



VAUGHN ENERGY SERVICES

Company: NOBLE  
Lease/Well: SH FARMS/C17-5

Location:

Rig Name: PRODUCTION  
State/County: COLORADO/WELD COUNTY

Latitude: 40.30

GRID North is 0.60 Degrees East of True North

VS-Azi: 0.00 Degrees



GYRO TECHNOLOGIES INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01\_ed.ut

Minimum Curvature Method

Report Date/Time: 3/16/2011 / 17:10

Vaughn Energy Services

Rifle, Colorado

970-456-2071

Garry Fowler

SH Farms C 17-5/05-123-15554

| Measured Depth<br>FT | Incl Angle<br>Deg | Drift Direction<br>Deg | TVD<br>FT | +N-S<br>FT | +E-W<br>FT | Vertical Section<br>FT | Closure Distance<br>FT | Closure Direction<br>Deg | Dogleg Severity<br>Deg/100 |
|----------------------|-------------------|------------------------|-----------|------------|------------|------------------------|------------------------|--------------------------|----------------------------|
| 0.00                 | 0.00              | 0.00                   | 0.00      | 0.00       | 0.00       | 0.00                   | 0.00                   | 0.00                     | ****                       |
| 100.00               | 0.50              | 44.47                  | 100.00    | 0.31       | 0.31       | 0.31                   | 0.44                   | 44.47                    | 0.50                       |
| 200.00               | 0.51              | 68.65                  | 199.99    | 0.79       | 1.03       | 0.79                   | 1.30                   | 52.57                    | 0.21                       |
| 300.00               | 0.52              | 83.11                  | 299.99    | 1.00       | 1.89       | 1.00                   | 2.14                   | 62.07                    | 0.13                       |
| 400.00               | 0.54              | 92.63                  | 399.99    | 1.04       | 2.81       | 1.04                   | 3.00                   | 69.75                    | 0.09                       |
| 500.00               | 0.55              | 98.78                  | 499.98    | 0.94       | 3.75       | 0.94                   | 3.87                   | 75.89                    | 0.06                       |
| 600.00               | 0.64              | 95.95                  | 599.98    | 0.81       | 4.77       | 0.81                   | 4.84                   | 80.34                    | 0.09                       |
| 700.00               | 0.76              | 89.67                  | 699.97    | 0.76       | 5.99       | 0.76                   | 6.03                   | 82.77                    | 0.14                       |
| 800.00               | 0.78              | 88.17                  | 799.96    | 0.78       | 7.32       | 0.78                   | 7.37                   | 83.88                    | 0.03                       |
| 900.00               | 0.89              | 89.20                  | 899.95    | 0.82       | 8.78       | 0.82                   | 8.82                   | 84.68                    | 0.12                       |
| 1000.00              | 0.87              | 88.57                  | 999.94    | 0.85       | 10.32      | 0.85                   | 10.35                  | 85.31                    | 0.02                       |
| 1100.00              | 0.73              | 88.54                  | 1099.93   | 0.88       | 11.71      | 0.88                   | 11.75                  | 85.69                    | 0.14                       |
| 1200.00              | 0.74              | 91.00                  | 1199.92   | 0.89       | 12.99      | 0.89                   | 13.02                  | 86.09                    | 0.03                       |
| 1300.00              | 0.73              | 91.53                  | 1299.91   | 0.86       | 14.27      | 0.86                   | 14.30                  | 86.56                    | 0.01                       |
| 1400.00              | 0.72              | 99.44                  | 1399.90   | 0.74       | 15.53      | 0.74                   | 15.55                  | 87.28                    | 0.10                       |
| 1500.00              | 0.68              | 110.12                 | 1499.90   | 0.43       | 16.71      | 0.43                   | 16.72                  | 88.52                    | 0.14                       |
| 1600.00              | 0.56              | 120.69                 | 1599.89   | -0.02      | 17.69      | -0.02                  | 17.69                  | 90.08                    | 0.16                       |
| 1700.00              | 0.49              | 128.24                 | 1699.89   | -0.54      | 18.45      | -0.54                  | 18.46                  | 91.68                    | 0.10                       |
| 1800.00              | 0.43              | 139.37                 | 1799.88   | -1.09      | 19.03      | -1.09                  | 19.07                  | 93.28                    | 0.11                       |
| 1900.00              | 0.41              | 151.08                 | 1899.88   | -1.69      | 19.45      | -1.69                  | 19.52                  | 94.96                    | 0.09                       |
| 2000.00              | 0.65              | 167.24                 | 1999.88   | -2.55      | 19.75      | -2.55                  | 19.91                  | 97.36                    | 0.28                       |
| 2100.00              | 0.78              | 180.24                 | 2099.87   | -3.78      | 19.87      | -3.78                  | 20.23                  | 100.78                   | 0.21                       |
| 2200.00              | 0.90              | 210.54                 | 2199.86   | -5.15      | 19.47      | -5.15                  | 20.13                  | 104.81                   | 0.46                       |
| 2300.00              | 1.00              | 262.79                 | 2299.85   | -5.94      | 18.20      | -5.94                  | 19.14                  | 108.07                   | 0.84                       |
| 2400.00              | 1.05              | 278.21                 | 2399.83   | -5.92      | 16.42      | -5.92                  | 17.46                  | 109.81                   | 0.28                       |
| 2500.00              | 1.10              | 277.40                 | 2499.81   | -5.66      | 14.57      | -5.66                  | 15.63                  | 111.24                   | 0.05                       |
| 2600.00              | 1.19              | 280.78                 | 2599.79   | -5.34      | 12.59      | -5.34                  | 13.68                  | 112.99                   | 0.12                       |
| 2700.00              | 1.19              | 285.17                 | 2699.77   | -4.88      | 10.56      | -4.88                  | 11.64                  | 114.78                   | 0.09                       |
| 2800.00              | 1.15              | 286.35                 | 2799.75   | -4.32      | 8.60       | -4.32                  | 9.63                   | 116.68                   | 0.05                       |
| 2900.00              | 1.07              | 290.72                 | 2899.73   | -3.71      | 6.76       | -3.71                  | 7.71                   | 118.74                   | 0.11                       |
| 3000.00              | 0.96              | 291.43                 | 2999.72   | -3.07      | 5.10       | -3.07                  | 5.96                   | 121.03                   | 0.11                       |
| 3100.00              | 0.88              | 292.91                 | 3099.70   | -2.46      | 3.61       | -2.46                  | 4.37                   | 124.29                   | 0.08                       |

| Measured<br>Depth<br>FT | Incl<br>Angle<br>Deg | Drift<br>Direction<br>Deg | TVD<br>FT | +N/-S<br>FT | +E/-W<br>FT | Vertical<br>Section<br>FT | Closure<br>Distance<br>FT | Closure<br>Direction<br>Deg | Dogleg<br>Severity<br>Deg/100 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3200.00                 | 0.77                 | 294.99                    | 3199.69   | -1.88       | 2.29        | -1.88                     | 2.96                      | 129.35                      | 0.12                          |
| 3300.00                 | 0.74                 | 295.35                    | 3299.68   | -1.32       | 1.09        | -1.32                     | 1.71                      | 140.28                      | 0.03                          |
| 3400.00                 | 0.67                 | 295.17                    | 3399.68   | -0.79       | -0.02       | -0.79                     | 0.79                      | 181.55                      | 0.08                          |
| 3500.00                 | 0.65                 | 296.58                    | 3499.67   | -0.29       | -1.06       | -0.29                     | 1.10                      | 254.77                      | 0.02                          |
| 3600.00                 | 0.64                 | 290.79                    | 3599.66   | 0.16        | -2.09       | 0.16                      | 2.09                      | 274.51                      | 0.07                          |
| 3700.00                 | 0.63                 | 282.95                    | 3699.66   | 0.49        | -3.14       | 0.49                      | 3.18                      | 278.79                      | 0.09                          |
| 3800.00                 | 0.62                 | 282.49                    | 3799.65   | 0.73        | -4.21       | 0.73                      | 4.27                      | 279.79                      | 0.01                          |
| 3900.00                 | 0.59                 | 281.74                    | 3899.65   | 0.95        | -5.24       | 0.95                      | 5.33                      | 280.25                      | 0.03                          |
| 4000.00                 | 0.59                 | 276.88                    | 3999.64   | 1.12        | -6.26       | 1.12                      | 6.36                      | 280.10                      | 0.05                          |
| 4100.00                 | 0.58                 | 259.48                    | 4099.63   | 1.08        | -7.27       | 1.08                      | 7.35                      | 278.48                      | 0.18                          |
| 4200.00                 | 0.66                 | 256.58                    | 4199.63   | 0.86        | -8.33       | 0.86                      | 8.37                      | 275.89                      | 0.08                          |
| 4300.00                 | 0.78                 | 243.02                    | 4299.62   | 0.42        | -9.49       | 0.42                      | 9.50                      | 272.51                      | 0.21                          |
| 4400.00                 | 0.81                 | 231.75                    | 4399.61   | -0.33       | -10.66      | -0.33                     | 10.66                     | 268.21                      | 0.16                          |
| 4500.00                 | 0.84                 | 220.67                    | 4499.60   | -1.33       | -11.69      | -1.33                     | 11.77                     | 263.53                      | 0.16                          |
| 4600.00                 | 0.93                 | 213.01                    | 4599.59   | -2.56       | -12.61      | -2.56                     | 12.87                     | 258.51                      | 0.15                          |
| 4700.00                 | 0.94                 | 179.10                    | 4699.58   | -4.07       | -13.04      | -4.07                     | 13.66                     | 252.69                      | 0.55                          |
| 4800.00                 | 0.95                 | 162.48                    | 4799.56   | -5.68       | -12.78      | -5.68                     | 13.98                     | 246.04                      | 0.27                          |
| 4900.00                 | 0.99                 | 157.09                    | 4899.55   | -7.27       | -12.19      | -7.27                     | 14.19                     | 239.20                      | 0.10                          |
| 5000.00                 | 1.02                 | 152.95                    | 4999.53   | -8.85       | -11.45      | -8.85                     | 14.47                     | 232.31                      | 0.08                          |
| 5100.00                 | 1.05                 | 149.52                    | 5099.52   | -10.43      | -10.58      | -10.43                    | 14.86                     | 225.43                      | 0.07                          |
| 5200.00                 | 1.06                 | 149.76                    | 5199.50   | -12.02      | -9.65       | -12.02                    | 15.42                     | 218.77                      | 0.01                          |
| 5300.00                 | 1.01                 | 136.37                    | 5299.48   | -13.46      | -8.58       | -13.46                    | 15.96                     | 212.50                      | 0.25                          |
| 5400.00                 | 0.94                 | 148.97                    | 5399.47   | -14.80      | -7.54       | -14.80                    | 16.61                     | 207.00                      | 0.23                          |
| 5500.00                 | 0.83                 | 150.16                    | 5499.46   | -16.14      | -6.76       | -16.14                    | 17.49                     | 202.73                      | 0.11                          |
| 5600.00                 | 0.63                 | 165.67                    | 5599.45   | -17.30      | -6.26       | -17.30                    | 18.40                     | 199.90                      | 0.28                          |
| 5700.00                 | 0.58                 | 179.61                    | 5699.44   | -18.34      | -6.12       | -18.34                    | 19.33                     | 198.46                      | 0.16                          |
| 5800.00                 | 0.59                 | 190.14                    | 5799.44   | -19.35      | -6.21       | -19.35                    | 20.33                     | 197.79                      | 0.11                          |
| 5900.00                 | 0.63                 | 200.56                    | 5899.43   | -20.38      | -6.49       | -20.38                    | 21.39                     | 197.67                      | 0.12                          |
| 6000.00                 | 0.59                 | 207.19                    | 5999.43   | -21.36      | -6.92       | -21.36                    | 22.45                     | 197.96                      | 0.08                          |
| 6100.00                 | 0.58                 | 212.76                    | 6099.42   | -22.25      | -7.44       | -22.25                    | 23.46                     | 198.48                      | 0.06                          |
| 6200.00                 | 0.49                 | 219.01                    | 6199.42   | -23.00      | -7.98       | -23.00                    | 24.35                     | 199.13                      | 0.11                          |
| 6300.00                 | 0.48                 | 218.18                    | 6299.41   | -23.66      | -8.51       | -23.66                    | 25.15                     | 199.77                      | 0.01                          |
| 6400.00                 | 0.48                 | 217.21                    | 6399.41   | -24.33      | -9.02       | -24.33                    | 25.94                     | 200.34                      | 0.01                          |
| 6500.00                 | 0.46                 | 216.92                    | 6499.41   | -24.98      | -9.51       | -24.98                    | 26.72                     | 200.84                      | 0.02                          |
| 6600.00                 | 0.44                 | 205.78                    | 6599.40   | -25.64      | -9.91       | -25.64                    | 27.49                     | 201.14                      | 0.09                          |
| 6700.00                 | 0.42                 | 191.30                    | 6699.40   | -26.34      | -10.15      | -26.34                    | 28.23                     | 201.08                      | 0.11                          |
| 6800.00                 | 0.38                 | 170.68                    | 6799.40   | -27.02      | -10.17      | -27.02                    | 28.88                     | 200.62                      | 0.15                          |
| 6900.00                 | 0.31                 | 154.39                    | 6899.40   | -27.60      | -10.00      | -27.60                    | 29.35                     | 199.92                      | 0.12                          |
| 6970.00                 | 0.20                 | 129.88                    | 6969.40   | -27.85      | -9.82       | -27.85                    | 29.53                     | 199.43                      | 0.23                          |

HORIZONTAL DISPLACEMENT IS  
29.53 FEET AT 199.43 DEGREES