



Company: Anadarko Petroleum Corp.  
 Well/API: Briggs 1-12A/05-123-16780  
 Tool Type: North Seeking Rate Gyro  
 Rig Name: Production/CoreTech  
 County/State: Weld/Colorado  
 Latitude: 40.259, Longitude: -104.836  
 Directions are relative to True North  
 VS-Azi: 0.000 Degrees



**FIELD COPY ONLY (NOT DEFINITIVE)**

**Depth Reference : RKB = GL Elevation = 4776**

**DRILLOG MS GYRO SURVEY CALCULATIONS**

**Filename: msgyro.ut**

**Minimum Curvature Method**

**Report Date/Time: 12/31/2014 / 14:40**

**Lat/Long Obtained By Handheld GPS At Wellhead**

**Handheld GPS Reference: NAD83/Device Error: ±9 Feet**

**VES Survey International - Henderson CO**

**Justin Williams**

**303-853-4976**

| 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 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 0.000                   | 0.000                | 0.000                     | 0.000     | 0.000       | 0.000       | 0.000                     | 0.000                     | 0.000                       | ****                          |
| 100.000                 | 0.204                | 231.406                   | 100.000   | -0.111      | -0.139      | -0.111                    | 0.178                     | 231.406                     | 0.204                         |
| 200.000                 | 0.632                | 263.200                   | 199.997   | -0.287      | -0.826      | -0.287                    | 0.874                     | 250.833                     | 0.472                         |
| 300.000                 | 0.819                | 255.334                   | 299.989   | -0.533      | -2.065      | -0.533                    | 2.133                     | 255.520                     | 0.211                         |
| 400.000                 | 1.527                | 263.646                   | 399.967   | -0.862      | -4.081      | -0.862                    | 4.171                     | 258.077                     | 0.727                         |
| 500.000                 | 1.881                | 261.110                   | 499.923   | -1.263      | -7.027      | -1.263                    | 7.139                     | 259.812                     | 0.361                         |
| 600.000                 | 2.309                | 264.955                   | 599.856   | -1.694      | -10.655     | -1.694                    | 10.788                    | 260.968                     | 0.450                         |
| 700.000                 | 2.745                | 266.256                   | 699.759   | -2.027      | -15.050     | -2.027                    | 15.186                    | 262.329                     | 0.440                         |
| 800.000                 | 2.950                | 265.005                   | 799.635   | -2.407      | -20.003     | -2.407                    | 20.147                    | 263.137                     | 0.215                         |
| 900.000                 | 3.550                | 266.005                   | 899.474   | -2.847      | -25.654     | -2.847                    | 25.812                    | 263.667                     | 0.603                         |
| 1000.000                | 4.048                | 268.596                   | 999.254   | -3.149      | -32.272     | -3.149                    | 32.425                    | 264.426                     | 0.527                         |
| 1100.000                | 4.371                | 273.896                   | 1098.984  | -2.977      | -39.603     | -2.977                    | 39.714                    | 265.701                     | 0.505                         |
| 1200.000                | 4.746                | 276.208                   | 1198.668  | -2.271      | -47.517     | -2.271                    | 47.571                    | 267.264                     | 0.418                         |
| 1300.000                | 4.739                | 275.997                   | 1298.326  | -1.392      | -55.738     | -1.392                    | 55.755                    | 268.570                     | 0.019                         |
| 1400.000                | 4.640                | 280.311                   | 1397.991  | -0.236      | -63.825     | -0.236                    | 63.825                    | 269.788                     | 0.366                         |
| 1500.000                | 4.367                | 279.712                   | 1497.682  | 1.130       | -71.558     | 1.130                     | 71.567                    | 270.905                     | 0.277                         |
| 1600.000                | 4.091                | 282.035                   | 1597.410  | 2.516       | -78.799     | 2.516                     | 78.840                    | 271.829                     | 0.325                         |
| 1700.000                | 3.695                | 280.169                   | 1697.179  | 3.829       | -85.460     | 3.829                     | 85.546                    | 272.565                     | 0.416                         |
| 1800.000                | 3.554                | 277.526                   | 1796.979  | 4.804       | -91.705     | 4.804                     | 91.830                    | 272.999                     | 0.219                         |
| 1900.000                | 3.244                | 279.154                   | 1896.803  | 5.660       | -97.571     | 5.660                     | 97.735                    | 273.320                     | 0.324                         |
| 2000.000                | 3.068                | 278.136                   | 1996.651  | 6.489       | -103.013    | 6.489                     | 103.218                   | 273.604                     | 0.185                         |
| 2100.000                | 2.863                | 274.470                   | 2096.517  | 7.062       | -108.152    | 7.062                     | 108.382                   | 273.736                     | 0.279                         |
| 2300.000                | 2.443                | 268.430                   | 2296.303  | 7.335       | -117.392    | 7.335                     | 117.621                   | 273.575                     | 0.252                         |
| 2300.000                | 2.041                | 261.872                   | 2296.303  | 7.335       | -117.392    | 7.335                     | 117.621                   | 273.575                     | ****                          |
| 2400.000                | 1.798                | 257.978                   | 2396.247  | 6.756       | -120.690    | 6.756                     | 120.878                   | 273.204                     | 0.276                         |
| 2500.000                | 1.727                | 257.537                   | 2496.200  | 6.104       | -123.695    | 6.104                     | 123.846                   | 272.825                     | 0.072                         |
| 2600.000                | 1.731                | 257.317                   | 2596.154  | 5.447       | -126.640    | 5.447                     | 126.757                   | 272.463                     | 0.008                         |
| 2700.000                | 2.077                | 266.147                   | 2696.099  | 4.994       | -129.922    | 4.994                     | 130.018                   | 272.201                     | 0.453                         |
| 2800.000                | 2.173                | 269.104                   | 2796.030  | 4.842       | -133.626    | 4.842                     | 133.714                   | 272.075                     | 0.146                         |
| 2900.000                | 2.246                | 271.385                   | 2895.956  | 4.860       | -137.481    | 4.860                     | 137.567                   | 272.025                     | 0.114                         |
| 3000.000                | 2.235                | 271.110                   | 2995.879  | 4.945       | -141.389    | 4.945                     | 141.476                   | 272.003                     | 0.016                         |
| 3100.000                | 2.276                | 273.115                   | 3095.802  | 5.091       | -145.321    | 5.091                     | 145.410                   | 272.006                     | 0.089                         |
| 3200.000                | 2.034                | 275.744                   | 3195.731  | 5.376       | -149.070    | 5.376                     | 149.167                   | 272.066                     | 0.262                         |
| 3300.000                | 1.760                | 279.371                   | 3295.676  | 5.804       | -152.351    | 5.804                     | 152.461                   | 272.182                     | 0.298                         |

| 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 |
|---|----------------------|---------------------------|-----------|------------|------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3400.000  | 1.679                | 280.368                   | 3395.631  | 6.318      | -155.307   | 6.318                     | 155.436                   | 272.329                     | 0.087                         |
| 3500.000  | 1.658                | 275.634                   | 3495.589  | 6.723      | -158.188   | 6.723                     | 158.330                   | 272.434                     | 0.139                         |
| 3600.000  | 1.627                | 272.317                   | 3595.548  | 6.923      | -161.046   | 6.923                     | 161.195                   | 272.461                     | 0.100                         |
| 3700.000  | 1.277                | 275.895                   | 3695.516  | 7.095      | -163.573   | 7.095                     | 163.727                   | 272.484                     | 0.362                         |
| 3800.000  | 1.236                | 278.535                   | 3795.491  | 7.369      | -165.748   | 7.369                     | 165.911                   | 272.546                     | 0.071                         |
| 3900.000  | 1.707                | 288.987                   | 3895.458  | 8.014      | -168.223   | 8.014                     | 168.413                   | 272.727                     | 0.541                         |
| 4000.000  | 1.816                | 288.978                   | 3995.411  | 9.014      | -171.130   | 9.014                     | 171.367                   | 273.015                     | 0.108                         |
| 4100.000  | 1.977                | 286.658                   | 4095.356  | 10.024     | -174.280   | 10.024                    | 174.568                   | 273.292                     | 0.179                         |
| 4200.000  | 2.205                | 284.116                   | 4195.290  | 10.987     | -177.799   | 10.987                    | 178.138                   | 273.536                     | 0.246                         |
| 4300.000  | 2.360                | 282.322                   | 4295.210  | 11.896     | -181.676   | 11.896                    | 182.065                   | 273.746                     | 0.171                         |
| 4400.000  | 2.355                | 279.750                   | 4395.126  | 12.683     | -185.713   | 12.683                    | 186.146                   | 273.907                     | 0.106                         |
| 4500.000  | 2.321                | 295.779                   | 4495.044  | 13.912     | -189.562   | 13.912                    | 190.071                   | 274.197                     | 0.653                         |
| 4600.000  | 1.812                | 318.183                   | 4594.980  | 15.971     | -192.439   | 15.971                    | 193.100                   | 274.744                     | 0.945                         |
| 4700.000  | 1.570                | 343.240                   | 4694.938  | 18.461     | -193.888   | 18.461                    | 194.765                   | 275.439                     | 0.770                         |
| 4800.000  | 1.572                | 350.758                   | 4794.900  | 21.126     | -194.503   | 21.126                    | 195.647                   | 276.199                     | 0.206                         |
| 4900.000  | 1.478                | 353.467                   | 4894.865  | 23.761     | -194.870   | 23.761                    | 196.313                   | 276.952                     | 0.118                         |
| 5000.000  | 1.180                | 343.933                   | 4994.838  | 26.033     | -195.302   | 26.033                    | 197.029                   | 277.592                     | 0.370                         |
| 5100.000  | 0.836                | 343.204                   | 5094.822  | 27.721     | -195.798   | 27.721                    | 197.750                   | 278.058                     | 0.345                         |
| 5200.000  | 0.672                | 333.420                   | 5194.813  | 28.944     | -196.271   | 28.944                    | 198.394                   | 278.389                     | 0.208                         |
| 5300.000  | 0.724                | 326.657                   | 5294.806  | 29.997     | -196.881   | 29.997                    | 199.153                   | 278.663                     | 0.097                         |
| 5400.000  | 0.386                | 312.978                   | 5394.801  | 30.754     | -197.475   | 30.754                    | 199.856                   | 278.852                     | 0.361                         |
| 5500.000  | 0.408                | 279.053                   | 5494.799  | 31.040     | -198.073   | 31.040                    | 200.490                   | 278.906                     | 0.233                         |
| 5600.000  | 0.531                | 223.947                   | 5594.796  | 30.762     | -198.746   | 30.762                    | 201.113                   | 278.799                     | 0.448                         |
| 5700.000  | 1.417                | 193.441                   | 5694.781  | 29.226     | -199.355   | 29.226                    | 201.486                   | 278.340                     | 0.997                         |
| 5800.000  | 1.751                | 174.201                   | 5794.743  | 26.503     | -199.489   | 26.503                    | 201.241                   | 277.568                     | 0.623                         |
| 5900.000  | 1.261                | 166.685                   | 5894.709  | 23.912     | -199.081   | 23.912                    | 200.512                   | 276.849                     | 0.528                         |
| 6000.000  | 1.283                | 145.479                   | 5994.685  | 21.919     | -198.193   | 21.919                    | 199.401                   | 276.311                     | 0.468                         |
| 6100.000  | 1.274                | 143.835                   | 6094.660  | 20.099     | -196.903   | 20.099                    | 197.926                   | 275.828                     | 0.038                         |
| 6200.000  | 1.274                | 142.071                   | 6194.635  | 18.324     | -195.563   | 18.324                    | 196.420                   | 275.353                     | 0.039                         |
| 6300.000  | 1.127                | 134.304                   | 6294.613  | 16.760     | -194.175   | 16.760                    | 194.897                   | 274.933                     | 0.219                         |
| 6400.000  | 0.904                | 118.602                   | 6394.597  | 15.695     | -192.779   | 15.695                    | 193.417                   | 274.654                     | 0.355                         |
| 6500.000  | 1.153                | 108.718                   | 6494.581  | 14.994     | -191.133   | 14.994                    | 191.720                   | 274.486                     | 0.305                         |
| 6600.000  | 0.891                | 119.724                   | 6594.565  | 14.286     | -189.505   | 14.286                    | 190.042                   | 274.311                     | 0.327                         |
| 6700.000  | 1.044                | 113.046                   | 6694.551  | 13.544     | -187.991   | 13.544                    | 188.478                   | 274.121                     | 0.190                         |
| 6800.000  | 1.179                | 117.210                   | 6794.532  | 12.717     | -186.238   | 12.717                    | 186.671                   | 273.906                     | 0.157                         |
| 6900.000  | 1.803                | 136.283                   | 6894.499  | 11.109     | -184.236   | 11.109                    | 184.570                   | 273.451                     | 0.789                         |
| 7000.000  | 2.156                | 143.319                   | 6994.439  | 8.464      | -182.025   | 8.464                     | 182.221                   | 272.662                     | 0.428                         |
| 7100.000  | 1.482                | 166.129                   | 7094.389  | 5.700      | -180.591   | 5.700                     | 180.681                   | 271.808                     | 0.977                         |
| 7200.000  | 2.352                | 218.075                   | 7194.339  | 2.830      | -181.547   | 2.830                     | 181.569                   | 270.893                     | 1.852                         |
| 7300.000  | 3.236                | 232.590                   | 7294.221  | -0.500     | -185.054   | -0.500                    | 185.054                   | 269.845                     | 1.126                         |
| HORIZONTAL DISPLACEMENT IS<br>185.054 FEET AT 269.845 DEGREES |                      |                           |           |            |            |                           |                           |                             |                               |