

# Final Surveys - Cimarex Vaca Draw 20-17 Federal #8H MWD 0ft-22328ft (Surcon Corrected) Survey Geodetic Report (Def Survey)

Report Date: March 11, 2019 - 09:31 AM  
 Client: Cimarex  
 Field: NM Lea County (NAD 83)  
 Structure / Slot: Cimarex Vaca Draw 20-17 Federal #8H / Cimarex Vaca Draw 20-17 Federal #8H  
 Well: Cimarex Vaca Draw 20-17 Federal #8H  
 Borehole: Original Borehole  
 UWI / API#: Unknown / Unknown  
 Survey Name: Final Surveys - Cimarex Vaca Draw 20-17 Federal #8H MWD 0ft-22328ft (Surcon Corrected)  
 Survey Date: January 09, 2019  
 Tort / AHD / DDI / ERD Ratio: 363.747' / 10809.621 ft / 6.650 / 0.872  
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet  
 Location Lat / Long: N 32° 6' 35.06070", W 103° 36' 1.99689"  
 Location Grid N/E Y/X: N 404430.870 ftUS, E 768221.880 ftUS  
 CRS Grid Convergence Angle: 0.3895°  
 Grid Scale Factor: 0.99998805  
 Version / Patch: 2.10.753.0

Survey / DLS Computation: Minimum Curvature / Lubinski  
 Vertical Section Azimuth: 359.630° (Grid North)  
 Vertical Section Origin: 0.000 ft, 0.000 ft  
 TVD Reference Datum: RKB  
 TVD Reference Elevation: 3445.900 ft above MSL  
 Seabed / Ground Elevation: 3422.900 ft above MSL  
 Magnetic Declination: 6.675°  
 Total Gravity Field Strength: 998.4295mgm (9.80685 Based)  
 Gravity Model: GARM  
 Total Magnetic Field Strength: 47805.222 nT  
 Magnetic Dip Angle: 59.732°  
 Declination Date: February 25, 2019  
 Magnetic Declination Model: HDGM 2019  
 North Reference: Grid North  
 Grid Convergence Used: 0.3895°  
 Total Corr Mag North->Grid North: 0.2854°  
 Local Coord Referenced To: Structure Reference Point

| Comments                    | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(ft/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ")           | Longitude<br>(E/W ° ' ") | Closure Azimuth<br>(°) | Closure<br>(ft) |
|-----------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|-------------------|--------------------|-------------------|-----------------------------------|--------------------------|------------------------|-----------------|
| SHL [330° FSL,<br>710° FWL] | 0.00       | 0.00        | 0.00             | 0.00        | 0.00         | 0.00       | 0.00       | N/A               | 404430.67          | 768221.88         | N 32° 6' 35.06" W 103° 36' 2.00"  |                          | 0.00                   | 0.00            |
|                             | 197.00     | 0.22        | 268.11           | 197.00      | -0.01        | -0.01      | -0.38      | 0.11              | 404430.66          | 768221.50         | N 32° 6' 35.06" W 103° 36' 2.00"  |                          | 268.11                 | 0.38            |
|                             | 299.00     | 0.09        | 14.98            | 299.00      | 0.06         | 0.06       | -0.55      | 0.26              | 404430.73          | 768221.33         | N 32° 6' 35.06" W 103° 36' 2.00"  |                          | 278.03                 | 0.56            |
|                             | 390.00     | 0.31        | 340.07           | 390.00      | 0.38         | 0.38       | -0.62      | 0.27              | 404431.03          | 768221.26         | N 32° 6' 35.06" W 103° 36' 2.00"  |                          | 300.13                 | 0.72            |
|                             | 481.00     | 0.31        | 308.08           | 481.00      | 0.75         | 0.74       | -0.90      | 0.19              | 404431.41          | 768220.98         | N 32° 6' 35.07" W 103° 36' 2.01"  |                          | 309.83                 | 1.16            |
|                             | 572.00     | 0.31        | 300.41           | 572.00      | 1.03         | 1.02       | -1.30      | 0.05              | 404431.69          | 768220.58         | N 32° 6' 35.07" W 103° 36' 2.01"  |                          | 308.03                 | 1.85            |
|                             | 664.00     | 0.49        | 290.18           | 663.99      | 1.29         | 1.28       | -1.89      | 0.21              | 404431.95          | 768219.99         | N 32° 6' 35.07" W 103° 36' 2.02"  |                          | 304.17                 | 2.28            |
|                             | 754.00     | 0.62        | 294.68           | 753.99      | 1.63         | 1.62       | -2.69      | 0.15              | 404432.29          | 768219.19         | N 32° 6' 35.08" W 103° 36' 2.03"  |                          | 301.00                 | 3.14            |
|                             | 846.00     | 0.49        | 129.29           | 845.99      | 1.59         | 1.58       | -2.84      | 1.20              | 404432.25          | 768219.04         | N 32° 6' 35.08" W 103° 36' 2.03"  |                          | 299.03                 | 3.25            |
|                             | 937.00     | 0.71        | 132.38           | 936.98      | 0.96         | 0.95       | -2.12      | 0.24              | 404431.62          | 768219.78         | N 32° 6' 35.07" W 103° 36' 2.02"  |                          | 294.11                 | 2.32            |
|                             | 1033.00    | 0.60        | 117.44           | 1032.98     | 0.32         | 0.32       | -1.23      | 0.21              | 404430.99          | 768220.05         | N 32° 6' 35.06" W 103° 36' 2.01"  |                          | 284.36                 | 1.27            |
|                             | 1127.00    | 0.89        | 116.34           | 1126.97     | -0.16        | -0.16      | -0.29      | 0.10              | 404430.51          | 768221.59         | N 32° 6' 35.06" W 103° 36' 2.00"  |                          | 240.88                 | 0.33            |
|                             | 1222.00    | 0.69        | 97.02            | 1221.99     | -0.49        | -0.49      | 0.79       | 0.24              | 404430.16          | 768222.67         | N 32° 6' 35.06" W 103° 36' 1.99"  |                          | 121.58                 | 0.63            |
|                             | 1317.00    | 0.60        | 79.12            | 1316.98     | -0.47        | -0.46      | 1.85       | 0.23              | 404430.21          | 768223.73         | N 32° 6' 35.06" W 103° 36' 1.98"  |                          | 104.04                 | 1.90            |
|                             | 1411.00    | 0.61        | 78.44            | 1410.95     | -0.29        | -0.27      | 2.82       | 0.01              | 404430.40          | 768224.70         | N 32° 6' 35.06" W 103° 36' 1.98"  |                          | 95.44                  | 2.83            |
|                             | 1506.00    | 0.57        | 40.20            | 1505.95     | 0.17         | 0.19       | 3.62       | 0.41              | 404430.86          | 768225.50         | N 32° 6' 35.06" W 103° 36' 1.95"  |                          | 88.93                  | 3.63            |
|                             | 1694.00    | 1.21        | 313.93           | 1693.93     | 2.27         | 2.29       | 2.79       | 0.69              | 404432.96          | 768224.87         | N 32° 6' 35.08" W 103° 36' 1.98"  |                          | 50.72                  | 3.81            |
|                             | 1789.00    | 2.02        | 311.08           | 1788.89     | 4.08         | 4.08       | 0.81       | 0.86              | 404434.75          | 768222.69         | N 32° 6' 35.10" W 103° 36' 1.99"  |                          | 11.22                  | 4.16            |
|                             | 1884.00    | 0.44        | 298.26           | 1883.87     | 5.38         | 5.35       | -0.77      | 1.68              | 404438.02          | 768221.11         | N 32° 6' 35.11" W 103° 36' 2.01"  |                          | 351.78                 | 5.41            |
|                             | 1978.00    | 2.08        | 105.38           | 1977.85     | 5.07         | 5.08       | 0.54       | 2.65              | 404435.75          | 768222.42         | N 32° 6' 35.11" W 103° 36' 1.99"  |                          | 8.04                   | 5.11            |
|                             | 2073.00    | 4.53        | 101.42           | 2072.69     | 3.84         | 3.88       | 5.86       | 2.61              | 404434.55          | 768227.74         | N 32° 6' 35.10" W 103° 36' 1.93"  |                          | 58.49                  | 7.03            |
|                             | 2167.00    | 5.71        | 96.86            | 2166.31     | 2.50         | 2.59       | 14.14      | 1.33              | 404433.28          | 768236.02         | N 32° 6' 35.09" W 103° 36' 1.83"  |                          | 79.63                  | 14.38           |
|                             | 2262.00    | 6.51        | 95.97            | 2260.77     | 1.31         | 1.46       | 24.19      | 0.85              | 404432.13          | 768246.07         | N 32° 6' 35.07" W 103° 36' 1.72"  |                          | 88.54                  | 24.24           |
|                             | 2355.00    | 5.88        | 95.56            | 2353.23     | 0.23         | 0.45       | 34.16      | 0.68              | 404431.12          | 768256.08         | N 32° 6' 35.06" W 103° 36' 1.60"  |                          | 89.24                  | 34.18           |
|                             | 2449.00    | 5.12        | 95.00            | 2448.79     | -0.66        | -0.38      | 43.15      | 0.81              | 404430.29          | 768265.03         | N 32° 6' 35.05" W 103° 36' 1.50"  |                          | 90.50                  | 43.15           |
|                             | 2544.00    | 5.59        | 92.32            | 2541.38     | -1.27        | -0.94      | 51.99      | 0.56              | 404429.73          | 768273.87         | N 32° 6' 35.05" W 103° 36' 1.39"  |                          | 91.03                  | 52.00           |
|                             | 2638.00    | 5.02        | 86.40            | 2634.86     | -1.25        | -0.88      | 60.67      | 0.84              | 404429.81          | 768282.55         | N 32° 6' 35.05" W 103° 36' 1.29"  |                          | 90.81                  | 60.68           |
|                             | 2733.00    | 3.85        | 76.30            | 2729.69     | -0.28        | 0.15       | 67.92      | 1.48              | 404430.62          | 768289.80         | N 32° 6' 35.06" W 103° 36' 1.21"  |                          | 89.67                  | 67.92           |
|                             | 2828.00    | 3.86        | 74.37            | 2824.48     | 1.29         | 1.77       | 74.10      | 0.14              | 404432.44          | 768295.98         | N 32° 6' 35.07" W 103° 36' 1.14"  |                          | 88.83                  | 74.12           |
|                             | 2923.00    | 3.97        | 80.68            | 2919.25     | 2.65         | 3.17       | 80.42      | 0.47              | 404433.64          | 768302.30         | N 32° 6' 35.09" W 103° 36' 1.06"  |                          | 87.75                  | 80.48           |
|                             | 3018.00    | 4.48        | 67.92            | 3014.00     | 2.62         | 3.19       | 87.34      | 1.44              | 404433.86          | 768309.22         | N 32° 6' 35.09" W 103° 36' 0.98"  |                          | 87.91                  | 87.40           |
|                             | 3112.00    | 5.04        | 94.37            | 3107.68     | 1.75         | 2.37       | 95.10      | 0.67              | 404433.04          | 768316.97         | N 32° 6' 35.08" W 103° 36' 0.89"  |                          | 88.57                  | 95.13           |
|                             | 3206.00    | 4.55        | 91.05            | 3201.35     | 1.32         | 1.98       | 102.94     | 0.60              | 404432.65          | 768324.82         | N 32° 6' 35.07" W 103° 36' 0.80"  |                          | 88.90                  | 102.96          |
|                             | 3300.00    | 3.70        | 82.93            | 3295.10     | 1.58         | 2.29       | 109.88     | 1.10              | 404432.96          | 768331.58         | N 32° 6' 35.08" W 103° 36' 0.72"  |                          | 88.80                  | 109.70          |
|                             | 3394.00    | 3.53        | 92.58            | 3388.92     | 1.79         | 2.53       | 115.58     | 0.87              | 404433.20          | 768337.48         | N 32° 6' 35.08" W 103° 36' 0.65"  |                          | 88.74                  | 115.61          |
|                             | 3488.00    | 3.67        | 118.82           | 3482.74     | 0.26         | 1.05       | 121.18     | 1.81              | 404431.72          | 768343.03         | N 32° 6' 35.08" W 103° 36' 0.59"  |                          | 89.51                  | 121.18          |
|                             | 3583.00    | 3.66        | 113.37           | 3577.54     | -2.35        | -1.53      | 126.65     | 0.23              | 404429.14          | 768348.53         | N 32° 6' 35.04" W 103° 36' 0.52"  |                          | 90.69                  | 126.66          |
|                             | 3677.00    | 3.57        | 117.89           | 3671.39     | -4.94        | -4.09      | 131.99     | 0.32              | 404426.58          | 768353.87         | N 32° 6' 35.01" W 103° 36' 0.46"  |                          | 91.77                  | 132.08          |
|                             | 3771.00    | 3.47        | 111.08           | 3765.18     | -7.37        | -6.48      | 137.23     | 0.46              | 404424.19          | 768359.11         | N 32° 6' 34.99" W 103° 36' 0.40"  |                          | 92.70                  | 137.39          |
|                             | 3859.00    | 3.34        | 101.33           | 3852.85     | -10.59       | -8.60      | 147.91     | 0.32              | 404421.07          | 768369.78         | N 32° 6' 34.96" W 103° 36' 0.28"  |                          | 93.71                  | 148.22          |
|                             | 4054.00    | 3.39        | 96.60            | 4047.68     | -11.48       | -10.47     | 153.42     | 0.30              | 404420.20          | 768375.29         | N 32° 6' 34.95" W 103° 36' 0.21"  |                          | 93.90                  | 153.77          |
|                             | 4148.00    | 3.22        | 94.46            | 4141.53     | -12.02       | -10.99     | 158.81     | 0.22              | 404416.68          | 768380.68         | N 32° 6' 34.94" W 103° 36' 0.15"  |                          | 93.96                  | 159.19          |
|                             | 4243.00    | 4.06        | 98.25            | 4236.34     | -12.75       | -11.68     | 164.80     | 0.92              | 404418.99          | 768388.67         | N 32° 6' 34.93" W 103° 36' 0.08"  |                          | 94.06                  | 165.21          |
|                             | 4337.00    | 5.48        | 97.79            | 4330.01     | -13.68       | -12.77     | 172.54     | 1.51              | 404417.90          | 768394.41         | N 32° 6' 34.92" W 103° 35' 59.99" |                          | 94.23                  | 173.01          |
|                             | 4431.00    | 5.89        | 98.82            | 4423.55     | -15.30       | -14.13     | 181.75     | 0.45              | 404416.54          | 768403.62         | N 32° 6' 34.91" W 103° 35' 59.88" |                          | 94.44                  | 182.30          |
|                             | 4526.00    | 6.18        | 100.75           | 4516.02     | -17.07       | -15.84     | 191.59     | 0.37              | 404414.83          | 768413.48         | N 32° 6' 34.89" W 103° 35' 59.77" |                          | 94.73                  | 192.24          |
|                             | 4553.00    | 5.59        | 98.35            | 4544.88     | -17.55       | -16.30     | 194.32     | 2.37              | 404414.37          | 768416.19         | N 32° 6' 34.89" W 103° 35' 59.74" |                          | 94.79                  | 195.00          |
|                             | 4620.00    | 5.73        | 101.10           | 4611.55     | -18.71       | -17.42     | 200.83     | 0.46              | 404413.25          | 768422.70         | N 32° 6' 34.87" W 103° 35' 59.66" |                          | 94.96                  | 201.58          |
|                             | 4714.00    | 5.15        | 100.66           | 4705.13     | -20.45       | -19.10     | 209.58     | 0.62              | 404411.57          | 768431.45         | N 32° 6' 34.86" W 103° 35' 59.56" |                          | 95.21                  | 210.45          |
|                             | 4808.00    | 3.20        | 96.17            | 4798.87     | -21.56       | -20.16     | 216.34     | 2.10              | 404410.51          | 768438.21         | N 32° 6' 34.85" W 103° 35' 59.46" |                          | 95.32                  | 217.27          |
|                             | 4903.00    | 3.48        | 76.69            | 4893.71     | -21.22       | -19.78     | 221.78     | 1.22              | 404410.89          | 768443.65         | N 32° 6' 34.85" W 103° 35' 59.42" |                          | 95.10                  | 222.66          |
|                             | 4998.00    | 3.25        | 79.32            | 4988.55     | -20.09       | -18.62     | 227.23     | 0.99              | 404412.05          | 768449.10         | N 32° 6' 34.86" W 103° 35' 59.36" |                          | 94.68                  | 227.99          |
|                             | 5092.00    | 3.33        | 79.34            | 5082.40     | -19.12       | -17.62     | 232.53     | 0.09              | 404413.05          | 768454.40         | N 32° 6' 34.87" W 103° 35' 59.29" |                          | 94.33                  | 233.20          |
|                             | 5187.00    | 3.24        | 78.44            | 5177.24     | -16.57       | -15.57     | 237.87     | 0.11              | 404414.10          | 768459.74         | N 32° 6' 34.88" W 103° 35' 59.23" |                          | 93.99                  | 238.45          |
|                             | 5281.00    | 3.27        | 80.59            | 5271.09     | -17.17       | -15.60     | 243.12     | 0.13              | 404415.07          | 768464.98         | N 32° 6' 34.89" W 103° 35' 59.17" |                          | 93.87                  | 243.62          |
|                             | 5375.00    | 3.44        | 79.54            | 5364.93     | -16.26       | -14.85     | 248.54     | 0.19              | 404416.02          | 768470.41         | N 32° 6' 34.90" W 103° 35' 59.11" |                          | 93.37                  | 248.97          |
|                             | 5470.00    | 3.80        | 80.90            | 5459.74     | -15.28       | -13.64     | 254.45     | 0.39              | 404417.03          | 768476.32         | N 32° 6' 34.91" W 103° 35' 59.04" |                          | 93.07                  | 254.81          |
|                             | 5564.00    | 4.00        | 82.17            | 5553.52     | -14.38       | -12.70     | 260.77     | 0.23              | 404417.97          | 768482.64         | N 32° 6' 34.92" W 103° 35' 58.97" |                          | 92.79                  | 261.08          |
|                             | 5658.00    | 4.52        | 82.80            | 5647.26     | -13.52       | -11.79     | 267.70     | 0.56              | 404418.88          | 768489.57         | N 32° 6' 34.93" W 103° 35' 58.89" |                          | 92.52                  | 267.96          |
|                             | 5753.00    | 4.41        | 80.11            | 5741.97     | -12.47       | -10.69     | 275.01     | 0.25              | 404419.98          | 768496.88         | N 32° 6' 34.94" W 103° 35' 58.80" |                          | 92.23                  | 275.22          |
|                             | 5847.00    | 4.19        | 81.29            | 5835.71     | -11.37       | -9.55      | 281.96     | 0.25              | 404421.12          | 768503.63         | N 32° 6' 34.95" W 103° 35' 58.72" |                          | 91.94                  | 282.12          |
|                             | 5942.00    | 3.68        | 79.13            | 5930.48     | -10.31       | -8.45      | 288.39     | 0.56              | 404422.22          | 768510.26         | N 32° 6' 34.96" W 103° 35' 58.64" |                          | 91.68                  | 288.51          |
|                             | 6036.00    | 3.62        | 80.18            | 6024.28     | -9.25        | -7.35      | 294.43     | 0.17              | 404423.32          | 768516.30         | N 32° 6                           |                          |                        |                 |

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(ft/100ft) | Northing<br>(ft) | Easting<br>(ft) | Latitude<br>(NS ° ' '') | Longitude<br>(EW ° ' '') | Closure Azimuth<br>(°) | Closure<br>(ft) |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|-------------------|------------------|-----------------|-------------------------|--------------------------|------------------------|-----------------|
|          | 8113.00    | 4.08        | 97.61            | 8096.13     | -7.57        | -4.73      | 439.00     | 0.21              | 404425.94        | 768880.66       | N 32° 34' 38.8" W       | 103° 35' 56.88"          | 90.82                  | 439.03          |
|          | 8207.00    | 3.94        | 91.31            | 8189.90     | -8.12        | -5.25      | 445.53     | 0.48              | 404425.42        | 768887.39       | N 32° 34' 38.8" W       | 103° 35' 56.82"          | 90.87                  | 445.56          |
|          | 8298.00    | 4.14        | 90.11            | 8280.68     | -8.24        | -5.32      | 451.94     | 0.24              | 404425.35        | 768873.80       | N 32° 34' 38.8" W       | 103° 35' 56.74"          | 90.87                  | 451.97          |
|          | 8392.00    | 5.23        | 82.25            | 8374.36     | -7.72        | -4.75      | 459.58     | 1.34              | 404425.82        | 768881.44       | N 32° 34' 38.8" W       | 103° 35' 56.85"          | 90.59                  | 459.80          |
|          | 8487.00    | 4.99        | 83.34            | 8468.98     | -8.71        | -3.69      | 467.97     | 0.27              | 404428.98        | 768889.83       | N 32° 34' 39.9" W       | 103° 35' 56.85"          | 90.45                  | 467.98          |
|          | 8581.00    | 4.81        | 84.10            | 8562.84     | -5.88        | -2.81      | 475.95     | 0.20              | 404427.88        | 768897.81       | N 32° 34' 35.00" W      | 103° 35' 56.48"          | 90.34                  | 475.96          |
|          | 8675.00    | 4.39        | 85.99            | 8656.34     | -5.28        | -2.15      | 483.48     | 0.47              | 404428.52        | 768705.32       | N 32° 34' 35.01" W      | 103° 35' 56.38"          | 90.28                  | 483.48          |
|          | 8770.00    | 4.14        | 87.80            | 8751.07     | -4.93        | -1.77      | 490.51     | 0.30              | 404428.90        | 768712.38       | N 32° 34' 35.01" W      | 103° 35' 56.29"          | 90.21                  | 490.52          |
|          | 8864.00    | 2.88        | 84.30            | 8844.90     | -4.61        | -1.40      | 498.24     | 1.38              | 404429.27        | 768718.10       | N 32° 34' 35.02" W      | 103° 35' 56.23"          | 90.18                  | 498.24          |
|          | 8959.00    | 1.54        | 83.04            | 8939.82     | -4.24        | -1.01      | 499.68     | 1.39              | 404428.68        | 768723.03       | N 32° 34' 35.02" W      | 103° 35' 56.19"          | 90.12                  | 499.68          |
|          | 9054.00    | 0.10        | 9034.81          | 9128.81     | -4.18        | -0.92      | 501.19     | 1.56              | 404428.75        | 768723.03       | N 32° 34' 35.02" W      | 103° 35' 56.19"          | 90.11                  | 501.19          |
|          | 9148.00    | 0.39        | 194.85           | 9223.81     | -4.52        | -1.29      | 501.18     | 0.37              | 404428.38        | 768723.03       | N 32° 34' 35.01" W      | 103° 35' 56.17"          | 90.15                  | 501.18          |
|          | 9243.00    | 0.58        | 217.51           | 9223.81     | -5.20        | -1.87      | 500.80     | 0.26              | 404428.70        | 768722.68       | N 32° 34' 35.01" W      | 103° 35' 56.17"          | 90.23                  | 500.80          |
|          | 9337.00    | 0.49        | 222.84           | 9317.80     | -5.86        | -2.63      | 500.24     | 0.09              | 404428.04        | 768722.11       | N 32° 34' 35.00" W      | 103° 35' 56.16"          | 90.30                  | 500.25          |
|          | 9431.00    | 0.38        | 230.89           | 9411.80     | -6.35        | -3.12      | 499.73     | 0.13              | 404427.55        | 768721.59       | N 32° 34' 35.00" W      | 103° 35' 56.19"          | 90.38                  | 499.74          |
|          | 9526.00    | 0.48        | 251.83           | 9506.80     | -6.66        | -3.44      | 499.12     | 0.18              | 404427.23        | 768720.89       | N 32° 34' 34.99" W      | 103° 35' 56.19"          | 90.39                  | 499.14          |
|          | 9620.00    | 0.97        | 257.54           | 9600.79     | -6.95        | -3.73      | 497.99     | 0.55              | 404428.94        | 768719.85       | N 32° 34' 34.99" W      | 103° 35' 56.21"          | 90.43                  | 498.00          |
|          | 9714.00    | 0.89        | 254.47           | 9694.78     | -7.32        | -4.12      | 496.43     | 0.06              | 404428.55        | 768718.29       | N 32° 34' 34.99" W      | 103° 35' 56.23"          | 90.48                  | 496.45          |
|          | 9808.00    | 0.50        | 268.58           | 9789.77     | -7.42        | -4.22      | 495.24     | 0.68              | 404428.45        | 768717.10       | N 32° 34' 34.99" W      | 103° 35' 56.24"          | 90.49                  | 495.25          |
|          | 9903.00    | 0.29        | 160.22           | 9883.77     | -7.52        | -4.33      | 494.93     | 0.76              | 404428.34        | 768716.79       | N 32° 34' 34.98" W      | 103° 35' 56.24"          | 90.50                  | 494.95          |
|          | 9997.00    | 0.71        | 129.93           | 9977.77     | -8.12        | -4.93      | 495.46     | 0.51              | 404425.75        | 768717.32       | N 32° 34' 34.98" W      | 103° 35' 56.24"          | 90.57                  | 495.48          |
|          | 10091.00   | 0.82        | 125.16           | 10071.76    | -8.69        | -5.69      | 496.45     | 0.14              | 404424.98        | 768718.32       | N 32° 34' 34.97" W      | 103° 35' 56.23"          | 90.66                  | 496.48          |
|          | 10186.00   | 0.89        | 149.40           | 10166.75    | -9.92        | -6.71      | 497.38     | 0.38              | 404423.96        | 768719.25       | N 32° 34' 34.96" W      | 103° 35' 56.21"          | 90.77                  | 497.43          |
|          | 10281.00   | 1.21        | 160.43           | 10261.73    | -11.51       | -8.29      | 498.10     | 0.40              | 404422.38        | 768719.96       | N 32° 34' 34.95" W      | 103° 35' 56.21"          | 90.95                  | 498.16          |
|          | 10375.00   | 1.41        | 167.38           | 10355.71    | -13.58       | -10.38     | 498.68     | 0.27              | 404420.31        | 768720.54       | N 32° 34' 34.92" W      | 103° 35' 56.20"          | 91.19                  | 498.79          |
|          | 10469.00   | 1.61        | 163.87           | 10449.67    | -15.98       | -12.75     | 499.30     | 0.23              | 404417.92        | 768721.16       | N 32° 34' 34.90" W      | 103° 35' 56.19"          | 91.48                  | 499.48          |
|          | 10563.00   | 1.22        | 168.00           | 10543.64    | -18.22       | -14.99     | 499.91     | 0.42              | 404415.68        | 768721.77       | N 32° 34' 34.88" W      | 103° 35' 56.19"          | 91.72                  | 500.13          |
|          | 10657.00   | 1.28        | 173.96           | 10637.62    | -20.24       | -17.01     | 500.26     | 0.20              | 404413.66        | 768722.13       | N 32° 34' 34.88" W      | 103° 35' 56.18"          | 91.95                  | 500.55          |
|          | 10752.00   | 1.45        | 182.79           | 10732.80    | -22.44       | -19.21     | 500.73     | 0.33              | 404411.48        | 768722.59       | N 32° 34' 34.84" W      | 103° 35' 56.18"          | 92.20                  | 501.10          |
|          | 10847.00   | 1.61        | 187.23           | 10827.56    | -24.90       | -21.68     | 501.38     | 0.21              | 404409.01        | 768723.24       | N 32° 34' 34.81" W      | 103° 35' 56.17"          | 92.47                  | 501.85          |
|          | 10941.00   | 1.55        | 183.68           | 10921.53    | -27.41       | -24.17     | 502.03     | 0.12              | 404406.50        | 768723.89       | N 32° 34' 34.79" W      | 103° 35' 56.18"          | 92.76                  | 502.81          |
|          | 11035.00   | 0.30        | 201.35           | 11015.51    | -28.88       | -25.82     | 502.30     | 1.41              | 404405.05        | 768724.16       | N 32° 34' 34.77" W      | 103° 35' 56.18"          | 92.92                  | 502.85          |
|          | 11130.00   | 0.58        | 280.01           | 11110.51    | -29.01       | -25.77     | 501.73     | 0.63              | 404404.90        | 768723.80       | N 32° 34' 34.77" W      | 103° 35' 56.17"          | 92.94                  | 502.39          |
|          | 11224.00   | 1.02        | 241.82           | 11204.50    | -29.31       | -26.08     | 500.53     | 0.71              | 404404.59        | 768722.39       | N 32° 34' 34.77" W      | 103° 35' 56.18"          | 92.98                  | 501.21          |
|          | 11319.00   | 1.61        | 234.63           | 11299.48    | -30.47       | -27.25     | 498.89     | 0.84              | 404403.42        | 768720.58       | N 32° 34' 34.78" W      | 103° 35' 56.20"          | 93.13                  | 499.44          |
|          | 11413.00   | 2.32        | 235.25           | 11393.42    | -32.30       | -29.10     | 496.05     | 0.78              | 404401.57        | 768717.92       | N 32° 34' 34.74" W      | 103° 35' 56.23"          | 93.38                  | 496.05          |
|          | 11507.00   | 2.17        | 262.68           | 11487.35    | -33.59       | -30.41     | 492.73     | 1.14              | 404400.26        | 768714.59       | N 32° 34' 34.73" W      | 103° 35' 56.27"          | 93.53                  | 493.68          |
|          | 11602.00   | 2.75        | 292.59           | 11582.27    | -35.18       | -32.03     | 489.13     | 1.47              | 404398.65        | 768710.99       | N 32° 34' 34.71" W      | 103° 35' 56.31"          | 93.75                  | 490.18          |
|          | 11697.00   | 2.80        | 228.97           | 11677.20    | -36.88       | -33.74     | 487.04     | 0.41              | 404396.93        | 768708.90       | N 32° 34' 34.69" W      | 103° 35' 56.34"          | 93.96                  | 488.20          |
|          | 11792.00   | 3.17        | 227.01           | 11770.11    | -39.10       | -35.97     | 484.57     | 0.47              | 404394.70        | 768706.43       | N 32° 34' 34.67" W      | 103° 35' 56.37"          | 94.25                  | 485.90          |
|          | 11887.00   | 0.78        | 174.00           | 11863.07    | -40.70       | -37.58     | 483.34     | 4.40              | 404393.09        | 768705.20       | N 32° 34' 34.68" W      | 103° 35' 56.38"          | 94.45                  | 484.79          |
|          | 11981.00   | 1.48        | 359.58           | 11974.07    | -40.52       | -37.40     | 483.35     | 7.22              | 404393.27        | 768705.22       | N 32° 34' 34.68" W      | 103° 35' 56.38"          | 94.42                  | 484.80          |
|          | 12076.00   | 5.68        | 351.43           | 12068.00    | -38.55       | -35.43     | 483.12     | 13.19             | 404395.24        | 768704.98       | N 32° 34' 34.68" W      | 103° 35' 56.38"          | 94.19                  | 484.41          |
|          | 12171.00   | 9.11        | 357.87           | 12162.74    | -34.58       | -31.46     | 482.79     | 11.41             | 404399.21        | 768704.65       | N 32° 34' 34.72" W      | 103° 35' 56.39"          | 93.73                  | 483.81          |
|          | 12266.00   | 12.55       | 359.58           | 12257.18    | -28.76       | -25.64     | 482.66     | 11.16             | 404405.03        | 768704.53       | N 32° 34' 34.77" W      | 103° 35' 56.39"          | 93.04                  | 483.34          |
|          | 12361.00   | 17.01       | 359.63           | 12352.18    | -20.60       | -17.48     | 482.81     | 13.94             | 404413.19        | 768704.47       | N 32° 34' 34.88" W      | 103° 35' 56.39"          | 92.07                  | 482.83          |
|          | 12456.00   | 20.64       | 359.78           | 12447.45    | -10.60       | -7.48      | 482.56     | 11.71             | 404423.19        | 768704.42       | N 32° 34' 34.95" W      | 103° 35' 56.39"          | 90.69                  | 482.62          |
|          | 12551.00   | 23.82       | 2.02             | 12542.77    | 1.50         | 4.62       | 482.76     | 10.28             | 404435.29        | 768704.63       | N 32° 34' 35.07" W      | 103° 35' 56.38"          | 89.45                  | 482.79          |
|          | 12646.00   | 28.32       | 5.24             | 12638.81    | 15.52        | 18.65      | 483.69     | 14.74             | 404449.32        | 768705.55       | N 32° 34' 35.21" W      | 103° 35' 56.37"          | 87.79                  | 484.05          |
|          | 12741.00   | 31.88       | 5.81             | 12732.61    | 31.01        | 34.14      | 485.19     | 11.84             | 404464.81        | 768707.05       | N 32° 34' 35.37" W      | 103° 35' 56.35"          | 85.97                  | 486.39          |
|          | 12836.00   | 34.84       | 5.13             | 12828.49    | 47.99        | 51.13      | 486.81     | 9.30              | 404481.80        | 768708.88       | N 32° 34' 35.53" W      | 103° 35' 56.33"          | 84.00                  | 489.49          |
|          | 12931.00   | 38.59       | 5.17             | 12924.13    | 67.02        | 70.18      | 488.53     | 11.72             | 404500.85        | 768710.39       | N 32° 34' 35.72" W      | 103° 35' 56.31"          | 81.82                  | 493.54          |
|          | 13026.00   | 41.64       | 4.44             | 13019.58    | 87.56        | 90.72      | 490.25     | 9.84              | 404521.39        | 768712.12       | N 32° 34' 35.93" W      | 103° 35' 56.29"          | 79.52                  | 496.58          |
|          | 13121.00   | 43.16       | 3.43             | 13115.23    | 109.07       | 112.25     | 491.73     | 5.20              | 404542.62        | 768713.59       | N 32° 34' 36.14" W      | 103° 35' 56.27"          | 77.14                  | 504.38          |
|          | 13216.00   | 44.79       | 2.80             | 13210.54    | 130.56       | 133.74     | 492.90     | 5.44              | 404564.41        | 768714.78       | N 32° 34' 36.35" W      | 103° 35' 56.28"          | 74.82                  | 510.72          |
|          | 13311.00   | 48.05       | 2.45             | 13215.81    | 152.98       | 156.17     | 493.92     | 10.55             | 404586.84        | 768715.79       | N 32° 34' 36.57" W      | 103° 35' 56.24"          | 72.45                  | 518.03          |
|          | 13406.00   | 51.48       | 1.70             | 13218.58    | 177.38       | 180.58     | 494.80     | 10.81             | 404611.24        | 768716.87       | N 32° 34' 36.81" W      | 103° 35' 56.23"          | 69.95                  | 526.73          |
|          | 13501.00   | 56.22       | 1.78             | 13221.87    | 202.38       | 205.59     | 495.56     | 15.38             | 404636.25        | 768717.43       | N 32° 34' 37.06" W      | 103° 35' 56.22"          | 67.47                  | 536.52          |
|          | 13596.00   | 60.24       | 2.11             | 13223.18    | 228.71       | 231.92     | 496.48     | 13.00             | 404662.58        | 768718.32       | N 32° 34' 37.32" W      | 103° 35' 56.21"          | 64.96                  | 547.96          |
|          | 13691.00   | 63.20       | 2.33             | 13226.34    | 256.86       | 260.08     | 497.55     | 9.27              | 404690.74        | 768719.42       | N 32° 34' 37.60" W      | 103° 35' 56.19"          | 62.40                  | 561.43          |
|          | 13786.00   | 66.48       | 1.63             | 13229.52    | 284.89       | 288.12     | 498.52     | 10.78             | 404718.78        | 768720.38       | N 32° 34' 37.88" W      | 103° 35' 56.18"          | 59.97                  | 575.79          |
|          | 13881.00   | 68.77       | 1.29             | 13232.67    | 301.53       | 304.76     | 498.94     | 12.84             | 404745.41        | 768720.81       | N 32° 34' 38.04" W      | 103° 35' 56.17"          | 58.58                  | 584.65          |
|          | 13976.00   | 75.07       | 1.80             | 13235.84    | 372.75       | 375.99     | 500.87     | 8.42              | 404808.05        | 768722.73       | N 32° 34' 38.75" W      | 103° 35' 56.14"          | 53.11                  | 626.29          |
|          | 14071.00   | 77.03       | 2.44             | 13238.99    | 402.70       | 405.95     | 501.98     | 2.38              | 404836.81        | 768723.84       | N 32° 34' 39.04" W      | 103° 35' 56.13"          | 51.04                  | 645.58          |
|          | 14166.00   | 78.40       | 3.38             | 13242.14    | 432.92       | 436.17     | 503.56     | 6.17              | 404869.67        | 768725.43       | N 32° 34' 39.34" W      | 103° 35' 56.11"          | 49.11                  | 666.10          |
|          | 14261.00   | 79.80       | 4.94             | 13245.29    | 463.93       | 467.21     | 505.73     | 4.90              | 404902.86        | 768727.59       | N 32° 34' 39.65" W      | 103° 35' 56.08"          | 47.27                  | 688.51          |
|          | 14356.00   | 81.54       | 5.89             | 13248.44    | 494.26       | 497.55     | 508.20     | 4.88              | 404936.20        | 768730.08       | N 32                    |                          |                        |                 |

| Comments                                          | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(ft/100ft) | Northing<br>(ft) | Easting<br>(ft) | Latitude<br>(N/S ° ° °) | Longitude<br>(E/W ° ° °) | Closure Azimuth<br>(°) | Closure<br>(ft) |
|---------------------------------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|-------------------|------------------|-----------------|-------------------------|--------------------------|------------------------|-----------------|
|                                                   | 16840.00   | 89.83       | 358.90           | 12358.15    | 4699.54      | 4702.73    | 477.64     | 2.39              | 409133.24        | 788699.50       | N 32 7 21.56 W          | 103 35 56.07             | 5.80                   | 4726.92         |
|                                                   | 16935.00   | 89.82       | 1.44             | 12358.61    | 4794.53      | 4797.72    | 477.92     | 2.68              | 409228.22        | 788699.78       | N 32 7 22.50 W          | 103 35 56.06             | 5.89                   | 4821.48         |
|                                                   | 17029.00   | 90.65       | 358.93           | 12358.39    | 4888.50      | 4891.68    | 478.58     | 4.92              | 409322.19        | 788698.45       | N 32 7 23.43 W          | 103 35 56.07             | 5.58                   | 4914.84         |
| Section Line<br>Crossing [1215'<br>FWL]           | 17089.30   | 90.24       | 357.71           | 12357.92    | 4948.75      | 4951.91    | 473.76     | 1.46              | 409382.42        | 788695.03       | N 32 7 24.03 W          | 103 35 56.10             | 5.47                   | 4974.53         |
|                                                   | 17124.00   | 90.00       | 358.16           | 12357.85    | 4983.44      | 4986.59    | 472.51     | 1.46              | 409417.09        | 788694.38       | N 32 7 24.37 W          | 103 35 56.11             | 5.41                   | 5008.93         |
|                                                   | 17218.00   | 89.80       | 357.81           | 12357.93    | 5077.39      | 5080.53    | 469.05     | 0.99              | 409511.02        | 788690.91       | N 32 7 25.30 W          | 103 35 56.14             | 5.27                   | 5102.13         |
|                                                   | 17312.00   | 91.20       | 358.99           | 12357.03    | 5171.36      | 5174.48    | 466.26     | 2.02              | 409604.87        | 788688.12       | N 32 7 26.23 W          | 103 35 56.17             | 5.15                   | 5195.44         |
|                                                   | 17406.00   | 94.54       | 359.10           | 12352.32    | 5265.22      | 5268.33    | 464.69     | 3.56              | 409698.82        | 788686.58       | N 32 7 27.16 W          | 103 35 56.18             | 5.04                   | 5288.79         |
|                                                   | 17500.00   | 91.89       | 357.77           | 12347.05    | 5359.04      | 5362.14    | 462.13     | 3.15              | 409792.63        | 788683.99       | N 32 7 28.09 W          | 103 35 56.20             | 4.93                   | 5382.02         |
|                                                   | 17594.00   | 90.10       | 358.56           | 12345.42    | 5452.84      | 5456.00    | 457.48     | 2.30              | 409886.49        | 788679.34       | N 32 7 28.02 W          | 103 35 56.25             | 4.79                   | 5475.15         |
|                                                   | 17688.00   | 87.83       | 354.35           | 12347.11    | 5548.68      | 5549.68    | 450.03     | 3.37              | 409980.16        | 788671.90       | N 32 7 28.94 W          | 103 35 56.33             | 4.64                   | 5567.90         |
|                                                   | 17782.00   | 84.56       | 353.81           | 12353.35    | 5640.00      | 5642.98    | 440.38     | 3.53              | 410073.44        | 788662.23       | N 32 7 30.87 W          | 103 35 56.43             | 4.48                   | 5660.12         |
|                                                   | 17876.00   | 83.00       | 357.83           | 12363.54    | 5733.21      | 5736.13    | 433.38     | 4.37              | 410166.80        | 788655.25       | N 32 7 31.79 W          | 103 35 56.50             | 4.32                   | 5752.47         |
|                                                   | 17970.00   | 82.45       | 0.87             | 12375.45    | 5826.44      | 5829.35    | 432.16     | 3.47              | 410259.82        | 788654.03       | N 32 7 32.71 W          | 103 35 56.51             | 4.24                   | 5845.35         |
|                                                   | 18064.00   | 83.28       | 3.78             | 12387.12    | 5919.59      | 5922.53    | 435.95     | 3.20              | 410353.00        | 788657.81       | N 32 7 33.64 W          | 103 35 56.48             | 4.21                   | 5938.56         |
|                                                   | 18158.00   | 89.90       | 5.22             | 12392.71    | 6013.03      | 6016.02    | 443.31     | 7.21              | 410446.49        | 788655.18       | N 32 7 34.56 W          | 103 35 56.37             | 4.21                   | 6032.33         |
|                                                   | 18252.00   | 91.31       | 4.42             | 12391.72    | 6106.64      | 6109.68    | 451.21     | 1.72              | 410540.14        | 788673.07       | N 32 7 35.49 W          | 103 35 56.27             | 4.22                   | 6126.32         |
|                                                   | 18346.00   | 89.31       | 1.72             | 12391.21    | 6200.46      | 6203.53    | 458.24     | 3.57              | 410633.99        | 788678.11       | N 32 7 36.41 W          | 103 35 56.20             | 4.21                   | 6220.26         |
|                                                   | 18440.00   | 88.21       | 0.85             | 12392.43    | 6294.41      | 6297.50    | 458.35     | 0.83              | 410727.95        | 788680.21       | N 32 7 37.34 W          | 103 35 56.17             | 4.16                   | 6314.16         |
|                                                   | 18534.00   | 92.20       | 357.62           | 12391.27    | 6388.37      | 6391.46    | 457.10     | 4.68              | 410821.91        | 788678.98       | N 32 7 38.27 W          | 103 35 56.18             | 4.09                   | 6407.78         |
|                                                   | 18628.00   | 88.00       | 357.23           | 12390.28    | 6482.29      | 6485.35    | 452.87     | 3.43              | 410915.80        | 788674.74       | N 32 7 39.20 W          | 103 35 56.22             | 3.99                   | 6501.14         |
|                                                   | 18723.00   | 88.86       | 1.43             | 12392.22    | 6577.25      | 6580.30    | 451.78     | 4.43              | 411010.75        | 788673.83       | N 32 7 40.14 W          | 103 35 56.22             | 3.93                   | 6595.79         |
|                                                   | 18817.00   | 90.65       | 1.98             | 12392.79    | 6671.18      | 6674.25    | 454.56     | 2.20              | 411104.69        | 788676.42       | N 32 7 41.07 W          | 103 35 56.18             | 3.90                   | 6689.71         |
|                                                   | 18911.00   | 89.00       | 1.38             | 12393.08    | 6765.11      | 6768.21    | 457.31     | 1.87              | 411198.65        | 788679.18       | N 32 7 42.00 W          | 103 35 56.14             | 3.87                   | 6783.64         |
|                                                   | 19005.00   | 90.86       | 2.35             | 12393.19    | 6859.04      | 6862.15    | 460.37     | 2.23              | 411292.59        | 788682.24       | N 32 7 42.93 W          | 103 35 56.10             | 3.84                   | 6877.58         |
|                                                   | 19099.00   | 92.88       | 2.19             | 12390.29    | 6952.89      | 6956.03    | 464.09     | 1.84              | 411386.48        | 788685.06       | N 32 7 43.86 W          | 103 35 56.05             | 3.82                   | 6971.49         |
|                                                   | 19193.00   | 91.65       | 359.92           | 12388.74    | 7046.78      | 7049.94    | 465.82     | 2.65              | 411480.37        | 788687.69       | N 32 7 44.79 W          | 103 35 56.02             | 3.78                   | 7065.31         |
|                                                   | 19287.00   | 91.79       | 357.70           | 12383.92    | 7140.73      | 7143.87    | 463.87     | 2.37              | 411574.30        | 788685.74       | N 32 7 45.72 W          | 103 35 56.04             | 3.72                   | 7158.91         |
|                                                   | 19381.00   | 92.10       | 359.71           | 12380.73    | 7234.65      | 7237.79    | 461.75     | 2.16              | 411668.21        | 788683.61       | N 32 7 46.65 W          | 103 35 56.06             | 3.65                   | 7252.50         |
|                                                   | 19475.00   | 89.97       | 357.38           | 12379.03    | 7328.81      | 7331.73    | 459.36     | 3.38              | 411762.15        | 788681.23       | N 32 7 47.58 W          | 103 35 56.08             | 3.59                   | 7346.11         |
|                                                   | 19569.00   | 91.20       | 358.92           | 12378.07    | 7422.52      | 7425.61    | 454.69     | 1.40              | 411856.02        | 788678.55       | N 32 7 48.51 W          | 103 35 56.12             | 3.50                   | 7439.51         |
|                                                   | 19663.00   | 89.62       | 358.25           | 12377.40    | 7516.38      | 7519.43    | 449.09     | 1.83              | 411949.85        | 788670.95       | N 32 7 49.44 W          | 103 35 56.18             | 3.42                   | 7532.83         |
|                                                   | 19758.00   | 91.93       | 355.22           | 12376.14    | 7609.15      | 7612.18    | 442.18     | 2.72              | 412042.57        | 788684.04       | N 32 7 50.35 W          | 103 35 56.25             | 3.32                   | 7624.99         |
|                                                   | 19851.00   | 90.10       | 353.97           | 12374.45    | 7703.76      | 7706.72    | 432.23     | 2.33              | 412137.13        | 788655.09       | N 32 7 51.29 W          | 103 35 56.35             | 3.22                   | 7718.88         |
|                                                   | 19944.00   | 88.93       | 356.85           | 12375.24    | 7796.50      | 7799.41    | 425.87     | 3.44              | 412229.81        | 788647.73       | N 32 7 52.21 W          | 103 35 56.43             | 3.13                   | 7811.03         |
|                                                   | 20039.00   | 90.17       | 359.68           | 12375.99    | 7891.48      | 7894.35    | 423.08     | 3.14              | 412324.78        | 788644.92       | N 32 7 53.15 W          | 103 35 56.45             | 3.07                   | 7905.68         |
|                                                   | 20133.00   | 90.07       | 1.38             | 12375.79    | 7985.44      | 7988.35    | 423.91     | 1.83              | 412418.75        | 788645.78       | N 32 7 54.08 W          | 103 35 56.44             | 3.04                   | 7999.59         |
|                                                   | 20228.00   | 92.96       | 358.57           | 12373.28    | 8080.39      | 8083.29    | 423.67     | 4.24              | 412513.69        | 788645.74       | N 32 7 55.02 W          | 103 35 56.43             | 3.00                   | 8094.40         |
|                                                   | 20322.00   | 92.82       | 358.55           | 12368.54    | 8174.25      | 8177.14    | 421.51     | 0.15              | 412607.54        | 788643.38       | N 32 7 55.95 W          | 103 35 56.45             | 2.95                   | 8188.00         |
|                                                   | 20416.00   | 90.52       | 359.32           | 12365.80    | 8268.20      | 8271.08    | 419.77     | 2.58              | 412701.47        | 788641.63       | N 32 7 56.88 W          | 103 35 56.46             | 2.91                   | 8281.73         |
|                                                   | 20510.00   | 88.73       | 2.85             | 12368.42    | 8362.15      | 8365.05    | 421.38     | 4.02              | 412795.43        | 788643.25       | N 32 7 57.81 W          | 103 35 56.44             | 2.88                   | 8375.68         |
|                                                   | 20604.00   | 90.79       | 2.20             | 12368.81    | 8456.04      | 8458.96    | 425.36     | 2.24              | 412889.34        | 788647.22       | N 32 7 58.73 W          | 103 35 56.38             | 2.88                   | 8469.65         |
|                                                   | 20698.00   | 90.31       | 1.57             | 12365.91    | 8549.96      | 8552.90    | 428.45     | 0.84              | 412983.28        | 788650.32       | N 32 7 59.66 W          | 103 35 56.34             | 2.87                   | 8563.63         |
|                                                   | 20792.00   | 90.83       | 0.95             | 12364.97    | 8643.91      | 8646.87    | 430.52     | 0.86              | 413077.25        | 788652.38       | N 32 8 0.59 W           | 103 35 56.31             | 2.85                   | 8657.59         |
|                                                   | 20886.00   | 88.89       | 1.23             | 12365.37    | 8737.88      | 8740.85    | 432.31     | 2.30              | 413171.22        | 788654.17       | N 32 8 1.52 W           | 103 35 56.28             | 2.83                   | 8751.53         |
|                                                   | 20980.00   | 91.27       | 1.39             | 12365.40    | 8831.83      | 8834.82    | 434.45     | 2.75              | 413265.19        | 788656.32       | N 32 8 2.45 W           | 103 35 56.25             | 2.82                   | 8845.49         |
|                                                   | 21074.00   | 90.41       | 0.13             | 12364.02    | 8925.80      | 8928.80    | 435.70     | 1.82              | 413359.18        | 788657.57       | N 32 8 3.38 W           | 103 35 56.22             | 2.79                   | 8939.42         |
|                                                   | 21168.00   | 90.10       | 0.49             | 12363.60    | 9020.79      | 9023.79    | 436.21     | 0.50              | 413454.16        | 788658.08       | N 32 8 4.32 W           | 103 35 56.21             | 2.77                   | 9034.33         |
|                                                   | 21262.00   | 89.55       | 0.63             | 12363.88    | 9113.78      | 9116.79    | 437.12     | 0.81              | 413547.15        | 788658.99       | N 32 8 5.24 W           | 103 35 56.19             | 2.75                   | 9127.26         |
|                                                   | 21357.00   | 91.65       | 1.48             | 12362.89    | 9208.74      | 9211.76    | 438.86     | 2.38              | 413642.12        | 788660.72       | N 32 8 6.18 W           | 103 35 56.16             | 2.73                   | 9222.21         |
|                                                   | 21451.00   | 92.34       | 1.84             | 12359.61    | 9302.82      | 9305.67    | 441.56     | 0.84              | 413736.02        | 788663.43       | N 32 8 7.11 W           | 103 35 56.13             | 2.72                   | 9316.14         |
|                                                   | 21545.00   | 92.20       | 1.71             | 12355.89    | 9396.48      | 9399.55    | 444.47     | 0.20              | 413829.90        | 788666.34       | N 32 8 8.04 W           | 103 35 56.08             | 2.71                   | 9410.05         |
|                                                   | 21639.00   | 92.13       | 1.67             | 12352.34    | 9490.35      | 9493.44    | 447.24     | 0.09              | 413923.79        | 788669.11       | N 32 8 8.97 W           | 103 35 56.05             | 2.70                   | 9503.97         |
|                                                   | 21734.00   | 91.62       | 359.80           | 12349.23    | 9585.28      | 9588.38    | 448.48     | 2.04              | 414018.72        | 788670.32       | N 32 8 9.91 W           | 103 35 56.02             | 2.68                   | 9598.88         |
|                                                   | 21828.00   | 90.79       | 357.81           | 12347.25    | 9679.24      | 9682.32    | 448.33     | 2.49              | 414112.67        | 788668.20       | N 32 8 10.84 W          | 103 35 56.04             | 2.64                   | 9692.81         |
|                                                   | 21921.00   | 90.62       | 357.22           | 12346.11    | 9772.18      | 9775.22    | 442.14     | 0.48              | 414205.56        | 788664.01       | N 32 8 11.78 W          | 103 35 56.08             | 2.59                   | 9785.22         |
|                                                   | 22015.00   | 91.00       | 357.77           | 12344.78    | 9866.09      | 9869.12    | 438.03     | 0.71              | 414299.46        | 788659.90       | N 32 8 12.69 W          | 103 35 56.12             | 2.54                   | 9878.84         |
|                                                   | 22109.00   | 91.13       | 359.13           | 12343.03    | 9960.05      | 9963.07    | 435.49     | 1.45              | 414393.40        | 788657.38       | N 32 8 13.62 W          | 103 35 56.14             | 2.50                   | 9972.58         |
|                                                   | 22203.00   | 89.68       | 359.13           | 12342.39    | 10054.04     | 10057.05   | 434.06     | 1.58              | 414487.38        | 788655.93       | N 32 8 14.55 W          | 103 35 56.15             | 2.47                   | 10066.42        |
| Last Legal Take<br>Point [100' FNL,<br>1208' FWL] | 22278.30   | 88.75       | 358.57           | 12343.43    | 10129.33     | 10132.33   | 432.55     | 1.43              | 414582.66        | 788654.41       | N 32 8 15.29 W          | 103 35 56.17             | 2.44                   | 10141.56        |
| Last Survey                                       | 22283.00   | 88.69       | 358.53           | 12343.54    | 10134.02     | 10137.03   | 432.43     | 1.43              | 414587.35        | 788654.29       | N 32 8 15.34 W          | 103 35 56.17             | 2.44                   | 10148.25        |
| TD, PTB [50'<br>FNL, 1208' FWL]                   | 22328.00   | 90.05       | 1.00             | 12344.03    | 10178.02     | 10182.02   | 432.25     | 6.27              | 414612.34        | 788654.11       | N 32 8 15.78 W          | 103 35 56.16             | 2.43                   | 10191.19        |

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 \*\*\* 3-D 95.000% Confidence 2.7955 sigma  
Survey Program:

| Description | Part | MD From<br>(ft) | MD To<br>(ft) | EOU Freq<br>(ft) | Hole Size<br>(in) | Casing Diameter<br>(in) | Survey Tool Type           | Borehole / Survey                                                                                      |
|-------------|------|-----------------|---------------|------------------|-------------------|-------------------------|----------------------------|--------------------------------------------------------------------------------------------------------|
|             | 1    | 0.000           | 23.000        | 1/88.425         | 12.250            | 9.825                   | NAL_MWD_IFR1+MS-Depth Only | Original Borehole / Final Surveys -<br>Cimarex Vaca Draw 20-17 Federal<br>88H MWD 0ft-22328ft (Surcon) |
|             | 1    | 23.000          | 23.000        | Act Strs         | 12.250            | 9.825                   | NAL_MWD_IFR1+MS-Depth Only | Original Borehole / Final Surveys -<br>Cimarex Vaca Draw 20-17 Federal<br>88H MWD 0ft-22328ft (Surcon) |
|             | 1    | 23.000          | 11657.000     | Act Strs         | 12.250            | 9.825                   | NAL_MWD_IFR1+MS            | Original Borehole / Final Surveys -<br>Cimarex Vaca Draw 20-17 Federal                                 |
|             | 1    | 11657.000       | 12505.000     | Act Strs         | 8.750             | 7.000                   | NAL_MWD_IFR1+MS            | Original Borehole / Final Surveys -<br>Cimarex Vaca Draw 20-17 Federal                                 |
|             | 1    | 12505.000       | 22328.000     | Act Strs         | 8.750             | 4.500                   | NAL_MWD_IFR1+MS            | Original Borehole / Final Surveys -<br>Cimarex Vaca Draw 20-17 Federal                                 |