

# Noble Energy

Project: Weld County, CO (NAD 83)  
Site: Sec. 36-T7N-R63W (Crow Creek State 36 PAD)  
Well: Crow Creek State AC36-76HN  
Wellbore: Plan A  
Design: Final Surveys



Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Wells Ranch A20-63-1HN 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.

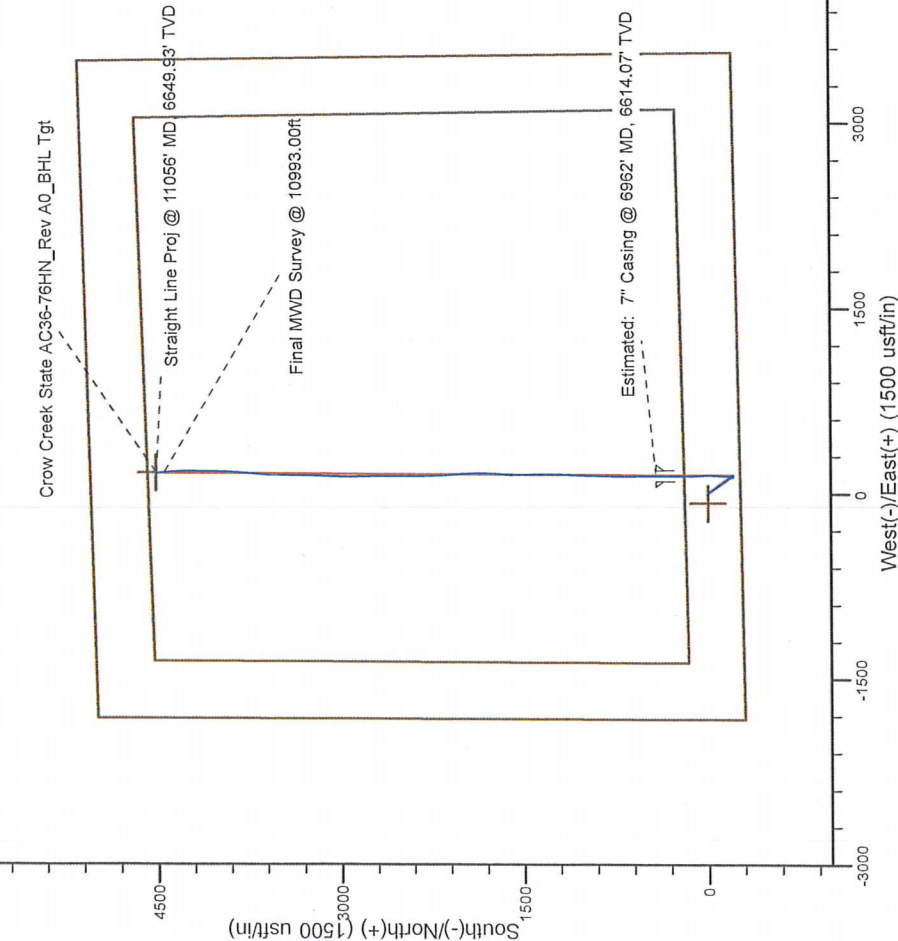
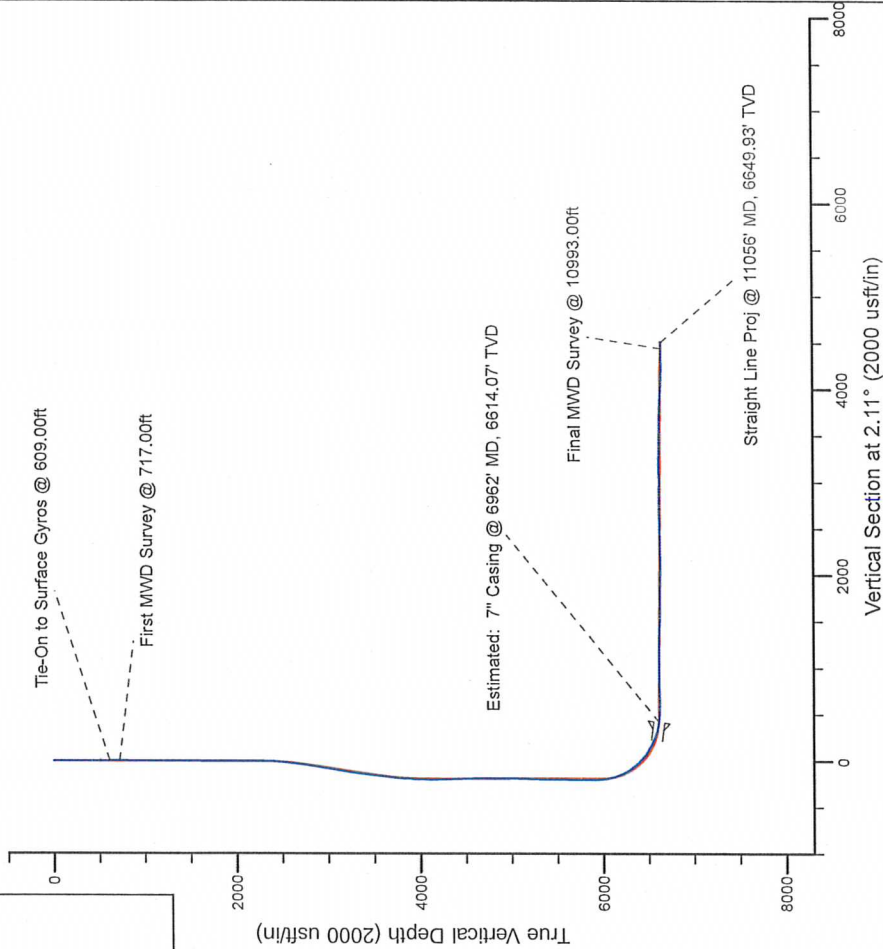
Platted SHL: 270' FSL, 1830' FWL  
Platted Lat/Long: 40.52358 N, 104.38767 W  
Location: Sec. 36-T7N-R63W

7" Casing: ~681.84' FSL, ~1970.56' FWL  
Lat/Long: 40° 31' 28.984 N, 104° 23' 13.674 W  
State Planes - CO Northern: 1,435,936.66' N, 3,309,367.04' E  
Location: Sec. 36-T7N-R63W

BHL: ~536.49' FNL, ~1978.35' FWL  
Lat/Long: 40° 32' 9.381 N, 104° 23' 12.768 W  
State Planes - CO Northern: 1,440,025.26' N, 3,309,385.66' E  
Location: Sec. 36-T7N-R63W

## LEGEND

- ✕ Crow Creek State AC36-76HN, Plan A, Rev A0 Proposal V0
- ▣ Final Surveys



WELL DETAILS: Crow Creek State AC36-76HN

Ground Level: 4789.00  
KB=24' @ 4813.00usft (H&P 315)

Design: Final Surveys (Crow Creek State AC36-76HN/Plan A)

Created By: Fred Hartmann Date: 10/21/2013

# Noble Energy

Weld County, CO (NAD 83)

Sec. 36-T7N-R63W (Crow Creek State 36 PAD)

Crow Creek State AC36-76HN - A3

Design: Final Surveys

## Sperry Drilling Services

### Final Survey Report

21 October, 2013

Well Coordinates: 1,435,520.30 N, 3,309,222.58 E (40° 31' 24.89" N, 104° 23' 15.61" W)

Ground Level: 4,789.00 usft

Local Coordinate Origin:

Centered on Well Crow Creek State AC36-76HN - Slot A3

Viewing Datum:

KB=24' @ 4813.00usft (H&P 315)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

**HALLIBURTON**

## Design Report for Crow Creek State AC36-76HN - Final Surveys

| Measured Depth (usft)              | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 0.00                               | 0.00            | 0.00        | 0.00                  | 0.00         | 0.00         | 0.00                    | 0.00                    |
| 322.00                             | 0.50            | 335.57      | 322.00                | 1.28         | -0.58        | 1.26                    | 0.16                    |
| 609.00                             | 0.30            | 313.67      | 608.99                | 2.94         | -1.64        | 2.88                    | 0.09                    |
| Tie-On to Surface Gyros @ 609.00ft |                 |             |                       |              |              |                         |                         |
| 717.00                             | 0.25            | 243.31      | 716.99                | 3.03         | -2.06        | 2.95                    | 0.30                    |
| First MWD Survey @ 717.00ft        |                 |             |                       |              |              |                         |                         |
| 808.00                             | 0.34            | 149.19      | 807.99                | 2.71         | -2.10        | 2.63                    | 0.48                    |
| 901.00                             | 0.28            | 263.89      | 900.99                | 2.45         | -2.18        | 2.36                    | 0.56                    |
| 994.00                             | 0.25            | 259.62      | 993.99                | 2.38         | -2.61        | 2.29                    | 0.04                    |
| 1,086.00                           | 0.46            | 235.84      | 1,085.98              | 2.14         | -3.11        | 2.03                    | 0.27                    |
| 1,180.00                           | 0.20            | 287.66      | 1,179.98              | 1.98         | -3.58        | 1.85                    | 0.39                    |
| 1,273.00                           | 0.47            | 171.29      | 1,272.98              | 1.65         | -3.68        | 1.51                    | 0.63                    |
| 1,366.00                           | 0.28            | 162.59      | 1,365.98              | 1.06         | -3.55        | 0.93                    | 0.21                    |
| 1,458.00                           | 0.10            | 155.89      | 1,457.98              | 0.77         | -3.45        | 0.64                    | 0.20                    |
| 1,553.00                           | 0.33            | 160.11      | 1,552.98              | 0.44         | -3.32        | 0.31                    | 0.24                    |
| 1,648.00                           | 0.31            | 129.61      | 1,647.98              | 0.02         | -3.03        | -0.10                   | 0.18                    |
| 1,743.00                           | 0.33            | 182.40      | 1,742.98              | -0.42        | -2.84        | -0.53                   | 0.30                    |
| 1,838.00                           | 0.37            | 132.43      | 1,837.97              | -0.90        | -2.63        | -1.00                   | 0.31                    |
| 1,933.00                           | 0.66            | 127.39      | 1,932.97              | -1.44        | -1.97        | -1.51                   | 0.31                    |
| 2,028.00                           | 0.55            | 105.85      | 2,027.96              | -1.90        | -1.10        | -1.94                   | 0.26                    |
| 2,123.00                           | 0.51            | 119.82      | 2,122.96              | -2.23        | -0.29        | -2.24                   | 0.14                    |
| 2,218.00                           | 1.03            | 66.54       | 2,217.95              | -2.10        | 0.86         | -2.07                   | 0.88                    |
| 2,313.00                           | 2.74            | 108.95      | 2,312.90              | -2.50        | 3.79         | -2.36                   | 2.21                    |
| 2,408.00                           | 3.82            | 134.72      | 2,407.75              | -5.46        | 8.19         | -5.16                   | 1.90                    |
| 2,503.00                           | 5.65            | 139.65      | 2,502.42              | -11.26       | 13.46        | -10.75                  | 1.97                    |
| 2,597.00                           | 7.94            | 147.50      | 2,595.76              | -20.26       | 19.95        | -19.51                  | 2.62                    |
| 2,692.00                           | 9.46            | 148.27      | 2,689.66              | -32.43       | 27.58        | -31.40                  | 1.60                    |
| 2,787.00                           | 11.32           | 150.24      | 2,783.10              | -47.17       | 36.32        | -45.80                  | 1.99                    |
| 2,882.00                           | 10.77           | 148.10      | 2,876.34              | -62.80       | 45.64        | -61.08                  | 0.72                    |
| 2,977.00                           | 10.24           | 147.96      | 2,969.75              | -77.49       | 54.81        | -75.43                  | 0.56                    |
| 3,072.00                           | 12.56           | 147.11      | 3,062.87              | -93.33       | 64.90        | -90.88                  | 2.45                    |
| 3,167.00                           | 11.86           | 145.70      | 3,155.72              | -110.07      | 76.01        | -107.20                 | 0.80                    |
| 3,262.00                           | 11.29           | 142.95      | 3,248.79              | -125.55      | 87.11        | -122.27                 | 0.83                    |
| 3,357.00                           | 10.15           | 141.20      | 3,342.13              | -139.50      | 97.96        | -135.80                 | 1.25                    |
| 3,452.00                           | 8.33            | 139.54      | 3,435.89              | -151.26      | 107.67       | -147.20                 | 1.94                    |
| 3,546.00                           | 6.91            | 142.76      | 3,529.06              | -160.94      | 115.51       | -156.59                 | 1.58                    |
| 3,641.00                           | 7.13            | 144.84      | 3,623.35              | -170.31      | 122.36       | -165.70                 | 0.35                    |
| 3,736.00                           | 7.93            | 145.03      | 3,717.53              | -180.50      | 129.52       | -175.62                 | 0.84                    |
| 3,831.00                           | 6.94            | 140.07      | 3,811.73              | -190.27      | 136.96       | -185.11                 | 1.24                    |
| 3,926.00                           | 6.28            | 134.80      | 3,906.10              | -198.34      | 144.33       | -192.90                 | 0.94                    |
| 4,021.00                           | 3.24            | 124.05      | 4,000.76              | -203.50      | 150.24       | -197.84                 | 3.32                    |
| 4,116.00                           | 1.53            | 77.08       | 4,095.68              | -204.72      | 153.70       | -198.93                 | 2.59                    |
| 4,211.00                           | 1.52            | 293.67      | 4,190.67              | -203.93      | 153.78       | -198.14                 | 3.05                    |
| 4,496.00                           | 3.30            | 309.78      | 4,475.41              | -197.17      | 144.02       | -191.74                 | 0.66                    |
| 4,591.00                           | 1.90            | 295.05      | 4,570.31              | -194.75      | 140.49       | -189.45                 | 1.62                    |
| 4,686.00                           | 3.21            | 316.47      | 4,665.21              | -192.15      | 137.23       | -186.98                 | 1.68                    |
| 4,780.00                           | 2.24            | 320.32      | 4,759.11              | -188.83      | 134.24       | -183.77                 | 1.05                    |
| 4,875.00                           | 1.64            | 269.06      | 4,854.06              | -187.42      | 131.70       | -182.46                 | 1.86                    |
| 4,971.00                           | 1.76            | 159.30      | 4,950.03              | -188.83      | 130.85       | -183.89                 | 2.90                    |
| 5,065.00                           | 1.25            | 152.22      | 5,044.00              | -191.08      | 131.83       | -186.11                 | 0.58                    |



## Design Report for Crow Creek State AC36-76HN - Final Surveys

| Measured<br>Depth<br>(usft)                   | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) |
|---|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|
| 5,350.00                                      | 2.66               | 163.60         | 5,328.83                    | -200.18         | 135.15          | -195.08                       | 0.51                          |
| 5,445.00                                      | 1.96               | 164.59         | 5,423.75                    | -203.86         | 136.20          | -198.72                       | 0.74                          |
| 5,540.00                                      | 1.08               | 80.08          | 5,518.73                    | -205.27         | 137.52          | -200.08                       | 2.26                          |
| 5,635.00                                      | 0.87               | 95.76          | 5,613.71                    | -205.19         | 139.12          | -199.94                       | 0.36                          |
| 5,825.00                                      | 1.33               | 128.17         | 5,803.68                    | -206.70         | 142.29          | -201.33                       | 0.40                          |
| 5,916.00                                      | 1.24               | 125.88         | 5,894.66                    | -207.93         | 143.91          | -202.50                       | 0.11                          |
| 5,943.00                                      | 1.31               | 83.08          | 5,921.65                    | -208.06         | 144.46          | -202.61                       | 3.45                          |
| 6,059.00                                      | 9.92               | 356.47         | 6,037.06                    | -197.90         | 145.16          | -192.44                       | 8.56                          |
| 6,106.00                                      | 13.26              | 356.43         | 6,083.09                    | -188.48         | 144.58          | -183.04                       | 7.11                          |
| 6,154.00                                      | 17.34              | 356.56         | 6,129.38                    | -175.84         | 143.80          | -170.44                       | 8.50                          |
| 6,201.00                                      | 20.89              | 359.65         | 6,173.78                    | -160.46         | 143.33          | -155.09                       | 7.85                          |
| 6,249.00                                      | 25.00              | 4.34           | 6,217.98                    | -141.78         | 144.05          | -136.39                       | 9.37                          |
| 6,296.00                                      | 29.55              | 3.62           | 6,259.74                    | -120.30         | 145.53          | -114.87                       | 9.71                          |
| 6,344.00                                      | 33.38              | 6.74           | 6,300.68                    | -95.37          | 147.83          | -89.87                        | 8.67                          |
| 6,391.00                                      | 37.69              | 5.33           | 6,338.92                    | -68.21          | 150.68          | -62.62                        | 9.33                          |
| 6,439.00                                      | 42.71              | 1.14           | 6,375.58                    | -37.30          | 152.37          | -31.67                        | 11.87                         |
| 6,486.00                                      | 47.13              | 358.91         | 6,408.85                    | -4.12           | 152.36          | 1.48                          | 9.98                          |
| 6,534.00                                      | 49.93              | 357.36         | 6,440.63                    | 31.82           | 151.18          | 37.36                         | 6.31                          |
| 6,581.00                                      | 52.91              | 357.78         | 6,469.94                    | 68.53           | 149.63          | 73.98                         | 6.38                          |
| 6,629.00                                      | 58.14              | 357.44         | 6,497.10                    | 108.05          | 147.97          | 113.41                        | 10.91                         |
| 6,676.00                                      | 60.41              | 357.59         | 6,521.11                    | 148.41          | 146.22          | 153.68                        | 4.84                          |
| 6,724.00                                      | 62.40              | 359.17         | 6,544.09                    | 190.53          | 145.04          | 195.73                        | 5.05                          |
| 6,771.00                                      | 65.21              | 359.05         | 6,564.83                    | 232.70          | 144.38          | 237.85                        | 5.98                          |
| 6,819.00                                      | 70.39              | 359.71         | 6,582.96                    | 277.12          | 143.90          | 282.22                        | 10.87                         |
| 6,866.00                                      | 75.20              | 0.23           | 6,596.86                    | 322.00          | 143.88          | 327.07                        | 10.29                         |
| 6,915.00                                      | 80.41              | 0.63           | 6,607.21                    | 369.88          | 144.24          | 374.93                        | 10.66                         |
| 6,962.00                                      | 82.81              | 359.92         | 6,614.07                    | 416.37          | 144.47          | 421.40                        | 5.32                          |
| Estimated: 7" Casing @ 6962' MD, 6614.07' TVD |                    |                |                             |                 |                 |                               |                               |
| 7,037.00                                      | 86.64              | 358.80         | 6,620.96                    | 491.04          | 143.63          | 495.98                        | 5.32                          |
| 7,132.00                                      | 87.79              | 358.62         | 6,625.58                    | 585.90          | 141.49          | 590.70                        | 1.23                          |
| 7,227.00                                      | 92.16              | 359.69         | 6,625.62                    | 680.86          | 140.09          | 685.55                        | 4.74                          |
| 7,322.00                                      | 92.37              | 1.53           | 6,621.86                    | 775.78          | 141.10          | 780.44                        | 1.95                          |
| 7,416.00                                      | 89.51              | 1.27           | 6,620.32                    | 869.73          | 143.40          | 874.41                        | 3.06                          |
| 7,511.00                                      | 90.03              | 1.87           | 6,620.70                    | 964.69          | 146.00          | 969.41                        | 0.84                          |
| 7,606.00                                      | 91.97              | 3.29           | 6,619.04                    | 1,059.57        | 150.28          | 1,064.38                      | 2.53                          |
| 7,701.00                                      | 90.37              | 2.49           | 6,617.10                    | 1,154.43        | 155.06          | 1,159.35                      | 1.88                          |
| 7,796.00                                      | 88.46              | 0.39           | 6,618.07                    | 1,249.38        | 157.45          | 1,254.33                      | 2.99                          |
| 7,891.00                                      | 87.48              | 359.74         | 6,621.44                    | 1,344.32        | 157.56          | 1,349.21                      | 1.24                          |
| 7,986.00                                      | 88.21              | 359.00         | 6,625.01                    | 1,439.25        | 156.52          | 1,444.03                      | 1.09                          |
| 8,081.00                                      | 89.23              | 357.55         | 6,627.13                    | 1,534.18        | 153.66          | 1,538.79                      | 1.87                          |
| 8,175.00                                      | 89.63              | 3.40           | 6,628.07                    | 1,628.13        | 154.44          | 1,632.71                      | 6.24                          |
| 8,270.00                                      | 89.45              | 4.01           | 6,628.83                    | 1,722.93        | 160.57          | 1,727.67                      | 0.67                          |
| 8,365.00                                      | 87.29              | 0.86           | 6,631.54                    | 1,817.79        | 164.61          | 1,822.61                      | 4.02                          |
| 8,460.00                                      | 88.15              | 357.86         | 6,635.32                    | 1,912.69        | 163.55          | 1,917.41                      | 3.28                          |
| 8,555.00                                      | 90.19              | 357.24         | 6,636.69                    | 2,007.59        | 159.49          | 2,012.10                      | 2.24                          |
| 8,650.00                                      | 88.89              | 356.26         | 6,637.45                    | 2,102.43        | 154.10          | 2,106.67                      | 1.71                          |
| 8,745.00                                      | 90.34              | 355.52         | 6,638.09                    | 2,197.18        | 147.29          | 2,201.11                      | 1.71                          |
| 8,840.00                                      | 93.67              | 357.45         | 6,634.77                    | 2,291.93        | 141.47          | 2,295.58                      | 4.05                          |
| 8,935.00                                      | 91.76              | 1.02           | 6,630.27                    | 2,386.79        | 140.21          | 2,390.33                      | 4.26                          |
| 9,030.00                                      | 91.48              | 0.77           | 6,627.58                    | 2,481.74        | 141.69          | 2,485.27                      | 0.40                          |
| 9,125.00                                      | 90.00              | 0.42           | 6,626.36                    | 2,576.73        | 142.68          | 2,580.23                      | 1.60                          |

## Design Report for Crow Creek State AC36-76HN - Final Surveys

| Measured Depth (usft)                        | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|--|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 9,220.00                                     | 88.86           | 358.89      | 6,627.30              | 2,671.72     | 142.11       | 2,675.13                | 2.01                    |
| 9,314.00                                     | 89.78           | 359.73      | 6,628.42              | 2,765.70     | 140.97       | 2,769.01                | 1.33                    |
| 9,409.00                                     | 89.07           | 357.68      | 6,629.37              | 2,860.67     | 138.83       | 2,863.84                | 2.28                    |
| 9,504.00                                     | 90.89           | 359.87      | 6,629.40              | 2,955.63     | 136.80       | 2,958.67                | 3.00                    |
| 9,599.00                                     | 92.62           | 2.01        | 6,626.49              | 3,050.57     | 138.35       | 3,053.59                | 2.90                    |
| 9,694.00                                     | 90.46           | 3.27        | 6,623.94              | 3,145.43     | 142.73       | 3,148.55                | 2.63                    |
| 9,789.00                                     | 87.97           | 1.23        | 6,625.24              | 3,240.33     | 146.46       | 3,243.52                | 3.39                    |
| 9,884.00                                     | 89.45           | 0.11        | 6,627.38              | 3,335.30     | 147.57       | 3,338.47                | 1.95                    |
| 9,979.00                                     | 90.34           | 1.05        | 6,627.55              | 3,430.29     | 148.53       | 3,433.43                | 1.36                    |
| 10,074.00                                    | 89.32           | 0.56        | 6,627.84              | 3,525.28     | 149.86       | 3,528.40                | 1.19                    |
| 10,169.00                                    | 90.55           | 3.82        | 6,627.94              | 3,620.19     | 153.49       | 3,623.39                | 3.67                    |
| 10,264.00                                    | 88.43           | 4.76        | 6,628.79              | 3,714.92     | 160.60       | 3,718.31                | 2.44                    |
| 10,359.00                                    | 86.86           | 4.25        | 6,632.69              | 3,809.54     | 168.06       | 3,813.14                | 1.74                    |
| 10,454.00                                    | 86.67           | 2.97        | 6,638.05              | 3,904.20     | 174.03       | 3,907.96                | 1.36                    |
| 10,548.00                                    | 86.93           | 2.18        | 6,643.30              | 3,997.96     | 178.24       | 4,001.81                | 0.88                    |
| 10,643.00                                    | 87.96           | 0.36        | 6,647.54              | 4,092.83     | 180.35       | 4,096.70                | 2.20                    |
| 10,738.00                                    | 88.46           | 359.33      | 6,650.50              | 4,187.79     | 180.09       | 4,191.57                | 1.20                    |
| 10,833.00                                    | 91.20           | 358.89      | 6,650.79              | 4,282.76     | 178.61       | 4,286.44                | 2.92                    |
| 10,928.00                                    | 90.93           | 356.64      | 6,649.02              | 4,377.67     | 174.91       | 4,381.14                | 2.39                    |
| 10,993.00                                    | 89.14           | 354.04      | 6,648.98              | 4,442.45     | 169.63       | 4,445.68                | 4.86                    |
| Final MWD Survey @ 10993.00ft                |                 |             |                       |              |              |                         |                         |
| 11,056.00                                    | 89.14           | 354.04      | 6,649.93              | 4,505.10     | 163.09       | 4,508.05                | 0.00                    |
| Straight Line Proj @ 11056' MD, 6649.93' TVD |                 |             |                       |              |              |                         |                         |

Design Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              | Comment                                      |
|-----------------------|-----------------------|-------------------|--------------|--|
|                       |                       | +N/-S (usft)      | +E/-W (usft) |  |
| 609.00                | 608.99                | 2.94              | -1.64        | Tie-On to Surface Gyros @ 609.00ft           |
| 717.00                | 716.99                | 3.03              | -2.06        | First MWD Survey @ 717.00ft                  |
| 10,993.00             | 6,648.98              | 4,442.45          | 169.63       | Final MWD Survey @ 10993.00ft                |
| 11,056.00             | 6,649.93              | 4,505.10          | 163.09       | Straight Line Proj @ 11056' MD, 6649.93' TVD |

Vertical Section Information

| Angle Type | Target                                    | Azimuth (°) | Origin Type | Origin       |              | Start TVD (usft) |
|------------|---|-------------|-------------|--------------|--------------|------------------|
|            |   |             |             | +N/_S (usft) | +E/-W (usft) |                  |
| Target     | Crow Creek State AC36-76HN_Rev A0_BHL Tgt | 2.11        | Slot        | 0.00         | 0.00         | 0.00             |

Survey tool program

| From (usft) | To (usft) | Survey/Plan              | Survey Tool |
|-------------|-----------|--------------------------|-------------|
| 322.00      | 609.00    | Surface Gyros            | Flexi-Shot  |
| 717.00      | 6,915.00  | MWD Surveys - Vert/Build | MWD         |
| 7,037.00    | 10,993.00 | MWD Surveys - Lateral    | MWD         |

## Design Report for Crow Creek State AC36-76HN - Final Surveys

Casing Details

| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Name  | Casing<br>Diameter<br>(") | Hole<br>Diameter<br>(") |
|-----------------------------|-----------------------------|---|---------------------------|-------------------------|
| 6,962.00                    |                             | Estimated: 7" Casing @ 6962' MD, 6614.07' TVD | 7                         | 8-3/4                   |

Wellbore Targets

| Target Name<br>- hit/miss target<br>- Shape  | Dip<br>Angle<br>(°) | Dip<br>Dir.<br>(°) | TVD<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Northing<br>(usft) | Easting<br>(usft) | Latitude         | Longitude         |
|--|---------------------|--------------------|---------------|-----------------|-----------------|--------------------|-------------------|------------------|-------------------|
| Crow Creek State AC3   | 0.00                | 0.00               | 1.00          | -0.94           | -75.05          | 1,435,519.36       | 3,309,147.53      | 40° 31' 24.888 N | 104° 23' 16.584 W |
| - actual wellpath misses target center by 75.06usft at 1.13usft MD (1.13 TVD, 0.00 N, 0.00 E)            |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Polygon  |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Point 1  |                     |                    | 1.00          | 161.00          | -1,293.00       | 1,435,680.35       | 3,307,854.57      |                  |                   |
| Point 2  |                     |                    | 1.00          | 4,528.00        | -1,279.00       | 1,440,047.22       | 3,307,868.57      |                  |                   |
| Point 3  |                     |                    | 1.00          | 4,675.00        | 3,109.00        | 1,440,194.21       | 3,312,256.43      |                  |                   |
| Point 4  |                     |                    | 1.00          | 255.00          | 3,185.00        | 1,435,774.35       | 3,312,332.43      |                  |                   |
| Point 5  |                     |                    | 1.00          | 161.00          | -1,293.00       | 1,435,680.35       | 3,307,854.57      |                  |                   |
| Crow Creek State AC3   | 0.00                | 0.00               | 1.00          | -0.94           | -75.05          | 1,435,519.36       | 3,309,147.53      | 40° 31' 24.888 N | 104° 23' 16.584 W |
| - actual wellpath misses target center by 75.06usft at 1.13usft MD (1.13 TVD, 0.00 N, 0.00 E)            |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Polygon  |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Point 1  |                     |                    | 1.00          | -299.00         | -1,753.00       | 1,435,220.37       | 3,307,394.58      |                  |                   |
| Point 2  |                     |                    | 1.00          | 4,988.00        | -1,739.00       | 1,440,507.20       | 3,307,408.58      |                  |                   |
| Point 3  |                     |                    | 1.00          | 5,135.00        | 3,569.00        | 1,440,654.20       | 3,312,716.41      |                  |                   |
| Point 4  |                     |                    | 1.00          | -205.00         | 3,645.00        | 1,435,314.37       | 3,312,792.41      |                  |                   |
| Point 5  |                     |                    | 1.00          | -299.00         | -1,753.00       | 1,435,220.37       | 3,307,394.58      |                  |                   |
| Crow Creek State AC3   | 0.00                | 0.00               | 5,977.40      | -195.00         | 150.00          | 1,435,325.31       | 3,309,372.58      | 40° 31' 22.943 N | 104° 23' 13.702 W |
| - actual wellpath misses target center by 11.59usft at 5999.78usft MD (5978.36 TVD, -205.54 N, 145.28 E) |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Circle (radius 35.00)  |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Crow Creek State AC3   | 270.40              | 0.19               | 6,617.69      | 523.19          | 152.42          | 1,436,043.47       | 3,309,375.00      | 40° 31' 30.039 N | 104° 23' 13.553 W |
| - actual wellpath misses target center by 10.73usft at 7068.75usft MD (6622.71 TVD, 522.73 N, 142.95 E)  |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Rectangle (sides W16.00 H70.00 D3,986.00)  |                     |                    |               |                 |                 |                    |                   |                  |                   |
| Crow Creek State AC3   | 0.00                | 0.00               | 6,645.52      | 4,509.07        | 165.82          | 1,440,029.23       | 3,309,388.40      | 40° 32' 9.420 N  | 104° 23' 12.732 W |
| - actual wellpath misses target center by 6.53usft at 11056.00usft MD (6649.93 TVD, 4505.10 N, 163.09 E) |                     |                    |               |                 |                 |                    |                   |                  |                   |
| - Point  |                     |                    |               |                 |                 |                    |                   |                  |                   |

Directional Difficulty Index

|                                     |                |                               |                                  |
|-------------------------------------|----------------|-------------------------------|----------------------------------|
| Average Dogleg over Survey:         | 2.16 °/100usft | Maximum Dogleg over Survey:   | 11.87 °/100usft at 6,439.00 usft |
| Net Tortousity applicable to Plans: | 1.15 °/100usft | Directional Difficulty Index: | 6.302                            |

Audit Info



## North Reference Sheet for Sec. 36-T7N-R63W (Crow Creek State 36 PAD) - Crow Creek State AC36-76HN -

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

Vertical Depths are relative to KB=24' @ 4813.00usft (H&P 315). Northing and Easting are relative to Crow Creek State AC36-76HN - Slot A3

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° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996816

Grid Coordinates of Well: 1,435,520.30 usft N, 3,309,222.58 usft E

Geographical Coordinates of Well: 40° 31' 24.89" N, 104° 23' 15.61" W

Grid Convergence at Surface is: 0.72°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,056.00usft the Bottom Hole Displacement is 4,508.05usft in the Direction of 2.07° (Grid).

Magnetic Convergence at surface is: -7.67° (26 September 2013, , BGGM2013)

