilled | 11,900.00 | 6,776.00 | 1,953.98 | 1,770.85 | 10.670 | SF |
| Turk Blue D19-02J - Turk Blue D19-02J - Turk Blue D19- | 14,015.89 | 6,859.46 | 5,088.72 | 5,001.58 | 58.398 | CC, ES |
| Turk Blue D19-02J - Turk Blue D19-02J - Turk Blue D19- | 15,300.00 | 6,855.77 | 5,248.23 | 5,153.49 | 55.396 | SF |
| Turk Blue D19-04 - Turk Blue D19-04 - Turk Blue D19-04 | 14,451.67 | 6,789.45 | 5,952.19 | 5,862.03 | 66.017 | CC |
| Turk Blue D19-04 - Turk Blue D19-04 - Turk Blue D19-04 | 14,500.00 | 6,789.63 | 5,952.39 | 5,861.87 | 65.757 | ES |
| Turk Blue D19-04 - Turk Blue D19-04 - Turk Blue D19-04 | 16,100.00 | 6,795.77 | 6,176.21 | 6,076.12 | 61.705 | SF |
| Turk Blue D19-05 - Turk Blue D19-05 - Turk Blue D19-05 | 12,805.53 | 6,958.80 | 5,942.97 | 5,864.45 | 75.687 | CC, ES |
| Turk Blue D19-05 - Turk Blue D19-05 - Turk Blue D19-05 | 14,700.00 | 6,989.16 | 6,237.52 | 6,147.79 | 69.512 | SF |
| Turk Blue D19-06 - Turk Blue D19-06 - Turk Blue D19-06 | 12,874.90 | 6,819.67 | 4,680.11 | 4,601.69 | 59.681 | CC |
| Turk Blue D19-06 - Turk Blue D19-06 - Turk Blue D19-06 | 12,900.00 | 6,819.74 | 4,680.18 | 4,601.58 | 59.546 | ES |
| Turk Blue D19-06 - Turk Blue D19-06 - Turk Blue D19-06 | 14,100.00 | 6,823.63 | 4,837.80 | 4,752.24 | 56.542 | SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 19 | | | | | | |
| Turk White D19-01 - Wellbore #1 - Wellbore #1 - As Drill | 14,333.73 | 6,771.59 | 1,954.68 | 1,865.48 | 21.915 | CC, ES |
| Turk White D19-01 - Wellbore #1 - Wellbore #1 - As Drill | 14,500.00 | 6,770.26 | 1,961.74 | 1,871.59 | 21.761 | SF |
| Turk White D19-02 - Wellbore #1 - Wellbore #1 - As Drill | 14,438.55 | 6,778.37 | 3,412.00 | 3,321.96 | 37.895 | CC, ES |
| Turk White D19-02 - Wellbore #1 - Wellbore #1 - As Drill | 15,000.00 | 6,777.26 | 3,457.88 | 3,364.55 | 37.048 | SF |
| Turk White D19-08 - Wellbore #1 - Wellbore #1 - As Drill | 12,851.27 | 6,764.68 | 2,083.57 | 2,005.57 | 26.714 | CC, ES |
| Turk White D19-08 - Wellbore #1 - Wellbore #1 - As Drill | 13,100.00 | 6,766.57 | 2,098.36 | 2,018.97 | 26.432 | SF |
| D Section 20 | | | | | | |
| Bohlender D20-2J - Wellbore #1 - No Surveys | 13,326.67 | 6,771.00 | 450.23 | 333.04 | 3.842 | CC, ES, SF |
| Bohlender D20-3 - Wellbore #1 - Gyro Surveys | 14,337.44 | 6,775.97 | 484.05 | 394.77 | 5.422 | CC, ES, SF |
| Bohlender D20-4 (P&A) - Wellbore #1 - No Surveys | 14,469.55 | 6,773.00 | 872.01 | 669.78 | 4.312 | CC, ES |
| Bohlender D20-4 (P&A) - Wellbore #1 - No Surveys | 14,500.00 | 6,773.00 | 872.54 | 670.15 | 4.311 | SF |
| Bohlender D20-6 - Wellbore#1 - Gyro Surveys | 12,990.67 | 6,763.09 | 505.16 | 426.07 | 6.387 | CC, ES |
| Bohlender D20-6 - Wellbore#1 - Gyro Surveys | 13,000.00 | 6,763.15 | 505.25 | 426.07 | 6.381 | SF |
| Butterball D19-27D - Butterball D19-27D - Butterball D19 | 15,123.22 | 7,016.03 | 2,728.07 | 2,630.22 | 27.880 | CC, ES |
| Butterball D19-27D - Butterball D19-27D - Butterball D19 | 15,600.00 | 7,012.03 | 2,769.41 | 2,669.04 | 27.592 | SF |
| Duncan D20-1 (P&A) - Wellbore #1 - No Surveys | 14,406.82 | 6,772.00 | 3,297.94 | 3,096.21 | 16.348 | CC, ES |
| Duncan D20-1 (P&A) - Wellbore #1 - No Surveys | 14,700.00 | 6,772.00 | 3,310.94 | 3,107.08 | 16.241 | SF |
| Duncan D20-10 - Wellbore #1 - Gyro Surveys | 11,290.46 | 6,785.74 | 2,128.45 | 2,061.43 | 31.759 | CC |
| Duncan D20-10 - Wellbore #1 - Gyro Surveys | 11,300.00 | 6,785.71 | 2,128.47 | 2,061.38 | 31.727 | ES |
| Duncan D20-10 - Wellbore #1 - Gyro Surveys | 11,600.00 | 6,784.79 | 2,150.84 | 2,081.88 | 31.190 | SF |
| Duncan D20-11 (SI) - Wellbore #1 - No Surveys | 11,709.70 | 6,778.00 | 577.76 | 472.26 | 5.476 | CC, ES, SF |
| Duncan D20-12 (SI) - Wellbore #1 - No Surveys | 11,670.97 | 6,776.00 | 799.43 | 694.22 | 7.598 | CC, ES |
| Duncan D20-12 (SI) - Wellbore #1 - No Surveys | 11,700.00 | 6,776.00 | 799.96 | 694.61 | 7.593 | SF |
| Duncan D20-13 (SI) - Wellbore #1 - No Surveys | 10,135.02 | 6,781.00 | 840.95 | 745.81 | 8.838 | CC, ES, SF |
| Duncan D20-14 (SI) - Wellbore #1 - Gyro Surveys | 10,666.91 | 6,770.69 | 179.50 | 116.64 | 2.856 | CC, ES, SF |
| Duncan D20-15 (P&A) - Wellbore #1 - Gyro Surveys | 10,306.12 | 6,772.35 | 1,653.74 | 1,593.20 | 27.313 | CC, ES |
| Duncan D20-15 (P&A) - Wellbore #1 - Gyro Surveys | 10,500.00 | 6,773.37 | 1,665.07 | 1,603.35 | 26.979 | SF |
| Duncan D20-16 (SI) - Wellbore #1 - Gyro Surveys | 10,278.49 | 6,760.07 | 3,296.97 | 3,236.66 | 54.664 | CC |
| Duncan D20-16 (SI) - Wellbore #1 - Gyro Surveys | 10,300.00 | 6,759.99 | 3,297.04 | 3,236.59 | 54.540 | ES |
| Duncan D20-16 (SI) - Wellbore #1 - Gyro Surveys | 11,100.00 | 6,756.99 | 3,397.78 | 3,332.74 | 52.244 | SF |
| Duncan D20-2 - Wellbore #1 - Gyro Surveys | 14,322.48 | 6,763.41 | 1,869.65 | 1,780.57 | 20.987 | CC, ES |
| Duncan D20-2 - Wellbore #1 - Gyro Surveys | 14,500.00 | 6,763.19 | 1,878.06 | 1,787.75 | 20.795 | SF |
| Duncan D20-7 - Wellbore #1 - Gyro Surveys | 13,302.86 | 6,767.94 | 2,147.49 | 2,066.10 | 26.388 | CC, ES |
| Duncan D20-7 - Wellbore #1 - Gyro Surveys | 13,600.00 | 6,767.87 | 2,167.95 | 2,084.64 | 26.023 | SF |
| Duncan D20-8 - Wellbore #1 - Gyro Surveys | 12,906.16 | 6,796.12 | 3,225.45 | 3,146.92 | 41.071 | CC, ES |
| Duncan D20-8 - Wellbore #1 - Gyro Surveys | 13,500.00 | 6,794.04 | 3,279.66 | 3,197.28 | 39.813 | SF |
| Duncan D20-9 (P&A) - Wellbore #1 - Gyro Surveys | 11,658.54 | 6,788.46 | 3,266.22 | 3,196.69 | 46.975 | CC |
| Duncan D20-9 (P&A) - Wellbore #1 - Gyro Surveys | 11,700.00 | 6,788.28 | 3,266.49 | 3,196.66 | 46.777 | ES |
| Duncan D20-9 (P&A) - Wellbore #1 - Gyro Surveys | 12,400.00 | 6,785.27 | 3,349.32 | 3,275.24 | 45.209 | SF |
| E Ranches (P&A) - Wellbore #1 - No Surveys | 10,341.31 | 6,773.00 | 336.89 | 164.19 | 1.951 | CC, ES, SF |
| Guttersen 10-20 - Wellbore #1 - Gyro Surveys | 11,840.82 | 6,758.18 | 1,641.86 | 1,571.58 | 23.363 | CC, ES |
| Guttersen 10-20 - Wellbore #1 - Gyro Surveys | 12,000.00 | 6,757.91 | 1,649.56 | 1,578.21 | 23.120 | SF |
| LDS D20-30D - LDS D20-30D - LDS D20-30D - As Drille | 14,859.17 | 6,822.18 | 1,559.82 | 1,464.74 | 16.405 | CC, ES |
| LDS D20-30D - LDS D20-30D - LDS D20-30D - As Drille | 14,900.00 | 6,821.93 | 1,560.36 | 1,465.10 | 16.380 | SF |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 28 | | | | | | |
| O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys | 7,713.29 | 6,813.00 | 7,035.56 | 6,874.07 | 43.564 | CC, ES |
| O'SH D 28-7 (P&A) - Wellbore #1 - No Surveys | 9,100.00 | 6,813.00 | 7,170.92 | 7,004.52 | 43.093 | SF |
| Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve | 6,778.04 | 6,610.23 | 4,329.56 | 4,282.84 | 92.659 | CC |
| Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve | 6,800.00 | 6,630.29 | 4,329.64 | 4,282.80 | 92.440 | ES |
| Spike ST GWS D 28-12 (SI) - Wellbore #1 - Gyro Surve | 7,150.00 | 6,811.40 | 4,356.89 | 4,308.93 | 90.832 | SF |
| Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su | 9,789.14 | 6,825.57 | 5,128.46 | 5,069.92 | 87.615 | CC |
| Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su | 9,800.00 | 6,825.56 | 5,128.47 | 5,069.86 | 87.510 | ES |
| Guttersen D State 28-29D (PR) - Wellbore #1 - MWD Su | 11,900.00 | 6,822.41 | 5,545.88 | 5,474.54 | 77.736 | SF |
| Guttersen D State 28-30D - Wellbore #1 - Guttersen D S | 9,656.31 | 6,897.53 | 3,674.45 | 3,616.92 | 63.868 | CC, ES |
| Guttersen D State 28-30D - Wellbore #1 - Guttersen D S | 10,700.00 | 6,888.66 | 3,819.79 | 3,757.29 | 61.122 | SF |
| Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur | 8,543.46 | 6,887.65 | 6,227.00 | 6,172.36 | 113.980 | CC, ES |
| Guttersen State D28-18D (PR) - Wellbore #1 - MWD Sur | 11,500.00 | 6,915.73 | 6,893.18 | 6,825.31 | 101.561 | SF |
| Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv | 7,242.39 | 6,848.61 | 6,319.92 | 6,269.09 | 124.340 | CC |
| Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv | 7,250.00 | 6,849.17 | 6,319.93 | 6,269.09 | 124.312 | ES |
| Guttersen State D28-21D (SI) - Wellbore #1 - MWD Surv | 9,100.00 | 9,100.00 | 6,593.92 | 6,529.76 | 102.774 | SF |
| Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv | 6,606.75 | 6,510.50 | 6,411.88 | 6,361.63 | 127.602 | CC |
| Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv | 6,650.00 | 6,579.92 | 6,412.13 | 6,361.59 | 126.862 | ES |
| Guttersen State D28-24D (SI) - Wellbore #1 - MWD Surv | 12,800.00 | 12,800.00 | 9,513.68 | 9,427.43 | 110.298 | SF |
| Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur | 9,855.62 | 6,834.34 | 6,303.13 | 6,242.71 | 104.323 | CC |
| Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur | 9,900.00 | 6,834.51 | 6,303.29 | 6,242.59 | 103.843 | ES |
| Guttersen State D28-28D (PR) - Wellbore #1 - MWD Sur | 12,700.00 | 6,845.33 | 6,915.19 | 6,837.96 | 89.540 | SF |
| Guttersen State D28-79HN - Wellbore #1 - Actual | 9,164.08 | 11,086.00 | 3,855.58 | 3,741.17 | 33.698 | CC, ES |
| Guttersen State D28-79HN - Wellbore #1 - Actual | 9,500.00 | 11,086.00 | 3,870.19 | 3,754.51 | 33.456 | SF |
| HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su | 6,937.21 | 6,862.80 | 6,782.76 | 6,734.90 | 141.740 | CC |
| HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su | 6,950.00 | 6,865.85 | 6,782.79 | 6,734.90 | 141.645 | ES |
| HSR Guttersen State 10-28 (SI) - Wellbore #1 - Gyro Su | 10,700.00 | 7,009.62 | 7,985.79 | 7,925.46 | 132.377 | SF |
| HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur | 7,770.00 | 6,555.10 | 6,818.45 | 6,770.30 | 141.615 | CC |
| HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur | 7,800.00 | 6,555.18 | 6,818.51 | 6,770.30 | 141.416 | ES |
| HSR Guttersen State 7-28 (PR) - Wellbore #1 - Gyro Sur | 11,800.00 | 6,569.23 | 7,920.34 | 7,854.54 | 120.367 | SF |
| O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys | 8,670.91 | 6,837.31 | 8,041.89 | 7,989.88 | 154.633 | CC |
| O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys | 8,700.00 | 6,837.48 | 8,041.94 | 7,989.81 | 154.271 | ES |
| O'SH D 28-1 (SI) - Wellbore #1 - Gyro Surveys | 13,500.00 | 6,960.93 | 9,380.29 | 9,303.02 | 121.398 | SF |
| O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys | 9,052.99 | 6,828.37 | 7,065.18 | 7,011.73 | 132.185 | CC |
| O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys | 9,100.00 | 6,828.40 | 7,065.33 | 7,011.66 | 131.623 | ES |
| O'SH D 28-2 (SI) - Wellbore #1 - Gyro Surveys | 12,800.00 | 6,831.22 | 7,997.30 | 7,924.06 | 109.189 | SF |
| O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys | 7,639.69 | 6,724.36 | 8,386.02 | 8,337.59 | 173.166 | CC, ES |
| O'SH D 28-8 (SI) - Wellbore #1 - Gyro Surveys | 13,000.00 | 6,576.06 | 9,951.86 | 9,879.45 | 137.437 | SF |
| Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys | 9,258.62 | 6,745.44 | 4,447.06 | 4,392.60 | 81.652 | CC |
| Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys | 9,300.00 | 6,745.34 | 4,447.26 | 4,392.58 | 81.333 | ES |
| Spike ST GWS D 28-4 (SI) - Wellbore #1 - Gyro Surveys | 10,900.00 | 6,740.91 | 4,740.31 | 4,677.36 | 75.304 | SF |
| Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys | 6,460.69 | 6,423.95 | 4,730.95 | 4,685.82 | 104.837 | CC, ES |
| Spike State D 28-13 (SI) - Wellbore #1 - Gyro Surveys | 6,950.00 | 6,761.95 | 4,810.55 | 4,763.22 | 101.631 | SF |
| Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys | 7,916.86 | 6,709.54 | 4,290.32 | 4,241.30 | 87.521 | CC, ES |
| Spike State D28-05 (PR) - Wellbore #1 - Gyro Surveys | 9,500.00 | 6,700.48 | 4,573.09 | 4,518.13 | 83.203 | SF |
| Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys | 7,860.52 | 6,737.34 | 5,980.60 | 5,931.64 | 122.150 | CC, ES |
| Spike State D28-06 (SI) - Wellbore #1 - Gyro Surveys | 11,000.00 | 6,718.47 | 6,754.52 | 6,692.30 | 108.564 | SF |
| Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys | 6,959.39 | 6,863.96 | 5,906.12 | 5,858.20 | 123.258 | CC, ES |
| Spike State D28-11 (SI) - Wellbore #1 - Gyro Surveys | 9,700.00 | 6,800.00 | 6,670.55 | 6,615.09 | 120.281 | SF |
| Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su | 6,446.68 | 6,197.78 | 6,188.73 | 6,144.33 | 139.406 | CC |
| Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su | 6,450.00 | 6,200.39 | 6,188.73 | 6,144.32 | 139.346 | ES |
| Spike State GWS D 28-14 (P&A) - Wellbore #1 - Gyro Su | 7,050.00 | 6,587.74 | 6,282.49 | 6,235.50 | 133.701 | SF |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 29 | | | | | | |
| Guttersen D29-30D - Wellbore #1 - Design #1 | 800.54 | 802.55 | 1,295.07 | 1,289.78 | 244.751 | CC |
| Guttersen D29-30D - Wellbore #1 - Design #1 | 900.00 | 886.20 | 1,295.39 | 1,289.44 | 217.805 | ES |
| Guttersen D29-30D - Wellbore #1 - Design #1 | 9,700.00 | 6,970.26 | 1,406.15 | 1,341.72 | 21.823 | SF |
| Guttersen D29-31D - Wellbore #1 - Guttersen D29-31D | 100.00 | 73.62 | 538.85 | 538.59 | 2,089.256 | CC |
| Guttersen D29-31D - Wellbore #1 - Guttersen D29-31D | 600.00 | 571.07 | 540.38 | 537.43 | 183.567 | ES |
| Guttersen D29-31D - Wellbore #1 - Guttersen D29-31D | 8,500.00 | 6,868.39 | 1,352.70 | 1,299.36 | 25.358 | SF |
| Guttersen D29-33D - Wellbore #1 - Guttersen D29-33D - | 872.87 | 872.64 | 848.86 | 844.26 | 184.649 | CC |
| Guttersen D29-33D - Wellbore #1 - Guttersen D29-33D - | 900.00 | 895.44 | 848.89 | 844.12 | 177.944 | ES |
| Guttersen D29-33D - Wellbore #1 - Guttersen D29-33D - | 6,350.00 | 6,476.41 | 1,591.99 | 1,542.27 | 32.015 | SF |
| Guttersen D29-65HN - Original Drilling - Original Drilling | 6,976.26 | 7,813.81 | 49.31 | 15.18 | 1.445 | Level 3, CC |
| Guttersen D29-65HN - Original Drilling - Original Drilling | 7,000.00 | 7,816.09 | 55.07 | 5.05 | 1.101 | Level 2, ES, SF |
| Guttersen D29-67HN - Original Drilling - Original Drilling | 8,300.00 | 7,665.64 | 103.68 | 60.17 | 2.383 | SF |
| Guttersen D29-67HN - Original Drilling - Original Drilling | 8,363.81 | 7,666.47 | 81.71 | 53.09 | 2.855 | CC, ES |
| Guttersen D29-69HN - Original Drilling - Original Drilling | 9,604.25 | 7,831.69 | 94.27 | 55.25 | 2.416 | CC, ES, SF |
| Guttersen D29-722 - Guttersen D29-722 - Prelim - Rev 1 | 17,532.06 | 17,642.54 | 3,052.82 | 2,871.07 | 16.797 | CC |
| Guttersen D29-722 - Guttersen D29-722 - Prelim - Rev 1 | 17,536.90 | 17,638.72 | 3,052.82 | 2,871.06 | 16.796 | ES, SF |
| Guttersen D29-730 - Guttersen D29-730 - Prelim - Rev 1 | 17,533.93 | 17,560.89 | 2,437.83 | 2,256.46 | 13.441 | CC, ES, SF |
| Guttersen D29-738 - Guttersen D29-738 - Prelim - Rev 1 | 2,200.00 | 2,208.00 | 1,403.18 | 1,387.85 | 91.500 | CC |
| Guttersen D29-738 - Guttersen D29-738 - Prelim - Rev 1 | 2,821.44 | 2,665.85 | 1,405.15 | 1,386.32 | 74.629 | ES |
| Guttersen D29-738 - Guttersen D29-738 - Prelim - Rev 1 | 17,536.90 | 17,785.14 | 1,808.03 | 1,626.99 | 9.987 | SF |
| Guttersen D29-746 - Guttersen D29-746 - Prelim - Rev 1 | 17,536.90 | 17,503.49 | 1,220.88 | 1,039.11 | 6.717 | CC, ES, SF |
| Guttersen D29-754 - Guttersen D29-754 - Prelim - Rev 1 | 17,536.90 | 17,719.61 | 664.74 | 484.45 | 3.687 | CC, ES, SF |
| Guttersen D29-778 - Guttersen D29-778 - Prelim - Rev 1 | 2,200.00 | 2,200.00 | 37.01 | 21.70 | 2.418 | CC, ES |
| Guttersen D29-778 - Guttersen D29-778 - Prelim - Rev 1 | 2,300.00 | 2,299.86 | 38.08 | 22.10 | 2.382 | SF |
| Guttersen D29-786 - Guttersen D29-786 - Prelim - Rev 1 | 2,200.00 | 2,200.00 | 75.01 | 59.71 | 4.901 | CC, ES |
| Guttersen D29-786 - Guttersen D29-786 - Prelim - Rev 1 | 2,300.00 | 2,298.36 | 76.98 | 61.00 | 4.817 | SF |
| Guttersen D29-99HZ - Wellbore #1 - MWD Surveys | 6,525.16 | 7,649.09 | 1,141.24 | 1,087.78 | 21.345 | CC, ES |
| Guttersen D29-99HZ - Wellbore #1 - MWD Surveys | 6,650.00 | 7,671.06 | 1,159.89 | 1,104.01 | 20.758 | SF |
| Guttersen D30-68-1HN - Original Drilling - Original Drillin | 1,031.57 | 1,021.58 | 1,234.65 | 1,229.08 | 221.732 | CC, ES |
| Guttersen D30-68-1HN - Original Drilling - Original Drillin | 8,900.00 | 6,420.79 | 1,528.02 | 1,479.01 | 31.178 | SF |
| Guttersen D30-69-1HN - Original Drilling - Original Drillin | 1,126.09 | 1,116.11 | 1,253.37 | 1,247.15 | 201.360 | CC |
| Guttersen D30-69-1HN - Original Drilling - Original Drillin | 1,200.00 | 1,180.07 | 1,253.66 | 1,246.95 | 186.678 | ES |
| Guttersen D30-69-1HN - Original Drilling - Original Drillin | 9,700.00 | 6,556.44 | 1,659.61 | 1,600.02 | 27.848 | SF |
| Guttersen State D29-714 - Guttersen D29-714 - Prelim - | 6,669.41 | 6,314.00 | 3,600.23 | 3,554.03 | 77.925 | CC |
| Guttersen State D29-714 - Guttersen D29-714 - Prelim - | 17,536.90 | 17,735.31 | 3,609.15 | 3,427.83 | 19.904 | ES, SF |
| Guttersen State Y05-719 - Guttersen Y05-719 - Prelim - | 7,924.18 | 6,747.25 | 3,433.10 | 3,383.57 | 69.321 | CC, ES |
| Guttersen State Y05-719 - Guttersen Y05-719 - Prelim - | 8,900.00 | 6,486.20 | 3,546.69 | 3,494.28 | 67.667 | SF |
| Guttersen Y05-726 - Guttersen Y05-726 - Prelim - Rev 1 | 7,245.37 | 7,532.59 | 2,828.44 | 2,779.18 | 57.426 | CC, ES |
| Guttersen Y05-726 - Guttersen Y05-726 - Prelim - Rev 1 | 8,400.00 | 6,769.78 | 2,892.87 | 2,841.83 | 56.675 | SF |
| Guttersen Y05-734 - Guttersen Y05-734 - Prelim - Rev 1 | 7,246.49 | 7,603.28 | 2,215.85 | 2,165.92 | 44.385 | CC |
| Guttersen Y05-734 - Guttersen Y05-734 - Prelim - Rev 1 | 7,250.00 | 7,606.80 | 2,215.85 | 2,165.92 | 44.378 | ES |
| Guttersen Y05-734 - Guttersen Y05-734 - Prelim - Rev 1 | 7,800.00 | 7,200.00 | 2,231.17 | 2,180.78 | 44.285 | SF |
| Guttersen Y05-749 - Guttersen Y05-749 - Prelim - Rev 1 | 2,200.00 | 2,202.00 | 1,375.77 | 1,360.46 | 89.838 | CC |
| Guttersen Y05-749 - Guttersen Y05-749 - Prelim - Rev 1 | 2,300.00 | 2,273.40 | 1,376.10 | 1,360.19 | 86.515 | ES |
| Guttersen Y05-749 - Guttersen Y05-749 - Prelim - Rev 1 | 8,100.00 | 6,619.74 | 1,569.01 | 1,518.87 | 31.291 | SF |
| Guttersen Y05-756 - Guttersen Y05-756 - Prelim - Rev 1 | 7,787.16 | 6,902.19 | 980.61 | 931.17 | 19.834 | CC, ES |
| Guttersen Y05-756 - Guttersen Y05-756 - Prelim - Rev 1 | 7,900.00 | 6,822.81 | 983.53 | 933.90 | 19.817 | SF |
| Guttersen Y05-771 - Guttersen Y05-771 - Prelim - Rev 1 | 2,200.00 | 2,200.00 | 150.03 | 134.72 | 9.801 | CC, ES |
| Guttersen Y05-771 - Guttersen Y05-771 - Prelim - Rev 1 | 7,800.00 | 6,939.03 | 263.08 | 212.93 | 5.245 | SF |
| Guttersen Y05-779 - Guttersen Y05- 779 - Prelim - Rev 1 | 2,200.00 | 2,200.00 | 153.82 | 138.51 | 10.049 | CC, ES |
| Guttersen Y05-779 - Guttersen Y05- 779 - Prelim - Rev 1 | 7,833.80 | 6,925.32 | 252.25 | 202.39 | 5.060 | SF |
| Guttersen Y05-786 - Guttersen Y05-786 - Prelim - Rev 1 | 2,200.00 | 2,204.00 | 166.42 | 151.10 | 10.862 | CC, ES |
| Guttersen Y05-786 - Guttersen Y05-786 - Prelim - Rev 1 | 2,300.00 | 2,298.22 | 169.92 | 153.93 | 10.625 | SF |

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 29 | | | | | | |
| Jessie D29-1J - Wellbore #1 - Gyro Surveys | 8,706.88 | 6,773.13 | 2,121.81 | 2,069.85 | 40.834 | CC, ES |
| Jessie D29-1J - Wellbore #1 - Gyro Surveys | 9,100.00 | 6,770.91 | 2,157.92 | 2,104.26 | 40.212 | SF |
| Jessie D29-4J - Wellbore #1 - Gyro Surveys | 6,464.76 | 6,313.49 | 2,279.81 | 2,234.97 | 50.843 | CC, ES |
| Jessie D29-4J - Wellbore #1 - Gyro Surveys | 6,800.00 | 6,569.38 | 2,312.45 | 2,265.94 | 49.721 | SF |
| Kate Red D29-03J - Kate Red D29-03J - Kate Red D29-0 | 6,204.30 | 6,109.15 | 795.55 | 752.10 | 18.310 | CC, ES |
| Kate Red D29-03J - Kate Red D29-03J - Kate Red D29-0 | 6,300.00 | 6,209.52 | 800.70 | 756.56 | 18.140 | SF |
| Kate Red D29-11 - Wellbore #1 - Gyro Surveys | 6,390.00 | 6,283.55 | 499.42 | 455.00 | 11.243 | CC |
| Kate Red D29-11 - Wellbore #1 - Gyro Surveys | 6,400.00 | 6,292.78 | 499.47 | 454.98 | 11.228 | ES |
| Kate Red D29-11 - Wellbore #1 - Gyro Surveys | 6,450.00 | 6,341.34 | 501.15 | 456.36 | 11.189 | SF |
| Kate Red D29-13 - Wellbore #1 - Gyro Surveys | 6,245.20 | 6,207.32 | 1,893.10 | 1,849.31 | 43.228 | CC |
| Kate Red D29-13 - Wellbore #1 - Gyro Surveys | 6,250.00 | 6,211.24 | 1,893.12 | 1,849.29 | 43.196 | ES |
| Kate Red D29-13 - Wellbore #1 - Gyro Surveys | 6,450.00 | 6,386.55 | 1,923.57 | 1,878.47 | 42.648 | SF |
| Kate Red D29-14 - Wellbore #1 - Gyro Surveys | 6,288.92 | 6,211.76 | 1,629.83 | 1,586.13 | 37.295 | CC, ES |
| Kate Red D29-14 - Wellbore #1 - Gyro Surveys | 6,450.00 | 6,354.14 | 1,650.72 | 1,606.00 | 36.915 | SF |
| Kate Red D29-2J - Wellbore #1 - Kate Red D29-2J | 8,641.51 | 6,786.71 | 353.04 | 301.25 | 6.817 | CC, ES, SF |
| Kate Red D29-3 - Wellbore #1 - Kate Red D29-3 | 9,038.76 | 6,776.14 | 536.45 | 482.98 | 10.033 | CC, ES, SF |
| Kate Red D29-5 - Wellbore #1 - Gyro Surveys | 100.00 | 70.24 | 512.48 | 512.23 | 2,046.390 | CC |
| Kate Red D29-5 - Wellbore #1 - Gyro Surveys | 900.00 | 866.55 | 514.63 | 508.78 | 87.976 | ES |
| Kate Red D29-5 - Wellbore #1 - Gyro Surveys | 7,732.44 | 6,800.57 | 843.02 | 794.13 | 17.243 | SF |
| Kate Red D29-6 - Wellbore #1 - Gyro Surveys | 7,685.28 | 6,779.82 | 514.23 | 465.53 | 10.561 | CC, ES |
| Kate Red D29-6 - Wellbore #1 - Gyro Surveys | 7,700.00 | 6,779.80 | 514.44 | 465.72 | 10.560 | SF |
| Kate White D29-1 - Wellbore #1 - Gyro Surveys | 9,078.46 | 6,796.63 | 3,207.62 | 3,153.91 | 59.717 | CC |
| Kate White D29-1 - Wellbore #1 - Gyro Surveys | 9,100.00 | 6,796.57 | 3,207.70 | 3,153.88 | 59.599 | ES |
| Kate White D29-1 - Wellbore #1 - Gyro Surveys | 9,900.00 | 6,793.92 | 3,311.16 | 3,253.41 | 57.332 | SF |
| Kate White D29-15 - Wellbore #1 - Gyro Surveys | 6,324.81 | 6,191.75 | 2,242.56 | 2,198.70 | 51.134 | CC, ES |
| Kate White D29-15 - Wellbore #1 - Gyro Surveys | 6,550.00 | 6,409.74 | 2,269.30 | 2,224.05 | 50.148 | SF |
| Kate White D29-16 - Wellbore #1 - Gyro Surveys | 6,396.55 | 6,285.42 | 3,486.15 | 3,441.69 | 78.421 | CC |
| Kate White D29-16 - Wellbore #1 - Gyro Surveys | 6,400.00 | 6,288.78 | 3,486.15 | 3,441.67 | 78.382 | ES |
| Kate White D29-16 - Wellbore #1 - Gyro Surveys | 6,800.00 | 6,630.42 | 3,548.40 | 3,501.81 | 76.151 | SF |
| Kate White D29-7 - Wellbore #1 - Gyro Surveys | 7,676.47 | 6,774.78 | 1,998.67 | 1,949.96 | 41.036 | CC, ES |
| Kate White D29-7 - Wellbore #1 - Gyro Surveys | 7,900.00 | 6,774.09 | 2,011.13 | 1,961.92 | 40.871 | SF |
| Kate White D29-8 - Wellbore #1 - Gyro Surveys | 7,697.32 | 6,813.10 | 3,133.28 | 3,084.45 | 64.166 | CC |
| Kate White D29-8 - Wellbore #1 - Gyro Surveys | 7,700.00 | 6,813.04 | 3,133.28 | 3,084.45 | 64.159 | ES |
| Kate White D29-8 - Wellbore #1 - Gyro Surveys | 8,300.00 | 6,799.32 | 3,190.69 | 3,140.28 | 63.295 | SF |
| Kate White D29-9 (SI) - Wellbore #1 - Gyro Surveys | 6,655.05 | 6,483.57 | 3,145.15 | 3,099.16 | 68.378 | CC, ES |
| Kate White D29-9 (SI) - Wellbore #1 - Gyro Surveys | 7,000.00 | 6,656.76 | 3,173.36 | 3,126.13 | 67.179 | SF |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| D Section 32 | | | | | | |
| HP D32-21D - Wellbore #1 - MWD Surveys | 6,282.77 | 6,350.30 | 4,988.32 | 4,942.79 | 109.560 | CC, ES |
| HP D32-21D - Wellbore #1 - MWD Surveys | 6,600.00 | 6,588.24 | 5,065.42 | 5,018.22 | 107.336 | SF |
| HP D32-23D - Wellbore #1 - MWD Surveys | 6,293.84 | 6,319.11 | 6,397.49 | 6,351.82 | 140.110 | CC |
| HP D32-23D - Wellbore #1 - MWD Surveys | 6,300.00 | 6,324.78 | 6,397.51 | 6,351.81 | 139.985 | ES |
| HP D32-23D - Wellbore #1 - MWD Surveys | 6,650.00 | 6,665.65 | 6,488.14 | 6,440.35 | 135.762 | SF |
| HP Farms D 32-22D - Wellbore #1 - MWD Surveys | 6,310.03 | 6,626.49 | 5,394.45 | 5,346.95 | 113.570 | CC, ES |
| HP Farms D 32-22D - Wellbore #1 - MWD Surveys | 6,550.00 | 6,774.52 | 5,436.25 | 5,387.77 | 112.117 | SF |
| HP Farms D32-03 - Wellbore #1 - Gyro Surveys | 6,276.04 | 6,184.33 | 3,133.42 | 3,089.79 | 71.819 | CC, ES |
| HP Farms D32-03 - Wellbore #1 - Gyro Surveys | 6,500.00 | 6,383.39 | 3,172.47 | 3,127.47 | 70.498 | SF |
| HP Farms D32-18D - Wellbore #1 - MWD Surveys | 6,282.41 | 6,374.75 | 3,807.67 | 3,754.87 | 72.119 | CC, ES |
| HP Farms D32-18D - Wellbore #1 - MWD Surveys | 6,550.00 | 6,648.70 | 3,859.76 | 3,805.39 | 70.998 | SF |
| HP Farms D32-24D - Wellbore #1 - MWD Surveys | 6,285.45 | 6,546.74 | 6,316.41 | 6,260.16 | 112.297 | CC, ES |
| HP Farms D32-24D - Wellbore #1 - MWD Surveys | 6,550.00 | 6,720.00 | 6,371.15 | 6,313.74 | 110.964 | SF |
| Norris 14-32 - Wellbore #1 - Projection Survey | 6,255.09 | 6,187.92 | 7,117.50 | 7,041.29 | 93.395 | CC, ES |
| Norris 14-32 - Wellbore #1 - Projection Survey | 6,750.00 | 6,634.25 | 7,298.84 | 7,217.52 | 89.753 | SF |
| Norris A Unit 2 - Wellbore #1 - Projection Survey | 6,261.27 | 6,199.05 | 6,328.76 | 6,252.46 | 82.953 | CC, ES |
| Norris A Unit 2 - Wellbore #1 - Projection Survey | 6,700.00 | 6,602.01 | 6,473.99 | 6,393.06 | 79.993 | SF |
| Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys | 6,343.29 | 6,287.32 | 4,336.42 | 4,292.24 | 98.164 | CC |
| Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys | 6,350.00 | 6,292.06 | 4,336.44 | 4,292.23 | 98.077 | ES |
| Norris D32-1 (SI) - Wellbore #1 - Gyro Surveys | 6,700.00 | 6,634.71 | 4,405.50 | 4,359.23 | 95.219 | SF |
| Norris D32-10 - Wellbore #1 - Gyro Surveys | 6,272.41 | 6,050.35 | 5,921.20 | 5,878.05 | 137.206 | CC, ES |
| Norris D32-10 - Wellbore #1 - Gyro Surveys | 6,950.00 | 6,950.00 | 6,230.60 | 6,183.01 | 130.927 | SF |
| Norris D32-15 - Wellbore #1 - Gyro Surveys | 6,301.16 | 6,423.72 | 7,173.22 | 7,128.77 | 161.366 | CC, ES |
| Norris D32-15 - Wellbore #1 - Gyro Surveys | 6,700.00 | 6,800.00 | 7,291.46 | 7,244.72 | 155.993 | SF |
| Norris D32-1J - Wellbore #1 - Gyro Surveys | 6,337.88 | 6,413.00 | 4,662.17 | 4,617.70 | 104.841 | CC, ES |
| Norris D32-1J - Wellbore #1 - Gyro Surveys | 6,750.00 | 6,778.96 | 4,769.33 | 4,722.60 | 102.074 | SF |
| Norris D32-2 - Wellbore #1 - Gyro Surveys | 6,304.89 | 6,221.19 | 3,421.73 | 3,377.93 | 78.132 | CC, ES |
| Norris D32-2 - Wellbore #1 - Gyro Surveys | 6,600.00 | 6,458.44 | 3,480.55 | 3,435.10 | 76.578 | SF |
| Norris D32-2J - Wellbore #1 - Gyro Surveys | 6,287.97 | 6,354.15 | 3,369.51 | 3,325.32 | 76.245 | CC, ES |
| Norris D32-2J - Wellbore #1 - Gyro Surveys | 6,500.00 | 6,500.00 | 3,406.36 | 3,360.97 | 75.047 | SF |
| Norris D32-4 (P&A) - Wellbore #1 - No Surveys | 6,244.36 | 6,160.26 | 3,034.05 | 2,888.62 | 20.862 | CC |
| Norris D32-4 (P&A) - Wellbore #1 - No Surveys | 6,250.00 | 6,165.86 | 3,034.08 | 2,888.51 | 20.843 | ES |
| Norris D32-4 (P&A) - Wellbore #1 - No Surveys | 6,550.00 | 6,454.51 | 3,103.42 | 2,951.19 | 20.386 | SF |
| Norris D32-5 - Wellbore #1 - Gyro Surveys | 6,260.66 | 6,250.15 | 4,343.54 | 4,299.66 | 98.998 | CC, ES |
| Norris D32-5 - Wellbore #1 - Gyro Surveys | 6,650.00 | 6,567.15 | 4,459.38 | 4,413.33 | 96.830 | SF |
| Norris D32-6 - Wellbore #1 - Gyro Surveys | 6,262.24 | 6,139.66 | 4,305.53 | 4,262.09 | 99.107 | CC, ES |
| Norris D32-6 - Wellbore #1 - Gyro Surveys | 6,550.00 | 6,407.58 | 4,370.20 | 4,324.98 | 96.642 | SF |
| Norris D32-7 - Wellbore #1 - Gyro Surveys | 6,287.87 | 6,146.81 | 4,600.70 | 4,557.22 | 105.800 | CC, ES |
| Norris D32-7 - Wellbore #1 - Gyro Surveys | 6,600.00 | 6,430.58 | 4,670.32 | 4,624.98 | 103.006 | SF |
| Norris D32-9 (SI) - Wellbore #1 - Gyro Surveys | 6,305.32 | 6,210.26 | 6,482.27 | 6,438.48 | 148.055 | CC, ES |
| Norris D32-9 (SI) - Wellbore #1 - Gyro Surveys | 6,700.00 | 6,562.95 | 6,586.56 | 6,540.55 | 143.159 | SF |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

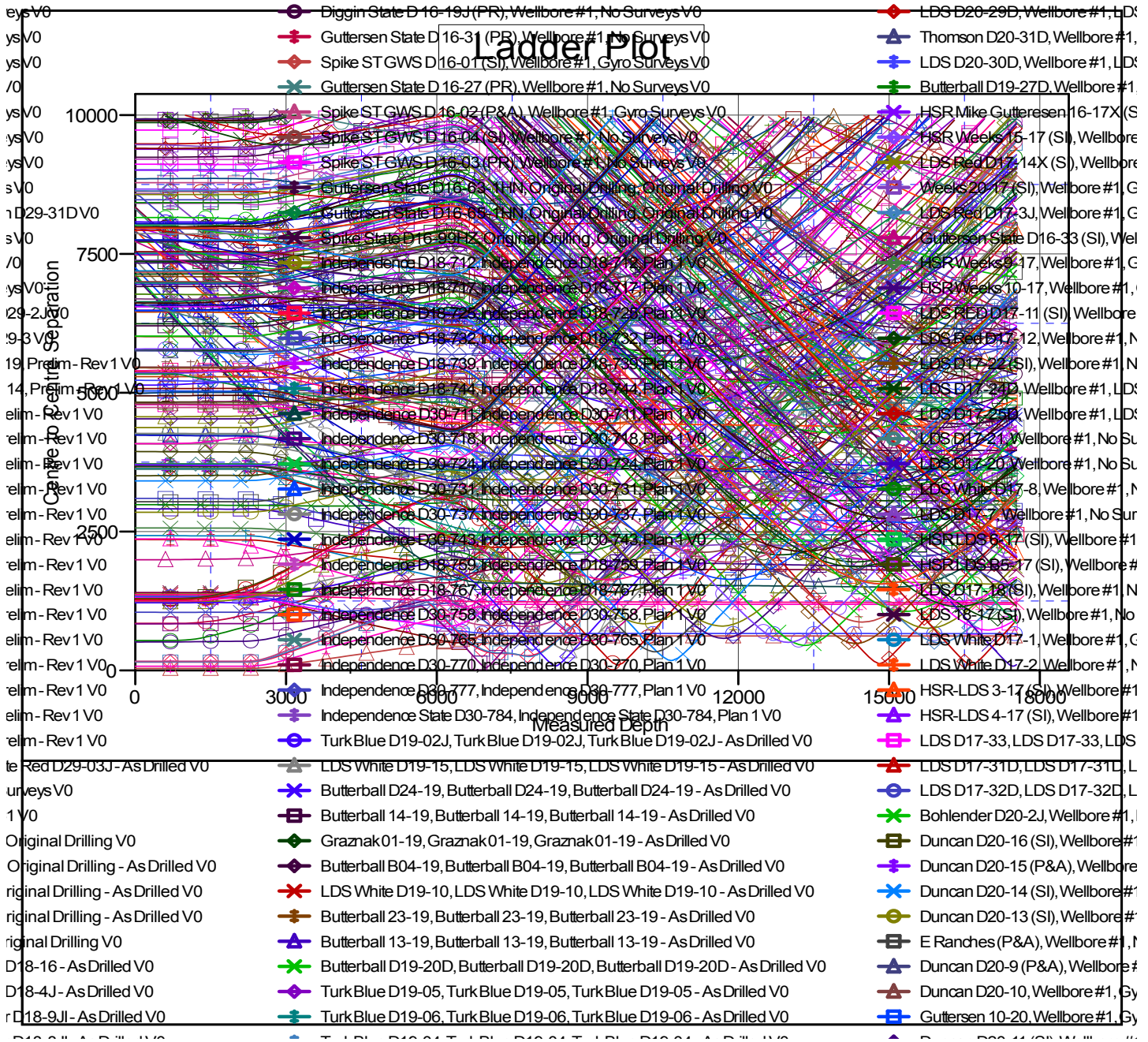
| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Y Section 05 | | | | | | |
| Olsen Red Y05-02D - Olsen Red Y05-02D - Olsen Red Y | 6,263.38 | 6,179.71 | 8,483.41 | 8,439.80 | 194.546 | CC, ES |
| Olsen Red Y05-02D - Olsen Red Y05-02D - Olsen Red Y | 6,800.00 | 6,713.99 | 8,696.42 | 8,649.72 | 186.235 | SF |
| Olsen Y5-05JI - Olsen Y5-05JI - Olsen Y5-05JI - As Drille | 6,257.73 | 6,193.54 | 9,502.86 | 9,469.79 | 287.430 | CC, ES |
| Olsen Y5-05JI - Olsen Y5-05JI - Olsen Y5-05JI - As Drille | 6,750.00 | 6,637.25 | 9,683.11 | 9,648.06 | 276.305 | SF |
| Perkins 32-05 - Perkins 32-05 - Perkins 32-05 - As Drille | 6,278.44 | 6,266.11 | 9,644.08 | 9,567.22 | 125.480 | CC, ES |
| Perkins 32-05 - Perkins 32-05 - Perkins 32-05 - As Drille | 6,850.00 | 6,755.44 | 9,880.35 | 9,797.99 | 119.956 | SF |
| Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille | 6,288.41 | 6,293.01 | 9,978.40 | 9,901.31 | 129.425 | CC |
| Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille | 6,300.00 | 6,304.51 | 9,978.50 | 9,901.27 | 129.191 | ES |
| Perkins 42-05 - Perkins 42-05 - Perkins 42-05 - As Drille | 6,450.00 | 6,450.96 | 9,997.85 | 9,918.88 | 126.596 | SF |
| Perkins 43-05 - Perkins 43-05 - Perkins 43-05 - As Drille | | | | | | Out of range |
| Perkins USX Y05-16 - Perkins USX Y05-16 - Perkins US | | | | | | Out of range |

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

| | |
|---|---|
| Reference Depths are relative to Well @ 4810.00ft | Coordinates are relative to: Guttersen D29-770 |
| Offset Depths are relative to Offset Datum | Coordinate System is US State Plane 1983, Colorado Northern Zone |
| Central Meridian is -105.5000000 | Grid Convergence at Surface is: 0.59° |




CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

# Noble Energy, Inc.

## Anticollision Summary Report

| | | | |
|---|---|---|---|
| **Company:** | Northern Region - DJ Basin | **Local Co-ordinate Reference:** | Well Guttersen D29-770 |
| **Project:** | Mustang | **TVD Reference:** | Well @ 4810.00ft |
| **Reference Site:** | D Section 29 | **MD Reference:** | Well @ 4810.00ft |
| **Site Error:** | 0.00 ft | **North Reference:** | Grid |
| **Reference Well:** | Guttersen D29-770 | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 ft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | Guttersen D29-770 | **Database:** | EDMP |
| **Reference Design:** | Prelim - Rev 1 | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to Well @ 4810.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Guttersen D29-770
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.59°