



Company: PDC Energy

Well: Asbury V 3-11

API: 05-123-16900

Rig Name: Production / V.E.S.

State/County: Colorado / Weld

Latitude: 40.165, Longitude: -104.879

Directions are relative to True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG GYRO SURVEY CALCULATIONS

Filename: survey.ut

Minimum Curvature Method

Report Date/Time: 12/18/2014 / 18:35

VES Survey International

Henderson Colorado

303-853-4976

Norman Cowan

| 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                 | 0.538                | 11.657                    | 99.999    | 0.460       | 0.095       | 0.460                     | 0.470                     | 11.657                      | 0.538                         |
| 200.000                 | 0.400                | 209.816                   | 199.997   | 0.617       | 0.016       | 0.617                     | 0.617                     | 1.494                       | 0.927                         |
| 300.000                 | 0.393                | 256.387                   | 299.995   | 0.233       | -0.491      | 0.233                     | 0.544                     | 295.370                     | 0.314                         |
| 400.000                 | 0.298                | 264.718                   | 399.993   | 0.128       | -1.084      | 0.128                     | 1.091                     | 276.752                     | 0.108                         |
| 500.000                 | 0.175                | 228.780                   | 499.992   | 0.004       | -1.457      | 0.004                     | 1.457                     | 270.146                     | 0.187                         |
| 600.000                 | 0.641                | 272.617                   | 599.990   | -0.071      | -2.130      | -0.071                    | 2.132                     | 268.080                     | 0.528                         |
| 700.000                 | 0.504                | 275.015                   | 699.985   | -0.007      | -3.127      | -0.007                    | 3.127                     | 269.864                     | 0.138                         |
| 800.000                 | 0.724                | 238.627                   | 799.979   | -0.298      | -4.105      | -0.298                    | 4.116                     | 265.847                     | 0.437                         |
| 900.000                 | 0.334                | 233.637                   | 899.975   | -0.800      | -4.880      | -0.800                    | 4.945                     | 260.688                     | 0.392                         |
| 1000.000                | 0.772                | 241.960                   | 999.970   | -1.290      | -5.710      | -1.290                    | 5.854                     | 257.269                     | 0.444                         |
| 1100.000                | 0.921                | 234.905                   | 1099.959  | -2.069      | -6.962      | -2.069                    | 7.263                     | 253.451                     | 0.181                         |
| 1200.000                | 1.308                | 275.643                   | 1199.941  | -2.418      | -8.755      | -2.418                    | 9.083                     | 254.558                     | 0.856                         |
| 1300.000                | 1.087                | 265.160                   | 1299.920  | -2.386      | -10.836     | -2.386                    | 11.095                    | 257.581                     | 0.310                         |
| 1400.000                | 1.339                | 267.290                   | 1399.897  | -2.521      | -12.948     | -2.521                    | 13.191                    | 258.980                     | 0.256                         |
| 1500.000                | 1.516                | 282.867                   | 1499.867  | -2.282      | -15.404     | -2.282                    | 15.573                    | 261.573                     | 0.425                         |
| 1600.000                | 1.206                | 263.729                   | 1599.839  | -2.103      | -17.740     | -2.103                    | 17.864                    | 263.241                     | 0.546                         |
| 1700.000                | 1.318                | 259.451                   | 1699.814  | -2.428      | -19.917     | -2.428                    | 20.064                    | 263.049                     | 0.147                         |
| 1800.000                | 1.449                | 284.520                   | 1799.786  | -2.322      | -22.272     | -2.322                    | 22.393                    | 264.049                     | 0.614                         |
| 1900.000                | 1.240                | 295.476                   | 1899.759  | -1.539      | -24.473     | -1.539                    | 24.521                    | 266.401                     | 0.331                         |
| 2000.000                | 1.407                | 304.804                   | 1999.732  | -0.374      | -26.457     | -0.374                    | 26.460                    | 269.191                     | 0.272                         |
| 2100.000                | 1.516                | 303.129                   | 2099.700  | 1.050       | -28.573     | 1.050                     | 28.592                    | 272.105                     | 0.118                         |
| 2200.000                | 1.242                | 272.592                   | 2199.672  | 1.822       | -30.764     | 1.822                     | 30.818                    | 273.390                     | 0.773                         |
| 2300.000                | 1.144                | 270.286                   | 2299.650  | 1.876       | -32.845     | 1.876                     | 32.899                    | 273.269                     | 0.110                         |
| 2400.000                | 1.288                | 265.472                   | 2399.628  | 1.792       | -34.963     | 1.792                     | 35.009                    | 272.935                     | 0.177                         |
| 2500.000                | 1.414                | 253.775                   | 2499.600  | 1.359       | -37.269     | 1.359                     | 37.293                    | 272.088                     | 0.303                         |
| 2600.000                | 1.523                | 261.440                   | 2599.567  | 0.816       | -39.768     | 0.816                     | 39.776                    | 271.176                     | 0.224                         |
| 2700.000                | 1.290                | 245.044                   | 2699.538  | 0.144       | -42.102     | 0.144                     | 42.103                    | 270.195                     | 0.463                         |
| 2800.000                | 1.337                | 267.458                   | 2799.512  | -0.383      | -44.288     | -0.383                    | 44.289                    | 269.505                     | 0.512                         |
| 2900.000                | 1.126                | 240.492                   | 2899.490  | -0.919      | -46.308     | -0.919                    | 46.317                    | 268.863                     | 0.610                         |
| 3000.000                | 1.392                | 267.919                   | 2999.466  | -1.447      | -48.377     | -1.447                    | 48.399                    | 268.287                     | 0.650                         |
| 3100.000                | 1.611                | 266.864                   | 3099.432  | -1.568      | -50.994     | -1.568                    | 51.019                    | 268.239                     | 0.221                         |
| 3200.000                | 1.041                | 238.997                   | 3199.406  | -2.113      | -53.177     | -2.113                    | 53.219                    | 267.725                     | 0.845                         |
| 3300.000                | 0.991                | 247.400                   | 3299.390  | -2.913      | -54.754     | -2.913                    | 54.831                    | 266.955                     | 0.157                         |
| 3400.000                | 0.784                | 258.998                   | 3399.378  | -3.376      | -56.225     | -3.376                    | 56.326                    | 266.564                     | 0.273                         |

| 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 |
|--|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3500.000   | 0.784                | 247.197                   | 3499.369  | -3.772      | -57.527     | -3.772                    | 57.651                    | 266.249                     | 0.161                         |
| 3600.000   | 0.803                | 228.073                   | 3599.359  | -4.505      | -58.679     | -4.505                    | 58.852                    | 265.610                     | 0.264                         |
| 3700.000   | 0.643                | 143.324                   | 3699.354  | -5.424      | -58.866     | -5.424                    | 59.115                    | 264.736                     | 0.982                         |
| 3800.000   | 0.965                | 163.273                   | 3799.344  | -6.681      | -58.288     | -6.681                    | 58.669                    | 263.462                     | 0.422                         |
| 3900.000   | 0.757                | 214.024                   | 3899.334  | -8.035      | -58.415     | -8.035                    | 58.965                    | 262.168                     | 0.762                         |
| 4000.000   | 1.053                | 161.108                   | 3999.323  | -9.452      | -58.487     | -9.452                    | 59.246                    | 260.820                     | 0.849                         |
| 4100.000   | 0.964                | 208.270                   | 4099.309  | -11.063     | -58.588     | -11.063                   | 59.623                    | 259.307                     | 0.811                         |
| 4200.000   | 0.783                | 219.152                   | 4199.297  | -12.333     | -59.418     | -12.333                   | 60.684                    | 258.274                     | 0.245                         |
| 4300.000   | 0.256                | 323.353                   | 4299.294  | -12.683     | -59.982     | -12.683                   | 61.309                    | 258.061                     | 0.881                         |
| 4400.000   | 0.842                | 310.119                   | 4399.289  | -12.030     | -60.678     | -12.030                   | 61.859                    | 258.786                     | 0.595                         |
| 4500.000   | 0.793                | 308.990                   | 4499.279  | -11.121     | -61.778     | -11.121                   | 62.771                    | 259.795                     | 0.051                         |
| 4600.000   | 1.160                | 326.778                   | 4599.265  | -9.839      | -62.870     | -9.839                    | 63.635                    | 261.105                     | 0.471                         |
| 4700.000   | 0.921                | 299.393                   | 4699.249  | -8.598      | -64.125     | -8.598                    | 64.699                    | 262.363                     | 0.544                         |
| 4800.000   | 0.786                | 290.756                   | 4799.238  | -7.960      | -65.467     | -7.960                    | 65.949                    | 263.067                     | 0.186                         |
| 4900.000   | 1.264                | 309.493                   | 4899.222  | -7.016      | -66.960     | -7.016                    | 67.326                    | 264.019                     | 0.577                         |
| 5000.000   | 1.386                | 299.365                   | 4999.195  | -5.721      | -68.865     | -5.721                    | 69.102                    | 265.251                     | 0.264                         |
| 5100.000   | 1.205                | 279.177                   | 5099.170  | -4.960      | -70.957     | -4.960                    | 71.130                    | 266.001                     | 0.488                         |
| 5200.000   | 0.690                | 269.925                   | 5199.156  | -4.793      | -72.597     | -4.793                    | 72.755                    | 266.222                     | 0.535                         |
| 5300.000   | 0.833                | 288.288                   | 5299.147  | -4.566      | -73.890     | -4.566                    | 74.031                    | 266.464                     | 0.281                         |
| 5400.000   | 1.140                | 301.323                   | 5399.132  | -3.821      | -75.430     | -3.821                    | 75.526                    | 267.100                     | 0.379                         |
| 5500.000   | 0.592                | 281.964                   | 5499.121  | -3.197      | -76.785     | -3.197                    | 76.852                    | 267.616                     | 0.613                         |
| 5600.000   | 0.886                | 273.141                   | 5599.112  | -3.047      | -78.063     | -3.047                    | 78.122                    | 267.765                     | 0.314                         |
| 5700.000   | 0.795                | 279.950                   | 5699.102  | -2.885      | -79.518     | -2.885                    | 79.571                    | 267.922                     | 0.135                         |
| 5800.000   | 0.746                | 250.029                   | 5799.093  | -2.988      | -80.813     | -2.988                    | 80.869                    | 267.883                     | 0.401                         |
| 5900.000   | 0.808                | 254.712                   | 5899.084  | -3.396      | -82.105     | -3.396                    | 82.175                    | 267.632                     | 0.088                         |
| 6000.000   | 0.525                | 291.570                   | 5999.077  | -3.413      | -83.211     | -3.413                    | 83.281                    | 267.651                     | 0.499                         |
| 6100.000   | 0.054                | 14.262                    | 6099.076  | -3.199      | -83.625     | -3.199                    | 83.687                    | 267.809                     | 0.521                         |
| 6200.000   | 0.540                | 349.693                   | 6199.074  | -2.690      | -83.698     | -2.690                    | 83.741                    | 268.159                     | 0.491                         |
| 6300.000   | 0.136                | 83.348                    | 6299.073  | -2.213      | -83.665     | -2.213                    | 83.694                    | 268.485                     | 0.565                         |
| 6400.000   | 0.303                | 71.786                    | 6399.072  | -2.116      | -83.295     | -2.116                    | 83.322                    | 268.545                     | 0.173                         |
| 6500.000   | 0.185                | 23.420                    | 6499.071  | -1.885      | -82.980     | -1.885                    | 83.001                    | 268.699                     | 0.227                         |
| 6600.000   | 0.426                | 260.544                   | 6599.070  | -1.798      | -83.282     | -1.798                    | 83.302                    | 268.763                     | 0.550                         |
| 6700.000   | 0.170                | 216.981                   | 6699.069  | -1.977      | -83.738     | -1.977                    | 83.762                    | 268.647                     | 0.325                         |
| 6800.000   | 0.405                | 337.624                   | 6799.068  | -1.768      | -83.962     | -1.768                    | 83.981                    | 268.793                     | 0.513                         |
| 6900.000   | 0.717                | 346.419                   | 6899.063  | -0.833      | -84.243     | -0.833                    | 84.248                    | 269.433                     | 0.322                         |
| 7000.000   | 0.656                | 336.322                   | 6999.056  | 0.299       | -84.620     | 0.299                     | 84.621                    | 270.202                     | 0.135                         |
| 7100.000   | 0.691                | 306.582                   | 7099.049  | 1.182       | -85.334     | 1.182                     | 85.342                    | 270.793                     | 0.347                         |
| 7200.000   | 0.830                | 321.220                   | 7199.041  | 2.106       | -86.272     | 2.106                     | 86.298                    | 271.398                     | 0.238                         |
| 7300.000   | 0.820                | 323.725                   | 7299.030  | 3.248       | -87.149     | 3.248                     | 87.210                    | 272.134                     | 0.038                         |
| 7350.000   | 1.278                | 324.050                   | 7349.022  | 3.987       | -87.688     | 3.987                     | 87.779                    | 272.604                     | 0.917                         |
| HORIZONTAL DISPLACEMENT IS<br>87.779 FEET AT 272.604 DEGREES |                      |                           |           |             |             |                           |                           |                             |                               |