

## Chisholm Minis 1 Fed Com WCA 16H MWD 0' to 19030' MD Survey

Geodetic Report  
(Def Survey)

**HOBBS OCD**  
**OCT 25 2019**  
**RECEIVED**

Report Date: September 18, 2019 - 12:59 PM  
Client: Chisholm  
Field: NM Lea County (NAD 83)  
Structure / Slot: Chisholm Minis 1 Fed Com WCA 16H / New Slot  
Well: Chisholm Minis 1 Fed Com WCA 16H  
Borehole: Original Borehole  
UWI / APIS: Unknown / Unknown  
Survey Name: Chisholm Minis 1 Fed Com WCA 16H MWD 0' to 19030' MD  
Survey Date: August 22, 2019  
Tort / AHD / DDI / ERD Ratio: 234.438' / 8639.740' / 0.522 / 0.745  
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet  
Location Lat / Long: N 32° 31' 17.88315" W 103° 37' 25.58585"  
Location Grid N/E Y/X: N 554209.100 RUS, E 780040.800 RUS  
CRS Grid Convergence Angle: 0.3815°  
Grid Scale Factor: 0.99996387  
Version / Patch: 2.10.760.0

Survey / DLS Computation: Minimum Curvature / Lubinski  
Vertical Section Azimuth: 179.570° (Grid North)  
Vertical Section Origin: 0.000 ft, 0.000 ft  
TVD Reference Datum: RKB  
TVD Reference Elevation: 3753.000 ft above MSL  
Seabed / Ground Elevation: 3722.000 ft above MSL  
Magnetic Declination: 6.877°  
Total Gravity Field Strength: 968.4818mgn (9.80665 Based)  
Gravity Model: GARM  
Total Magnetic Field Strength: 48135.274 nT  
Magnetic Dip Angle: 60.370°  
Declination Date: July 30, 2019  
Magnetic Declination Model: HDGM 2019  
North Reference: Grid North  
Grid Convergence Used: 0.3815°  
Total Corr Mag North-Grid: 6.2955°  
North: Well Head  
Local Coord Referenced To: Well Head

| Comments    | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEIC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(ft/100ft) | Northing<br>(RUS) | Easting<br>(RUS) | Latitude<br>(N/S ° ' ")          | Longitude<br>(E/W ° ' ") | Closure<br>(ft) | Closure<br>Azimuth<br>(°) |
|-------------|------------|-------------|------------------|-------------|---------------|------------|------------|-------------------|-------------------|------------------|----------------------------------|--------------------------|-----------------|---------------------------|
| SHL         | 0.00       | 0.00        | 173.04           | 0.00        | 0.00          | 0.00       | 0.00       | N/A               | 554208.10         | 780040.80        | N 32° 31' 17.88 W 103° 37' 25.59 |                          | 0.00            | 0.00                      |
| Begin SLB   | 190.00     | 0.45        | 177.45           | 190.00      | 0.75          | -0.75      | 0.03       | 0.24              | 554208.35         | 780040.63        | N 32° 31' 17.88 W 103° 37' 25.59 |                          | 0.75            | 177.45                    |
| MWD Surveys |            |             |                  |             |               |            |            |                   |                   |                  |                                  |                          |                 |                           |
|             | 284.00     | 0.83        | 197.14           | 283.89      | 1.81          | -1.81      | -0.10      | 0.27              | 554207.48         | 780040.50        | N 32° 31' 17.87 W 103° 37' 25.59 |                          | 1.81            | 183.65                    |
|             | 378.00     | 0.58        | 201.53           | 378.89      | 2.55          | -2.55      | -0.43      | 0.07              | 554206.55         | 780040.17        | N 32° 31' 17.86 W 103° 37' 25.59 |                          | 2.59            | 189.62                    |
|             | 473.00     | 0.83        | 170.55           | 472.98      | 3.98          | -3.87      | -0.50      | 0.48              | 554205.43         | 780040.10        | N 32° 31' 17.85 W 103° 37' 25.59 |                          | 3.70            | 187.70                    |
|             | 568.00     | 0.96        | 176.09           | 567.87      | 5.14          | -5.14      | -0.33      | 0.16              | 554203.96         | 780040.27        | N 32° 31' 17.83 W 103° 37' 25.59 |                          | 5.15            | 183.68                    |
|             | 634.00     | 0.80        | 185.42           | 633.86      | 6.15          | -6.15      | -0.33      | 0.32              | 554202.85         | 780040.27        | N 32° 31' 17.82 W 103° 37' 25.59 |                          | 6.16            | 183.11                    |
|             | 728.00     | 0.68        | 173.89           | 727.85      | 7.53          | -7.53      | -0.32      | 0.20              | 554201.57         | 780040.28        | N 32° 31' 17.81 W 103° 37' 25.59 |                          | 7.54            | 182.42                    |
|             | 823.00     | 1.25        | 187.72           | 822.84      | 9.29          | -9.29      | -0.38      | 0.48              | 554199.81         | 780040.22        | N 32° 31' 17.59 W 103° 37' 25.59 |                          | 9.30            | 182.34                    |
|             | 917.00     | 1.32        | 176.29           | 916.91      | 11.38         | -11.39     | -0.45      | 0.28              | 554197.71         | 780040.15        | N 32° 31' 17.57 W 103° 37' 25.59 |                          | 11.40           | 182.25                    |
|             | 1012.00    | 1.25        | 173.79           | 1011.89     | 13.51         | -13.51     | -0.28      | 0.09              | 554195.59         | 780040.34        | N 32° 31' 17.55 W 103° 37' 25.59 |                          | 13.51           | 181.12                    |
|             | 1106.00    | 1.41        | 174.08           | 1105.88     | 15.68         | -15.68     | -0.03      | 0.17              | 554193.42         | 780040.57        | N 32° 31' 17.53 W 103° 37' 25.59 |                          | 15.68           | 180.12                    |
|             | 1201.00    | 1.29        | 142.22           | 1200.84     | 17.89         | -17.89     | 0.74       | 0.79              | 554191.41         | 780041.34        | N 32° 31' 17.51 W 103° 37' 25.57 |                          | 17.70           | 177.60                    |
|             | 1296.00    | 1.18        | 161.35           | 1295.82     | 19.47         | -19.46     | 1.71       | 0.45              | 554189.84         | 780042.31        | N 32° 31' 17.49 W 103° 37' 25.57 |                          | 19.53           | 174.98                    |
|             | 1390.00    | 1.26        | 153.81           | 1389.79     | 21.32         | -21.32     | 2.48       | 0.19              | 554187.80         | 780043.08        | N 32° 31' 17.47 W 103° 37' 25.56 |                          | 21.45           | 173.37                    |
|             | 1485.00    | 1.56        | 136.48           | 1484.77     | 23.21         | -23.18     | 3.83       | 0.55              | 554185.82         | 780044.43        | N 32° 31' 17.45 W 103° 37' 25.54 |                          | 23.49           | 170.62                    |
|             | 1555.00    | 2.08        | 123.40           | 1554.73     | 24.60         | -24.56     | 5.53       | 0.92              | 554184.54         | 780046.13        | N 32° 31' 17.44 W 103° 37' 25.52 |                          | 25.18           | 167.30                    |
|             | 1675.00    | 2.39        | 114.28           | 1674.64     | 26.85         | -26.78     | 8.62       | 0.40              | 554182.32         | 780050.22        | N 32° 31' 17.42 W 103° 37' 25.48 |                          | 28.45           | 160.25                    |
|             | 1789.00    | 4.37        | 103.25           | 1788.47     | 28.52         | -28.41     | 14.88      | 2.21              | 554180.70         | 780055.49        | N 32° 31' 17.40 W 103° 37' 25.41 |                          | 32.07           | 152.34                    |
|             | 1884.00    | 6.18        | 100.11           | 1883.07     | 30.31         | -30.13     | 23.45      | 1.93              | 554178.97         | 780064.05        | N 32° 31' 17.38 W 103° 37' 25.31 |                          | 36.18           | 142.11                    |
|             | 1958.00    | 6.03        | 99.82            | 1956.53     | 32.09         | -31.85     | 33.30      | 0.17              | 554177.26         | 780073.89        | N 32° 31' 17.37 W 103° 37' 25.20 |                          | 46.07           | 133.72                    |
|             | 2052.00    | 6.58        | 86.82            | 2049.97     | 32.71         | -32.38     | 43.53      | 1.58              | 554176.72         | 780084.12        | N 32° 31' 17.36 W 103° 37' 25.08 |                          | 54.25           | 126.65                    |
|             | 2147.00    | 7.59        | 77.48            | 2144.25     | 31.14         | -30.73     | 55.07      | 1.63              | 554176.37         | 780095.87        | N 32° 31' 17.38 W 103° 37' 24.95 |                          | 63.08           | 119.16                    |
|             | 2240.00    | 7.55        | 76.75            | 2238.44     | 28.50         | -28.00     | 67.01      | 0.11              | 554181.10         | 780107.61        | N 32° 31' 17.40 W 103° 37' 24.81 |                          | 72.83           | 112.68                    |
|             | 2335.00    | 7.86        | 75.86            | 2330.51     | 25.14         | -24.55     | 79.69      | 0.75              | 554184.55         | 780119.89        | N 32° 31' 17.44 W 103° 37' 24.86 |                          | 82.81           | 107.24                    |
|             | 2430.00    | 7.87        | 66.14            | 2424.74     | 20.58         | -19.90     | 91.04      | 0.78              | 554189.20         | 780131.63        | N 32° 31' 17.48 W 103° 37' 24.52 |                          | 92.33           | 102.33                    |
|             | 2524.00    | 8.18        | 66.87            | 2517.82     | 15.42         | -14.85     | 103.06     | 0.34              | 554194.45         | 780143.68        | N 32° 31' 17.53 W 103° 37' 24.38 |                          | 104.10          | 98.09                     |
|             | 2619.00    | 8.51        | 66.86            | 2611.81     | 10.06         | -9.19      | 115.72     | 0.35              | 554199.91         | 780156.32        | N 32° 31' 17.58 W 103° 37' 24.24 |                          | 116.09          | 94.54                     |
|             | 2713.00    | 8.88        | 67.86            | 2704.73     | 4.68          | -3.70      | 128.83     | 0.44              | 554205.40         | 780169.43        | N 32° 31' 17.64 W 103° 37' 24.08 |                          | 128.88          | 91.64                     |
|             | 2808.00    | 8.98        | 68.08            | 2798.58     | -1.00         | 2.07       | 142.40     | 0.31              | 554211.17         | 780182.89        | N 32° 31' 17.69 W 103° 37' 23.92 |                          | 142.41          | 89.17                     |
|             | 2902.00    | 8.91        | 67.13            | 2891.43     | -6.71         | 7.88       | 155.81     | 0.19              | 554216.98         | 780196.41        | N 32° 31' 17.75 W 103° 37' 23.77 |                          | 158.01          | 87.11                     |
|             | 2997.00    | 9.10        | 67.15            | 2885.28     | -12.38        | 13.85      | 169.51     | 0.20              | 554222.75         | 780210.11        | N 32° 31' 17.81 W 103° 37' 23.61 |                          | 170.06          | 85.40                     |
|             | 3092.00    | 8.80        | 68.70            | 3078.11     | -17.83        | 19.21      | 183.21     | 0.41              | 554228.31         | 780223.80        | N 32° 31' 17.86 W 103° 37' 23.44 |                          | 184.21          | 84.01                     |
|             | 3187.00    | 8.42        | 72.30            | 3173.04     | -22.49        | 23.96      | 196.80     | 0.89              | 554233.06         | 780237.20        | N 32° 31' 17.91 W 103° 37' 23.29 |                          | 198.06          | 83.05                     |
|             | 3281.00    | 7.90        | 71.88            | 3266.08     | -26.49        | 28.06      | 209.30     | 0.56              | 554237.16         | 780249.89        | N 32° 31' 17.95 W 103° 37' 23.14 |                          | 211.17          | 82.36                     |
|             | 3375.00    | 7.34        | 71.16            | 3359.25     | -30.35        | 32.01      | 221.12     | 0.60              | 554241.11         | 780261.72        | N 32° 31' 17.99 W 103° 37' 23.00 |                          | 223.43          | 81.78                     |
|             | 3470.00    | 6.77        | 69.24            | 3453.53     | -34.21        | 35.98      | 232.10     | 0.65              | 554245.08         | 780272.69        | N 32° 31' 18.02 W 103° 37' 22.87 |                          | 234.87          | 81.19                     |
|             | 3564.00    | 6.08        | 68.95            | 3546.91     | -38.00        | 39.82      | 242.22     | 0.33              | 554248.92         | 780282.81        | N 32° 31' 18.06 W 103° 37' 22.75 |                          | 245.47          | 80.88                     |
|             | 3658.00    | 6.26        | 68.28            | 3641.32     | -41.78        | 43.66      | 252.02     | 0.22              | 554252.76         | 780292.81        | N 32° 31' 18.10 W 103° 37' 22.64 |                          | 255.77          | 80.17                     |
|             | 3753.00    | 5.69        | 66.33            | 3734.81     | -45.48        | 47.42      | 261.05     | 0.64              | 554256.52         | 780301.84        | N 32° 31' 18.14 W 103° 37' 22.53 |                          | 265.32          | 79.70                     |
|             | 3848.00    | 5.41        | 67.02            | 3829.37     | -49.04        | 51.06      | 269.48     | 0.30              | 554260.16         | 780310.07        | N 32° 31' 18.17 W 103° 37' 22.42 |                          | 274.28          | 79.27                     |
|             | 3942.00    | 5.44        | 65.10            | 3922.95     | -52.58        | 54.87      | 277.80     | 0.20              | 554263.77         | 780318.19        | N 32° 31' 18.21 W 103° 37' 22.34 |                          | 282.94          | 78.86                     |
|             | 4037.00    | 5.78        | 59.39            | 4017.49     | -56.86        | 58.01      | 285.81     | 0.69              | 554268.10         | 780326.40        | N 32° 31' 18.25 W 103° 37' 22.24 |                          | 291.84          | 78.34                     |
|             | 4131.00    | 5.32        | 60.09            | 4111.05     | -61.39        | 63.59      | 293.87     | 0.51              | 554272.89         | 780334.26        | N 32° 31' 18.28 W 103° 37' 22.15 |                          | 300.48          | 77.78                     |
|             | 4225.00    | 5.68        | 60.90            | 4206.62     | -65.78        | 68.05      | 301.50     | 0.39              | 554277.14         | 780342.09        | N 32° 31' 18.34 W 103° 37' 22.06 |                          | 309.09          | 77.28                     |
|             | 4320.00    | 6.28        | 65.47            | 4298.10     | -70.18        | 72.51      | 310.33     | 0.85              | 554281.60         | 780350.92        | N 32° 31' 18.38 W 103° 37' 21.96 |                          | 318.69          | 76.85                     |
|             | 4414.00    | 5.90        | 62.77            | 4392.57     | -74.45        | 76.85      | 319.30     | 0.51              | 554285.95         | 780359.89        | N 32° 31' 18.42 W 103° 37' 21.85 |                          | 328.42          | 76.47                     |
|             | 4509.00    | 5.53        | 64.56            | 4487.10     | -78.59        | 81.05      | 327.78     | 0.43              | 554290.15         | 780368.36        | N 32° 31' 18.46 W 103° 37' 21.75 |                          | 337.65          | 76.11                     |
|             | 4603.00    | 5.45        | 66.23            | 4580.67     | -82.27        | 84.80      | 335.95     | 0.37              | 554293.89         | 780376.54        | N 32° 31' 18.50 W 103° 37' 21.68 |                          | 346.49          | 75.83                     |
|             | 4698.00    | 5.45        | 68.90            | 4675.24     | -85.57        | 88.16      | 344.32     | 0.37              | 554297.26         | 780384.61        | N 32° 31' 18.53 W 103° 37' 21.58 |                          | 355.43          | 75.64                     |
|             | 4792.00    | 5.21        | 70.38            | 4768.83     | -88.48        | 91.12      | 352.53     | 0.26              | 554300.22         | 780393.12        | N 32° 31' 18.56 W 103° 37' 21.48 |                          | 364.12          | 75.51                     |
|             | 4887.00    | 5.20        | 70.43            | 4863.44     | -91.30        | 94.01      | 360.85     | 0.01              | 554303.11         | 780401.24        | N 32° 31' 18.59 W 103° 37' 21.37 |                          | 372.70          | 75.39                     |
|             | 4981.00    | 5.35        | 70.59            | 4957.04     | -94.13        | 96.90      | 368.80     | 0.16              | 554305.99         | 780409.39        | N 32° 31' 18.62 W 103° 37' 21.27 |                          | 381.32          | 75.28                     |
|             | 5076.00    | 5.21        | 69.25            | 5051.64     | -97.06        | 99.80      | 377.01     | 0.20              | 554308.99         | 780417.60        | N 32° 31' 18.65 W 103° 37' 21.18 |                          | 390.02          | 75.16                     |
|             | 5170.00    | 5.12        | 69.85            | 5145.26     | -99.96        | 102.85     | 384.94     | 0.11              | 554311.95         | 780425.52        | N 32° 31' 18.68 W 103° 37' 21.08 |                          | 398.44          | 75.04                     |
|             | 5265.00    | 4.95        | 68.49            | 5238.89     | -102.87       | 105.82     | 392.73     | 0.22              | 554314.81         | 780433.32        | N 32° 31' 18.70 W 103° 37' 20.99 |                          | 406.74          | 74.92                     |
|             | 5359.00    | 5.00        | 67.01            | 5333.50     | -105.90       | 108.90     | 400.28     | 0.15              | 554317.60         | 780440.86        | N 32° 31' 18.73 W 103° 37' 20.89 |                          | 414.83          | 74.78                     |
|             | 5454.00    | 4.98        | 66.31            | 5428.17     | -108.12       | 112.18     | 407.87     | 0.07              | 554321.28         | 780448.45        | N 32° 31' 18.77 W 103° 37' 20.81 |                          | 423.02          | 74.62                     |
|             | 5548.00    | 4.74        | 66.11            | 5521.84     | -112.28       | 115.40     | 415.16     | 0.27              | 554324.49         | 780455.75        | N 32° 31' 18.80 W 103° 37' 20.73 |                          | 430.90          | 74.47                     |
|             | 5643.00    | 4.53        | 66.75            | 5616.53     | -115.30       | 118.47     | 422.20     | 0.23              | 554327.58         | 780462.78        | N 32° 31' 18.83 W 103° 37' 20.65 |                          | 438.51          | 74.33                     |
|             | 5734.00    | 4.24        | 66.83            | 5707.26     | -117.99       | 121.21     | 428.60     | 0.32              | 554330.30         | 780469.18        | N 32° 31' 18.85 W 103° 37' 20.57 |                          | 445.40          | 74.21                     |
|             | 5829.00    | 3.84        | 68.37            | 5801.67     | -122.08       | 125.38     | 436.69     | 0.27              | 554334.47         | 780476.27        | N 32° 31' 18.89 W 103° 37' 20.45 |                          | 452.25          | 74.05                     |
|             | 5984.00    | 3.90        | 65.15            | 5956.66     |               |            |            |                   |                   |                  |                                  |                          |                 |                           |

| Comments    | MD<br>(ft) | Incl<br>(°) | Azim Grd<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<br>(ft) | Closure<br>Azimuth<br>(°) |
|-------------|------------|-------------|-----------------|-------------|--------------|------------|------------|-------------------|------------------|-----------------|------------------------------|-----------------------|-----------------|---------------------------|
|             | 9102.00    | 3.96        | 87.70           | 9061.41     | -199.06      | 204.43     | 714.37     | 0.75              | 554413.52        | 760754.94       | N 32 31 19.88 W 103 37 17.23 |                       | 743.04          | 74.03                     |
|             | 9196.00    | 3.01        | 81.21           | 9155.24     | -199.52      | 204.83     | 720.05     | 1.09              | 554413.27        | 760760.82       | N 32 31 19.88 W 103 37 17.18 |                       | 748.84          | 74.11                     |
|             | 9291.00    | 4.39        | 78.25           | 9250.04     | -200.72      | 206.18     | 728.05     | 1.49              | 554415.27        | 760766.82       | N 32 31 19.88 W 103 37 17.09 |                       | 754.75          | 74.15                     |
|             | 9385.00    | 3.30        | 81.55           | 9343.83     | -201.83      | 207.43     | 732.43     | 1.22              | 554415.52        | 760772.79       | N 32 31 19.88 W 103 37 17.02 |                       | 761.03          | 74.18                     |
|             | 9479.00    | 2.28        | 80.50           | 9437.71     | -202.80      | 208.14     | 736.74     | 1.09              | 554417.23        | 760777.31       | N 32 31 19.88 W 103 37 16.97 |                       | 765.97          | 74.22                     |
|             | 9574.00    | 4.44        | 71.17           | 9532.54     | -204.06      | 208.64     | 742.08     | 2.34              | 554418.73        | 760782.65       | N 32 31 19.71 W 103 37 16.90 |                       | 771.12          | 74.23                     |
|             | 9668.00    | 5.50        | 62.47           | 9626.19     | -207.26      | 212.89     | 749.52     | 1.38              | 554421.98        | 760790.09       | N 32 31 19.74 W 103 37 16.82 |                       | 779.17          | 74.14                     |
|             | 9763.00    | 4.83        | 83.80           | 9720.80     | -211.07      | 216.78     | 757.15     | 0.72              | 554425.85        | 760797.72       | N 32 31 19.78 W 103 37 16.73 |                       | 787.56          | 74.02                     |
|             | 9857.00    | 6.28        | 63.71           | 9814.39     | -215.04      | 220.79     | 763.31     | 1.54              | 554429.88        | 760805.88       | N 32 31 19.82 W 103 37 16.63 |                       | 798.52          | 73.91                     |
|             | 9952.00    | 6.02        | 68.50           | 9908.81     | -219.10      | 224.91     | 771.60     | 0.93              | 554434.01        | 760815.17       | N 32 31 19.88 W 103 37 16.52 |                       | 806.59          | 73.81                     |
|             | 10046.00   | 4.80        | 72.82           | 10002.39    | -222.00      | 227.88     | 778.20     | 1.37              | 554438.97        | 760823.51       | N 32 31 19.89 W 103 37 16.42 |                       | 815.43          | 73.77                     |
|             | 10141.00   | 3.81        | 79.55           | 10097.13    | -223.70      | 229.63     | 789.85     | 1.17              | 554438.72        | 760830.42       | N 32 31 19.90 W 103 37 16.34 |                       | 822.55          | 73.78                     |
|             | 10235.00   | 3.90        | 70.81           | 10180.91    | -225.27      | 231.25     | 795.94     | 0.63              | 554440.34        | 760836.51       | N 32 31 19.92 W 103 37 16.27 |                       | 828.85          | 73.80                     |
|             | 10340.00   | 3.54        | 74.90           | 10269.69    | -227.24      | 233.26     | 802.44     | 0.43              | 554442.38        | 760843.01       | N 32 31 19.94 W 103 37 16.20 |                       | 835.68          | 73.79                     |
|             | 10434.00   | 3.05        | 76.59           | 10369.54    | -228.53      | 234.80     | 807.67     | 0.53              | 554443.69        | 760848.24       | N 32 31 19.95 W 103 37 16.14 |                       | 841.05          | 73.80                     |
|             | 10528.00   | 2.53        | 75.48           | 10464.42    | -229.81      | 236.30     | 812.16     | 0.55              | 554444.80        | 760852.73       | N 32 31 19.96 W 103 37 16.08 |                       | 845.87          | 73.82                     |
|             | 10623.00   | 1.03        | 85.48           | 10578.38    | -230.18      | 238.30     | 815.01     | 1.62              | 554445.39        | 760855.56       | N 32 31 19.97 W 103 37 16.05 |                       | 848.58          | 73.83                     |
|             | 10718.00   | 0.47        | 26.92           | 10673.37    | -230.58      | 238.71     | 816.04     | 0.93              | 554445.81        | 760856.81       | N 32 31 19.97 W 103 37 16.04 |                       | 849.68          | 73.82                     |
|             | 10813.00   | 0.75        | 1.15            | 10768.36    | -231.55      | 237.68     | 816.23     | 0.41              | 554446.77        | 760858.80       | N 32 31 19.98 W 103 37 16.03 |                       | 850.13          | 73.78                     |
|             | 10907.00   | 0.13        | 123.86          | 10862.36    | -232.11      | 238.24     | 816.33     | 0.88              | 554447.33        | 760859.90       | N 32 31 19.99 W 103 37 16.03 |                       | 850.38          | 73.73                     |
|             | 10954.00   | 5.11        | 178.91          | 10909.30    | -229.98      | 236.12     | 816.49     | 5.01              | 554445.21        | 760857.06       | N 32 31 19.97 W 103 37 16.03 |                       | 849.94          | 73.87                     |
|             | 11001.00   | 11.62       | 178.41          | 10955.77    | -223.18      | 229.30     | 816.90     | 13.85             | 554438.39        | 760857.47       | N 32 31 19.90 W 103 37 16.03 |                       | 848.47          | 74.32                     |
|             | 11048.00   | 14.68       | 178.41          | 11001.54    | -212.54      | 218.68     | 816.08     | 8.63              | 554437.77        | 760858.65       | N 32 31 19.79 W 103 37 16.01 |                       | 846.80          | 75.03                     |
|             | 11096.00   | 16.81       | 171.08          | 11047.24    | -198.73      | 205.89     | 820.05     | 4.03              | 554414.68        | 760860.62       | N 32 31 19.87 W 103 37 15.98 |                       | 845.50          | 75.91                     |
|             | 11143.00   | 21.03       | 177.80          | 11092.74    | -184.64      | 190.81     | 821.40     | 10.49             | 554399.91        | 760861.97       | N 32 31 19.52 W 103 37 15.98 |                       | 843.27          | 76.92                     |
| HL Crossing | 11160.00   | 22.52       | 178.39          | 11108.02    | -178.34      | 184.51     | 821.60     | 8.83              | 554393.60        | 760862.17       | N 32 31 19.45 W 103 37 15.98 |                       | 842.06          | 77.34                     |
|             | 11191.00   | 25.24       | 179.14          | 11136.37    | -185.79      | 171.87     | 821.87     | 8.83              | 554381.06        | 760862.44       | N 32 31 19.33 W 103 37 15.97 |                       | 839.67          | 78.18                     |
|             | 11238.00   | 28.37       | 177.33          | 11178.31    | -144.81      | 150.78     | 822.54     | 10.88             | 554359.88        | 760863.11       | N 32 31 19.12 W 103 37 15.97 |                       | 838.25          | 79.61                     |
|             | 11285.00   | 33.28       | 177.79          | 11218.68    | -120.55      | 126.73     | 823.58     | 4.66              | 554335.83        | 760864.12       | N 32 31 18.88 W 103 37 15.98 |                       | 833.25          | 81.25                     |
|             | 11332.00   | 37.44       | 177.44          | 11265.88    | -98.57       | 89.57      | 824.77     | 8.89              | 554303.43        | 760865.38       | N 32 31 18.61 W 103 37 15.95 |                       | 830.43          | 83.12                     |
|             | 11380.00   | 39.18       | 175.78          | 11294.65    | -63.68       | 69.87      | 826.61     | 4.02              | 554278.97        | 760867.18       | N 32 31 18.32 W 103 37 15.93 |                       | 829.56          | 85.17                     |
|             | 11427.00   | 44.08       | 178.23          | 11326.77    | -32.49       | 38.70      | 828.20     | 10.88             | 554247.80        | 760868.77       | N 32 31 18.01 W 103 37 15.91 |                       | 829.11          | 87.32                     |
|             | 11475.00   | 49.23       | 179.84          | 11362.71    | 2.41         | 3.81       | 828.77     | 11.20             | 554212.91        | 760869.34       | N 32 31 17.67 W 103 37 15.91 |                       | 828.78          | 89.74                     |
|             | 11522.00   | 53.97       | 181.04          | 11391.89    | 39.22        | -33.01     | 828.48     | 10.88             | 554176.09        | 760869.04       | N 32 31 17.30 W 103 37 15.91 |                       | 828.13          | 92.28                     |
|             | 11569.00   | 58.16       | 182.86          | 11418.12    | 71.87        | -71.87     | 827.13     | 9.48              | 554137.14        | 760867.70       | N 32 31 16.92 W 103 37 15.93 |                       | 830.26          | 94.97                     |
|             | 11616.00   | 62.07       | 184.51          | 11441.54    | 118.63       | -112.64    | 824.83     | 8.43              | 554096.48        | 760865.40       | N 32 31 16.51 W 103 37 15.96 |                       | 832.49          | 97.78                     |
|             | 11664.00   | 65.94       | 184.39          | 11462.57    | 161.84       | -161.84    | 821.82     | 8.16              | 554053.43        | 760862.38       | N 32 31 16.09 W 103 37 16.00 |                       | 830.73          | 100.73                    |
|             | 11711.00   | 70.05       | 184.50          | 11480.18    | 205.25       | -199.11    | 818.44     | 8.75              | 554010.00        | 760859.01       | N 32 31 15.68 W 103 37 16.04 |                       | 842.31          | 103.67                    |
|             | 11758.00   | 74.06       | 182.62          | 11494.68    | 249.84       | -243.73    | 815.87     | 9.34              | 553965.38        | 760856.24       | N 32 31 15.22 W 103 37 16.08 |                       | 851.31          | 106.84                    |
|             | 11805.00   | 77.01       | 177.86          | 11506.40    | 295.33       | -289.22    | 815.45     | 11.47             | 553919.89        | 760856.02       | N 32 31 14.77 W 103 37 16.09 |                       | 865.22          | 109.53                    |
|             | 11852.00   | 77.23       | 178.45          | 11516.88    | 341.10       | -334.98    | 817.09     | 3.17              | 553874.14        | 760856.28       | N 32 31 14.31 W 103 37 16.08 |                       | 883.64          | 112.28                    |
|             | 11899.00   | 78.81       | 178.57          | 11526.23    | 387.10       | -380.95    | 820.49     | 5.50              | 553828.17        | 760861.06       | N 32 31 13.88 W 103 37 16.03 |                       | 904.61          | 114.91                    |
|             | 11947.00   | 85.06       | 178.58          | 11532.55    | 434.80       | -428.43    | 823.33     | 10.94             | 553786.69        | 760863.90       | N 32 31 13.39 W 103 37 16.00 |                       | 926.13          | 117.49                    |
|             | 11994.00   | 89.27       | 178.53          | 11534.88    | 481.48       | -475.28    | 826.15     | 8.96              | 553734.84        | 760866.72       | N 32 31 12.93 W 103 37 15.97 |                       | 945.50          | 119.81                    |
|             | 12042.00   | 90.45       | 178.66          | 11534.99    | 529.40       | -523.20    | 828.88     | 2.82              | 553685.82        | 760869.45       | N 32 31 12.45 W 103 37 15.95 |                       | 960.19          | 122.26                    |
|             | 12161.00   | 90.90       | 178.03          | 11533.59    | 584.22       | -641.86    | 836.15     | 0.87              | 553567.16        | 760876.72       | N 32 31 12.28 W 103 37 15.87 |                       | 1054.17         | 127.52                    |
|             | 12256.00   | 90.78       | 177.62          | 11532.20    | 743.10       | -736.81    | 841.41     | 1.88              | 553472.32        | 760881.88       | N 32 31 12.04 W 103 37 15.82 |                       | 1118.42         | 131.21                    |
|             | 12351.00   | 90.60       | 181.73          | 11530.80    | 838.07       | -831.77    | 841.95     | 4.33              | 553377.38        | 760882.52       | N 32 31 11.60 W 103 37 15.82 |                       | 1183.52         | 134.65                    |
|             | 12445.00   | 90.50       | 185.98          | 11529.68    | 931.78       | -925.53    | 835.65     | 4.52              | 553283.60        | 760876.22       | N 32 31 11.17 W 103 37 15.80 |                       | 1246.87         | 137.82                    |
|             | 12540.00   | 90.28       | 189.43          | 11528.01    | 1026.81      | -1019.86   | 822.93     | 3.98              | 553189.48        | 760863.50       | N 32 31 10.74 W 103 37 16.05 |                       | 1410.95         | 141.09                    |
|             | 12634.00   | 90.39       | 186.63          | 11528.48    | 1118.78      | -1112.73   | 809.80     | 2.98              | 553096.41        | 760850.37       | N 32 31 10.32 W 103 37 16.22 |                       | 1376.21         | 143.95                    |
|             | 12729.00   | 89.50       | 183.24          | 11528.55    | 1213.34      | -1207.36   | 801.63     | 3.69              | 553001.78        | 760842.20       | N 32 31 9.88 W 103 37 16.32  |                       | 1449.25         | 146.42                    |
|             | 12823.00   | 89.94       | 181.40          | 11529.01    | 1307.23      | -1301.28   | 797.83     | 2.01              | 552907.87        | 760838.40       | N 32 31 9.48 W 103 37 16.37  |                       | 1526.39         | 148.49                    |
|             | 12918.00   | 90.17       | 180.02          | 11528.92    | 1402.21      | -1396.27   | 798.65     | 1.47              | 552812.88        | 760837.22       | N 32 31 9.02 W 103 37 16.39  |                       | 1607.55         | 150.29                    |
|             | 13012.00   | 89.94       | 176.11          | 11528.83    | 1496.18      | -1490.20   | 799.82     | 4.17              | 552718.96        | 760840.39       | N 32 31 8.58 W 103 37 16.38  |                       | 1691.27         | 151.78                    |
|             | 13107.00   | 89.83       | 174.38          | 11528.02    | 1590.88      | -1584.87   | 807.70     | 1.92              | 552624.29        | 760848.27       | N 32 31 8.15 W 103 37 16.28  |                       | 1778.81         | 153.21                    |
|             | 13202.00   | 89.55       | 173.77          | 11528.53    | 1685.45      | -1679.36   | 817.50     | 0.71              | 552529.87        | 760858.07       | N 32 31 7.71 W 103 37 16.17  |                       | 1867.77         | 154.04                    |
|             | 13296.00   | 88.71       | 173.84          | 11530.98    | 1778.94      | -1772.78   | 827.81     | 0.90              | 552438.39        | 760868.38       | N 32 31 7.29 W 103 37 16.06  |                       | 1956.53         | 154.97                    |
|             | 13391.00   | 88.94       | 175.02          | 11532.91    | 1873.52      | -1867.29   | 837.19     | 1.47              | 552341.88        | 760877.76       | N 32 30 59.15 W 103 37 15.95 |                       | 2046.38         | 155.85                    |
|             | 13485.00   | 88.32       | 178.55          | 11535.18    | 1967.26      | -1961.01   | 844.10     | 1.78              | 552248.17        | 760884.67       | N 32 30 56.22 W 103 37 15.88 |                       | 2134.96         | 156.71                    |
|             | 13580.00   | 89.16       | 177.81          | 11537.25    | 2062.17      | -2055.88   | 848.94     | 1.42              | 552153.32        | 760899.51       | N 32 30 52.57 W 103 37 15.83 |                       | 2224.24         | 157.56                    |
|             | 13675.00   | 89.05       | 178.68          | 11538.73    | 2157.13      | -2150.80   | 852.01     | 1.13              | 552058.39        | 760892.58       | N 32 30 56.35 W 103 37 15.80 |                       | 2313.41         | 158.39                    |
|             | 13769.00   | 89.33       | 180.07          | 11541.12    | 2251.12      | -2244.70   | 855.01     | 1.51              | 551964.41        | 760893.61       | N 32 30 54.42 W 103 37 15.80 |                       | 2403.60         | 159.18                    |
|             | 13863.00   | 89.27       | 180.40          | 11541.21    | 2345.10      | -2338.77   | 852.65     | 0.38              | 551870.42        | 760893.22       | N 32 30 54.48 W 103 37 15.81 |                       | 2489.35         | 159.87                    |
|             | 13958.00   | 89.38       | 180.32          | 11542.33    | 2440.09      | -2433.76   | 852.08     | 0.14              | 551775.43        | 760892.62       | N 32 30 53.55 W 103 37 15.82 |                       | 2578.60         | 160.70                    |
|             | 14052.00   | 88.15       | 180.22          | 11544.35    | 2534.06      | -2527.74   | 851.61     | 1.31              | 551681.46        | 760892.18       | N 32 30 52.62 W 103 37 15.84 |                       | 2667.34         | 161.38                    |
|             | 14147.00   | 89.33       | 180.23          | 11546.44    | 2628.03      | -2622.71   | 851.24     | 1.24              | 551586.49        | 760891.81       | N 32 30 51.68 W 103 37 15.85 | </                    |                 |                           |

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLG<br>(ft/100ft) | Northing<br>(RUS) | Easting<br>(RUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") | Closure<br>(ft) | Closure<br>Azimuth<br>(°) |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|-------------------|-------------------|------------------|-------------------------|--------------------------|-----------------|---------------------------|
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|-------------------|-------------------|------------------|-------------------------|--------------------------|-----------------|---------------------------|

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<br>Diameter<br>(in) | Survey Tool Type               | Borehole / Survey                                                              |
|-------------|------|-----------------|---------------|------------------|-------------------|----------------------------|--------------------------------|--------------------------------------------------------------------------------|
|             | 1    | 0.000           | 31.000        | 1/88.425         | 30.000            | 30.000                     | NAL_MWVD_1.0_DEG-Depth<br>Only | Original Borehole / Chisholm<br>Minis 1 Fed Com WCA 16H<br>MWD 0' to 19030' MD |
|             | 1    | 31.000          | 31.000        | Act Strs         | 30.000            | 30.000                     | NAL_MWVD_1.0_DEG-Depth<br>Only | Original Borehole / Chisholm<br>Minis 1 Fed Com WCA 16H<br>MWD 0' to 19030' MD |
|             | 1    | 31.000          | 19030.000     | Act Strs         | 30.000            | 30.000                     | NAL_MWVD_1.0_DEG               | Original Borehole / Chisholm<br>Minis 1 Fed Com WCA 16H                        |

...Original Borehole\Chisholm Minis 1 Fed Com WCA 16H MWD 0' to 19030' MD