

## Chisholm Outland WCA State Unit 11-2 5H ST01 MWD Surveys 11766ft to 18900ft MD Survey Geodetic Report (Def Survey)

**Report Date:** February 25, 2020 - 12:28 PM  
**Client:** Chisholm  
**Field:** NM Lea County (NAD 83)  
**Structure / Slot:** Chisholm Outland WCA State Unit 11-2 5H / New Slot  
**Well:** Original Hole  
**Borehole:** ST01  
**UWI / API#:** Unknown / Unknown  
**Survey Name:** Chisholm Outland WCA State Unit 11-2 5H ST01 MWD Surveys 11766ft to 18900ft MD  
**Survey Date:** January 25, 2020  
**Tort / AHD / DDI / ERD Ratio:** 260.903 ° / 8290.077 ft / 6.545 / 0.711  
**Coordinate Reference System:** NAD83 New Mexico State Plane, Eastern Zone, US Feet  
**Location Lat / Long:** N 32° 29' 11.83683", W 103° 26' 15.16045"  
**Location Grid N/E Y/X:** N 541923.430 ftUS, E 817549.530 ftUS  
**CRS Grid Convergence Angle:** 0.4812 °  
**Grid Scale Factor:** 0.99999647  
**Version / Patch:** 2.10.787.0

**Survey / DLS Computation:** Minimum Curvature / Lubinski  
**Vertical Section Azimuth:** 359.520 ° (Grid North)  
**Vertical Section Origin:** 0.000 ft, 0.000 ft  
**TVD Reference Datum:** KB = 31ft  
**TVD Reference Elevation:** 3702.800 ft above MSL  
**Seabed / Ground Elevation:** 3671.800 ft above MSL  
**Magnetic Declination:** 6.542 °  
**Total Gravity Field Strength:** 998.4926mgn (9.80665 Based)  
**Gravity Model:** GARM  
**Total Magnetic Field Strength:** 47966.747 nT  
**Magnetic Dip Angle:** 60.320 °  
**Declination Date:** January 25, 2020  
**Magnetic Declination Model:** HDGM 2019  
**North Reference:** Grid North  
**Grid Convergence Used:** 0.4812 °  
**Total Corr Mag North->Grid North:** 6.0604 °  
**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 ° ' ") |
|----------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
| Surface              | 0.00       | 0.00        | 5.00             | 0.00        | 0.00         | 0.00       | 0.00       | N/A              | 541923.43          | 817549.53         | N 32 29 11.84           | W 103 26 15.16           |
| First SLB MWD Survey | 140.00     | 0.08        | 115.06           | 140.00      | -0.04        | -0.04      | 0.09       | 0.06             | 541923.39          | 817549.62         | N 32 29 11.84           | W 103 26 15.16           |
|                      | 243.00     | 0.34        | 165.34           | 243.00      | -0.37        | -0.37      | 0.23       | 0.29             | 541923.06          | 817549.76         | N 32 29 11.83           | W 103 26 15.16           |
|                      | 336.00     | 0.53        | 100.18           | 336.00      | -0.72        | -0.71      | 0.72       | 0.53             | 541922.72          | 817550.25         | N 32 29 11.83           | W 103 26 15.15           |
|                      | 404.00     | 0.38        | 92.21            | 403.99      | -0.79        | -0.77      | 1.26       | 0.24             | 541922.66          | 817550.79         | N 32 29 11.83           | W 103 26 15.15           |
|                      | 579.00     | 0.73        | 88.75            | 578.99      | -0.80        | -0.77      | 2.95       | 0.20             | 541922.66          | 817552.48         | N 32 29 11.83           | W 103 26 15.13           |
|                      | 673.00     | 0.86        | 86.07            | 672.98      | -0.75        | -0.71      | 4.26       | 0.14             | 541922.72          | 817553.79         | N 32 29 11.83           | W 103 26 15.11           |
|                      | 705.00     | 0.84        | 90.98            | 704.97      | -0.74        | -0.70      | 4.73       | 0.24             | 541922.73          | 817554.26         | N 32 29 11.83           | W 103 26 15.11           |
|                      | 788.00     | 0.98        | 83.83            | 787.96      | -0.68        | -0.63      | 6.04       | 0.22             | 541922.80          | 817555.57         | N 32 29 11.83           | W 103 26 15.09           |
|                      | 882.00     | 1.41        | 64.28            | 881.94      | -0.11        | -0.04      | 7.89       | 0.62             | 541923.39          | 817557.42         | N 32 29 11.84           | W 103 26 15.07           |
|                      | 977.00     | 1.14        | 84.30            | 976.92      | 0.47         | 0.56       | 9.88       | 0.54             | 541923.99          | 817559.41         | N 32 29 11.84           | W 103 26 15.05           |
|                      | 1071.00    | 1.57        | 126.97           | 1070.90     | -0.22        | -0.13      | 11.84      | 1.13             | 541923.30          | 817561.37         | N 32 29 11.83           | W 103 26 15.02           |
|                      | 1166.00    | 1.96        | 148.52           | 1165.85     | -2.41        | -2.29      | 13.73      | 0.80             | 541921.14          | 817563.26         | N 32 29 11.81           | W 103 26 15.00           |
|                      | 1260.00    | 1.58        | 152.13           | 1259.81     | -4.94        | -4.81      | 15.17      | 0.42             | 541918.62          | 817564.70         | N 32 29 11.79           | W 103 26 14.98           |
|                      | 1334.00    | 1.65        | 149.11           | 1333.78     | -6.76        | -6.63      | 16.20      | 0.15             | 541916.80          | 817565.73         | N 32 29 11.77           | W 103 26 14.97           |
|                      | 1441.00    | 1.65        | 171.80           | 1440.73     | -9.62        | -9.47      | 17.21      | 0.61             | 541913.96          | 817566.74         | N 32 29 11.74           | W 103 26 14.96           |
|                      | 1535.00    | 3.43        | 229.16           | 1534.65     | -12.78       | -12.65     | 15.27      | 3.08             | 541910.78          | 817564.80         | N 32 29 11.71           | W 103 26 14.98           |
|                      | 1625.00    | 6.31        | 225.50           | 1624.32     | -17.96       | -17.88     | 9.71       | 3.22             | 541905.55          | 817559.24         | N 32 29 11.66           | W 103 26 15.05           |
|                      | 1731.00    | 6.97        | 219.86           | 1729.61     | -26.91       | -26.90     | 1.43       | 0.87             | 541896.53          | 817550.96         | N 32 29 11.57           | W 103 26 15.15           |
|                      | 1826.00    | 5.76        | 210.22           | 1824.02     | -35.40       | -35.44     | -4.67      | 1.70             | 541887.99          | 817544.86         | N 32 29 11.49           | W 103 26 15.22           |
|                      | 1921.00    | 4.22        | 192.67           | 1918.66     | -42.91       | -42.98     | -7.83      | 2.26             | 541880.46          | 817541.70         | N 32 29 11.41           | W 103 26 15.26           |
|                      | 2016.00    | 3.20        | 150.20           | 2013.48     | -48.62       | -48.69     | -7.28      | 3.00             | 541874.74          | 817542.25         | N 32 29 11.36           | W 103 26 15.25           |
|                      | 2111.00    | 3.63        | 137.96           | 2108.31     | -53.19       | -53.22     | -3.95      | 0.89             | 541870.21          | 817545.58         | N 32 29 11.31           | W 103 26 15.21           |
|                      | 2205.00    | 4.29        | 132.06           | 2202.09     | -57.79       | -57.79     | 0.65       | 0.82             | 541865.64          | 817550.18         | N 32 29 11.27           | W 103 26 15.16           |
|                      | 2299.00    | 3.91        | 132.96           | 2295.85     | -62.37       | -62.33     | 5.61       | 0.41             | 541861.10          | 817555.14         | N 32 29 11.22           | W 103 26 15.10           |
|                      | 2394.00    | 3.84        | 130.70           | 2390.63     | -66.69       | -66.61     | 10.39      | 0.18             | 541856.82          | 817559.92         | N 32 29 11.18           | W 103 26 15.05           |
|                      | 2489.00    | 4.18        | 119.09           | 2485.40     | -70.50       | -70.37     | 15.83      | 0.92             | 541853.06          | 817565.36         | N 32 29 11.14           | W 103 26 14.98           |
|                      | 2583.00    | 4.81        | 111.72           | 2579.11     | -73.68       | -73.49     | 22.48      | 0.91             | 541849.94          | 817572.01         | N 32 29 11.11           | W 103 26 14.91           |
|                      | 2678.00    | 5.33        | 107.71           | 2673.74     | -76.56       | -76.31     | 30.39      | 0.66             | 541847.12          | 817579.92         | N 32 29 11.08           | W 103 26 14.81           |
|                      | 2772.00    | 4.85        | 103.29           | 2767.37     | -78.87       | -78.55     | 38.41      | 0.66             | 541844.88          | 817587.94         | N 32 29 11.06           | W 103 26 14.72           |
|                      | 2868.00    | 5.46        | 98.72            | 2862.98     | -80.56       | -80.17     | 46.88      | 0.77             | 541843.26          | 817596.41         | N 32 29 11.04           | W 103 26 14.62           |
|                      | 2962.00    | 6.27        | 92.13            | 2956.49     | -81.51       | -81.04     | 56.43      | 1.12             | 541842.39          | 817605.96         | N 32 29 11.03           | W 103 26 14.51           |
|                      | 3057.00    | 6.71        | 84.82            | 3050.88     | -81.29       | -80.73     | 67.14      | 0.98             | 541842.70          | 817616.67         | N 32 29 11.03           | W 103 26 14.38           |
|                      | 3153.00    | 6.40        | 78.75            | 3146.25     | -79.83       | -79.18     | 77.97      | 0.79             | 541844.25          | 817627.50         | N 32 29 11.05           | W 103 26 14.26           |
|                      | 3248.00    | 6.76        | 73.37            | 3240.63     | -77.29       | -76.55     | 88.52      | 0.75             | 541846.88          | 817638.05         | N 32 29 11.07           | W 103 26 14.13           |
|                      | 3343.00    | 6.28        | 68.15            | 3335.01     | -73.84       | -73.02     | 98.70      | 0.80             | 541850.41          | 817648.23         | N 32 29 11.11           | W 103 26 14.02           |
|                      | 3438.00    | 6.23        | 70.65            | 3429.45     | -70.28       | -69.37     | 108.39     | 0.29             | 541854.06          | 817657.92         | N 32 29 11.14           | W 103 26 13.90           |
|                      | 3533.00    | 5.33        | 79.32            | 3523.97     | -67.83       | -66.85     | 117.59     | 1.32             | 541856.58          | 817667.12         | N 32 29 11.17           | W 103 26 13.79           |
|                      | 3628.00    | 4.30        | 81.27            | 3618.63     | -66.54       | -65.49     | 125.45     | 1.10             | 541857.94          | 817674.98         | N 32 29 11.18           | W 103 26 13.70           |
|                      | 3723.00    | 3.66        | 87.23            | 3713.40     | -65.91       | -64.80     | 132.00     | 0.80             | 541858.63          | 817681.52         | N 32 29 11.18           | W 103 26 13.63           |
|                      | 3818.00    | 3.14        | 89.01            | 3808.23     | -65.76       | -64.61     | 137.63     | 0.56             | 541858.82          | 817687.15         | N 32 29 11.19           | W 103 26 13.56           |
|                      | 3913.00    | 2.66        | 94.18            | 3903.11     | -65.92       | -64.73     | 142.43     | 0.57             | 541858.70          | 817691.95         | N 32 29 11.18           | W 103 26 13.50           |
|                      | 4008.00    | 2.56        | 95.45            | 3998.01     | -66.32       | -65.09     | 146.74     | 0.12             | 541858.34          | 817696.27         | N 32 29 11.18           | W 103 26 13.45           |
|                      | 4102.00    | 2.26        | 98.72            | 4091.93     | -66.83       | -65.57     | 150.66     | 0.35             | 541857.86          | 817700.19         | N 32 29 11.18           | W 103 26 13.41           |
|                      | 4197.00    | 1.69        | 98.22            | 4186.87     | -67.34       | -66.05     | 153.90     | 0.60             | 541857.38          | 817703.43         | N 32 29 11.17           | W 103 26 13.37           |
|                      | 4292.00    | 1.54        | 102.35           | 4281.84     | -67.84       | -66.53     | 156.53     | 0.20             | 541856.90          | 817706.06         | N 32 29 11.17           | W 103 26 13.34           |
|                      | 4386.00    | 1.23        | 94.58            | 4375.81     | -68.21       | -66.88     | 158.77     | 0.38             | 541856.55          | 817708.30         | N 32 29 11.16           | W 103 26 13.31           |
|                      | 4493.00    | 1.27        | 85.97            | 4482.78     | -68.23       | -66.89     | 161.10     | 0.18             | 541856.54          | 817710.63         | N 32 29 11.16           | W 103 26 13.29           |
|                      | 4588.00    | 1.06        | 83.06            | 4577.76     | -68.07       | -66.71     | 163.02     | 0.23             | 541856.72          | 817712.55         | N 32 29 11.16           | W 103 26 13.26           |
|                      | 4683.00    | 0.57        | 41.13            | 4672.75     | -67.62       | -66.24     | 164.20     | 0.78             | 541857.19          | 817713.73         | N 32 29 11.17           | W 103 26 13.25           |
|                      | 4777.00    | 0.80        | 22.95            | 4766.75     | -66.67       | -65.29     | 164.77     | 0.33             | 541858.14          | 817714.29         | N 32 29 11.18           | W 103 26 13.24           |
|                      | 4872.00    | 0.84        | 25.01            | 4861.74     | -65.43       | -64.05     | 165.32     | 0.05             | 541859.38          | 817714.85         | N 32 29 11.19           | W 103 26 13.24           |
|                      | 4966.00    | 0.58        | 27.91            | 4955.73     | -64.39       | -63.00     | 165.83     | 0.28             | 541860.43          | 817715.36         | N 32 29 11.20           | W 103 26 13.23           |
|                      | 5061.00    | 0.50        | 17.92            | 5050.73     | -63.57       | -62.18     | 166.19     | 0.13             | 541861.25          | 817715.71         | N 32 29 11.21           | W 103 26 13.23           |
|                      | 5155.00    | 0.53        | 9.56             | 5144.72     | -62.76       | -61.36     | 166.38     | 0.09             | 541862.07          | 817715.91         | N 32 29 11.22           | W 103 26 13.22           |
|                      | 5250.00    | 0.51        | 356.86           | 5239.72     | -61.90       | -60.51     | 166.43     | 0.12             | 541862.92          | 817715.96         | N 32 29 11.22           | W 103 26 13.22           |
|                      | 5345.00    | 0.44        | 350.29           | 5334.72     | -61.12       | -59.73     | 166.35     | 0.09             | 541863.70          | 817715.88         | N 32 29 11.23           | W 103 26 13.22           |
|                      | 5401.00    | 0.36        | 348.08           | 5390.71     | -60.73       | -59.34     | 166.28     | 0.15             | 541864.09          | 817715.81         | N 32 29 11.24           | W 103 26 13.23           |
|                      | 5535.00    | 0.45        | 1.17             | 5524.71     | -59.79       | -58.40     | 166.20     | 0.10             | 541865.03          | 817715.73         | N 32 29 11.25           | W 103 26 13.23           |
|                      | 5629.00    | 2.66        | 66.38            | 5618.67     | -58.57       | -57.16     | 168.21     | 2.66             | 541866.27          | 817717.74         | N 32 29 11.26           | W 103 26 13.20           |
|                      | 5723.00    | 5.26        | 73.89            | 5712.44     | -56.55       | -55.09     | 174.35     | 2.81             | 541868.34          | 817723.87         | N 32 29 11.28           | W 103 26 13.13           |
|                      | 5818.00    | 4.72        | 74.83            | 5807.08     | -54.39       | -52.86     | 182.30     | 0.57             | 541870.57          | 817731.83         | N 32 29 11.30           | W 103 26 13.04           |
|                      | 5912.00    | 5.41        | 78.50            | 5900.71     | -52.56       | -50.96     | 190.38     | 0.81             | 541872.47          | 817739.91         | N 32 29 11.32           | W 103 26 12.94           |
|                      | 6007.00    | 6.47        | 89.28            | 5995.21     | -51.68       | -50.00     | 200.12     | 1.62             | 541873.43          | 817749.65         | N 32 29 11.33           | W 103 26 12.83           |
|                      | 6101.00    | 5.86        | 86.61            | 6088.66     | -51.41       | -49.65     | 210.20     | 0.72             | 541873.78          | 817759.73         | N 32 29 11.33           | W 103 26 12.71           |
|                      | 6196.00    | 6.86        | 94.09            | 6183.08     | -51.62       | -49.77     | 220.70     | 1.36             | 541873.66          | 817770.23         | N 32 29 11.33           | W 103 26 12.59           |
|                      | 6290.00    | 8.17        | 105.11           | 6276.27     | -53.86       | -51.91     | 232.75     | 2.07             | 541871.52          | 817782.28         | N 32 29 11.30           | W 103 26 12.45           |
|                      | 6385.00    | 7.96        | 109.51           | 6370.33     | -57.92       | -55.87     | 245.47     | 0.69             | 541867.56          | 817795.00         | N 32 29 11.26           | W 103 26 12.30           |
|                      | 6479.00    | 7.53        | 107.32           | 6463.48     | -62.03       | -59.88     | 257.49     | 0.55             | 541863.55          | 817807.01         | N 32 29 11.22           | W 103 26 12.16           |
|                      | 6574.00    | 7.30        | 108.13           | 6557.68     | -65.86       | -63.61     | 269.16     | 0.27             | 541859.82          | 817818.69         | N 32 29 11.19           | W 103 26 12.02           |
|                      | 6668.00    | 6.83        | 107.81           | 6650.97     | -69.52       | -67.18     | 280.16     | 0.50             | 541856.25          | 817829.69         | N 32 29 11.15           | W 103 26 11.90           |
|                      | 6763.00    | 6.39        | 106.28           | 6745.34     | -72.82       | -70.39     | 290.61     | 0.50             | 541853.04          | 817840.14         | N 32 29 11.12           | W 103 26 11.77           |
|                      | 6857.00    | 5.33        | 89.15            | 6838.85     | -74.30       | -71.79     | 300.00     | 2.16             | 541851.64          | 817849.53         | N 32 29 11.10           | W 103 26 11.67           |
|                      | 6952.00    | 5.05        | 80.22            | 6933.46     |              |            |            |                  |                    |                   |                         |                          |

| 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 ° ' ") |
|----------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|------------------------------|--------------------------|
|                | 7330.00    | 4.26        | 98.77            | 7310.16     | -76.41       | -73.57     | 339.52     | 0.15             | 541849.86          | 817889.05         | N 32 29 11.08 W 103 26 11.20 |                          |
|                | 7424.00    | 4.05        | 101.16           | 7403.92     | -77.64       | -74.75     | 346.23     | 0.29             | 541848.68          | 817895.76         | N 32 29 11.07 W 103 26 11.13 |                          |
|                | 7519.00    | 3.93        | 100.09           | 7498.69     | -78.92       | -75.97     | 352.72     | 0.15             | 541847.46          | 817902.25         | N 32 29 11.06 W 103 26 11.05 |                          |
|                | 7614.00    | 3.72        | 98.43            | 7593.48     | -79.99       | -76.99     | 358.98     | 0.25             | 541846.44          | 817908.51         | N 32 29 11.05 W 103 26 10.98 |                          |
|                | 7708.00    | 3.45        | 99.00            | 7687.29     | -80.93       | -77.88     | 364.79     | 0.29             | 541845.55          | 817914.32         | N 32 29 11.04 W 103 26 10.91 |                          |
|                | 7803.00    | 3.32        | 101.38           | 7782.13     | -81.97       | -78.87     | 370.31     | 0.20             | 541844.56          | 817919.84         | N 32 29 11.03 W 103 26 10.85 |                          |
|                | 7897.00    | 2.73        | 104.32           | 7875.99     | -83.10       | -79.96     | 375.15     | 0.65             | 541843.47          | 817924.67         | N 32 29 11.01 W 103 26 10.79 |                          |
|                | 7992.00    | 2.12        | 112.56           | 7970.91     | -84.36       | -81.19     | 378.96     | 0.74             | 541842.24          | 817928.49         | N 32 29 11.00 W 103 26 10.74 |                          |
|                | 8086.00    | 0.75        | 101.47           | 8064.88     | -85.17       | -81.98     | 381.17     | 1.48             | 541841.45          | 817930.70         | N 32 29 10.99 W 103 26 10.72 |                          |
|                | 8181.00    | 0.20        | 4.78             | 8159.88     | -85.14       | -81.94     | 381.79     | 0.84             | 541841.49          | 817931.32         | N 32 29 10.99 W 103 26 10.71 |                          |
|                | 8276.00    | 0.20        | 96.48            | 8254.87     | -84.99       | -81.79     | 381.97     | 0.30             | 541841.64          | 817931.50         | N 32 29 11.00 W 103 26 10.71 |                          |
|                | 8370.00    | 0.34        | 130.54           | 8348.87     | -85.19       | -81.99     | 382.35     | 0.22             | 541841.44          | 817931.87         | N 32 29 10.99 W 103 26 10.71 |                          |
|                | 8465.00    | 0.53        | 138.28           | 8443.87     | -85.71       | -82.50     | 382.85     | 0.21             | 541840.93          | 817932.38         | N 32 29 10.99 W 103 26 10.70 |                          |
|                | 8559.00    | 0.90        | 152.90           | 8537.86     | -86.70       | -83.49     | 383.48     | 0.44             | 541839.94          | 817933.01         | N 32 29 10.98 W 103 26 10.69 |                          |
|                | 8654.00    | 0.95        | 156.71           | 8632.85     | -88.09       | -84.87     | 384.13     | 0.08             | 541838.56          | 817933.66         | N 32 29 10.97 W 103 26 10.68 |                          |
|                | 8748.00    | 1.08        | 160.05           | 8726.84     | -89.64       | -86.42     | 384.74     | 0.15             | 541837.01          | 817934.27         | N 32 29 10.95 W 103 26 10.68 |                          |
|                | 8843.00    | 0.83        | 181.12           | 8821.82     | -91.17       | -87.95     | 385.03     | 0.45             | 541835.48          | 817934.56         | N 32 29 10.93 W 103 26 10.67 |                          |
|                | 8937.00    | 0.83        | 190.79           | 8915.81     | -92.52       | -89.30     | 384.89     | 0.15             | 541834.13          | 817934.42         | N 32 29 10.92 W 103 26 10.68 |                          |
|                | 9032.00    | 0.74        | 185.60           | 9010.80     | -93.81       | -90.59     | 384.70     | 0.12             | 541832.84          | 817934.23         | N 32 29 10.91 W 103 26 10.68 |                          |
|                | 9127.00    | 0.44        | 193.72           | 9105.80     | -94.77       | -91.55     | 384.56     | 0.33             | 541831.88          | 817934.08         | N 32 29 10.90 W 103 26 10.68 |                          |
|                | 9208.00    | 0.66        | 278.93           | 9186.80     | -95.00       | -91.78     | 384.02     | 0.94             | 541831.65          | 817933.55         | N 32 29 10.90 W 103 26 10.69 |                          |
|                | 9305.00    | 1.10        | 297.66           | 9263.79     | -94.47       | -91.26     | 382.64     | 0.54             | 541832.17          | 817932.17         | N 32 29 10.90 W 103 26 10.70 |                          |
|                | 9400.00    | 1.38        | 297.15           | 9378.76     | -93.51       | -90.32     | 380.82     | 0.29             | 541833.11          | 817930.35         | N 32 29 10.91 W 103 26 10.72 |                          |
|                | 9494.00    | 1.07        | 303.18           | 9472.74     | -92.49       | -89.32     | 379.08     | 0.36             | 541834.11          | 817928.61         | N 32 29 10.92 W 103 26 10.74 |                          |
|                | 9589.00    | 1.18        | 288.56           | 9567.72     | -91.68       | -88.52     | 377.41     | 0.32             | 541834.91          | 817926.94         | N 32 29 10.93 W 103 26 10.76 |                          |
|                | 9684.00    | 0.86        | 291.13           | 9662.71     | -91.10       | -87.96     | 375.82     | 0.34             | 541835.47          | 817925.34         | N 32 29 10.94 W 103 26 10.78 |                          |
|                | 9779.00    | 0.53        | 314.09           | 9757.70     | -90.53       | -87.39     | 374.83     | 0.45             | 541836.04          | 817924.36         | N 32 29 10.94 W 103 26 10.79 |                          |
|                | 9874.00    | 0.98        | 300.79           | 9852.69     | -89.80       | -86.67     | 373.82     | 0.51             | 541836.76          | 817923.35         | N 32 29 10.95 W 103 26 10.80 |                          |
|                | 9968.00    | 0.66        | 307.43           | 9946.68     | -89.05       | -85.93     | 372.70     | 0.35             | 541837.50          | 817922.23         | N 32 29 10.96 W 103 26 10.82 |                          |
|                | 10062.00   | 0.29        | 292.12           | 10040.68    | -88.63       | -85.51     | 372.05     | 0.41             | 541837.92          | 817921.58         | N 32 29 10.96 W 103 26 10.83 |                          |
|                | 10157.00   | 0.30        | 2.16             | 10135.68    | -88.29       | -85.17     | 371.84     | 0.36             | 541838.26          | 817921.37         | N 32 29 10.96 W 103 26 10.83 |                          |
|                | 10251.00   | 0.68        | 29.88            | 10229.68    | -87.56       | -84.44     | 372.12     | 0.47             | 541838.99          | 817921.65         | N 32 29 10.97 W 103 26 10.82 |                          |
|                | 10346.00   | 0.69        | 38.07            | 10324.67    | -86.63       | -83.51     | 372.76     | 0.10             | 541839.93          | 817922.29         | N 32 29 10.98 W 103 26 10.82 |                          |
|                | 10440.00   | 0.90        | 80.20            | 10418.66    | -86.06       | -82.93     | 373.83     | 0.64             | 541840.50          | 817923.36         | N 32 29 10.99 W 103 26 10.80 |                          |
|                | 10505.00   | 0.79        | 100.80           | 10483.65    | -86.07       | -82.93     | 374.78     | 0.49             | 541840.50          | 817924.31         | N 32 29 10.99 W 103 26 10.79 |                          |
|                | 10680.00   | 1.75        | 130.51           | 10658.61    | -88.06       | -84.89     | 377.99     | 0.65             | 541838.54          | 817927.52         | N 32 29 10.97 W 103 26 10.76 |                          |
|                | 10775.00   | 4.83        | 348.81           | 10753.51    | -85.08       | -81.91     | 378.32     | 6.63             | 541841.52          | 817927.85         | N 32 29 10.99 W 103 26 10.75 |                          |
|                | 10822.00   | 10.49       | 346.85           | 10800.08    | -78.95       | -75.80     | 376.96     | 12.05            | 541847.63          | 817926.49         | N 32 29 11.06 W 103 26 10.77 |                          |
|                | 10869.00   | 14.88       | 351.33           | 10845.92    | -68.80       | -65.66     | 375.08     | 9.57             | 541857.77          | 817924.61         | N 32 29 11.16 W 103 26 10.79 |                          |
|                | 10916.00   | 18.58       | 349.28           | 10890.92    | -55.45       | -52.33     | 372.78     | 7.97             | 541871.10          | 817922.30         | N 32 29 11.29 W 103 26 10.81 |                          |
|                | 10964.00   | 22.03       | 349.99           | 10935.93    | -39.04       | -35.95     | 369.79     | 7.21             | 541887.48          | 817919.32         | N 32 29 11.45 W 103 26 10.85 |                          |
| HL Crossing    | 11001.43   | 25.04       | 353.11           | 10970.25    | -24.25       | -21.17     | 367.62     | 8.70             | 541902.26          | 817917.14         | N 32 29 11.60 W 103 26 10.87 |                          |
|                | 11011.00   | 25.82       | 353.80           | 10978.89    | -20.16       | -17.08     | 367.15     | 8.70             | 541906.35          | 817916.68         | N 32 29 11.64 W 103 26 10.88 |                          |
|                | 11058.00   | 29.27       | 356.97           | 11020.56    | 1.51         | 4.57       | 365.44     | 7.97             | 541928.00          | 817914.96         | N 32 29 11.85 W 103 26 10.89 |                          |
|                | 11105.00   | 33.04       | 359.30           | 11060.77    | 25.81        | 28.87      | 364.67     | 8.42             | 541952.30          | 817914.20         | N 32 29 12.09 W 103 26 10.90 |                          |
|                | 11152.00   | 36.78       | 1.88             | 11099.31    | 52.69        | 55.75      | 364.98     | 8.55             | 541979.18          | 817914.50         | N 32 29 12.36 W 103 26 10.89 |                          |
|                | 11199.00   | 40.19       | 0.27             | 11136.10    | 81.93        | 84.99      | 365.51     | 7.56             | 542008.42          | 817915.04         | N 32 29 12.65 W 103 26 10.89 |                          |
|                | 11247.00   | 43.76       | 357.46           | 11171.78    | 114.01       | 117.08     | 364.85     | 8.40             | 542040.50          | 817914.37         | N 32 29 12.96 W 103 26 10.89 |                          |
|                | 11294.00   | 46.26       | 357.14           | 11205.00    | 147.23       | 150.28     | 363.28     | 5.34             | 542073.70          | 817912.81         | N 32 29 13.29 W 103 26 10.90 |                          |
|                | 11342.00   | 48.80       | 357.39           | 11237.41    | 182.60       | 185.64     | 361.59     | 5.31             | 542109.07          | 817911.12         | N 32 29 13.64 W 103 26 10.92 |                          |
|                | 11389.00   | 53.48       | 357.16           | 11266.89    | 219.16       | 222.18     | 359.85     | 9.96             | 542145.61          | 817909.38         | N 32 29 14.01 W 103 26 10.94 |                          |
|                | 11436.00   | 56.85       | 358.33           | 11293.74    | 257.71       | 260.73     | 358.34     | 7.46             | 542184.15          | 817907.87         | N 32 29 14.39 W 103 26 10.95 |                          |
|                | 11530.00   | 59.30       | 1.85             | 11343.45    | 337.47       | 340.48     | 358.50     | 4.11             | 542263.91          | 817908.03         | N 32 29 15.18 W 103 26 10.94 |                          |
|                | 11577.00   | 63.46       | 2.54             | 11365.96    | 378.67       | 381.70     | 360.08     | 8.94             | 542305.13          | 817909.61         | N 32 29 15.58 W 103 26 10.92 |                          |
| Tie-In         |            |             |                  |             |              |            |            |                  |                    |                   |                              |                          |
| First ST01 SLB | 11678.00   | 70.95       | 10.09            | 11405.11    | 470.95       | 474.07     | 370.48     | 10.12            | 542397.50          | 817920.00         | N 32 29 16.50 W 103 26 10.79 |                          |
| MWD Survey     |            |             |                  |             |              |            |            |                  |                    |                   |                              |                          |
|                | 11726.00   | 76.54       | 7.64             | 11418.54    | 516.40       | 519.59     | 377.56     | 12.63            | 542443.01          | 817927.09         | N 32 29 16.95 W 103 26 10.70 |                          |
|                | 11773.00   | 80.88       | 6.62             | 11427.74    | 562.08       | 565.31     | 383.28     | 9.48             | 542488.74          | 817932.80         | N 32 29 17.40 W 103 26 10.63 |                          |
|                | 11821.00   | 82.98       | 6.66             | 11434.48    | 609.23       | 612.51     | 388.77     | 4.38             | 542535.94          | 817938.30         | N 32 29 17.86 W 103 26 10.56 |                          |
|                | 11916.00   | 86.86       | 5.55             | 11442.89    | 703.22       | 706.58     | 398.83     | 4.25             | 542630.01          | 817948.36         | N 32 29 18.79 W 103 26 10.44 |                          |
|                | 12011.00   | 87.31       | 4.50             | 11447.72    | 797.65       | 801.09     | 407.14     | 1.20             | 542724.52          | 817956.67         | N 32 29 19.73 W 103 26 10.33 |                          |
|                | 12106.00   | 87.14       | 3.24             | 11452.32    | 892.27       | 895.76     | 413.54     | 1.34             | 542819.19          | 817963.07         | N 32 29 20.67 W 103 26 10.24 |                          |
|                | 12201.00   | 88.37       | 2.26             | 11456.04    | 987.04       | 990.58     | 418.10     | 1.65             | 542914.00          | 817967.63         | N 32 29 21.60 W 103 26 10.18 |                          |
|                | 12296.00   | 88.15       | 2.22             | 11458.93    | 1081.89      | 1085.46    | 421.81     | 0.24             | 543008.89          | 817971.34         | N 32 29 22.54 W 103 26 10.13 |                          |
|                | 12391.00   | 86.75       | 2.99             | 11463.15    | 1176.66      | 1180.27    | 426.12     | 1.68             | 543103.69          | 817975.65         | N 32 29 23.48 W 103 26 10.07 |                          |
|                | 12486.00   | 86.08       | 2.66             | 11469.09    | 1271.31      | 1274.96    | 430.79     | 0.79             | 543198.39          | 817980.32         | N 32 29 24.42 W 103 26 10.01 |                          |
|                | 12580.00   | 86.13       | 1.91             | 11475.48    | 1364.98      | 1368.67    | 434.53     | 0.80             | 543292.09          | 817984.06         | N 32 29 25.34 W 103 26 9.95  |                          |
|                | 12675.00   | 88.21       | 1.48             | 11480.17    | 1459.79      | 1463.51    | 437.34     | 2.24             | 543386.93          | 817986.87         | N 32 29 26.28 W 103 26 9.91  |                          |
|                | 12770.00   | 86.86       | 2.18             | 11484.26    | 1554.63      | 1558.37    | 440.37     | 1.60             | 543481.79          | 817989.90         | N 32 29 27.22 W 103 26 9.87  |                          |
|                | 12864.00   | 84.84       | 1.78             | 11491.06    | 1648.29      | 1652.06    | 443.61     | 2.19             | 543575.48          | 817993.14         | N 32 29 28.15 W 103 26 9.82  |                          |
|                | 12959.00   | 85.85       | 1.52             | 11498.77    | 1742.91      | 1746.71    | 446.34     | 1.10             | 543670.13          | 817995.86         | N 32 29 29.08 W 103 26 9.78  |                          |
|                | 13054.00   | 85.18       | 1.61             | 11506.20    | 1837.56      | 1841.38    | 448.92     | 0.71             | 543764.80          | 817998.45         | N 32 29 30.02 W 103 26 9.74  |                          |
|                | 13149.00   | 87.59       | 1.10             | 11512.19    | 1932.31      | 1936.16    | 451.16     | 2.59             | 543859.58          | 818000.69         | N 32 29 30.96 W 103 26 9.70  |                          |
|                | 13243.00   | 87.98       | 0.93             | 11515.82    | 2026.21      | 2030.07    | 452.83     | 0.45             | 543953.49          | 818002.36         | N 32 29 31.89 W 103 26 9.67  |                          |
|                | 13338.00   | 85.01       | 4.07             | 11521.63    | 2120.88      | 2124.78    | 456.96     | 4.54             | 544048.20          | 818006.49         | N 32 29 32.82 W 103 26 9.62  |                          |
|                | 13432.00   | 83.66       | 6.02             | 11530.91    | 2213.98      | 2217.96    | 465.18     | 2.51             | 544141.37          | 818014.71         | N 32 29 33.74 W 103 26 9.51  |                          |
|                | 13527.00   | 82.98       | 6.12             | 11541.96    | 2307.72      | 2311.78    | 475.16     | 0.72             | 544235.20          | 818024.69         | N 32 29 34.67 W 103 26 9.39  |                          |
|                | 13621.00   | 82.08       | 3.63             | 11554.18    | 2400.51      | 2404.64    |            |                  |                    |                   |                              |                          |

| 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 ° ' ") |
|-------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
|                   | 16637.00   | 90.95       | 352.37           | 11659.74    | 5408.24      | 5411.81    | 403.60     | 0.21             | 547335.21          | 817953.13         | N 32 30 5.35            | W 103 26 9.92            |
|                   | 16731.00   | 91.01       | 351.85           | 11658.13    | 5501.44      | 5504.91    | 390.70     | 0.56             | 547428.31          | 817940.23         | N 32 30 6.27            | W 103 26 10.06           |
|                   | 16826.00   | 90.50       | 352.05           | 11656.88    | 5595.61      | 5598.96    | 377.40     | 0.58             | 547522.36          | 817926.93         | N 32 30 7.20            | W 103 26 10.20           |
|                   | 16921.00   | 90.11       | 352.71           | 11656.38    | 5689.87      | 5693.12    | 364.80     | 0.81             | 547616.52          | 817914.33         | N 32 30 8.14            | W 103 26 10.34           |
|                   | 17015.00   | 90.17       | 353.51           | 11656.15    | 5783.28      | 5786.44    | 353.52     | 0.85             | 547709.84          | 817903.05         | N 32 30 9.06            | W 103 26 10.47           |
|                   | 17110.00   | 88.77       | 352.85           | 11657.02    | 5877.69      | 5880.76    | 342.24     | 1.63             | 547804.16          | 817891.77         | N 32 30 9.99            | W 103 26 10.59           |
|                   | 17204.00   | 90.28       | 354.20           | 11657.80    | 5971.17      | 5974.16    | 331.64     | 2.15             | 547897.55          | 817881.17         | N 32 30 10.92           | W 103 26 10.70           |
|                   | 17299.00   | 89.89       | 355.58           | 11657.66    | 6065.86      | 6068.78    | 323.18     | 1.51             | 547992.17          | 817872.71         | N 32 30 11.86           | W 103 26 10.79           |
|                   | 17394.00   | 89.78       | 357.45           | 11657.94    | 6160.72      | 6163.60    | 317.41     | 1.97             | 548086.99          | 817866.94         | N 32 30 12.80           | W 103 26 10.85           |
|                   | 17488.00   | 91.68       | 359.46           | 11656.74    | 6254.69      | 6257.54    | 314.87     | 2.94             | 548180.94          | 817864.40         | N 32 30 13.73           | W 103 26 10.87           |
|                   | 17583.00   | 92.13       | 359.71           | 11653.58    | 6349.63      | 6352.49    | 314.19     | 0.54             | 548275.88          | 817863.71         | N 32 30 14.66           | W 103 26 10.87           |
|                   | 17677.00   | 90.39       | 359.56           | 11651.51    | 6443.61      | 6446.46    | 313.59     | 1.86             | 548369.86          | 817863.12         | N 32 30 15.59           | W 103 26 10.87           |
|                   | 17772.00   | 89.50       | 359.73           | 11651.60    | 6538.61      | 6541.46    | 313.00     | 0.95             | 548464.85          | 817862.53         | N 32 30 16.53           | W 103 26 10.86           |
|                   | 17866.00   | 89.66       | 359.80           | 11652.29    | 6632.60      | 6635.46    | 312.61     | 0.19             | 548558.85          | 817862.14         | N 32 30 17.46           | W 103 26 10.86           |
|                   | 17961.00   | 89.10       | 359.98           | 11653.32    | 6727.60      | 6730.45    | 312.43     | 0.62             | 548653.84          | 817861.96         | N 32 30 18.40           | W 103 26 10.85           |
|                   | 18056.00   | 89.05       | 359.99           | 11654.86    | 6822.58      | 6825.44    | 312.41     | 0.05             | 548748.83          | 817861.93         | N 32 30 19.34           | W 103 26 10.84           |
|                   | 18151.00   | 89.27       | 0.23             | 11656.25    | 6917.56      | 6920.43    | 312.59     | 0.34             | 548843.82          | 817862.12         | N 32 30 20.28           | W 103 26 10.83           |
|                   | 18246.00   | 89.10       | 0.48             | 11657.60    | 7012.54      | 7015.41    | 313.18     | 0.32             | 548938.81          | 817862.71         | N 32 30 21.22           | W 103 26 10.82           |
|                   | 18341.00   | 89.16       | 1.01             | 11659.04    | 7107.51      | 7110.40    | 314.41     | 0.56             | 549033.79          | 817863.94         | N 32 30 22.16           | W 103 26 10.79           |
|                   | 18436.00   | 89.61       | 359.88           | 11660.06    | 7202.49      | 7205.39    | 315.15     | 1.28             | 549128.78          | 817864.68         | N 32 30 23.10           | W 103 26 10.77           |
|                   | 18531.00   | 89.22       | 0.24             | 11661.03    | 7297.48      | 7300.38    | 315.25     | 0.56             | 549223.77          | 817864.78         | N 32 30 24.04           | W 103 26 10.76           |
|                   | 18625.00   | 88.99       | 358.61           | 11662.50    | 7391.47      | 7394.36    | 314.31     | 1.75             | 549317.75          | 817863.83         | N 32 30 24.97           | W 103 26 10.77           |
|                   | 18719.00   | 89.10       | 359.53           | 11664.07    | 7485.45      | 7488.33    | 312.78     | 0.99             | 549411.72          | 817862.31         | N 32 30 25.90           | W 103 26 10.77           |
|                   | 18813.00   | 90.11       | 359.39           | 11664.71    | 7579.45      | 7582.33    | 311.90     | 1.08             | 549505.71          | 817861.42         | N 32 30 26.83           | W 103 26 10.77           |
| Final Survey      | 18865.00   | 90.11       | 359.06           | 11664.62    | 7631.45      | 7634.32    | 311.19     | 0.63             | 549557.71          | 817860.72         | N 32 30 27.35           | W 103 26 10.78           |
| Projection To Bit | 18900.00   | 90.11       | 359.06           | 11664.55    | 7666.45      | 7669.32    | 310.62     | 0.00             | 549592.70          | 817860.15         | N 32 30 27.69           | W 103 26 10.78           |

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 Casing Diameter<br>(in) | Survey Tool Type                  | Borehole / Survey                                                                                                                      |
|-------------|------|-----------------|---------------|------------------|-----------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|             | 1    | 0.000           | 31.000        | 1/98.425         | 26.000                            | 13.375 NAL_MWD_1.0_DEG-Depth Only | Chisholm Outland WCA State Unit<br>11-2 5H / Chisholm Outland WCA<br>State Unit 11-2 5H MWD Surveys<br>Chisholm Outland WCA State Unit |
|             | 1    | 31.000          | 31.000        | Act Stns         | 26.000                            | 13.375 NAL_MWD_1.0_DEG-Depth Only | 11-2 5H / Chisholm Outland WCA<br>State Unit 11-2 5H MWD Surveys<br>Chisholm Outland WCA State Unit                                    |
|             | 1    | 31.000          | 1395.000      | Act Stns         | 26.000                            | 13.375 NAL_MWD_1.0_DEG            | 11-2 5H / Chisholm Outland WCA<br>Chisholm Outland WCA State Unit                                                                      |
|             | 1    | 1395.000        | 5460.000      | Act Stns         | 17.500                            | 13.375 NAL_MWD_1.0_DEG            | 11-2 5H / Chisholm Outland WCA<br>Chisholm Outland WCA State Unit                                                                      |
|             | 1    | 5460.000        | 10560.000     | Act Stns         | 12.250                            | 9.625 NAL_MWD_1.0_DEG             | 11-2 5H / Chisholm Outland WCA<br>Chisholm Outland WCA State Unit                                                                      |
|             | 1    | 10560.000       | 11577.000     | Act Stns         | 8.750                             | 0.000 NAL_MWD_1.0_DEG             | 11-2 5H / Chisholm Outland WCA<br>ST01 / Chisholm Outland WCA                                                                          |
|             | 1    | 11577.000       | 18900.000     | Act Stns         | 6.750                             | 0.000 NAL_MWD_1.0_DEG             | State Unit 11-2 5H ST01 MWD                                                                                                            |