

# Noble Energy

Weld County, CO (NAD 83)

Sec. 6-T6N-R62W (Wells Ranch 5 North PAD)

Wells Ranch AE05-68HN

Design: Vaughn ESS and Sperry MWD Survey

## Sperry Drilling Services

### Final Survey Report

12 September, 2013

Well Coordinates: 1,434,116.02 N, 3,317,976.27 E (40° 31' 09.91" N, 104° 21' 22.50" W)

Ground Level: 4,933.00 ft

Local Coordinate Origin: Centered on Well Wells Ranch AE05-68HN - Slot A2

Viewing Datum: KB=30' @ 4963.00ft (H&P 321)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

**HALLIBURTON**

## Design Report for Wells Ranch AE05-68HN - Vaughn ESS and Sperry MWD Survey

| Measured Depth (ft)                                      | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|
| 0.00   | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                  | 0.00                  |
| 312.00   | 0.41            | 16.47       | 312.00              | 1.07       | 0.32       | 0.48                  | 0.13                  |
| Surveys from 312.00ft to 620.00ft are Vaughn ESS Surveys |                 |             |                     |            |            |                       |                       |
| 620.00   | 0.60            | 123.55      | 619.99              | 1.24       | 1.97       | 2.14                  | 0.27                  |
| Tie-On to Vaughn ESS Survey                              |                 |             |                     |            |            |                       |                       |
| 729.00   | 0.92            | 5.63        | 728.98              | 1.79       | 2.53       | 2.78                  | 1.20                  |
| First Sperry MWD Survey                                  |                 |             |                     |            |            |                       |                       |
| 821.00   | 0.61            | 28.32       | 820.98              | 2.95       | 2.84       | 3.27                  | 0.46                  |
| 913.00   | 0.83            | 0.41        | 912.97              | 4.05       | 3.08       | 3.67                  | 0.44                  |
| 1,005.00   | 0.65            | 22.49       | 1,004.96            | 5.19       | 3.28       | 4.05                  | 0.36                  |
| 1,097.00   | 0.28            | 59.55       | 1,096.96            | 5.79       | 3.68       | 4.54                  | 0.49                  |
| 1,188.00   | 0.39            | 32.65       | 1,187.96            | 6.16       | 4.04       | 4.95                  | 0.21                  |
| 1,280.00   | 0.44            | 2.54        | 1,279.96            | 6.78       | 4.22       | 5.23                  | 0.24                  |
| 1,372.00   | 0.17            | 58.93       | 1,371.95            | 7.20       | 4.36       | 5.43                  | 0.40                  |
| 1,463.00   | 0.75            | 85.28       | 1,462.95            | 7.32       | 5.07       | 6.15                  | 0.66                  |
| 1,558.00   | 1.96            | 61.31       | 1,557.92            | 8.15       | 7.12       | 8.31                  | 1.38                  |
| 1,653.00   | 3.24            | 50.04       | 1,652.82            | 10.65      | 10.60      | 12.14                 | 1.44                  |
| 1,748.00   | 4.56            | 44.01       | 1,747.60            | 15.09      | 15.28      | 17.45                 | 1.45                  |
| 1,843.00   | 6.04            | 39.40       | 1,842.20            | 21.66      | 21.07      | 24.20                 | 1.62                  |
| 1,937.00   | 6.97            | 41.92       | 1,935.59            | 29.72      | 28.02      | 32.32                 | 1.04                  |
| 2,032.00   | 8.42            | 41.43       | 2,029.73            | 39.23      | 36.47      | 42.16                 | 1.53                  |
| 2,127.00   | 8.40            | 42.17       | 2,123.71            | 49.58      | 45.72      | 52.92                 | 0.12                  |
| 2,222.00   | 7.83            | 40.31       | 2,217.76            | 59.65      | 54.57      | 63.23                 | 0.66                  |
| 2,317.00   | 7.94            | 39.82       | 2,311.86            | 69.63      | 62.95      | 73.08                 | 0.14                  |
| 2,411.00   | 8.88            | 30.90       | 2,404.85            | 80.84      | 70.84      | 82.62                 | 1.71                  |
| 2,506.00   | 9.80            | 28.25       | 2,498.59            | 94.26      | 78.43      | 92.22                 | 1.07                  |
| 2,601.00   | 11.85           | 22.30       | 2,591.90            | 110.40     | 85.96      | 102.18                | 2.45                  |
| 2,696.00   | 14.21           | 20.48       | 2,684.45            | 130.35     | 93.74      | 112.99                | 2.52                  |
| 2,791.00   | 13.82           | 21.37       | 2,776.62            | 151.84     | 101.96     | 124.46                | 0.47                  |
| 2,886.00   | 14.14           | 17.82       | 2,868.81            | 173.45     | 109.64     | 135.44                | 0.96                  |
| 2,981.00   | 14.51           | 17.83       | 2,960.86            | 195.82     | 116.83     | 146.04                | 0.39                  |
| 3,075.00   | 14.62           | 16.95       | 3,051.84            | 218.38     | 123.90     | 156.55                | 0.26                  |
| 3,170.00   | 15.47           | 15.68       | 3,143.58            | 242.05     | 130.82     | 167.09                | 0.96                  |
| 3,265.00   | 14.32           | 17.30       | 3,235.39            | 265.47     | 137.74     | 177.59                | 1.29                  |
| 3,360.00   | 13.15           | 16.05       | 3,327.67            | 287.07     | 144.22     | 187.37                | 1.27                  |
| 3,455.00   | 13.60           | 14.19       | 3,420.09            | 308.29     | 149.94     | 196.35                | 0.65                  |
| 3,550.00   | 12.72           | 12.97       | 3,512.60            | 329.31     | 155.03     | 204.66                | 0.97                  |
| 3,644.00   | 12.81           | 15.63       | 3,604.27            | 349.43     | 160.16     | 212.88                | 0.63                  |
| 3,739.00   | 14.63           | 18.10       | 3,696.56            | 370.98     | 166.73     | 222.74                | 2.01                  |
| 3,834.00   | 15.22           | 18.04       | 3,788.35            | 394.24     | 174.32     | 233.87                | 0.63                  |
| 3,929.00   | 15.27           | 15.87       | 3,880.01            | 418.13     | 181.60     | 244.81                | 0.60                  |
| 4,024.00   | 15.30           | 13.46       | 3,971.65            | 442.35     | 187.94     | 254.86                | 0.67                  |
| 4,119.00   | 14.81           | 14.56       | 4,063.39            | 466.29     | 193.91     | 264.50                | 0.59                  |
| 4,214.00   | 13.04           | 18.93       | 4,155.60            | 488.19     | 200.44     | 274.38                | 2.17                  |
| 4,309.00   | 12.60           | 19.58       | 4,248.23            | 508.09     | 207.39     | 284.36                | 0.48                  |
| 4,404.00   | 11.87           | 20.30       | 4,341.07            | 527.01     | 214.25     | 294.10                | 0.79                  |
| 4,499.00   | 13.03           | 19.30       | 4,433.84            | 546.29     | 221.18     | 303.96                | 1.25                  |
| 4,594.00   | 12.75           | 18.45       | 4,526.44            | 566.34     | 228.04     | 313.87                | 0.36                  |
| 4,688.00   | 12.58           | 19.38       | 4,618.16            | 585.83     | 234.72     | 323.52                | 0.28                  |
| 4,783.00   | 11.52           | 12.27       | 4,711.07            | 604.86     | 240.17     | 331.88                | 1.91                  |

## Design Report for Wells Ranch AE05-68HN - Vaughn ESS and Sperry MWD Survey

| Measured Depth (ft)   | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|
| 4,878.00  | 7.90            | 16.21       | 4,804.69            | 620.41     | 244.01     | 338.11                | 3.88                  |
| 4,973.00  | 5.93            | 12.88       | 4,898.99            | 631.46     | 246.92     | 342.72                | 2.12                  |
| 5,068.00  | 4.53            | 5.46        | 4,993.60            | 639.98     | 248.37     | 345.48                | 1.63                  |
| 5,163.00  | 1.24            | 44.08       | 5,088.47            | 644.46     | 249.45     | 347.25                | 3.84                  |
| 5,258.00  | 0.16            | 193.28      | 5,183.46            | 645.07     | 250.14     | 348.02                | 1.46                  |
| 5,353.00  | 0.50            | 208.51      | 5,278.46            | 644.58     | 249.91     | 347.72                | 0.37                  |
| 5,448.00  | 1.08            | 224.70      | 5,373.45            | 643.58     | 249.08     | 346.74                | 0.65                  |
| 5,542.00  | 0.53            | 195.29      | 5,467.44            | 642.52     | 248.34     | 345.85                | 0.72                  |
| 5,637.00  | 0.98            | 157.99      | 5,562.43            | 641.35     | 248.53     | 345.85                | 0.68                  |
| 5,732.00  | 0.62            | 152.82      | 5,657.43            | 640.13     | 249.07     | 346.19                | 0.38                  |
| 5,827.00  | 0.33            | 252.33      | 5,752.42            | 639.59     | 249.05     | 346.09                | 0.79                  |
| 5,922.00  | 0.63            | 204.74      | 5,847.42            | 639.03     | 248.57     | 345.53                | 0.50                  |
| 6,016.00  | 0.71            | 264.65      | 5,941.41            | 638.50     | 247.77     | 344.65                | 0.72                  |
| 6,105.00  | 0.31            | 286.33      | 6,030.41            | 638.52     | 246.99     | 343.89                | 0.50                  |
| 6,167.00  | 0.40            | 117.86      | 6,092.41            | 638.47     | 247.02     | 343.91                | 1.14                  |
| 6,204.00  | 0.32            | 161.52      | 6,129.41            | 638.31     | 247.17     | 344.03                | 0.75                  |
| 6,252.00  | 4.90            | 94.68       | 6,177.35            | 638.01     | 249.25     | 346.04                | 9.96                  |
| 6,299.00  | 10.74           | 88.16       | 6,223.89            | 637.99     | 255.64     | 352.34                | 12.56                 |
| 6,347.00  | 15.51           | 85.59       | 6,270.63            | 638.63     | 266.51     | 363.19                | 10.00                 |
| 6,394.00  | 19.63           | 85.38       | 6,315.42            | 639.75     | 280.65     | 377.33                | 8.77                  |
| 6,442.00  | 23.11           | 84.70       | 6,360.12            | 641.27     | 298.07     | 394.77                | 7.27                  |
| 6,489.00  | 26.05           | 85.66       | 6,402.85            | 642.90     | 317.55     | 414.26                | 6.31                  |
| 6,537.00  | 29.51           | 86.98       | 6,445.32            | 644.32     | 339.87     | 436.53                | 7.33                  |
| 6,584.00  | 33.34           | 90.21       | 6,485.42            | 644.88     | 364.36     | 460.81                | 8.90                  |
| 6,632.00  | 37.24           | 90.40       | 6,524.59            | 644.73     | 392.08     | 488.16                | 8.12                  |
| 6,679.00  | 42.04           | 88.51       | 6,560.78            | 645.05     | 422.05     | 517.81                | 10.54                 |
| 6,727.00  | 46.19           | 88.91       | 6,595.23            | 645.79     | 455.45     | 550.91                | 8.66                  |
| 6,774.00  | 50.05           | 87.18       | 6,626.60            | 647.00     | 490.41     | 585.64                | 8.67                  |
| 6,822.00  | 52.94           | 85.76       | 6,656.48            | 649.32     | 527.90     | 623.02                | 6.44                  |
| 6,868.00  | 55.94           | 85.18       | 6,683.23            | 652.28     | 565.20     | 660.32                | 6.60                  |
| 6,916.00  | 59.31           | 87.41       | 6,708.93            | 654.88     | 605.64     | 700.68                | 8.04                  |
| 6,964.00  | 63.55           | 89.04       | 6,731.88            | 656.18     | 647.76     | 742.49                | 9.31                  |
| 7,012.00  | 68.52           | 90.84       | 6,751.38            | 656.21     | 691.61     | 785.80                | 10.92                 |
| 7,058.00  | 73.85           | 90.33       | 6,766.21            | 655.77     | 735.13     | 828.72                | 11.62                 |
| 7,105.00  | 81.39           | 89.73       | 6,776.27            | 655.75     | 781.01     | 874.02                | 16.10                 |
| 7,155.00  | 85.71           | 89.06       | 6,781.89            | 656.28     | 830.68     | 923.16                | 8.75                  |
| <b>Estimated 7" Casing Point: 666' FNL, 777' FEL (Not a Survey Station)</b> |                 |             |                     |            |            |                       |                       |
| 7,180.00  | 87.88           | 88.73       | 6,783.28            | 656.76     | 855.63     | 947.88                | 8.75                  |
| 7,221.00  | 88.12           | 88.00       | 6,784.72            | 657.93     | 896.59     | 988.52                | 1.86                  |
| 7,316.00  | 86.24           | 86.49       | 6,789.39            | 662.48     | 991.36     | 1,082.83              | 2.54                  |
| 7,411.00  | 88.73           | 87.86       | 6,793.56            | 667.16     | 1,086.14   | 1,177.18              | 2.99                  |
| 7,505.00  | 90.00           | 89.36       | 6,794.60            | 669.44     | 1,180.10   | 1,270.34              | 2.09                  |
| 7,600.00  | 90.49           | 88.35       | 6,794.19            | 671.34     | 1,275.08   | 1,364.45              | 1.18                  |
| 7,695.00  | 90.62           | 91.33       | 6,793.27            | 671.61     | 1,370.07   | 1,458.30              | 3.14                  |
| 7,790.00  | 90.83           | 95.46       | 6,792.07            | 665.99     | 1,464.87   | 1,551.06              | 4.35                  |
| 7,885.00  | 89.75           | 93.29       | 6,791.58            | 658.74     | 1,559.59   | 1,643.47              | 2.54                  |
| 7,979.00  | 88.89           | 88.63       | 6,792.69            | 657.17     | 1,653.54   | 1,736.02              | 5.04                  |
| 8,074.00  | 90.86           | 88.10       | 6,792.90            | 659.87     | 1,748.50   | 1,830.23              | 2.15                  |
| 8,169.00  | 90.83           | 87.95       | 6,791.49            | 663.14     | 1,843.43   | 1,924.50              | 0.16                  |
| 8,263.00  | 89.94           | 87.56       | 6,790.86            | 666.82     | 1,937.36   | 2,017.85              | 1.04                  |
| 8,358.00  | 91.54           | 88.09       | 6,789.63            | 670.43     | 2,032.28   | 2,112.16              | 1.78                  |

## Design Report for Wells Ranch AE05-68HN - Vaughn ESS and Sperry MWD Survey

| Measured Depth (ft)  | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|
| 8,453.00   | 93.21           | 87.14       | 6,785.69            | 674.38     | 2,127.11   | 2,206.44              | 2.02                  |
| 8,548.00   | 89.78           | 85.42       | 6,783.21            | 680.54     | 2,221.86   | 2,300.99              | 4.03                  |
| 8,643.00   | 90.03           | 85.26       | 6,783.36            | 688.25     | 2,316.54   | 2,395.72              | 0.31                  |
| 8,738.00   | 89.88           | 86.08       | 6,783.44            | 695.42     | 2,411.27   | 2,490.40              | 0.87                  |
| 8,833.00   | 89.44           | 86.13       | 6,784.00            | 701.88     | 2,506.05   | 2,585.02              | 0.46                  |
| 8,928.00   | 90.37           | 88.80       | 6,784.16            | 706.09     | 2,600.95   | 2,679.41              | 2.98                  |
| 9,022.00   | 91.88           | 91.23       | 6,782.31            | 706.06     | 2,694.92   | 2,772.22              | 3.04                  |
| 9,117.00   | 90.90           | 89.96       | 6,780.01            | 705.08     | 2,789.88   | 2,865.86              | 1.69                  |
| 9,212.00   | 87.63           | 87.86       | 6,781.24            | 706.88     | 2,884.84   | 2,959.92              | 4.09                  |
| 9,307.00   | 88.27           | 87.44       | 6,784.64            | 710.77     | 2,979.70   | 3,054.22              | 0.82                  |
| 9,401.00   | 89.78           | 87.15       | 6,786.23            | 715.21     | 3,073.58   | 3,147.64              | 1.64                  |
| 9,496.00   | 86.73           | 84.76       | 6,789.12            | 721.91     | 3,168.28   | 3,242.22              | 4.08                  |
| 9,591.00   | 87.90           | 85.38       | 6,793.57            | 730.07     | 3,262.82   | 3,336.88              | 1.39                  |
| 9,686.00   | 89.66           | 86.93       | 6,795.59            | 736.44     | 3,357.58   | 3,431.46              | 2.47                  |
| 9,780.00   | 91.73           | 89.59       | 6,794.45            | 739.30     | 3,451.51   | 3,524.69              | 3.58                  |
| 9,875.00   | 91.08           | 88.82       | 6,792.12            | 740.62     | 3,546.48   | 3,618.69              | 1.06                  |
| 9,970.00   | 90.59           | 86.88       | 6,790.74            | 744.19     | 3,641.39   | 3,712.99              | 2.10                  |
| 10,065.00  | 89.32           | 84.78       | 6,790.82            | 751.09     | 3,736.13   | 3,807.65              | 2.58                  |
| 10,159.00  | 90.28           | 86.31       | 6,791.15            | 758.39     | 3,829.85   | 3,901.35              | 1.92                  |
| 10,254.00  | 91.48           | 90.23       | 6,789.69            | 761.25     | 3,924.77   | 3,995.55              | 4.32                  |
| 10,349.00  | 90.37           | 89.08       | 6,788.16            | 761.82     | 4,019.75   | 4,089.45              | 1.68                  |
| 10,444.00  | 89.94           | 89.64       | 6,787.90            | 762.88     | 4,114.75   | 4,183.44              | 0.74                  |
| 10,538.00  | 91.73           | 91.98       | 6,786.54            | 761.56     | 4,208.72   | 4,276.04              | 3.14                  |
| 10,633.00  | 91.08           | 90.33       | 6,784.21            | 759.64     | 4,303.67   | 4,369.52              | 1.86                  |
| 10,728.00  | 92.59           | 90.89       | 6,781.17            | 758.63     | 4,398.61   | 4,463.14              | 1.69                  |
| 10,822.00  | 87.97           | 88.32       | 6,780.72            | 759.28     | 4,492.57   | 4,556.04              | 5.62                  |
| 10,917.00  | 88.06           | 87.17       | 6,784.01            | 763.02     | 4,587.44   | 4,650.33              | 1.22                  |
| 11,012.00  | 88.83           | 87.24       | 6,786.60            | 767.65     | 4,682.29   | 4,744.73              | 0.81                  |
| 11,074.00  | 88.37           | 86.94       | 6,788.11            | 770.80     | 4,744.19   | 4,806.36              | 0.89                  |
| <b>Final Sperry MWD Survey</b>                                     |                 |             |                     |            |            |                       |                       |
| 11,138.00  | 88.37           | 86.94       | 6,789.94            | 774.21     | 4,808.08   | 4,869.99              | 0.01                  |
| <b>Survey Projection to TD - Estimated BHL: 648' FNL, 536' FWL</b> |                 |             |                     |            |            |                       |                       |

Design Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates |            | Comment  |
|---------------------|---------------------|-------------------|------------|--|
|                     |                     | +N/-S (ft)        | +E/-W (ft) |  |
| 312.00              | 312.00              | 1.07              | 0.32       | Surveys from 312.00ft to 620.00ft are Vaughn ESS Surveys             |
| 620.00              | 619.99              | 1.24              | 1.97       | Tie-On to Vaughn ESS Survey  |
| 729.00              | 728.98              | 1.79              | 2.53       | First Sperry MWD Survey  |
| 7,155.00            | 6,781.89            | 656.28            | 830.68     | Estimated 7" Casing Point: 666' FNL, 777' FEL (Not a Survey Station) |
|                     |                     |                   |            |  |
| 11,074.00           | 6,788.11            | 770.80            | 4,744.19   | Final Sperry MWD Survey  |
| 11,138.00           | 6,789.94            | 774.21            | 4,808.08   | Survey Projection to TD  |
| 11,138.00           | 6,789.94            | 774.21            | 4,808.08   | Estimated BHL: 648' FNL, 536' FWL                                    |

## Design Report for Wells Ranch AE05-68HN - Vaughn ESS and Sperry MWD Survey

**Vertical Section Information**

| Angle Type | Target  | Azimuth (°) | Origin Type | Origin +N/-S (ft) | Origin +E/-W (ft) | Start TVD (ft) |
|------------|---|-------------|-------------|-------------------|-------------------|----------------|
| Target     | Wells Ranch<br>AE05-68HN_PlanA - Rev0_BH<br>L Tgt | 80.99       | Slot        | 0.00              | 0.00              | 0.00           |

**Survey tool program**

| From (ft) | To (ft)   | Survey/Plan        | Survey Tool |
|-----------|-----------|--------------------|-------------|
| 312.00    | 620.00    | Vaughn ESS Surveys | EMS         |
| 729.00    | 7,155.00  | Sperry MWD Surveys | MWD         |
| 7,155.00  | 11,138.00 | Sperry MWD Surveys | MWD         |

**Casing Details**

| Measured Depth (ft) | Vertical Depth (ft) | Name   | Casing Diameter (") | Hole Diameter (") |
|---------------------|---------------------|--------|---------------------|-------------------|
| 7,155.00            | 6,781.89            | 7" Csg | 7                   | 8-3/4             |

**Targets**

| Target Name<br>- hit/miss<br>target<br>- Shape  | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude  | Longitude   |
|---|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| Wells Ranch   | 0.00          | 0.00         | 6,779.89 | 762.05     | 4,808.67   | 1,434,878.05  | 3,322,784.78 | 40.521340 | -104.338920 |
| - actual wellpath misses target center by 15.78ft at 11137.66ft MD (6789.93 TVD, 774.19 N, 4807.73 E) |               |              |          |            |            |               |              |           |             |
| - Point   |               |              |          |            |            |               |              |           |             |
| Wells Ranch   | 0.00          | 0.00         | -6.00    | -2,648.70  | 9.13       | 1,431,467.41  | 3,317,985.40 | 40.512150 | -104.356340 |
| - actual wellpath misses target center by 2648.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)           |               |              |          |            |            |               |              |           |             |
| - Polygon   |               |              |          |            |            |               |              |           |             |
| Point 1   |               |              |          | 598.06     | -3,545.75  | 1,430,570.39  | 3,318,574.31 |           |             |
| Point 2   |               |              |          | 501.44     | 841.26     | 1,434,957.25  | 3,318,477.69 |           |             |
| Point 3   |               |              |          | 4,871.45   | 974.88     | 1,435,090.87  | 3,322,847.56 |           |             |
| Point 4   |               |              |          | 4,954.07   | -3,376.13  | 1,430,740.00  | 3,322,930.18 |           |             |
| Point 5   |               |              |          | 598.06     | -3,545.75  | 1,430,570.39  | 3,318,574.31 |           |             |
| Wells Ranch   | 0.00          | 0.00         | -6.00    | -2,648.70  | 9.13       | 1,431,467.41  | 3,317,985.40 | 40.512150 | -104.356340 |
| - actual wellpath misses target center by 2648.72ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)           |               |              |          |            |            |               |              |           |             |
| - Polygon   |               |              |          |            |            |               |              |           |             |
| Point 1   |               |              |          | 138.02     | -4,005.71  | 1,430,110.44  | 3,318,114.28 |           |             |
| Point 2   |               |              |          | 41.48      | 1,301.30   | 1,435,417.28  | 3,318,017.75 |           |             |
| Point 3   |               |              |          | 5,331.49   | 1,434.84   | 1,435,550.81  | 3,323,307.59 |           |             |
| Point 4   |               |              |          | 5,414.03   | -3,836.17  | 1,430,279.98  | 3,323,390.13 |           |             |
| Point 5   |               |              |          | 138.02     | -4,005.71  | 1,430,110.44  | 3,318,114.28 |           |             |

## North Reference Sheet for Sec. 6-T6N-R62W (Wells Ranch 5 North PAD) - Wells Ranch AE05-68HN

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB=30' @ 4963.00ft (H&P 321). Northing and Easting are relative to Wells Ranch AE05-68HN - Slot A2

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996781

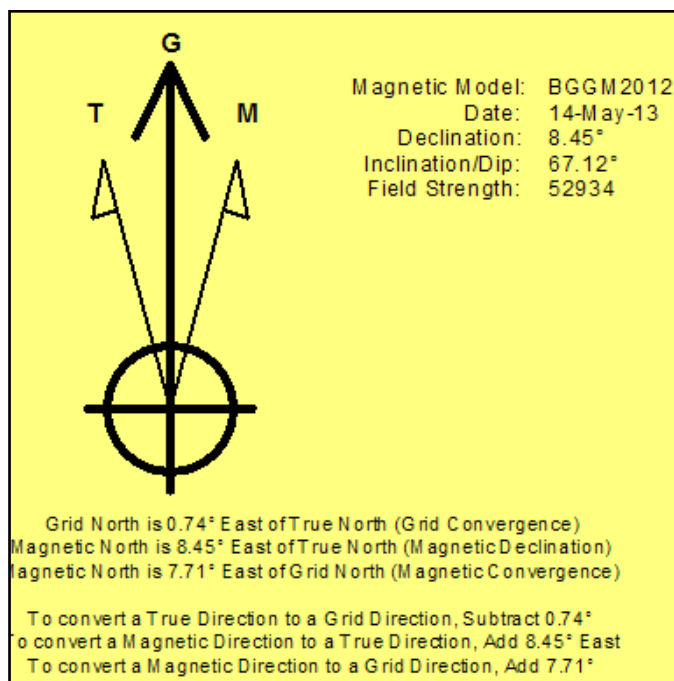
Grid Coordinates of Well: 1,434,116.02 ft N, 3,317,976.27 ft E

Geographical Coordinates of Well: 40° 31' 09.91" N, 104° 21' 22.50" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,138.00ft the Bottom Hole Displacement is 4,870.01ft in the Direction of 80.85° (Grid).

Magnetic Convergence at surface is: -7.71° (14 May 2013, , BGGM2012)

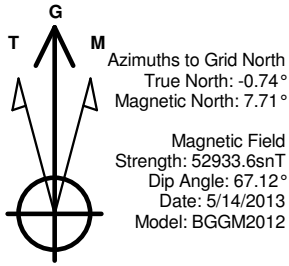


Project: Weld County, CO (NAD 83)  
Site: Sec. 6-T6N-R62W (Wells Ranch 5 North PAD)  
Well: Wells Ranch AE05-68HN

# Noble Energy

**HALLIBURTON**

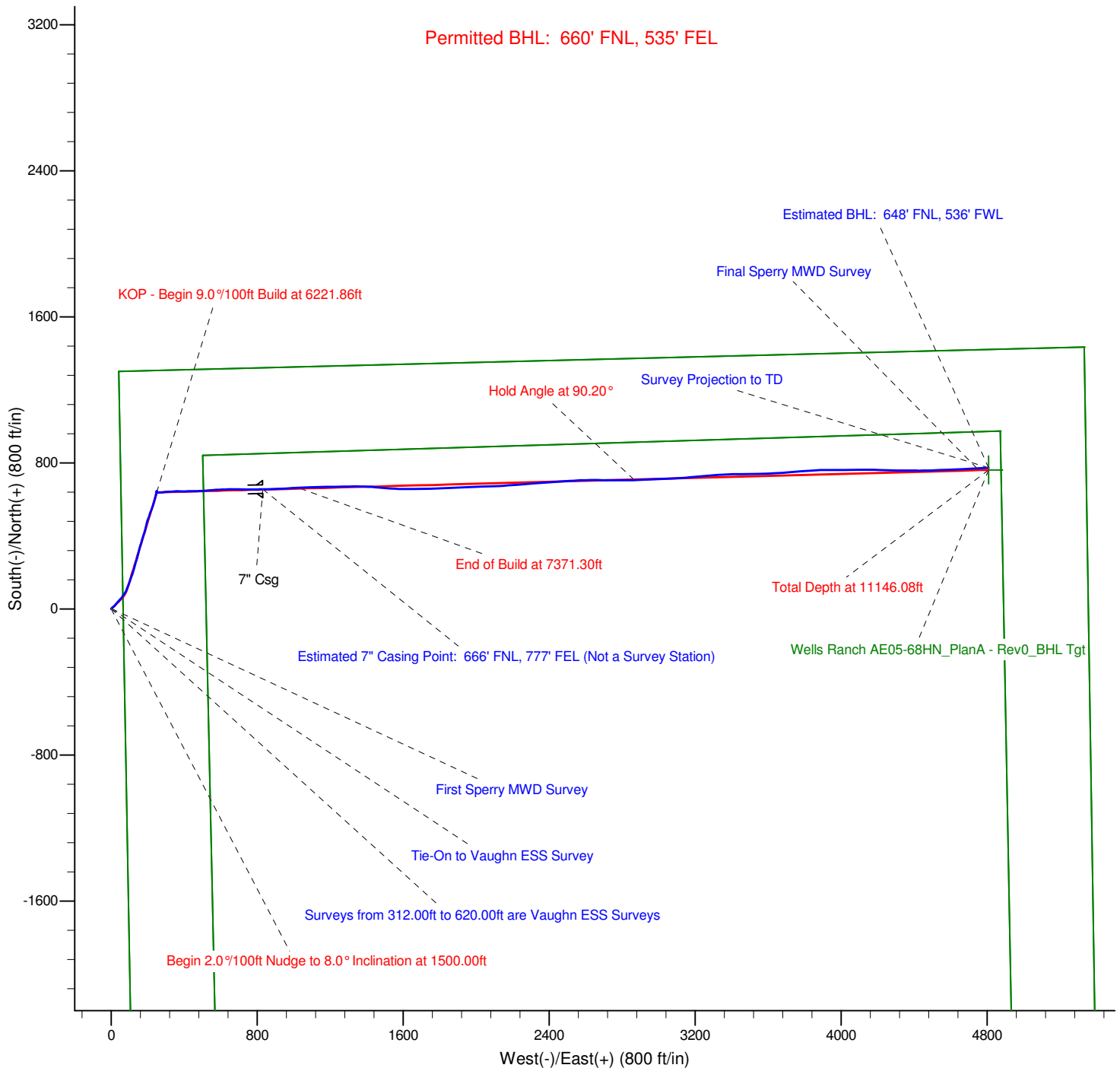
Sperry Drilling



## LEGEND

- Wells Ranch AE05-68HN, Plan A, Plan A - Rev 0 Proposal V0
- Vaughn ESS and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch AE05-68HN well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

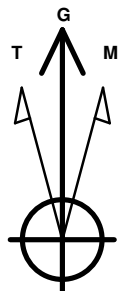


Project: Weld County, CO (NAD 83)  
Site: Sec. 6-T6N-R62W (Wells Ranch 5 North PAD)  
Well: Wells Ranch AE05-68HN

# Noble Energy

**HALLIBURTON**

Sperry Drilling



Azimuths to Grid North  
True North:  $-0.74^\circ$   
Magnetic North:  $7.71^\circ$

Magnetic Field  
Strength: 52933.6snT  
Dip Angle:  $67.12^\circ$   
Date: 5/14/2013  
Model: BGGM2012

## LEGEND

- Wells Ranch AE05-68HN, Plan A, Plan A - Rev 0 Proposal V0
- Vaughn ESS and Sperry MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch AE05-68HN well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

