

CATENA RESOURCES

# SURVEY REPORT

ANCHOR 19 35 33 STATE 1H

ENSIGN 225

6/15/2019



The **Ultimate Partner** In Wellbore Placement

CUSTOMER **Catena Resources**  
PROJECT **Anchor 19 35 33 #State 1H**  
FIELD **Klien Ranch**

SDI JOB NO. **OP.019392**  
SDI DISTRICT **Midland**  
SDI KIT/UNIT **KIT MUD PULSE**

### SITE INFORMATION

Site Name **Anchor 19 35 33 State 1H**  
Lat/Long **32° 36' 36.104" N , 103° 28' 8.406" W**  
Northing **586,722 ft**  
Easting **766,153 ft**

Section **33**  
Township **19S**  
Range **35E**

### MAP INFORMATION

North Reference **Grid North**  
Grid Correction **-0.47 deg**  
System **US State Plane 1927**  
Datum **North American Datum 1927 (Clarke 1866)**  
Map Zone **New Mexico East: 3001**



### WELL INFORMATION

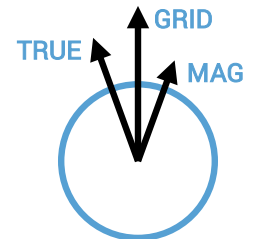
Lat/Long **32° 36' 36.104" N , 103° 28' 8.406" W**  
Northing **586,722 ft**  
Easting **766,153.4 ft**  
UWI **30-025-45896**

### DEPTH AND ELEVATION REFERENCE

Ground Level **3691 ft above Mean Sea Level**  
Reference Datum **RKB**  
Reference Height **25 ft above G.L.**  
Reference Elevation **3716 ft**

### VERTICAL SECTION REFERENCE

+N/-S **0 ft**  
+E/-W **0 ft**  
Proposal Direction **358.83°**  
Calculation Method **Minimum Curvature**



### GEOMAGNETIC REFERENCE INFORMATION

Local Gravity: **998.505 mG** [computed]

| MD         | MODEL    | DATE        | DECLINATION | TRUE TO GRID   | MAG TO GRID |
|------------|----------|-------------|-------------|----------------|-------------|
| 0-15986 ft | HDGM2019 | 23 May 2019 | 6.52°       | subtract 0.47° | add 6.05°   |

### WELL NOTES

### OPERATORS

B. QUIBODEAUX

SDI Operator Name (Printed)

SIGNATURE

DATE

| MD      | INC  | AZIM   | TVD     | VS    | +N/-S | +E/-W | DLS     | CLOSURE<br>DIST | CLOSURE<br>DIR | COURSE<br>LENGTH |
|---------|------|--------|---------|-------|-------|-------|---------|-----------------|----------------|------------------|
| ft      | deg  | deg    | ft      | ft    | ft    | ft    | °/100ft | ft              | deg            | ft               |
| 0.00    | 0.00 | 0.00   | 0.00    | 0.00  | 0.00  | 0.00  | Invalid | 0.00            | 0.00           | Invalid          |
| 148.00  | 0.57 | 312.21 | 148.00  | 0.51  | 0.50  | -0.55 | 0.39    | 0.74            | 312.21         | 148.00           |
| 285.00  | 0.51 | 345.17 | 284.99  | 1.57  | 1.54  | -1.21 | 0.23    | 1.96            | 321.87         | 137.00           |
| 332.00  | 0.61 | 346.42 | 331.99  | 2.01  | 1.98  | -1.32 | 0.22    | 2.38            | 326.34         | 47.00            |
| 394.00  | 0.12 | 326.05 | 393.99  | 2.39  | 2.36  | -1.43 | 0.80    | 2.76            | 328.68         | 62.00            |
| 502.00  | 0.42 | 47.97  | 501.99  | 2.74  | 2.72  | -1.20 | 0.39    | 2.97            | 336.10         | 108.00           |
| 666.00  | 0.67 | 13.99  | 665.98  | 4.06  | 4.05  | -0.53 | 0.24    | 4.08            | 352.60         | 164.00           |
| 755.00  | 0.72 | 9.23   | 754.97  | 5.11  | 5.10  | -0.31 | 0.08    | 5.11            | 356.51         | 89.00            |
| 844.00  | 0.51 | 43.76  | 843.97  | 5.94  | 5.94  | 0.05  | 0.47    | 5.94            | 0.49           | 89.00            |
| 933.00  | 0.44 | 38.25  | 932.97  | 6.48  | 6.49  | 0.54  | 0.09    | 6.51            | 4.72           | 89.00            |
| 1022.00 | 0.70 | 23.57  | 1021.96 | 7.24  | 7.26  | 0.97  | 0.33    | 7.32            | 7.57           | 89.00            |
| 1111.00 | 0.65 | 68.43  | 1110.96 | 7.91  | 7.94  | 1.65  | 0.58    | 8.11            | 11.76          | 89.00            |
| 1200.00 | 0.57 | 72.75  | 1199.95 | 8.21  | 8.26  | 2.55  | 0.10    | 8.65            | 17.14          | 89.00            |
| 1289.00 | 0.84 | 59.87  | 1288.94 | 8.65  | 8.72  | 3.54  | 0.35    | 9.41            | 22.09          | 89.00            |
| 1378.00 | 0.92 | 34.32  | 1377.93 | 9.55  | 9.64  | 4.51  | 0.44    | 10.64           | 25.07          | 89.00            |
| 1467.00 | 1.07 | 25.46  | 1466.92 | 10.87 | 10.98 | 5.27  | 0.24    | 12.18           | 25.63          | 89.00            |
| 1556.00 | 0.69 | 22.56  | 1555.91 | 12.10 | 12.22 | 5.83  | 0.43    | 13.54           | 25.50          | 89.00            |
| 1645.00 | 0.99 | 21.53  | 1644.90 | 13.30 | 13.43 | 6.32  | 0.34    | 14.85           | 25.19          | 89.00            |
| 1734.00 | 1.10 | 21.71  | 1733.88 | 14.80 | 14.94 | 6.92  | 0.12    | 16.46           | 24.84          | 89.00            |
| 1796.00 | 1.17 | 41.70  | 1795.87 | 15.81 | 15.97 | 7.56  | 0.65    | 17.66           | 25.33          | 62.00            |
| 1970.00 | 0.83 | 8.74   | 1969.85 | 18.35 | 18.54 | 8.93  | 0.38    | 20.58           | 25.73          | 174.00           |
| 2059.00 | 1.29 | 35.79  | 2058.83 | 19.79 | 19.99 | 9.62  | 0.76    | 22.18           | 25.70          | 89.00            |
| 2237.00 | 1.38 | 37.19  | 2236.78 | 23.08 | 23.33 | 12.09 | 0.05    | 26.28           | 27.40          | 178.00           |
| 2326.00 | 1.11 | 37.66  | 2325.76 | 24.59 | 24.87 | 13.27 | 0.30    | 28.18           | 28.08          | 89.00            |
| 2415.00 | 1.16 | 14.17  | 2414.75 | 26.13 | 26.42 | 14.02 | 0.52    | 29.91           | 27.94          | 89.00            |
| 2504.00 | 1.59 | 28.96  | 2503.72 | 28.07 | 28.38 | 14.83 | 0.63    | 32.02           | 27.60          | 89.00            |
| 2593.00 | 1.45 | 20.41  | 2592.69 | 30.19 | 30.52 | 15.83 | 0.30    | 34.38           | 27.41          | 89.00            |
| 2683.00 | 1.26 | 37.34  | 2682.66 | 32.02 | 32.37 | 16.83 | 0.49    | 36.48           | 27.46          | 90.00            |
| 2772.00 | 1.67 | 39.90  | 2771.63 | 33.77 | 34.15 | 18.25 | 0.46    | 38.72           | 28.12          | 89.00            |
| 2861.00 | 1.86 | 34.83  | 2860.59 | 35.91 | 36.33 | 19.91 | 0.28    | 41.42           | 28.72          | 89.00            |
| 2950.00 | 2.13 | 35.98  | 2949.54 | 38.40 | 38.85 | 21.71 | 0.30    | 44.50           | 29.19          | 89.00            |
| 3039.00 | 2.03 | 50.24  | 3038.48 | 40.70 | 41.20 | 23.89 | 0.59    | 47.62           | 30.11          | 89.00            |

| MD      | INC  | AZIM   | TVD     | VS     | +N/-S  | +E/-W  | DLS     | CLOSURE<br>DIST | CLOSURE<br>DIR | COURSE<br>LENGTH |
|---------|------|--------|---------|--------|--------|--------|---------|-----------------|----------------|------------------|
| ft      | deg  | deg    | ft      | ft     | ft     | ft     | °/100ft | ft              | deg            | ft               |
| 3128.00 | 2.16 | 52.36  | 3127.42 | 42.68  | 43.23  | 26.43  | 0.17    | 50.67           | 31.44          | 89.00            |
| 3217.00 | 2.50 | 52.55  | 3216.35 | 44.83  | 45.44  | 29.30  | 0.38    | 54.06           | 32.82          | 89.00            |
| 3306.00 | 2.26 | 46.04  | 3305.27 | 47.17  | 47.84  | 32.11  | 0.41    | 57.61           | 33.87          | 89.00            |
| 3395.00 | 3.03 | 45.33  | 3394.18 | 49.98  | 50.71  | 35.04  | 0.86    | 61.64           | 34.65          | 89.00            |
| 3484.00 | 2.56 | 45.98  | 3483.07 | 52.95  | 53.74  | 38.14  | 0.52    | 65.90           | 35.36          | 89.00            |
| 3573.00 | 2.43 | 48.61  | 3571.98 | 55.52  | 56.37  | 40.99  | 0.20    | 69.70           | 36.02          | 89.00            |
| 3663.00 | 1.88 | 46.72  | 3661.92 | 57.74  | 58.64  | 43.49  | 0.62    | 73.01           | 36.56          | 90.00            |
| 3752.00 | 2.01 | 50.75  | 3750.87 | 59.68  | 60.63  | 45.76  | 0.21    | 75.96           | 37.04          | 89.00            |
| 3930.00 | 2.35 | 50.15  | 3928.74 | 63.88  | 64.94  | 50.97  | 0.19    | 82.55           | 38.13          | 178.00           |
| 4019.00 | 2.59 | 42.79  | 4017.66 | 66.47  | 67.58  | 53.74  | 0.45    | 86.34           | 38.49          | 89.00            |
| 4050.00 | 2.60 | 37.89  | 4048.63 | 67.52  | 68.65  | 54.65  | 0.72    | 87.74           | 38.52          | 31.00            |
| 4182.00 | 3.37 | 38.22  | 4180.45 | 72.84  | 74.06  | 58.89  | 0.58    | 94.62           | 38.49          | 132.00           |
| 4271.00 | 2.04 | 11.25  | 4269.35 | 76.41  | 77.67  | 60.81  | 2.03    | 98.65           | 38.06          | 89.00            |
| 4360.00 | 1.02 | 321.85 | 4358.32 | 78.59  | 79.85  | 60.64  | 1.78    | 100.26          | 37.21          | 89.00            |
| 4450.00 | 2.00 | 247.43 | 4448.29 | 78.66  | 79.87  | 58.69  | 2.21    | 99.12           | 36.31          | 90.00            |
| 4539.00 | 4.60 | 228.03 | 4537.14 | 75.76  | 76.89  | 54.60  | 3.14    | 94.30           | 35.38          | 89.00            |
| 4628.00 | 6.02 | 226.49 | 4625.76 | 70.28  | 71.29  | 48.56  | 1.61    | 86.26           | 34.26          | 89.00            |
| 4717.00 | 5.70 | 223.55 | 4714.29 | 64.00  | 64.87  | 42.13  | 0.49    | 77.35           | 33.00          | 89.00            |
| 4806.00 | 5.70 | 220.67 | 4802.85 | 57.57  | 58.32  | 36.20  | 0.32    | 68.64           | 31.83          | 89.00            |
| 4895.00 | 5.71 | 220.69 | 4891.41 | 50.97  | 51.61  | 30.43  | 0.01    | 59.91           | 30.53          | 89.00            |
| 4984.00 | 5.53 | 219.47 | 4979.98 | 44.42  | 44.94  | 24.82  | 0.25    | 51.34           | 28.91          | 89.00            |
| 5073.00 | 5.26 | 220.09 | 5068.59 | 38.10  | 38.51  | 19.47  | 0.31    | 43.15           | 26.82          | 89.00            |
| 5162.00 | 5.55 | 224.69 | 5157.19 | 32.04  | 32.33  | 13.82  | 0.59    | 35.16           | 23.14          | 89.00            |
| 5251.00 | 5.41 | 221.79 | 5245.79 | 25.97  | 26.14  | 7.99   | 0.35    | 27.34           | 17.00          | 89.00            |
| 5340.00 | 5.27 | 220.81 | 5334.40 | 19.86  | 19.92  | 2.53   | 0.20    | 20.08           | 7.23           | 89.00            |
| 5429.00 | 5.72 | 222.59 | 5422.99 | 13.62  | 13.56  | -3.14  | 0.55    | 13.92           | 346.95         | 89.00            |
| 5518.00 | 5.43 | 219.87 | 5511.57 | 7.24   | 7.06   | -8.85  | 0.44    | 11.32           | 308.61         | 89.00            |
| 5607.00 | 5.63 | 223.76 | 5600.16 | 0.98   | 0.68   | -14.56 | 0.48    | 14.58           | 272.67         | 89.00            |
| 5696.00 | 4.84 | 221.68 | 5688.78 | -4.86  | -5.28  | -20.08 | 0.91    | 20.76           | 255.28         | 89.00            |
| 5785.00 | 4.81 | 224.22 | 5777.47 | -10.24 | -10.75 | -25.18 | 0.24    | 27.38           | 246.87         | 89.00            |
| 5875.00 | 4.58 | 204.64 | 5867.17 | -16.12 | -16.73 | -29.31 | 1.79    | 33.74           | 240.28         | 90.00            |
| 5964.00 | 4.54 | 200.30 | 5955.89 | -22.60 | -23.26 | -32.01 | 0.39    | 39.57           | 234.00         | 89.00            |

| MD<br>ft | INC<br>deg | AZIM<br>deg | TVD<br>ft | VS<br>ft | +N/-S<br>ft | +E/-W<br>ft | DLS<br>°/100ft | CLOSURE<br>DIST<br>ft | CLOSURE<br>DIR<br>deg | COURSE<br>LENGTH<br>ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|-----------------------|-----------------------|------------------------|
| 6053.00  | 4.20       | 207.67      | 6044.63   | -28.73   | -29.45      | -34.74      | 0.73           | 45.54                 | 229.72                | 89.00                  |
| 6142.00  | 3.85       | 201.14      | 6133.41   | -34.35   | -35.12      | -37.33      | 0.65           | 51.25                 | 226.75                | 89.00                  |
| 6231.00  | 2.99       | 203.89      | 6222.26   | -39.21   | -40.02      | -39.35      | 0.98           | 56.13                 | 224.52                | 89.00                  |
| 6320.00  | 2.59       | 204.69      | 6311.15   | -43.12   | -43.97      | -41.13      | 0.46           | 60.21                 | 223.09                | 89.00                  |
| 6409.00  | 3.39       | 209.74      | 6400.03   | -47.18   | -48.08      | -43.27      | 0.95           | 64.68                 | 221.99                | 89.00                  |
| 6498.00  | 3.53       | 212.26      | 6488.87   | -51.72   | -52.68      | -46.04      | 0.23           | 69.96                 | 221.15                | 89.00                  |
| 6587.00  | 3.44       | 209.89      | 6577.70   | -56.30   | -57.30      | -48.83      | 0.19           | 75.29                 | 220.44                | 89.00                  |
| 6676.00  | 3.58       | 205.86      | 6666.54   | -61.06   | -62.12      | -51.37      | 0.32           | 80.61                 | 219.59                | 89.00                  |
| 6765.00  | 3.55       | 205.15      | 6755.36   | -66.00   | -67.12      | -53.76      | 0.06           | 85.99                 | 218.69                | 89.00                  |
| 6854.00  | 3.44       | 210.14      | 6844.20   | -70.75   | -71.92      | -56.27      | 0.36           | 91.31                 | 218.04                | 89.00                  |
| 6943.00  | 3.38       | 202.82      | 6933.04   | -75.43   | -76.64      | -58.63      | 0.49           | 96.49                 | 217.41                | 89.00                  |
| 7032.00  | 3.38       | 208.18      | 7021.89   | -80.11   | -81.37      | -60.88      | 0.35           | 101.62                | 216.80                | 89.00                  |
| 7121.00  | 3.42       | 206.59      | 7110.73   | -84.74   | -86.05      | -63.30      | 0.12           | 106.83                | 216.34                | 89.00                  |
| 7210.00  | 3.17       | 203.02      | 7199.58   | -89.33   | -90.69      | -65.46      | 0.36           | 111.84                | 215.82                | 89.00                  |
| 7300.00  | 2.23       | 180.01      | 7289.48   | -93.35   | -94.73      | -66.43      | 1.58           | 115.70                | 215.04                | 90.00                  |
| 7389.00  | 2.39       | 176.61      | 7378.41   | -96.94   | -98.32      | -66.32      | 0.24           | 118.59                | 214.00                | 89.00                  |
| 7478.00  | 2.38       | 175.74      | 7467.34   | -100.64  | -102.01     | -66.07      | 0.04           | 121.54                | 212.93                | 89.00                  |
| 7567.00  | 2.16       | 195.86      | 7556.27   | -104.09  | -105.46     | -66.39      | 0.92           | 124.62                | 212.19                | 89.00                  |
| 7656.00  | 1.14       | 195.92      | 7645.23   | -106.54  | -107.93     | -67.10      | 1.15           | 127.09                | 211.87                | 89.00                  |
| 7745.00  | 0.57       | 176.49      | 7734.22   | -107.83  | -109.23     | -67.31      | 0.71           | 128.30                | 211.64                | 89.00                  |
| 7835.00  | 0.26       | 328.63      | 7824.22   | -108.10  | -109.50     | -67.39      | 0.90           | 128.57                | 211.61                | 90.00                  |
| 7924.00  | 0.64       | 40.06       | 7913.22   | -107.55  | -108.94     | -67.18      | 0.68           | 127.99                | 211.66                | 89.00                  |
| 8013.00  | 0.20       | 75.17       | 8002.21   | -107.14  | -108.52     | -66.71      | 0.54           | 127.39                | 211.58                | 89.00                  |
| 8102.00  | 0.55       | 47.98       | 8091.21   | -106.83  | -108.20     | -66.24      | 0.42           | 126.87                | 211.47                | 89.00                  |
| 8191.00  | 0.55       | 138.26      | 8180.21   | -106.87  | -108.24     | -65.64      | 0.87           | 126.58                | 211.24                | 89.00                  |
| 8280.00  | 0.74       | 141.81      | 8269.20   | -107.65  | -109.00     | -65.00      | 0.22           | 126.91                | 210.81                | 89.00                  |
| 8370.00  | 0.53       | 157.22      | 8359.20   | -108.50  | -109.84     | -64.48      | 0.30           | 127.37                | 210.42                | 90.00                  |
| 8459.00  | 0.40       | 132.02      | 8448.19   | -109.10  | -110.43     | -64.09      | 0.27           | 127.68                | 210.13                | 89.00                  |
| 8548.00  | 0.91       | 157.31      | 8537.19   | -109.97  | -111.29     | -63.59      | 0.64           | 128.18                | 209.74                | 89.00                  |
| 8637.00  | 0.76       | 188.65      | 8626.18   | -111.21  | -112.53     | -63.40      | 0.53           | 129.16                | 209.40                | 89.00                  |
| 8727.00  | 1.62       | 208.40      | 8716.16   | -112.91  | -114.24     | -64.10      | 1.04           | 130.99                | 209.30                | 90.00                  |
| 8816.00  | 0.82       | 179.51      | 8805.14   | -114.64  | -115.98     | -64.69      | 1.10           | 132.80                | 209.15                | 89.00                  |

| MD       | INC   | AZIM   | TVD      | VS      | +N/-S   | +E/-W   | DLS     | CLOSURE<br>DIST | CLOSURE<br>DIR | COURSE<br>LENGTH |
|----------|-------|--------|----------|---------|---------|---------|---------|-----------------|----------------|------------------|
| ft       | deg   | deg    | ft       | ft      | ft      | ft      | °/100ft | ft              | deg            | ft               |
| 8905.00  | 0.40  | 41.21  | 8894.14  | -115.04 | -116.39 | -64.48  | 1.30    | 133.05          | 208.99         | 89.00            |
| 8994.00  | 1.69  | 316.08 | 8983.12  | -113.85 | -115.20 | -65.18  | 1.92    | 132.37          | 209.50         | 89.00            |
| 9083.00  | 1.04  | 279.43 | 9072.10  | -112.74 | -114.13 | -66.89  | 1.19    | 132.28          | 210.37         | 89.00            |
| 9172.00  | 1.34  | 291.64 | 9161.08  | -112.18 | -113.61 | -68.65  | 0.45    | 132.74          | 211.14         | 89.00            |
| 9261.00  | 1.42  | 296.74 | 9250.05  | -111.26 | -112.73 | -70.61  | 0.16    | 133.02          | 212.06         | 89.00            |
| 9364.00  | 1.76  | 301.82 | 9353.01  | -109.80 | -111.32 | -73.09  | 0.36    | 133.17          | 213.29         | 103.00           |
| 9453.00  | 2.22  | 304.56 | 9441.96  | -108.05 | -109.62 | -75.67  | 0.52    | 133.20          | 214.62         | 89.00            |
| 9542.00  | 2.28  | 301.58 | 9530.89  | -106.09 | -107.72 | -78.59  | 0.15    | 133.34          | 216.11         | 89.00            |
| 9631.00  | 1.31  | 299.14 | 9619.85  | -104.62 | -106.30 | -80.99  | 1.09    | 133.64          | 217.30         | 89.00            |
| 9721.00  | 0.34  | 328.53 | 9709.84  | -103.88 | -105.57 | -82.02  | 1.15    | 133.69          | 217.85         | 90.00            |
| 9809.00  | 0.26  | 315.92 | 9797.84  | -103.51 | -105.21 | -82.30  | 0.11    | 133.57          | 218.03         | 88.00            |
| 9898.00  | 0.33  | 215.72 | 9886.83  | -103.56 | -105.27 | -82.59  | 0.51    | 133.80          | 218.12         | 89.00            |
| 9987.00  | 0.32  | 222.53 | 9975.83  | -103.95 | -105.66 | -82.91  | 0.04    | 134.31          | 218.12         | 89.00            |
| 10076.00 | 0.41  | 276.02 | 10064.83 | -104.09 | -105.82 | -83.40  | 0.38    | 134.73          | 218.24         | 89.00            |
| 10165.00 | 0.09  | 51.90  | 10153.83 | -104.01 | -105.74 | -83.66  | 0.53    | 134.84          | 218.35         | 89.00            |
| 10343.00 | 0.44  | 81.40  | 10331.83 | -103.84 | -105.56 | -82.88  | 0.20    | 134.21          | 218.14         | 178.00           |
| 10432.00 | 0.74  | 72.62  | 10420.82 | -103.64 | -105.34 | -82.00  | 0.36    | 133.49          | 217.90         | 89.00            |
| 10491.00 | 0.95  | 81.39  | 10479.82 | -103.47 | -105.15 | -81.15  | 0.41    | 132.82          | 217.66         | 59.00            |
| 10580.00 | 1.76  | 37.28  | 10568.79 | -102.30 | -103.95 | -79.59  | 1.42    | 130.92          | 217.44         | 89.00            |
| 10669.00 | 12.31 | 350.83 | 10657.03 | -91.80  | -93.46  | -80.27  | 12.55   | 123.20          | 220.66         | 89.00            |
| 10758.00 | 27.58 | 350.08 | 10740.44 | -61.87  | -63.62  | -85.36  | 17.16   | 106.47          | 233.30         | 89.00            |
| 10847.00 | 37.04 | 356.78 | 10815.60 | -14.59  | -16.44  | -90.44  | 11.36   | 91.92           | 259.70         | 89.00            |
| 10936.00 | 46.53 | 1.44   | 10881.90 | 44.61   | 42.76   | -91.13  | 11.21   | 100.67          | 295.14         | 89.00            |
| 11025.00 | 50.68 | 2.17   | 10940.74 | 111.27  | 109.48  | -89.02  | 4.70    | 141.10          | 320.88         | 89.00            |
| 11114.00 | 54.33 | 1.63   | 10994.90 | 181.77  | 180.04  | -86.69  | 4.13    | 199.82          | 334.29         | 89.00            |
| 11184.00 | 57.64 | 1.91   | 11034.06 | 239.71  | 238.02  | -84.89  | 4.73    | 252.71          | 340.37         | 70.00            |
| 11202.00 | 58.67 | 2.11   | 11043.56 | 254.97  | 253.30  | -84.36  | 5.80    | 266.98          | 341.58         | 18.00            |
| 11291.00 | 60.56 | 359.74 | 11088.58 | 331.69  | 330.06  | -83.14  | 3.13    | 340.37          | 345.86         | 89.00            |
| 11380.00 | 65.10 | 353.96 | 11129.23 | 410.75  | 409.05  | -87.56  | 7.70    | 418.31          | 347.92         | 89.00            |
| 11469.00 | 70.08 | 351.63 | 11163.16 | 492.54  | 490.64  | -97.90  | 6.09    | 500.31          | 348.72         | 89.00            |
| 11513.00 | 74.98 | 351.44 | 11176.37 | 534.15  | 532.14  | -104.08 | 11.14   | 542.22          | 348.93         | 44.00            |
| 11558.00 | 80.32 | 352.57 | 11185.99 | 577.78  | 575.65  | -110.19 | 12.13   | 586.10          | 349.16         | 45.00            |

| MD       | INC   | AZIM   | TVD      | VS      | +N/-S   | +E/-W   | DLS     | CLOSURE<br>DIST | CLOSURE<br>DIR | COURSE<br>LENGTH |
|----------|-------|--------|----------|---------|---------|---------|---------|-----------------|----------------|------------------|
| ft       | deg   | deg    | ft       | ft      | ft      | ft      | °/100ft | ft              | deg            | ft               |
| 11647.00 | 84.72 | 1.18   | 11197.59 | 665.87  | 663.66  | -114.96 | 10.79   | 673.54          | 350.17         | 89.00            |
| 11736.00 | 86.47 | 9.20   | 11204.43 | 753.98  | 751.96  | -106.93 | 9.20    | 759.52          | 351.91         | 89.00            |
| 11825.00 | 89.80 | 8.77   | 11207.32 | 841.53  | 839.81  | -93.04  | 3.77    | 844.94          | 353.68         | 89.00            |
| 11914.00 | 91.04 | 6.89   | 11206.67 | 929.43  | 927.97  | -80.91  | 2.53    | 931.49          | 355.02         | 89.00            |
| 12003.00 | 91.78 | 4.01   | 11204.48 | 1017.80 | 1016.53 | -72.46  | 3.34    | 1019.11         | 355.92         | 89.00            |
| 12092.00 | 91.38 | 2.15   | 11202.03 | 1106.51 | 1105.36 | -67.68  | 2.14    | 1107.43         | 356.50         | 89.00            |
| 12181.00 | 91.51 | 2.35   | 11199.78 | 1195.33 | 1194.26 | -64.18  | 0.27    | 1195.99         | 356.92         | 89.00            |
| 12270.00 | 92.38 | 2.72   | 11196.76 | 1284.09 | 1283.12 | -60.25  | 1.06    | 1284.54         | 357.31         | 89.00            |
| 12359.00 | 93.49 | 1.47   | 11192.20 | 1372.82 | 1371.95 | -57.01  | 1.88    | 1373.13         | 357.62         | 89.00            |
| 12447.00 | 93.22 | 0.50   | 11187.04 | 1460.61 | 1459.78 | -55.50  | 1.14    | 1460.83         | 357.82         | 88.00            |
| 12537.00 | 93.06 | 359.69 | 11182.11 | 1550.45 | 1549.64 | -55.35  | 0.91    | 1550.63         | 357.95         | 90.00            |
| 12626.00 | 92.42 | 359.20 | 11177.86 | 1639.34 | 1638.54 | -56.20  | 0.91    | 1639.50         | 358.04         | 89.00            |
| 12715.00 | 91.58 | 358.13 | 11174.76 | 1728.29 | 1727.46 | -58.28  | 1.53    | 1728.44         | 358.07         | 89.00            |
| 12804.00 | 90.47 | 358.33 | 11173.17 | 1817.27 | 1816.40 | -61.03  | 1.27    | 1817.42         | 358.08         | 89.00            |
| 12893.00 | 91.27 | 358.12 | 11171.82 | 1906.25 | 1905.35 | -63.79  | 0.94    | 1906.41         | 358.08         | 89.00            |
| 12982.00 | 89.09 | 358.03 | 11171.53 | 1995.24 | 1994.29 | -66.78  | 2.45    | 1995.41         | 358.08         | 89.00            |
| 13071.00 | 89.56 | 358.35 | 11172.57 | 2084.22 | 2083.24 | -69.59  | 0.64    | 2084.40         | 358.09         | 89.00            |
| 13161.00 | 90.03 | 358.38 | 11172.89 | 2174.22 | 2173.20 | -72.16  | 0.52    | 2174.40         | 358.10         | 90.00            |
| 13250.00 | 90.47 | 358.78 | 11172.50 | 2263.22 | 2262.17 | -74.36  | 0.67    | 2263.39         | 358.12         | 89.00            |
| 13339.00 | 90.97 | 358.74 | 11171.38 | 2352.21 | 2351.14 | -76.28  | 0.57    | 2352.38         | 358.14         | 89.00            |
| 13428.00 | 90.24 | 359.01 | 11170.44 | 2441.21 | 2440.12 | -78.03  | 0.88    | 2441.37         | 358.17         | 89.00            |
| 13517.00 | 89.53 | 358.93 | 11170.62 | 2530.20 | 2529.11 | -79.63  | 0.80    | 2530.36         | 358.20         | 89.00            |
| 13607.00 | 89.87 | 358.93 | 11171.10 | 2620.20 | 2619.09 | -81.30  | 0.37    | 2620.35         | 358.22         | 90.00            |
| 13696.00 | 90.03 | 359.19 | 11171.17 | 2709.20 | 2708.08 | -82.76  | 0.35    | 2709.34         | 358.25         | 89.00            |
| 13785.00 | 90.47 | 359.35 | 11170.78 | 2798.20 | 2797.07 | -83.89  | 0.52    | 2798.33         | 358.28         | 89.00            |
| 13874.00 | 90.97 | 359.68 | 11169.66 | 2887.18 | 2886.06 | -84.64  | 0.68    | 2887.30         | 358.32         | 89.00            |
| 13964.00 | 91.24 | 359.18 | 11167.92 | 2977.16 | 2976.04 | -85.53  | 0.63    | 2977.27         | 358.35         | 90.00            |
| 14053.00 | 92.45 | 359.60 | 11165.05 | 3066.11 | 3064.98 | -86.48  | 1.44    | 3066.20         | 358.38         | 89.00            |
| 14142.00 | 91.41 | 359.86 | 11162.06 | 3155.05 | 3153.93 | -86.90  | 1.20    | 3155.13         | 358.42         | 89.00            |
| 14231.00 | 91.61 | 0.07   | 11159.71 | 3244.00 | 3242.90 | -86.96  | 0.33    | 3244.07         | 358.46         | 89.00            |
| 14320.00 | 92.11 | 359.54 | 11156.81 | 3332.94 | 3331.85 | -87.26  | 0.82    | 3332.99         | 358.50         | 89.00            |
| 14409.00 | 90.10 | 359.06 | 11155.09 | 3421.91 | 3420.82 | -88.34  | 2.33    | 3421.96         | 358.52         | 89.00            |

| MD<br>ft | INC<br>deg | AZIM<br>deg | TVD<br>ft | VS<br>ft | +N/-S<br>ft | +E/-W<br>ft | DLS<br>°/100ft | CLOSURE<br>DIST<br>ft | CLOSURE<br>DIR<br>deg | COURSE<br>LENGTH<br>ft |
|----------|------------|-------------|-----------|----------|-------------|-------------|----------------|-----------------------|-----------------------|------------------------|
| 14498.00 | 90.97      | 359.44      | 11154.26  | 3510.91  | 3509.81     | -89.51      | 1.07           | 3510.95               | 358.54                | 89.00                  |
| 14588.00 | 91.34      | 358.95      | 11152.44  | 3600.89  | 3599.78     | -90.78      | 0.68           | 3600.93               | 358.56                | 90.00                  |
| 14677.00 | 92.08      | 359.23      | 11149.78  | 3689.84  | 3688.73     | -92.19      | 0.89           | 3689.88               | 358.57                | 89.00                  |
| 14766.00 | 90.74      | 0.01        | 11147.59  | 3778.81  | 3777.70     | -92.78      | 1.74           | 3778.84               | 358.59                | 89.00                  |
| 14855.00 | 92.89      | 0.80        | 11144.78  | 3867.72  | 3866.65     | -92.15      | 2.58           | 3867.75               | 358.63                | 89.00                  |
| 14945.00 | 92.72      | 1.50        | 11140.38  | 3957.54  | 3956.52     | -90.35      | 0.79           | 3957.55               | 358.69                | 90.00                  |
| 15034.00 | 92.79      | 1.80        | 11136.10  | 4046.33  | 4045.38     | -87.79      | 0.35           | 4046.33               | 358.76                | 89.00                  |
| 15123.00 | 92.75      | 1.88        | 11131.80  | 4135.10  | 4134.23     | -84.93      | 0.10           | 4135.10               | 358.82                | 89.00                  |
| 15212.00 | 91.81      | 0.32        | 11128.25  | 4223.96  | 4223.14     | -83.23      | 2.04           | 4223.96               | 358.87                | 89.00                  |
| 15301.00 | 92.05      | 0.10        | 11125.26  | 4312.88  | 4312.09     | -82.90      | 0.36           | 4312.89               | 358.90                | 89.00                  |
| 15390.00 | 91.98      | 359.46      | 11122.13  | 4401.82  | 4401.03     | -83.24      | 0.72           | 4401.82               | 358.92                | 89.00                  |
| 15479.00 | 92.48      | 359.08      | 11118.66  | 4490.74  | 4489.96     | -84.37      | 0.71           | 4490.75               | 358.92                | 89.00                  |
| 15569.00 | 93.32      | 358.99      | 11114.11  | 4580.63  | 4579.83     | -85.89      | 0.94           | 4580.63               | 358.93                | 90.00                  |
| 15658.00 | 91.48      | 359.28      | 11110.38  | 4669.54  | 4668.74     | -87.23      | 2.10           | 4669.55               | 358.93                | 89.00                  |
| 15747.00 | 91.07      | 359.12      | 11108.40  | 4758.52  | 4757.71     | -88.48      | 0.49           | 4758.53               | 358.93                | 89.00                  |
| 15836.00 | 91.91      | 359.44      | 11106.08  | 4847.49  | 4846.67     | -89.59      | 1.01           | 4847.50               | 358.94                | 89.00                  |
| 15916.00 | 93.06      | 359.43      | 11102.61  | 4927.41  | 4926.59     | -90.38      | 1.43           | 4927.42               | 358.95                | 80.00                  |
| 15986.00 | 93.06      | 359.43      | 11098.88  | 4997.30  | 4996.48     | -91.08      | 0.00           | 4997.31               | 358.96                | 70.00                  |