



Job Number: SVGJ-121076
 Company: PDC
 Lease/Well: Brown-McCarty 30-5
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.75°
 Grid: East To True North
 File name: F:\SURVEY\2012SU~1\PDC\GJ\BROWN\MCAR305.SVY
 Date/Time: 02-Nov-12 / 09:25
 Curve Name: Surface - 7300' M.D. (Rate Gyro)

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane .00
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 100.00 | .25 | 30.63 | 100.00 | .19 | .11 | .19 | .22 | 30.63 | .25 |
| 200.00 | .17 | 5.76 | 200.00 | .52 | .24 | .52 | .57 | 24.39 | .12 |
| 300.00 | .24 | 318.05 | 300.00 | .83 | .11 | .83 | .83 | 7.72 | .18 |
| 400.00 | .27 | 266.65 | 400.00 | .97 | -.26 | .97 | 1.00 | 344.80 | .22 |
| 500.00 | .24 | 219.46 | 500.00 | .79 | -.63 | .79 | 1.01 | 321.47 | .21 |
| 600.00 | .29 | 265.97 | 600.00 | .61 | -1.02 | .61 | 1.19 | 301.10 | .21 |
| 700.00 | .29 | 282.56 | 699.99 | .65 | -1.52 | .65 | 1.65 | 293.22 | .08 |
| 800.00 | .42 | 297.03 | 799.99 | .87 | -2.09 | .87 | 2.26 | 292.65 | .16 |
| 900.00 | .31 | 302.20 | 899.99 | 1.18 | -2.65 | 1.18 | 2.90 | 294.09 | .11 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 1000.00 | .42 | 298.29 | 999.99 | 1.50 | -3.20 | 1.50 | 3.53 | 295.15 | .11 |
| 1100.00 | .46 | 296.28 | 1099.99 | 1.85 | -3.88 | 1.85 | 4.30 | 295.52 | .04 |
| 1200.00 | .51 | 301.75 | 1199.98 | 2.26 | -4.62 | 2.26 | 5.14 | 296.12 | .07 |
| 1300.00 | .28 | 278.25 | 1299.98 | 2.53 | -5.24 | 2.53 | 5.82 | 295.81 | .28 |
| 1400.00 | .33 | 324.39 | 1399.98 | 2.80 | -5.65 | 2.80 | 6.31 | 296.39 | .24 |
| 1500.00 | .49 | 288.66 | 1499.98 | 3.17 | -6.22 | 3.17 | 6.98 | 297.03 | .29 |
| 1600.00 | .45 | 296.96 | 1599.97 | 3.49 | -6.98 | 3.49 | 7.80 | 296.57 | .08 |
| 1700.00 | .37 | 272.50 | 1699.97 | 3.68 | -7.65 | 3.68 | 8.49 | 295.70 | .19 |
| 1800.00 | .59 | 269.72 | 1799.97 | 3.69 | -8.49 | 3.69 | 9.25 | 293.51 | .22 |
| 1900.00 | .45 | 292.67 | 1899.96 | 3.84 | -9.36 | 3.84 | 10.12 | 292.31 | .25 |
| 2000.00 | .60 | 270.75 | 1999.96 | 4.00 | -10.25 | 4.00 | 11.00 | 291.32 | .25 |
| 2100.00 | .57 | 272.71 | 2099.95 | 4.03 | -11.27 | 4.03 | 11.97 | 289.68 | .04 |
| 2200.00 | .39 | 294.56 | 2199.95 | 4.19 | -12.08 | 4.19 | 12.78 | 289.15 | .25 |
| 2300.00 | .59 | 305.48 | 2299.95 | 4.63 | -12.80 | 4.63 | 13.62 | 289.90 | .22 |
| 2400.00 | .44 | 286.49 | 2399.94 | 5.04 | -13.59 | 5.04 | 14.50 | 290.36 | .23 |
| 2500.00 | .61 | 300.17 | 2499.94 | 5.42 | -14.42 | 5.42 | 15.41 | 290.60 | .21 |
| 2600.00 | .47 | 323.03 | 2599.93 | 6.01 | -15.13 | 6.01 | 16.28 | 291.68 | .25 |
| 2700.00 | .49 | 303.37 | 2699.93 | 6.58 | -15.73 | 6.58 | 17.05 | 292.69 | .17 |
| 2800.00 | .29 | 297.87 | 2799.93 | 6.93 | -16.31 | 6.93 | 17.72 | 293.02 | .20 |
| 2900.00 | .37 | 328.04 | 2899.93 | 7.32 | -16.71 | 7.32 | 18.24 | 293.67 | .19 |
| 3000.00 | .29 | 287.20 | 2999.92 | 7.67 | -17.12 | 7.67 | 18.76 | 294.14 | .24 |
| 3100.00 | .46 | 251.72 | 3099.92 | 7.62 | -17.74 | 7.62 | 19.31 | 293.25 | .28 |
| 3200.00 | .45 | 248.77 | 3199.92 | 7.35 | -18.49 | 7.35 | 19.90 | 291.69 | .03 |
| 3300.00 | .71 | 256.35 | 3299.91 | 7.06 | -19.46 | 7.06 | 20.70 | 289.95 | .27 |
| 3400.00 | .82 | 264.60 | 3399.91 | 6.85 | -20.77 | 6.85 | 21.87 | 288.25 | .16 |
| 3500.00 | .81 | 257.97 | 3499.90 | 6.64 | -22.18 | 6.64 | 23.15 | 286.66 | .09 |
| 3600.00 | .67 | 255.38 | 3599.89 | 6.34 | -23.43 | 6.34 | 24.28 | 285.14 | .14 |
| 3700.00 | .55 | 230.90 | 3699.88 | 5.89 | -24.37 | 5.89 | 25.07 | 283.59 | .28 |
| 3800.00 | .33 | 244.60 | 3799.88 | 5.46 | -25.00 | 5.46 | 25.59 | 282.33 | .24 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 3900.00 | .68 | 219.63 | 3899.87 | 4.88 | -25.64 | 4.88 | 26.10 | 280.78 | .41 |
| 4000.00 | .55 | 232.02 | 3999.87 | 4.13 | -26.40 | 4.13 | 26.72 | 278.90 | .19 |
| 4100.00 | .98 | 217.28 | 4099.86 | 3.16 | -27.30 | 3.16 | 27.48 | 276.60 | .47 |
| 4200.00 | 1.20 | 224.27 | 4199.84 | 1.73 | -28.54 | 1.73 | 28.60 | 273.46 | .26 |
| 4300.00 | 1.34 | 218.75 | 4299.82 | .06 | -30.01 | .06 | 30.01 | 270.12 | .19 |
| 4400.00 | 1.29 | 233.23 | 4399.79 | -1.52 | -31.64 | -1.52 | 31.68 | 267.25 | .34 |
| 4500.00 | 1.30 | 237.02 | 4499.77 | -2.81 | -33.49 | -2.81 | 33.61 | 265.20 | .09 |
| 4600.00 | 1.26 | 241.17 | 4599.74 | -3.96 | -35.41 | -3.96 | 35.63 | 263.62 | .10 |
| 4700.00 | 1.45 | 242.64 | 4699.71 | -5.07 | -37.50 | -5.07 | 37.84 | 262.30 | .19 |
| 4800.00 | .78 | 224.33 | 4799.69 | -6.14 | -39.09 | -6.14 | 39.57 | 261.07 | .75 |
| 4900.00 | .95 | 226.81 | 4899.68 | -7.20 | -40.17 | -7.20 | 40.81 | 259.85 | .17 |
| 5000.00 | .82 | 237.79 | 4999.67 | -8.14 | -41.38 | -8.14 | 42.18 | 258.87 | .21 |
| 5100.00 | .56 | 233.03 | 5099.66 | -8.82 | -42.38 | -8.82 | 43.29 | 258.24 | .27 |
| 5200.00 | .45 | 241.85 | 5199.66 | -9.30 | -43.12 | -9.30 | 44.11 | 257.83 | .13 |
| 5300.00 | .81 | 228.92 | 5299.65 | -9.95 | -44.00 | -9.95 | 45.11 | 257.26 | .38 |
| 5400.00 | .94 | 262.02 | 5399.64 | -10.53 | -45.34 | -10.53 | 46.55 | 256.93 | .51 |
| 5500.00 | .70 | 276.44 | 5499.63 | -10.57 | -46.76 | -10.57 | 47.94 | 257.26 | .31 |
| 5600.00 | .98 | 304.11 | 5599.62 | -10.02 | -48.08 | -10.02 | 49.11 | 258.22 | .49 |
| 5700.00 | 1.55 | 300.25 | 5699.60 | -8.86 | -49.95 | -8.86 | 50.73 | 259.94 | .58 |
| 5800.00 | .94 | 275.03 | 5799.57 | -8.11 | -51.94 | -8.11 | 52.57 | 261.13 | .81 |
| 5900.00 | .49 | 340.06 | 5899.57 | -7.64 | -52.90 | -7.64 | 53.45 | 261.79 | .86 |
| 6000.00 | .50 | 36.11 | 5999.56 | -6.88 | -52.79 | -6.88 | 53.24 | 262.57 | .47 |
| 6100.00 | .15 | 247.46 | 6099.56 | -6.58 | -52.65 | -6.58 | 53.06 | 262.88 | .63 |
| 6200.00 | .27 | 198.00 | 6199.56 | -6.85 | -52.85 | -6.85 | 53.29 | 262.61 | .21 |
| 6300.00 | .79 | 341.37 | 6299.56 | -6.42 | -53.14 | -6.42 | 53.53 | 263.11 | 1.02 |
| 6400.00 | .30 | 283.45 | 6399.55 | -5.71 | -53.61 | -5.71 | 53.92 | 263.92 | .68 |
| 6500.00 | .26 | 253.14 | 6499.55 | -5.71 | -54.09 | -5.71 | 54.39 | 263.97 | .15 |
| 6600.00 | .21 | 253.99 | 6599.55 | -5.83 | -54.48 | -5.83 | 54.79 | 263.89 | .05 |
| 6700.00 | .30 | 226.78 | 6699.55 | -6.06 | -54.85 | -6.06 | 55.18 | 263.69 | .15 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 6800.00 | .14 | 186.92 | 6799.55 | -6.36 | -55.05 | -6.36 | 55.42 | 263.41 | .21 |
| 6900.00 | .09 | 248.68 | 6899.55 | -6.51 | -55.14 | -6.51 | 55.52 | 263.27 | .13 |
| 7000.00 | .35 | 254.85 | 6999.55 | -6.62 | -55.51 | -6.62 | 55.90 | 263.20 | .26 |
| 7100.00 | .30 | 193.39 | 7099.55 | -6.95 | -55.86 | -6.95 | 56.29 | 262.90 | .33 |
| 7200.00 | .47 | 161.60 | 7199.55 | -7.60 | -55.79 | -7.60 | 56.31 | 262.25 | .27 |

| | | | | | | | | | |
|-----------------------------------|-----|--------|---------|-------|--------|-------|-------|--------|-----|
| Last Survey Depth Recorded | | | | | | | | | |
| 7300.00 | .23 | 140.89 | 7299.54 | -8.14 | -55.54 | -8.14 | 56.13 | 261.66 | .27 |