



Well 12-22-9-H2  
 Sam Gary and Associates  
 HWD 3  
 Trego Co, Kansas  
 Minimum Curvature Calculation

MWD George Hunt / Sean Sivannarath  
 DIRECTIONAL DRILLERS: Chris Moon / Mike Foster  
 Magnetic Declination: 6.72  
 Job #: DR1306079  
 Vertical Section Azimuth 1.39

| No.        | Survey Depth | INC         | AZM         | TVD         | N-S         | E-W         | Vertical Section | DLS/100     | BUR      | WR     |
|------------|--------------|-------------|-------------|-------------|-------------|-------------|------------------|-------------|----------|--------|
| <b>Tie</b> | <b>0</b>     | <b>0.00</b> | <b>0.00</b> | <b>0.00</b> | <b>0.00</b> | <b>0.00</b> | <b>0.00</b>      | <b>0.00</b> | <b>0</b> |        |
| 1          | 348          | 1.01        | 215.39      | 347.98      | -2.50       | -1.78       | -2.54            | 0.29        | 0.29     | 41.55  |
| 2          | 438          | 0.88        | 211.96      | 437.97      | -3.73       | -2.60       | -3.80            | 0.16        | -0.14    | -3.81  |
| 3          | 528          | 0.48        | 181.77      | 527.96      | -4.70       | -2.98       | -4.77            | 0.58        | -0.44    | -33.54 |
| 4          | 618          | 0.40        | 170.96      | 617.96      | -5.38       | -2.94       | -5.45            | 0.13        | -0.09    | -12.01 |
| 5          | 708          | 0.60        | 176.53      | 707.96      | -6.16       | -2.86       | -6.23            | 0.23        | 0.22     | 6.19   |
| 6          | 798          | 0.48        | 181.59      | 797.95      | -7.01       | -2.85       | -7.08            | 0.14        | -0.13    | 5.62   |
| 7          | 888          | 0.48        | 181.59      | 887.95      | -7.77       | -2.87       | -7.83            | 0.00        | 0.00     | 0.00   |
| 8          | 978          | 0.62        | 202.86      | 977.95      | -8.59       | -3.07       | -8.66            | 0.27        | 0.16     | 23.63  |
| 9          | 1068         | 0.46        | 212.60      | 1067.94     | -9.34       | -3.45       | -9.42            | 0.20        | -0.18    | 10.82  |
| 10         | 1158         | 0.50        | 203.02      | 1157.94     | -10.01      | -3.80       | -10.10           | 0.10        | 0.04     | -10.64 |
| 11         | 1248         | 0.48        | 193.28      | 1247.94     | -10.74      | -4.04       | -10.83           | 0.10        | -0.02    | -10.82 |
| 12         | 1338         | 0.40        | 186.47      | 1337.93     | -11.42      | -4.16       | -11.51           | 0.11        | -0.09    | -7.57  |
| 13         | 1428         | 0.22        | 242.68      | 1427.93     | -11.81      | -4.35       | -11.91           | 0.37        | -0.20    | 62.46  |
| 14         | 1518         | 0.22        | 251.16      | 1517.93     | -11.94      | -4.67       | -12.05           | 0.04        | 0.00     | 9.42   |
| 15         | 1608         | 0.40        | 310.97      | 1607.93     | -11.79      | -5.07       | -11.91           | 0.38        | 0.20     | 66.46  |
| 16         | 1698         | 0.40        | 305.72      | 1697.93     | -11.40      | -5.56       | -11.54           | 0.04        | 0.00     | -5.83  |
| 17         | 1788         | 0.40        | 299.06      | 1787.93     | -11.07      | -6.09       | -11.21           | 0.05        | 0.00     | -7.40  |
| 18         | 1878         | 0.40        | 291.06      | 1877.92     | -10.80      | -6.66       | -10.96           | 0.06        | 0.00     | -8.89  |
| 19         | 1968         | 0.48        | 265.26      | 1967.92     | -10.72      | -7.33       | -10.90           | 0.23        | 0.09     | -28.67 |
| 20         | 2058         | 1.32        | 249.88      | 2057.91     | -11.11      | -8.67       | -11.32           | 0.96        | 0.93     | -17.09 |
| 21         | 2148         | 1.58        | 247.60      | 2147.88     | -11.94      | -10.79      | -12.20           | 0.30        | 0.29     | -2.53  |
| 22         | 2238         | 2.50        | 242.59      | 2237.82     | -13.31      | -13.68      | -13.64           | 1.04        | 1.02     | -5.57  |
| 23         | 2328         | 2.81        | 244.70      | 2327.73     | -15.16      | -17.42      | -15.58           | 0.36        | 0.34     | 2.34   |
| 24         | 2418         | 3.52        | 241.27      | 2417.59     | -17.43      | -21.84      | -17.96           | 0.82        | 0.79     | -3.81  |
| 25         | 2508         | 4.48        | 241.80      | 2507.37     | -20.42      | -27.36      | -21.08           | 1.07        | 1.07     | 0.59   |
| 26         | 2598         | 5.10        | 240.57      | 2597.05     | -24.05      | -33.94      | -24.86           | 0.70        | 0.69     | -1.37  |
| 27         | 2688         | 6.11        | 240.08      | 2686.62     | -28.40      | -41.58      | -29.40           | 1.12        | 1.12     | -0.54  |
| 28         | 2778         | 7.69        | 239.07      | 2775.97     | -33.89      | -50.89      | -35.11           | 1.76        | 1.76     | -1.12  |
| 29         | 2868         | 9.10        | 238.59      | 2865.00     | -40.69      | -62.13      | -42.19           | 1.57        | 1.57     | -0.53  |
| 30         | 2958         | 10.50       | 239.38      | 2953.68     | -48.58      | -75.27      | -50.39           | 1.56        | 1.56     | 0.88   |
| 31         | 3048         | 11.91       | 238.19      | 3041.97     | -57.65      | -90.22      | -59.82           | 1.59        | 1.57     | -1.32  |
| 32         | 3079         | 12.30       | 238.60      | 3072.28     | -61.06      | -95.75      | -63.36           | 1.29        | 1.26     | 1.32   |
| 33         | 3123         | 10.70       | 247.80      | 3115.40     | -65.04      | -103.54     | -67.53           | 5.52        | -3.64    | 20.91  |
| 34         | 3168         | 9.40        | 254.10      | 3159.71     | -67.63      | -110.94     | -70.30           | 3.78        | -2.89    | 14.00  |
| 35         | 3213         | 9.60        | 267.70      | 3204.09     | -68.79      | -118.22     | -71.63           | 5.00        | 0.44     | 30.22  |
| 36         | 3258         | 10.20       | 279.80      | 3248.43     | -68.26      | -125.90     | -71.29           | 4.80        | 1.33     | 26.89  |
| 37         | 3303         | 10.80       | 291.90      | 3292.68     | -66.01      | -133.74     | -69.23           | 5.07        | 1.33     | 26.89  |
| 38         | 3348         | 13.10       | 307.20      | 3336.71     | -61.35      | -141.72     | -64.77           | 8.66        | 5.11     | 34.00  |
| 39         | 3393         | 16.50       | 318.80      | 3380.22     | -53.45      | -149.99     | -57.08           | 9.99        | 7.56     | 25.78  |
| 40         | 3435         | 17.40       | 321.10      | 3420.40     | -44.08      | -157.86     | -47.89           | 2.67        | 2.14     | 5.48   |



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|-----|-----------------|-------|--------|---------|--------|---------|---------------------|-------------|-------|-------|
| 41  | 3480            | 19.90 | 324.60 | 3463.03 | -32.60 | -166.53 | -36.63              | 6.08        | 5.56  | 7.78  |
| 42  | 3522            | 22.80 | 331.10 | 3502.15 | -19.64 | -174.60 | -23.87              | 8.90        | 6.90  | 15.48 |
| 43  | 3567            | 24.50 | 335.10 | 3543.38 | -3.54  | -182.75 | -7.97               | 5.19        | 3.78  | 8.89  |
| 44  | 3612            | 27.30 | 338.80 | 3583.85 | 14.55  | -190.41 | 9.92                | 7.18        | 6.22  | 8.22  |
| 45  | 3657            | 33.10 | 344.60 | 3622.74 | 36.04  | -197.41 | 31.24               | 14.41       | 12.89 | 12.89 |