



Job Number: SVGJ-170064
 Company: PDC
 Lease/Well: Fickle 31-21
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.44°
 Grid: East To True North
 File name: C:\WINSER~1\2017\PDC\GJ\FICKLE\3121.SVY
 Date/Time: 12-May-17 / 16:19
 Curve Name: Surface - 7200' M.D. (Rate Gyro)
 Lat: 40.30422 Long: -104.89364

MS Energy

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 | .76 | 286.51 | 100.00 | .19 | -.64 | .19 | .66 | 286.51 | .76 |
| 200.00 | .88 | 279.55 | 199.99 | .50 | -2.03 | .50 | 2.09 | 283.96 | .16 |
| 300.00 | 1.33 | 302.91 | 299.97 | 1.26 | -3.76 | 1.26 | 3.97 | 288.56 | .63 |
| 400.00 | 2.17 | 328.08 | 399.92 | 3.50 | -5.74 | 3.50 | 6.72 | 301.39 | 1.12 |
| | | | | | | | | | |
| 500.00 | 2.78 | 334.11 | 499.83 | 7.29 | -7.80 | 7.29 | 10.67 | 313.07 | .66 |
| 600.00 | 2.77 | 335.98 | 599.71 | 11.68 | -9.84 | 11.68 | 15.27 | 319.89 | .09 |
| 700.00 | 2.84 | 337.29 | 699.59 | 16.17 | -11.78 | 16.17 | 20.00 | 323.93 | .09 |
| 800.00 | 2.87 | 337.25 | 799.47 | 20.76 | -13.70 | 20.76 | 24.88 | 326.58 | .03 |
| 900.00 | 2.90 | 335.85 | 899.34 | 25.38 | -15.71 | 25.38 | 29.85 | 328.25 | .08 |
| | | | | | | | | | |
| 1000.00 | 3.00 | 335.08 | 999.21 | 30.06 | -17.84 | 30.06 | 34.96 | 329.31 | .11 |
| 1100.00 | 2.95 | 331.46 | 1099.07 | 34.70 | -20.18 | 34.70 | 40.14 | 329.82 | .19 |
| 1200.00 | 2.72 | 330.36 | 1198.95 | 39.02 | -22.58 | 39.02 | 45.08 | 329.94 | .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 | |
| 1300.00 | 2.64 | 331.59 | 1298.84 | 43.11 | -24.85 | 43.11 | 49.76 | 330.04 | .10 |
| 1400.00 | 2.54 | 332.89 | 1398.74 | 47.10 | -26.95 | 47.10 | 54.27 | 330.22 | .12 |
| 1500.00 | 2.53 | 334.62 | 1498.64 | 51.07 | -28.91 | 51.07 | 58.69 | 330.49 | .08 |
| 1600.00 | 2.58 | 333.69 | 1598.54 | 55.08 | -30.85 | 55.08 | 63.13 | 330.75 | .06 |
| 1700.00 | 2.45 | 330.99 | 1698.45 | 58.97 | -32.89 | 58.97 | 67.52 | 330.85 | .18 |
| 1800.00 | 2.42 | 329.02 | 1798.36 | 62.65 | -35.01 | 62.65 | 71.77 | 330.80 | .09 |
| 1900.00 | 2.10 | 327.51 | 1898.28 | 66.00 | -37.08 | 66.00 | 75.71 | 330.67 | .33 |
| 2000.00 | 1.91 | 328.78 | 1998.22 | 68.97 | -38.93 | 68.97 | 79.20 | 330.56 | .20 |
| 2100.00 | 1.53 | 332.82 | 2098.17 | 71.59 | -40.40 | 71.59 | 82.20 | 330.56 | .40 |
| 2200.00 | 1.24 | 352.10 | 2198.14 | 73.85 | -41.16 | 73.85 | 84.54 | 330.87 | .54 |
| 2300.00 | 1.07 | 16.82 | 2298.12 | 75.81 | -41.04 | 75.81 | 86.21 | 331.57 | .52 |
| 2400.00 | 1.10 | 17.78 | 2398.10 | 77.62 | -40.48 | 77.62 | 87.54 | 332.46 | .04 |
| 2500.00 | 1.04 | 19.28 | 2498.09 | 79.39 | -39.88 | 79.39 | 88.85 | 333.33 | .07 |
| 2600.00 | 1.01 | 21.73 | 2598.07 | 81.07 | -39.26 | 81.07 | 90.07 | 334.16 | .05 |
| 2700.00 | .65 | 25.19 | 2698.06 | 82.40 | -38.69 | 82.40 | 91.03 | 334.85 | .36 |
| 2800.00 | .27 | 68.11 | 2798.06 | 83.00 | -38.23 | 83.00 | 91.38 | 335.27 | .49 |
| 2900.00 | .12 | 122.79 | 2898.06 | 83.03 | -37.92 | 83.03 | 91.28 | 335.45 | .22 |
| 3000.00 | .05 | 207.14 | 2998.06 | 82.93 | -37.85 | 82.93 | 91.17 | 335.47 | .13 |
| 3100.00 | .37 | 317.44 | 3098.06 | 83.13 | -38.09 | 83.13 | 91.45 | 335.38 | .39 |
| 3200.00 | .94 | 319.46 | 3198.05 | 84.00 | -38.84 | 84.00 | 92.54 | 335.18 | .57 |
| 3300.00 | 1.09 | 316.95 | 3298.03 | 85.31 | -40.03 | 85.31 | 94.24 | 334.87 | .16 |
| 3400.00 | 1.20 | 296.74 | 3398.01 | 86.48 | -41.61 | 86.48 | 95.97 | 334.30 | .42 |
| 3500.00 | .72 | 265.13 | 3498.00 | 86.90 | -43.17 | 86.90 | 97.03 | 333.58 | .70 |
| 3600.00 | .93 | 281.27 | 3597.99 | 87.00 | -44.59 | 87.00 | 97.77 | 332.86 | .31 |
| 3700.00 | 1.15 | 303.92 | 3697.97 | 87.72 | -46.22 | 87.72 | 99.15 | 332.21 | .46 |
| 3800.00 | 1.27 | 292.21 | 3797.95 | 88.70 | -48.08 | 88.70 | 100.89 | 331.54 | .27 |
| 3900.00 | 1.33 | 282.81 | 3897.93 | 89.38 | -50.24 | 89.38 | 102.53 | 330.66 | .22 |
| 4000.00 | 1.08 | 286.86 | 3997.90 | 89.91 | -52.27 | 89.91 | 104.00 | 329.83 | .26 |
| 4100.00 | 1.10 | 315.21 | 4097.89 | 90.86 | -53.85 | 90.86 | 105.62 | 329.35 | .53 |
| 4200.00 | 1.20 | 316.25 | 4197.87 | 92.30 | -55.25 | 92.30 | 107.57 | 329.09 | .10 |
| 4300.00 | 1.08 | 307.90 | 4297.85 | 93.63 | -56.72 | 93.63 | 109.47 | 328.79 | .20 |
| 4400.00 | 1.08 | 305.86 | 4397.83 | 94.77 | -58.23 | 94.77 | 111.22 | 328.43 | .04 |
| 4500.00 | .72 | 298.47 | 4497.82 | 95.62 | -59.54 | 95.62 | 112.64 | 328.09 | .38 |
| 4600.00 | .60 | 245.79 | 4597.81 | 95.70 | -60.57 | 95.70 | 113.26 | 327.67 | .60 |

| 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 | |
| 4700.00 | 1.11 | 221.22 | 4697.80 | 94.76 | -61.69 | 94.76 | 113.07 | 326.94 | .62 |
| 4800.00 | 1.20 | 210.07 | 4797.78 | 93.12 | -62.85 | 93.12 | 112.35 | 325.98 | .24 |
| 4900.00 | .84 | 211.52 | 4897.76 | 91.59 | -63.76 | 91.59 | 111.60 | 325.16 | .36 |
| 5000.00 | .85 | 225.18 | 4997.75 | 90.45 | -64.67 | 90.45 | 111.19 | 324.44 | .20 |
| 5100.00 | .85 | 221.00 | 5097.74 | 89.36 | -65.68 | 89.36 | 110.90 | 323.68 | .06 |
| 5200.00 | .61 | 211.60 | 5197.73 | 88.35 | -66.45 | 88.35 | 110.55 | 323.05 | .27 |
| 5300.00 | .56 | 231.21 | 5297.73 | 87.59 | -67.11 | 87.59 | 110.34 | 322.54 | .21 |
| 5400.00 | .62 | 237.76 | 5397.72 | 87.00 | -67.95 | 87.00 | 110.38 | 322.01 | .09 |
| 5500.00 | .59 | 222.43 | 5497.72 | 86.33 | -68.75 | 86.33 | 110.36 | 321.47 | .16 |
| 5600.00 | .12 | 233.04 | 5597.72 | 85.88 | -69.18 | 85.88 | 110.28 | 321.15 | .47 |
| 5700.00 | .15 | 323.39 | 5697.72 | 85.93 | -69.34 | 85.93 | 110.42 | 321.10 | .19 |
| 5800.00 | .29 | 280.17 | 5797.71 | 86.08 | -69.67 | 86.08 | 110.74 | 321.01 | .21 |
| 5900.00 | .04 | 219.18 | 5897.71 | 86.09 | -69.94 | 86.09 | 110.92 | 320.91 | .27 |
| 6000.00 | .03 | 199.77 | 5997.71 | 86.04 | -69.97 | 86.04 | 110.90 | 320.88 | .02 |
| 6100.00 | .21 | 335.69 | 6097.71 | 86.18 | -70.06 | 86.18 | 111.07 | 320.89 | .23 |
| 6200.00 | .27 | 279.15 | 6197.71 | 86.39 | -70.36 | 86.39 | 111.42 | 320.84 | .23 |
| 6300.00 | .22 | 237.89 | 6297.71 | 86.32 | -70.76 | 86.32 | 111.62 | 320.66 | .18 |
| 6400.00 | .12 | 194.46 | 6397.71 | 86.12 | -70.95 | 86.12 | 111.58 | 320.52 | .16 |
| 6500.00 | .16 | 188.24 | 6497.71 | 85.88 | -70.99 | 85.88 | 111.43 | 320.42 | .04 |
| 6600.00 | .25 | 280.51 | 6597.71 | 85.78 | -71.23 | 85.78 | 111.50 | 320.30 | .30 |
| 6700.00 | .43 | 255.18 | 6697.71 | 85.73 | -71.81 | 85.73 | 111.83 | 320.05 | .23 |
| 6800.00 | .40 | 225.59 | 6797.71 | 85.39 | -72.42 | 85.39 | 111.96 | 319.70 | .21 |
| 6900.00 | .29 | 239.60 | 6897.71 | 85.01 | -72.89 | 85.01 | 111.98 | 319.39 | .14 |
| 7000.00 | .41 | 278.92 | 6997.70 | 84.94 | -73.46 | 84.94 | 112.30 | 319.15 | .26 |
| 7100.00 | .36 | 236.94 | 7097.70 | 84.82 | -74.08 | 84.82 | 112.62 | 318.87 | .28 |

Last Survey Depth Recorded

| | | | | | | | | | |
|---------|-----|--------|---------|-------|--------|-------|--------|--------|-----|
| 7200.00 | .19 | 220.35 | 7197.70 | 84.53 | -74.45 | 84.53 | 112.64 | 318.63 | .19 |
|---------|-----|--------|---------|-------|--------|-------|--------|--------|-----|