

30-025-41473

## Final PvA



Grid  
True      Mag

Grid North  
Tot Corr (M→G 6.409°)  
Mag Dec (6.830°)  
Grid Conv (0.421°)

**CONTROLLED**

Patient: [ ]  
 Referring: [ ]  
 Copy: [ ]  
 Date: [ ]

Department: [ ]  
 Date: [ ]

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# Cimarex West Bell Lake 26 Federal #2H Final Survey Survey Geodetic Report (Def Survey)



Report Date: September 13, 2017 - 03:32 PM  
Client: Cimarex  
Field: NM Lea County (NAD 83)  
Structure / Slot: Cimarex West Bell Lake 26 Federal #2H / Cimarex West Bell Lake 26 Federal #2H  
Well: Cimarex West Bell Lake 26 Federal #2H  
Borehole: Original Borehole  
UWI / API#: Unknown / Unknown  
Survey Name: Cimarex West Bell Lake 26 Federal #2H Final Survey  
Survey Date: August 25, 2017  
Tort / AHD / DDI / ERD Ratio: 200.605 ° / 5027.810 ft / 6.150 / 0.444  
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet  
Location Lat / Long: N 32° 16' 9.40177", W 103° 32' 39.05625"  
Location Grid N/E Y/X: N 462593.300 ftUS, E 785250.600 ftUS  
CRS Grid Convergence Angle: 0.4213 °  
Grid Scale Factor: 0.99997723  
Version / Patch: 2.10.254.0

Survey / DLS Computation: Minimum Curvature / Lubinski  
Vertical Section Azimuth: 359.580 ° (Grid North)  
Vertical Section Origin: 0.000 ft, 0.000 ft  
TVD Reference Datum: RKB  
TVD Reference Elevation: 3668.000 ft above MSL  
Seabed / Ground Elevation: 3643.000 ft above MSL  
Magnetic Declination: 6.830 °  
Total Gravity Field Strength: 998.4433mgn (9.80665 Based)  
Gravity Model: GARM  
Total Magnetic Field Strength: 48146.391 nT  
Magnetic Dip Angle: 60.071 °  
Declination Date: September 07, 2017  
Magnetic Declination Model: HDGM 2016  
North Reference: Grid North  
Grid Convergence Used: 0.4213 °  
Total Corr Mag North->Grid North: 6.4085 °  
Local Coord Referenced To: Well Head

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
| Tie-In   | 0.00       | 0.00        | 0.00             | 0.00        | 0.00         | 0.00       | 0.00       | N/A              | 462593.30          | 785250.60         | N 32 16 9.40            | W 103 32 39.06           |
|          | 173.00     | 0.09        | 87.90            | 173.00      | 0.00         | 0.00       | 0.14       | 0.05             | 462593.30          | 785250.74         | N 32 16 9.40            | W 103 32 39.05           |
|          | 302.00     | 0.09        | 184.72           | 302.00      | -0.09        | -0.09      | 0.23       | 0.10             | 462593.21          | 785250.83         | N 32 16 9.40            | W 103 32 39.05           |
|          | 392.00     | 0.09        | 255.62           | 392.00      | -0.18        | -0.18      | 0.15       | 0.12             | 462593.12          | 785250.75         | N 32 16 9.40            | W 103 32 39.05           |
|          | 482.00     | 0.22        | 216.93           | 482.00      | -0.34        | -0.34      | -0.02      | 0.18             | 462592.96          | 785250.58         | N 32 16 9.40            | W 103 32 39.06           |
|          | 575.00     | 0.22        | 134.71           | 575.00      | -0.60        | -0.60      | 0.00       | 0.31             | 462592.70          | 785250.60         | N 32 16 9.40            | W 103 32 39.06           |
|          | 665.00     | 0.22        | 298.01           | 665.00      | -0.64        | -0.64      | -0.03      | 0.48             | 462592.66          | 785250.57         | N 32 16 9.40            | W 103 32 39.06           |
|          | 757.00     | 0.31        | 276.02           | 757.00      | -0.53        | -0.54      | -0.43      | 0.15             | 462592.76          | 785250.17         | N 32 16 9.40            | W 103 32 39.06           |
|          | 847.00     | 0.31        | 247.91           | 847.00      | -0.60        | -0.60      | -0.90      | 0.17             | 462592.70          | 785249.70         | N 32 16 9.40            | W 103 32 39.07           |
|          | 938.00     | 0.22        | 243.33           | 938.00      | -0.76        | -0.77      | -1.28      | 0.10             | 462592.53          | 785249.32         | N 32 16 9.39            | W 103 32 39.07           |
|          | 1033.00    | 0.22        | 241.52           | 1032.99     | -0.93        | -0.94      | -1.61      | 0.01             | 462592.36          | 785248.99         | N 32 16 9.39            | W 103 32 39.08           |
|          | 1128.00    | 0.31        | 260.91           | 1127.99     | -1.05        | -1.07      | -2.02      | 0.13             | 462592.23          | 785248.58         | N 32 16 9.39            | W 103 32 39.08           |
|          | 1223.00    | 0.31        | 285.50           | 1222.99     | -1.02        | -1.04      | -2.52      | 0.14             | 462592.26          | 785248.08         | N 32 16 9.39            | W 103 32 39.09           |
|          | 1317.00    | 0.31        | 250.42           | 1316.99     | -1.04        | -1.06      | -3.01      | 0.20             | 462592.24          | 785247.59         | N 32 16 9.39            | W 103 32 39.09           |
|          | 1348.00    | 0.31        | 257.82           | 1347.99     | -1.08        | -1.10      | -3.17      | 0.13             | 462592.20          | 785247.43         | N 32 16 9.39            | W 103 32 39.09           |
|          | 1506.00    | 0.40        | 275.72           | 1505.99     | -1.11        | -1.14      | -4.13      | 0.09             | 462592.16          | 785246.47         | N 32 16 9.39            | W 103 32 39.10           |
|          | 1600.00    | 0.49        | 298.23           | 1599.98     | -0.88        | -0.92      | -4.82      | 0.21             | 462592.38          | 785245.79         | N 32 16 9.39            | W 103 32 39.11           |
|          | 1695.00    | 0.49        | 282.63           | 1694.98     | -0.59        | -0.64      | -5.57      | 0.14             | 462592.66          | 785245.03         | N 32 16 9.40            | W 103 32 39.12           |
|          | 1789.00    | 0.49        | 301.54           | 1788.98     | -0.29        | -0.34      | -6.30      | 0.17             | 462592.96          | 785244.30         | N 32 16 9.40            | W 103 32 39.13           |
|          | 1884.00    | 0.71        | 297.13           | 1883.97     | 0.20         | 0.14       | -7.17      | 0.24             | 462593.44          | 785243.43         | N 32 16 9.40            | W 103 32 39.14           |
|          | 1978.00    | 0.62        | 283.74           | 1977.97     | 0.59         | 0.53       | -8.19      | 0.19             | 462593.83          | 785242.41         | N 32 16 9.41            | W 103 32 39.15           |
|          | 2073.00    | 0.80        | 296.82           | 2072.96     | 1.02         | 0.95       | -9.28      | 0.25             | 462594.25          | 785241.32         | N 32 16 9.41            | W 103 32 39.16           |
|          | 2167.00    | 0.71        | 284.44           | 2166.95     | 1.47         | 1.39       | -10.43     | 0.20             | 462594.69          | 785240.17         | N 32 16 9.42            | W 103 32 39.18           |
|          | 2262.00    | 0.71        | 298.72           | 2261.94     | 1.91         | 1.82       | -11.51     | 0.19             | 462595.12          | 785239.09         | N 32 16 9.42            | W 103 32 39.19           |
|          | 2357.00    | 0.88        | 302.02           | 2356.93     | 2.58         | 2.49       | -12.65     | 0.19             | 462595.79          | 785237.95         | N 32 16 9.43            | W 103 32 39.20           |
|          | 2451.00    | 1.02        | 293.12           | 2450.92     | 3.31         | 3.20       | -14.03     | 0.22             | 462596.50          | 785236.57         | N 32 16 9.43            | W 103 32 39.22           |
|          | 2546.00    | 1.02        | 301.31           | 2545.91     | 4.09         | 3.97       | -15.53     | 0.15             | 462597.27          | 785235.07         | N 32 16 9.44            | W 103 32 39.24           |

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
|          | 2640.00    | 1.02        | 298.72           | 2639.89     | 4.94         | 4.81       | -16.98     | 0.05             | 462598.11          | 785233.62         | N 32 16 9.45            | W 103 32 39.25           |
|          | 2735.00    | 1.02        | 310.91           | 2734.88     | 5.91         | 5.77       | -18.36     | 0.23             | 462599.07          | 785232.24         | N 32 16 9.46            | W 103 32 39.27           |
|          | 2830.00    | 1.19        | 301.63           | 2829.86     | 6.99         | 6.84       | -19.84     | 0.26             | 462600.14          | 785230.76         | N 32 16 9.47            | W 103 32 39.29           |
|          | 2924.00    | 1.02        | 315.33           | 2923.84     | 8.10         | 7.95       | -21.26     | 0.33             | 462601.25          | 785229.34         | N 32 16 9.48            | W 103 32 39.30           |
|          | 3019.00    | 1.19        | 312.51           | 3018.82     | 9.38         | 9.22       | -22.58     | 0.19             | 462602.52          | 785228.02         | N 32 16 9.49            | W 103 32 39.32           |
|          | 3114.00    | 1.10        | 313.44           | 3113.81     | 10.69        | 10.51      | -23.97     | 0.10             | 462603.81          | 785226.63         | N 32 16 9.51            | W 103 32 39.33           |
|          | 3208.00    | 1.02        | 330.23           | 3207.79     | 12.04        | 11.86      | -25.04     | 0.34             | 462605.16          | 785225.56         | N 32 16 9.52            | W 103 32 39.35           |
|          | 3303.00    | 1.28        | 330.01           | 3302.77     | 13.70        | 13.51      | -25.99     | 0.27             | 462606.81          | 785224.61         | N 32 16 9.54            | W 103 32 39.36           |
|          | 3397.00    | 1.41        | 330.54           | 3396.74     | 15.62        | 15.43      | -27.08     | 0.14             | 462608.73          | 785223.52         | N 32 16 9.56            | W 103 32 39.37           |
|          | 3492.00    | 1.50        | 332.43           | 3491.71     | 17.75        | 17.55      | -28.23     | 0.11             | 462610.85          | 785222.37         | N 32 16 9.58            | W 103 32 39.38           |
|          | 3587.00    | 1.50        | 328.64           | 3586.68     | 19.93        | 19.71      | -29.46     | 0.10             | 462613.01          | 785221.15         | N 32 16 9.60            | W 103 32 39.40           |
|          | 3681.00    | 1.80        | 326.61           | 3680.64     | 22.22        | 21.99      | -30.91     | 0.33             | 462615.29          | 785219.69         | N 32 16 9.62            | W 103 32 39.41           |
|          | 3776.00    | 1.81        | 325.20           | 3775.60     | 24.71        | 24.47      | -32.59     | 0.05             | 462617.77          | 785218.02         | N 32 16 9.65            | W 103 32 39.43           |
|          | 3870.00    | 1.02        | 7.30             | 3869.57     | 26.76        | 26.52      | -33.33     | 1.34             | 462619.82          | 785217.27         | N 32 16 9.67            | W 103 32 39.44           |
|          | 3965.00    | 1.19        | 75.41            | 3964.55     | 27.84        | 27.61      | -32.26     | 1.31             | 462620.91          | 785218.34         | N 32 16 9.68            | W 103 32 39.43           |
|          | 4060.00    | 1.19        | 61.24            | 4059.53     | 28.55        | 28.33      | -30.44     | 0.31             | 462621.63          | 785220.16         | N 32 16 9.68            | W 103 32 39.41           |
|          | 4154.00    | 1.10        | 64.94            | 4153.51     | 29.39        | 29.18      | -28.77     | 0.12             | 462622.48          | 785221.83         | N 32 16 9.69            | W 103 32 39.39           |
|          | 4249.00    | 1.10        | 59.21            | 4248.50     | 30.23        | 30.04      | -27.16     | 0.12             | 462623.34          | 785223.44         | N 32 16 9.70            | W 103 32 39.37           |
|          | 4344.00    | 1.41        | 62.12            | 4343.47     | 31.23        | 31.05      | -25.35     | 0.33             | 462624.35          | 785225.25         | N 32 16 9.71            | W 103 32 39.35           |
|          | 4438.00    | 1.68        | 72.43            | 4437.44     | 32.17        | 32.01      | -23.01     | 0.41             | 462625.31          | 785227.59         | N 32 16 9.72            | W 103 32 39.32           |
|          | 4533.00    | 2.30        | 84.64            | 4532.38     | 32.75        | 32.60      | -19.78     | 0.79             | 462625.90          | 785230.82         | N 32 16 9.73            | W 103 32 39.28           |
|          | 4627.00    | 1.68        | 117.34           | 4626.33     | 32.27        | 32.15      | -16.68     | 1.35             | 462625.45          | 785233.92         | N 32 16 9.72            | W 103 32 39.25           |
|          | 4722.00    | 1.50        | 150.43           | 4721.29     | 30.53        | 30.43      | -14.83     | 0.97             | 462623.73          | 785235.77         | N 32 16 9.70            | W 103 32 39.23           |
|          | 4817.00    | 2.12        | 134.04           | 4816.25     | 28.22        | 28.12      | -12.95     | 0.84             | 462621.42          | 785237.65         | N 32 16 9.68            | W 103 32 39.20           |
|          | 4911.00    | 1.59        | 141.22           | 4910.20     | 25.98        | 25.90      | -10.89     | 0.61             | 462619.20          | 785239.71         | N 32 16 9.66            | W 103 32 39.18           |
|          | 5006.00    | 1.28        | 129.63           | 5005.17     | 24.26        | 24.19      | -9.25      | 0.45             | 462617.49          | 785241.35         | N 32 16 9.64            | W 103 32 39.16           |
|          | 5100.00    | 1.68        | 132.72           | 5099.14     | 22.64        | 22.59      | -7.42      | 0.43             | 462615.89          | 785243.18         | N 32 16 9.63            | W 103 32 39.14           |
|          | 5267.00    | 1.59        | 134.44           | 5266.07     | 19.34        | 19.31      | -3.97      | 0.06             | 462612.61          | 785246.63         | N 32 16 9.59            | W 103 32 39.10           |
|          | 5361.00    | 1.28        | 138.31           | 5360.04     | 17.63        | 17.61      | -2.34      | 0.35             | 462610.91          | 785248.26         | N 32 16 9.58            | W 103 32 39.08           |
|          | 5456.00    | 1.59        | 153.52           | 5455.01     | 15.64        | 15.64      | -1.05      | 0.51             | 462608.94          | 785249.55         | N 32 16 9.56            | W 103 32 39.07           |
|          | 5550.00    | 1.41        | 138.93           | 5548.98     | 13.60        | 13.60      | 0.29       | 0.45             | 462606.90          | 785250.89         | N 32 16 9.54            | W 103 32 39.05           |
|          | 5645.00    | 1.19        | 147.92           | 5643.95     | 11.87        | 11.88      | 1.58       | 0.32             | 462605.18          | 785252.18         | N 32 16 9.52            | W 103 32 39.04           |
|          | 5739.00    | 1.19        | 143.60           | 5737.93     | 10.25        | 10.27      | 2.68       | 0.10             | 462603.57          | 785253.28         | N 32 16 9.50            | W 103 32 39.02           |
|          | 5834.00    | 1.41        | 164.23           | 5832.91     | 8.32         | 8.35       | 3.58       | 0.54             | 462601.65          | 785254.18         | N 32 16 9.48            | W 103 32 39.01           |
|          | 5929.00    | 1.19        | 147.70           | 5927.88     | 6.36         | 6.39       | 4.43       | 0.46             | 462599.69          | 785255.03         | N 32 16 9.46            | W 103 32 39.00           |
|          | 6023.00    | 1.19        | 163.61           | 6021.86     | 4.59         | 4.63       | 5.23       | 0.35             | 462597.93          | 785255.83         | N 32 16 9.45            | W 103 32 38.99           |
|          | 6118.00    | 1.59        | 152.02           | 6116.84     | 2.47         | 2.52       | 6.12       | 0.51             | 462595.82          | 785256.72         | N 32 16 9.43            | W 103 32 38.98           |
|          | 6212.00    | 1.28        | 152.64           | 6210.81     | 0.38         | 0.44       | 7.22       | 0.33             | 462593.74          | 785257.82         | N 32 16 9.41            | W 103 32 38.97           |
|          | 6307.00    | 1.02        | 188.11           | 6305.79     | -1.40        | -1.34      | 7.59       | 0.78             | 462591.96          | 785258.19         | N 32 16 9.39            | W 103 32 38.97           |
|          | 6402.00    | 1.10        | 185.42           | 6400.77     | -3.14        | -3.09      | 7.38       | 0.10             | 462590.21          | 785257.98         | N 32 16 9.37            | W 103 32 38.97           |
|          | 6497.00    | 1.19        | 191.64           | 6495.75     | -5.02        | -4.96      | 7.10       | 0.16             | 462588.34          | 785257.70         | N 32 16 9.35            | W 103 32 38.97           |
|          | 6591.00    | 1.19        | 185.60           | 6589.73     | -6.94        | -6.89      | 6.80       | 0.13             | 462586.41          | 785257.40         | N 32 16 9.33            | W 103 32 38.98           |
|          | 6686.00    | 1.02        | 182.43           | 6684.72     | -8.77        | -8.72      | 6.67       | 0.19             | 462584.58          | 785257.27         | N 32 16 9.32            | W 103 32 38.98           |
|          | 6781.00    | 0.71        | 163.04           | 6779.70     | -10.17       | -10.13     | 6.81       | 0.44             | 462583.18          | 785257.41         | N 32 16 9.30            | W 103 32 38.98           |
|          | 6875.00    | 0.49        | 179.34           | 6873.70     | -11.14       | -11.08     | 6.98       | 0.29             | 462582.22          | 785257.58         | N 32 16 9.29            | W 103 32 38.98           |
|          | 6970.00    | 0.49        | 187.40           | 6968.70     | -11.94       | -11.89     | 6.93       | 0.07             | 462581.41          | 785257.53         | N 32 16 9.28            | W 103 32 38.98           |
|          | 7065.00    | 0.49        | 185.11           | 7063.69     | -12.75       | -12.70     | 6.85       | 0.02             | 462580.60          | 785257.45         | N 32 16 9.28            | W 103 32 38.98           |
|          | 7159.00    | 0.71        | 170.31           | 7157.69     | -13.73       | -13.68     | 6.91       | 0.28             | 462579.63          | 785257.51         | N 32 16 9.27            | W 103 32 38.98           |
|          | 7254.00    | 1.02        | 171.32           | 7252.68     | -15.14       | -15.09     | 7.13       | 0.33             | 462578.21          | 785257.73         | N 32 16 9.25            | W 103 32 38.97           |
|          | 7348.00    | 1.19        | 178.81           | 7346.66     | -16.95       | -16.89     | 7.28       | 0.24             | 462576.41          | 785257.88         | N 32 16 9.23            | W 103 32 38.97           |
|          | 7443.00    | 1.10        | 203.62           | 7441.64     | -18.77       | -18.72     | 6.94       | 0.53             | 462574.58          | 785257.54         | N 32 16 9.22            | W 103 32 38.98           |
|          | 7538.00    | 1.50        | 186.13           | 7536.62     | -20.83       | -20.79     | 6.44       | 0.59             | 462572.51          | 785257.04         | N 32 16 9.20            | W 103 32 38.98           |
|          | 7632.00    | 1.41        | 177.00           | 7630.59     | -23.21       | -23.17     | 6.37       | 0.26             | 462570.13          | 785256.97         | N 32 16 9.17            | W 103 32 38.98           |
|          | 7727.00    | 1.28        | 183.31           | 7725.56     | -25.44       | -25.39     | 6.37       | 0.21             | 462567.91          | 785256.97         | N 32 16 9.15            | W 103 32 38.98           |
|          | 7822.00    | 1.90        | 192.43           | 7820.52     | -28.03       | -27.99     | 5.97       | 0.70             | 462565.31          | 785256.57         | N 32 16 9.12            | W 103 32 38.99           |
|          | 7916.00    | 1.59        | 177.51           | 7914.48     | -30.86       | -30.81     | 5.69       | 0.58             | 462562.49          | 785256.29         | N 32 16 9.10            | W 103 32 38.99           |
|          | 8011.00    | 1.10        | 191.33           | 8009.45     | -33.07       | -33.03     | 5.57       | 0.61             | 462560.28          | 785256.17         | N 32 16 9.07            | W 103 32 38.99           |
|          | 8105.00    | 1.19        | 211.64           | 8103.44     | -34.78       | -34.74     | 4.88       | 0.44             | 462558.56          | 785255.48         | N 32 16 9.06            | W 103 32 39.00           |

| Comments         | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' '') | Longitude<br>(E/W ° ' '') |
|------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|--------------------------|---------------------------|
|                  | 8200.00    | 1.50        | 214.81           | 8198.41     | -36.63       | -36.60     | 3.65       | 0.34             | 462556.70          | 785254.25         | N 32 16 9.04             | W 103 32 39.02            |
|                  | 8294.00    | 1.28        | 277.13           | 8292.39     | -37.49       | -37.48     | 1.91       | 1.54             | 462555.82          | 785252.51         | N 32 16 9.03             | W 103 32 39.04            |
|                  | 8389.00    | 1.59        | 276.33           | 8387.36     | -37.20       | -37.20     | -0.46      | 0.33             | 462556.10          | 785250.14         | N 32 16 9.03             | W 103 32 39.06            |
|                  | 8484.00    | 0.80        | 22.11            | 8482.34     | -36.43       | -36.44     | -1.52      | 2.07             | 462556.86          | 785249.08         | N 32 16 9.04             | W 103 32 39.08            |
|                  | 8578.00    | 1.50        | 56.61            | 8576.32     | -35.16       | -35.16     | -0.24      | 1.02             | 462558.14          | 785250.36         | N 32 16 9.05             | W 103 32 39.06            |
|                  | 8673.00    | 1.19        | 51.81            | 8671.30     | -33.88       | -33.87     | 1.57       | 0.35             | 462559.44          | 785252.17         | N 32 16 9.07             | W 103 32 39.04            |
|                  | 8768.00    | 1.28        | 76.00            | 8766.28     | -33.02       | -33.00     | 3.37       | 0.55             | 462560.30          | 785253.97         | N 32 16 9.08             | W 103 32 39.02            |
|                  | 8862.00    | 1.41        | 84.90            | 8860.25     | -32.68       | -32.64     | 5.55       | 0.26             | 462560.66          | 785256.15         | N 32 16 9.08             | W 103 32 38.99            |
|                  | 8956.00    | 1.50        | 89.22            | 8954.22     | -32.58       | -32.52     | 7.93       | 0.15             | 462560.78          | 785258.53         | N 32 16 9.08             | W 103 32 38.97            |
|                  | 9051.00    | 1.50        | 95.83            | 9049.19     | -32.71       | -32.63     | 10.41      | 0.18             | 462560.67          | 785261.01         | N 32 16 9.08             | W 103 32 38.94            |
|                  | 9145.00    | 1.68        | 95.13            | 9143.15     | -32.97       | -32.88     | 13.00      | 0.19             | 462560.42          | 785263.60         | N 32 16 9.08             | W 103 32 38.91            |
|                  | 9240.00    | 0.71        | 46.61            | 9238.13     | -32.71       | -32.60     | 14.82      | 1.39             | 462560.70          | 785265.42         | N 32 16 9.08             | W 103 32 38.89            |
|                  | 9335.00    | 0.80        | 352.92           | 9333.12     | -31.65       | -31.54     | 15.16      | 0.72             | 462561.76          | 785265.76         | N 32 16 9.09             | W 103 32 38.88            |
|                  | 9429.00    | 0.31        | 353.01           | 9427.12     | -30.74       | -30.63     | 15.05      | 0.52             | 462562.67          | 785265.65         | N 32 16 9.10             | W 103 32 38.88            |
|                  | 9524.00    | 0.22        | 1.03             | 9522.12     | -30.31       | -30.20     | 15.02      | 0.10             | 462563.10          | 785265.62         | N 32 16 9.10             | W 103 32 38.88            |
|                  | 9618.00    | 0.62        | 94.51            | 9616.12     | -30.17       | -30.06     | 15.54      | 0.71             | 462563.24          | 785266.13         | N 32 16 9.10             | W 103 32 38.88            |
|                  | 9713.00    | 0.80        | 114.74           | 9711.11     | -30.50       | -30.37     | 16.65      | 0.32             | 462562.93          | 785267.25         | N 32 16 9.10             | W 103 32 38.86            |
|                  | 9808.00    | 0.88        | 128.62           | 9806.10     | -31.24       | -31.11     | 17.82      | 0.23             | 462562.19          | 785268.42         | N 32 16 9.09             | W 103 32 38.85            |
|                  | 9903.00    | 0.71        | 97.42            | 9901.09     | -31.78       | -31.64     | 18.98      | 0.48             | 462561.66          | 785269.58         | N 32 16 9.09             | W 103 32 38.84            |
|                  | 9997.00    | 0.40        | 106.94           | 9995.09     | -31.95       | -31.81     | 19.87      | 0.34             | 462561.49          | 785270.47         | N 32 16 9.09             | W 103 32 38.83            |
|                  | 10092.00   | 0.40        | 161.71           | 10090.08    | -32.37       | -32.22     | 20.29      | 0.39             | 462561.08          | 785270.89         | N 32 16 9.08             | W 103 32 38.82            |
|                  | 10186.00   | 1.10        | 85.74            | 10184.08    | -32.62       | -32.47     | 21.29      | 1.14             | 462560.84          | 785271.89         | N 32 16 9.08             | W 103 32 38.81            |
|                  | 10281.00   | 1.28        | 87.02            | 10279.06    | -32.51       | -32.34     | 23.26      | 0.19             | 462560.96          | 785273.86         | N 32 16 9.08             | W 103 32 38.79            |
|                  | 10376.00   | 1.50        | 87.11            | 10374.03    | -32.41       | -32.22     | 25.56      | 0.23             | 462561.08          | 785276.16         | N 32 16 9.08             | W 103 32 38.76            |
|                  | 10470.00   | 1.50        | 90.50            | 10468.00    | -32.38       | -32.17     | 28.02      | 0.09             | 462561.13          | 785278.62         | N 32 16 9.08             | W 103 32 38.73            |
|                  | 10565.00   | 1.41        | 87.90            | 10562.97    | -32.36       | -32.14     | 30.43      | 0.12             | 462561.16          | 785281.03         | N 32 16 9.08             | W 103 32 38.70            |
|                  | 10656.00   | 1.41        | 89.71            | 10653.94    | -32.33       | -32.09     | 32.67      | 0.05             | 462561.21          | 785283.27         | N 32 16 9.08             | W 103 32 38.68            |
|                  | 10737.00   | 1.03        | 346.59           | 10734.93    | -31.63       | -31.38     | 33.50      | 2.38             | 462561.92          | 785284.10         | N 32 16 9.09             | W 103 32 38.67            |
|                  | 10768.00   | 5.42        | 308.51           | 10765.87    | -30.43       | -30.20     | 32.29      | 15.01            | 462563.10          | 785282.89         | N 32 16 9.10             | W 103 32 38.68            |
|                  | 10800.00   | 10.38       | 301.81           | 10797.56    | -27.95       | -27.74     | 28.65      | 15.74            | 462565.56          | 785279.25         | N 32 16 9.13             | W 103 32 38.72            |
|                  | 10847.00   | 16.70       | 296.10           | 10843.23    | -22.67       | -22.53     | 18.98      | 13.73            | 462570.77          | 785269.58         | N 32 16 9.18             | W 103 32 38.84            |
|                  | 10894.00   | 22.27       | 295.94           | 10887.52    | -15.69       | -15.66     | 4.90       | 11.85            | 462577.64          | 785255.50         | N 32 16 9.25             | W 103 32 39.00            |
|                  | 10941.00   | 27.17       | 293.92           | 10930.20    | -7.31        | -7.40      | -12.93     | 10.58            | 462585.90          | 785237.67         | N 32 16 9.33             | W 103 32 39.21            |
|                  | 10989.00   | 32.87       | 290.50           | 10971.75    | 1.87         | 1.61       | -35.17     | 12.39            | 462594.91          | 785215.43         | N 32 16 9.42             | W 103 32 39.47            |
| First Take Point | 11012.00   | 36.55       | 290.61           | 10990.65    | 6.56         | 6.21       | -47.43     | 16.00            | 462599.51          | 785203.17         | N 32 16 9.47             | W 103 32 39.61            |
|                  | 11036.00   | 40.39       | 290.71           | 11009.44    | 11.93        | 11.48      | -61.40     | 16.00            | 462604.78          | 785189.20         | N 32 16 9.52             | W 103 32 39.77            |
|                  | 11083.00   | 46.92       | 293.95           | 11043.43    | 24.51        | 23.84      | -91.37     | 14.68            | 462617.14          | 785159.24         | N 32 16 9.64             | W 103 32 40.12            |
|                  | 11131.00   | 51.86       | 296.70           | 11074.67    | 40.36        | 39.45      | -124.27    | 11.17            | 462632.75          | 785126.33         | N 32 16 9.80             | W 103 32 40.50            |
|                  | 11178.00   | 56.58       | 301.68           | 11102.15    | 59.23        | 58.08      | -157.51    | 13.21            | 462651.37          | 785093.09         | N 32 16 9.99             | W 103 32 40.89            |
|                  | 11226.00   | 58.80       | 309.01           | 11127.83    | 82.94        | 81.54      | -190.54    | 13.71            | 462674.84          | 785060.06         | N 32 16 10.22            | W 103 32 41.27            |
|                  | 11273.00   | 61.10       | 316.53           | 11151.39    | 110.77       | 109.16     | -220.35    | 14.68            | 462702.46          | 785030.25         | N 32 16 10.50            | W 103 32 41.61            |
|                  | 11320.00   | 63.62       | 324.58           | 11173.22    | 143.10       | 141.29     | -246.75    | 16.09            | 462734.59          | 785003.86         | N 32 16 10.82            | W 103 32 41.92            |
|                  | 11367.00   | 65.15       | 332.61           | 11193.57    | 179.40       | 177.44     | -268.79    | 15.74            | 462770.73          | 784981.82         | N 32 16 11.18            | W 103 32 42.17            |
|                  | 11414.00   | 65.40       | 338.13           | 11213.24    | 218.32       | 216.22     | -286.57    | 10.68            | 462809.52          | 784964.04         | N 32 16 11.56            | W 103 32 42.38            |
|                  | 11462.00   | 63.87       | 343.37           | 11233.81    | 259.34       | 257.15     | -300.88    | 10.37            | 462850.44          | 784949.73         | N 32 16 11.97            | W 103 32 42.54            |
|                  | 11509.00   | 64.69       | 349.75           | 11254.23    | 300.57       | 298.30     | -310.70    | 12.35            | 462891.59          | 784939.91         | N 32 16 12.38            | W 103 32 42.65            |
|                  | 11556.00   | 69.19       | 349.52           | 11272.63    | 343.15       | 340.83     | -318.48    | 9.59             | 462934.12          | 784932.13         | N 32 16 12.80            | W 103 32 42.74            |
|                  | 11603.00   | 74.19       | 350.13           | 11287.39    | 387.12       | 384.73     | -326.36    | 10.71            | 462978.02          | 784924.25         | N 32 16 13.23            | W 103 32 42.82            |
|                  | 11651.00   | 80.02       | 351.06           | 11298.10    | 433.31       | 430.88     | -334.00    | 12.29            | 463024.16          | 784916.61         | N 32 16 13.69            | W 103 32 42.91            |
|                  | 11698.00   | 86.25       | 354.66           | 11303.72    | 479.62       | 477.15     | -339.78    | 15.28            | 463070.44          | 784910.83         | N 32 16 14.15            | W 103 32 42.97            |
|                  | 11745.00   | 89.96       | 358.50           | 11305.27    | 526.52       | 524.02     | -342.58    | 11.36            | 463117.31          | 784908.03         | N 32 16 14.61            | W 103 32 43.00            |
|                  | 11777.00   | 90.17       | 359.24           | 11305.23    | 558.52       | 556.01     | -343.21    | 2.40             | 463149.30          | 784907.39         | N 32 16 14.93            | W 103 32 43.01            |
|                  | 11874.00   | 91.34       | 359.30           | 11303.96    | 655.50       | 653.00     | -344.45    | 1.21             | 463246.28          | 784906.16         | N 32 16 15.89            | W 103 32 43.01            |
|                  | 11968.00   | 91.07       | 359.70           | 11301.98    | 749.48       | 746.97     | -345.27    | 0.51             | 463340.25          | 784905.34         | N 32 16 16.82            | W 103 32 43.01            |
|                  | 12063.00   | 90.62       | 359.63           | 11300.58    | 844.47       | 841.96     | -345.82    | 0.48             | 463435.24          | 784904.78         | N 32 16 17.76            | W 103 32 43.01            |
|                  | 12157.00   | 90.41       | 359.92           | 11299.73    | 938.47       | 935.95     | -346.19    | 0.38             | 463529.23          | 784904.41         | N 32 16 18.69            | W 103 32 43.01            |
|                  | 12252.00   | 89.90       | 0.10             | 11299.48    | 1033.46      | 1030.95    | -346.18    | 0.57             | 463624.23          | 784904.43         | N 32 16 19.63            | W 103 32 43.00            |

| Comments           | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|--------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
|                    | 12346.00   | 89.90       | 359.26           | 11299.64    | 1127.46      | 1124.95    | -346.70    | 0.89             | 463718.22          | 784903.91         | N 32 16 20.56           | W 103 32 43.00           |
|                    | 12441.00   | 90.03       | 358.98           | 11299.70    | 1222.46      | 1219.94    | -348.16    | 0.32             | 463813.21          | 784902.45         | N 32 16 21.50           | W 103 32 43.01           |
|                    | 12533.00   | 89.66       | 359.53           | 11299.95    | 1314.46      | 1311.93    | -349.36    | 0.72             | 463905.20          | 784901.25         | N 32 16 22.41           | W 103 32 43.01           |
|                    | 12630.00   | 90.07       | 359.65           | 11300.18    | 1411.46      | 1408.93    | -350.05    | 0.44             | 464002.19          | 784900.56         | N 32 16 23.37           | W 103 32 43.01           |
|                    | 12724.00   | 90.17       | 359.32           | 11299.98    | 1505.46      | 1502.92    | -350.90    | 0.37             | 464096.19          | 784899.71         | N 32 16 24.30           | W 103 32 43.01           |
|                    | 12819.00   | 90.31       | 359.40           | 11299.58    | 1600.45      | 1597.92    | -351.96    | 0.17             | 464191.18          | 784898.65         | N 32 16 25.24           | W 103 32 43.02           |
|                    | 12914.00   | 90.14       | 359.56           | 11299.21    | 1695.45      | 1692.91    | -352.82    | 0.25             | 464286.17          | 784897.79         | N 32 16 26.18           | W 103 32 43.02           |
|                    | 13008.00   | 89.79       | 359.51           | 11299.27    | 1789.45      | 1786.91    | -353.58    | 0.38             | 464380.17          | 784897.03         | N 32 16 27.11           | W 103 32 43.02           |
|                    | 13103.00   | 90.38       | 0.08             | 11299.12    | 1884.45      | 1881.91    | -353.92    | 0.86             | 464475.16          | 784896.69         | N 32 16 28.05           | W 103 32 43.02           |
|                    | 13198.00   | 89.96       | 359.56           | 11298.84    | 1979.45      | 1976.91    | -354.22    | 0.70             | 464570.16          | 784896.39         | N 32 16 28.99           | W 103 32 43.01           |
|                    | 13292.00   | 89.83       | 359.67           | 11299.01    | 2073.45      | 2070.90    | -354.85    | 0.18             | 464664.15          | 784895.76         | N 32 16 29.92           | W 103 32 43.01           |
|                    | 13387.00   | 89.48       | 359.22           | 11299.59    | 2168.45      | 2165.90    | -355.77    | 0.60             | 464759.14          | 784894.84         | N 32 16 30.86           | W 103 32 43.01           |
|                    | 13481.00   | 89.66       | 359.04           | 11300.29    | 2262.44      | 2259.88    | -357.20    | 0.27             | 464853.13          | 784893.41         | N 32 16 31.79           | W 103 32 43.02           |
|                    | 13576.00   | 89.24       | 359.16           | 11301.20    | 2357.43      | 2354.87    | -358.69    | 0.46             | 464948.11          | 784891.92         | N 32 16 32.73           | W 103 32 43.03           |
|                    | 13671.00   | 90.28       | 359.23           | 11301.60    | 2452.43      | 2449.86    | -360.03    | 1.10             | 465043.10          | 784890.58         | N 32 16 33.67           | W 103 32 43.04           |
|                    | 13765.00   | 89.52       | 1.08             | 11301.77    | 2546.42      | 2543.85    | -359.77    | 2.13             | 465137.09          | 784890.84         | N 32 16 34.60           | W 103 32 43.03           |
|                    | 13860.00   | 90.00       | 1.98             | 11302.16    | 2641.36      | 2638.82    | -357.24    | 1.07             | 465232.05          | 784893.37         | N 32 16 35.54           | W 103 32 42.99           |
|                    | 13954.00   | 89.69       | 2.06             | 11302.42    | 2735.28      | 2732.76    | -353.92    | 0.34             | 465325.99          | 784896.69         | N 32 16 36.47           | W 103 32 42.94           |
|                    | 14049.00   | 89.66       | 0.75             | 11302.96    | 2830.23      | 2827.72    | -351.59    | 1.38             | 465420.95          | 784899.01         | N 32 16 37.41           | W 103 32 42.91           |
|                    | 14143.00   | 89.79       | 359.81           | 11303.41    | 2924.22      | 2921.72    | -351.13    | 1.01             | 465514.95          | 784899.47         | N 32 16 38.34           | W 103 32 42.90           |
|                    | 14238.00   | 89.62       | 359.18           | 11303.90    | 3019.21      | 3016.72    | -351.97    | 0.69             | 465609.94          | 784898.64         | N 32 16 39.28           | W 103 32 42.90           |
|                    | 14332.00   | 89.72       | 358.44           | 11304.44    | 3113.20      | 3110.69    | -353.92    | 0.79             | 465703.92          | 784896.68         | N 32 16 40.21           | W 103 32 42.91           |
|                    | 14427.00   | 89.62       | 358.92           | 11304.99    | 3208.19      | 3205.67    | -356.11    | 0.52             | 465798.89          | 784894.50         | N 32 16 41.15           | W 103 32 42.93           |
|                    | 14521.00   | 89.69       | 359.21           | 11305.55    | 3302.18      | 3299.65    | -357.65    | 0.32             | 465892.87          | 784892.96         | N 32 16 42.08           | W 103 32 42.94           |
|                    | 14616.00   | 89.72       | 359.05           | 11306.04    | 3397.18      | 3394.64    | -359.09    | 0.17             | 465987.86          | 784891.52         | N 32 16 43.02           | W 103 32 42.95           |
|                    | 14710.00   | 89.45       | 358.89           | 11306.72    | 3491.17      | 3488.62    | -360.78    | 0.33             | 466081.84          | 784889.83         | N 32 16 43.95           | W 103 32 42.96           |
|                    | 14806.00   | 89.59       | 358.62           | 11307.53    | 3587.16      | 3584.60    | -362.86    | 0.32             | 466177.81          | 784887.74         | N 32 16 44.90           | W 103 32 42.98           |
|                    | 14900.00   | 89.52       | 358.26           | 11308.26    | 3681.14      | 3678.56    | -365.42    | 0.39             | 466271.77          | 784885.19         | N 32 16 45.83           | W 103 32 43.00           |
|                    | 14995.00   | 89.55       | 358.36           | 11309.03    | 3776.11      | 3773.51    | -368.22    | 0.11             | 466366.72          | 784882.38         | N 32 16 46.77           | W 103 32 43.02           |
|                    | 15089.00   | 89.24       | 359.88           | 11310.02    | 3870.10      | 3867.49    | -369.67    | 1.65             | 466460.70          | 784880.94         | N 32 16 47.70           | W 103 32 43.03           |
|                    | 15184.00   | 89.28       | 1.15             | 11311.25    | 3965.08      | 3962.48    | -368.81    | 1.34             | 466555.68          | 784881.79         | N 32 16 48.64           | W 103 32 43.01           |
|                    | 15279.00   | 89.79       | 1.63             | 11312.02    | 4060.03      | 4057.45    | -366.51    | 0.74             | 466650.65          | 784884.10         | N 32 16 49.58           | W 103 32 42.98           |
|                    | 15373.00   | 89.35       | 1.30             | 11312.72    | 4153.97      | 4151.41    | -364.11    | 0.59             | 466744.61          | 784886.50         | N 32 16 50.51           | W 103 32 42.94           |
|                    | 15468.00   | 89.35       | 1.86             | 11313.80    | 4248.91      | 4246.37    | -361.49    | 0.59             | 466839.57          | 784889.12         | N 32 16 51.45           | W 103 32 42.90           |
|                    | 15562.00   | 90.17       | 2.45             | 11314.19    | 4342.81      | 4340.30    | -357.95    | 1.07             | 466933.50          | 784892.66         | N 32 16 52.37           | W 103 32 42.85           |
|                    | 15657.00   | 90.52       | 0.99             | 11313.62    | 4437.74      | 4435.26    | -355.10    | 1.58             | 467028.45          | 784895.51         | N 32 16 53.31           | W 103 32 42.81           |
|                    | 15751.00   | 90.72       | 359.84           | 11312.61    | 4531.72      | 4529.25    | -354.42    | 1.24             | 467122.43          | 784896.19         | N 32 16 54.24           | W 103 32 42.80           |
|                    | 15778.00   | 91.00       | 359.96           | 11312.20    | 4558.72      | 4556.24    | -354.47    | 1.13             | 467149.43          | 784896.14         | N 32 16 54.51           | W 103 32 42.79           |
| TD, project to bit | 15850.00   | 91.00       | 359.96           | 11310.94    | 4630.71      | 4628.23    | -354.52    | 0.00             | 467221.42          | 784896.09         | N 32 16 55.22           | W 103 32 42.79           |

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           | 25.000        | 1/98.425         | 30.000            | 30.000                  | NAL_MWD_PLUS_0.5_DEG-<br>Depth Only | Original Borehole / Cimarex West<br>Bell Lake 26 Federal #2H Final<br>Survey |
|             | 1    | 25.000          | 25.000        | Act Stns         | 30.000            | 30.000                  | NAL_MWD_PLUS_0.5_DEG-<br>Depth Only | Original Borehole / Cimarex West<br>Bell Lake 26 Federal #2H Final<br>Survey |

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft)     | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ")                                            | Longitude<br>(E/W ° ' ") |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|----------------------|--------------------|-------------------|--------------------------------------------------------------------|--------------------------|
|          |            | 1           | 25.000           | 15850.000   | Act Stns     | 30.000     | 30.000     | NAL_MWD_PLUS_0.5_DEG |                    |                   | Original Borehole / Cimarex West<br>Bell Lake 26 Federal #2H Final |                          |