

# Oxy Length CC 6-7 Federal Com 24H Gyro + MWD 0-18869'MD Survey

## Geodetic Report

(Def Survey)



**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**AUG 16 2019**

**RECEIVED**

Report Date: April 23, 2019 - 12:45 PM  
Client: OXY  
Field: NM Eddy County (NAD 83)  
Structure / Slot: Oxy Length CC 6-7 Federal Com 24H / Oxy Length CC 6-7 Federal Com 24H  
Well: Oxy Length CC 6-7 Federal Com 24H  
Borehole: Original Borehole  
UWI / API#: H&P636 / 30-015-45552  
Survey Name: Oxy Length CC 6-7 Federal Com 24H Gyro + MWD 0-18869'MD  
Survey Date: March 21, 2019  
Tort / AHD / DDI / ERD Ratio: 261.767' / 11190.304 ft / 6.812' / 1.314  
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet  
Location Lat / Long: N 32° 15' 13.04428", W 104° 1' 28.20889"  
Location Grid N/E Y/X: N 456138.790 ftUS, E 636807.120 ftUS  
CRS Grid Convergence Angle: 0.1648°  
Grid Scale Factor: 0.99991953  
Version / Patch: 2.10.753.0

Survey / DLS Computation: Minimum Curvature / Lubinski  
Vertical Section Azimuth: 176.388° (Grid North)  
Vertical Section Origin: 0.000 ft, 0.000 ft  
TVD Reference Datum: RKB=26.5'  
TVD Reference Elevation: 2985.200 ft above MSL  
Seabed / Ground Elevation: 2958.700 ft above MSL  
Magnetic Declination: 7.037°  
Total Gravity Field Strength: 998.4714mgn (9.80665 Based)  
Gravity Model: GARM  
Total Magnetic Field Strength: 47931.700 nT  
Magnetic Dip Angle: 60.023°  
Declination Date: April 08, 2019  
Magnetic Declination Model: IFR1  
North Reference: Grid North  
Grid Convergence Used: 0.1648°  
Total Corr Mag North->Grid North: 6.8722°  
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 ° ' ") |
|------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-----------------------------|-----------------------------|--------------------------|
| RKB<br>SHL | 0.00       | 0.00        | 0.00             | 0.00        | 0.00         | 0.00       | 0.00       | N/A              | 456138.79          | 636807.12                   | N 32 15 13.04 W 104 1 28.21 | 128.21                   |
|            | 26.50      | 0.00        | 0.00             | 26.50       | 0.00         | 0.00       | 0.00       | 0.00             | 456138.79          | 636807.12                   | N 32 15 13.04 W 104 1 28.21 | 128.21                   |
|            | 117.80     | 0.64        | 226.56           | 117.80      | 0.33         | -0.35      | -0.37      | 0.70             | 456138.44          | 636806.75                   | N 32 15 13.04 W 104 1 28.21 | 128.21                   |
|            | 162.80     | 0.67        | 184.54           | 162.80      | 0.75         | -0.79      | -0.57      | 1.05             | 456138.00          | 636806.55                   | N 32 15 13.04 W 104 1 28.22 | 128.22                   |
|            | 250.00     | 1.04        | 215.16           | 249.99      | 1.87         | -1.94      | -1.07      | 0.66             | 456136.85          | 636806.05                   | N 32 15 13.03 W 104 1 28.22 | 128.22                   |
| Last Gyro  | 339.90     | 0.85        | 222.16           | 339.87      | 2.97         | -3.10      | -1.99      | 0.25             | 456135.69          | 636805.13                   | N 32 15 13.01 W 104 1 28.23 | 128.23                   |
|            | 430.50     | 1.08        | 253.30           | 430.46      | 3.63         | -3.85      | -3.26      | 0.62             | 456134.94          | 636803.86                   | N 32 15 13.01 W 104 1 28.25 | 128.25                   |
|            | 566.00     | 1.21        | 269.03           | 565.93      | 3.86         | -4.24      | -5.91      | 0.25             | 456134.55          | 636801.21                   | N 32 15 13.00 W 104 1 28.28 | 128.28                   |
|            | 660.00     | 1.62        | 310.48           | 659.91      | 2.89         | -3.39      | -7.91      | 1.14             | 456135.40          | 636799.21                   | N 32 15 13.01 W 104 1 28.30 | 128.30                   |
|            | 754.00     | 2.61        | 304.75           | 753.84      | 0.63         | -1.31      | -10.68     | 1.08             | 456137.48          | 636796.44                   | N 32 15 13.03 W 104 1 28.33 | 128.33                   |
|            | 842.00     | 3.38        | 318.57           | 841.72      | -2.66        | 1.78       | -14.04     | 1.19             | 456140.57          | 636793.08                   | N 32 15 13.06 W 104 1 28.37 | 128.37                   |
|            | 936.00     | 3.25        | 347.47           | 935.57      | -7.48        | 6.46       | -16.46     | 1.76             | 456145.25          | 636790.66                   | N 32 15 13.11 W 104 1 28.40 | 128.40                   |
|            | 1030.00    | 3.28        | 6.45             | 1029.42     | -12.76       | 11.73      | -16.73     | 1.15             | 456150.52          | 636790.39                   | N 32 15 13.16 W 104 1 28.40 | 128.40                   |
|            | 1124.00    | 0.30        | 19.88            | 1123.37     | -15.64       | 14.64      | -16.35     | 3.18             | 456153.42          | 636790.77                   | N 32 15 13.19 W 104 1 28.40 | 128.40                   |
|            | 1218.00    | 0.32        | 142.85           | 1217.37     | -15.64       | 14.66      | -16.10     | 0.58             | 456153.45          | 636791.02                   | N 32 15 13.19 W 104 1 28.40 | 128.40                   |
|            | 1313.00    | 0.11        | 113.40           | 1312.37     | -15.38       | 14.41      | -15.86     | 0.24             | 456153.20          | 636791.26                   | N 32 15 13.19 W 104 1 28.39 | 128.39                   |
|            | 1407.00    | 0.31        | 298.09           | 1406.36     | -15.47       | 14.49      | -16.00     | 0.45             | 456153.28          | 636791.12                   | N 32 15 13.19 W 104 1 28.39 | 128.39                   |
|            | 1595.00    | 0.13        | 302.30           | 1594.36     | -15.87       | 14.85      | -16.63     | 0.10             | 456153.64          | 636790.49                   | N 32 15 13.19 W 104 1 28.40 | 128.40                   |
|            | 1696.00    | 0.18        | 322.33           | 1695.36     | -16.05       | 15.03      | -16.82     | 0.07             | 456153.82          | 636790.30                   | N 32 15 13.19 W 104 1 28.40 | 128.40                   |
|            | 1790.00    | 0.17        | 326.32           | 1789.36     | -16.31       | 15.27      | -16.99     | 0.02             | 456154.06          | 636790.13                   | N 32 15 13.20 W 104 1 28.41 | 128.41                   |
|            | 1979.00    | 0.12        | 265.82           | 1978.36     | -16.55       | 15.49      | -17.35     | 0.08             | 456154.27          | 636789.78                   | N 32 15 13.20 W 104 1 28.41 | 128.41                   |
|            | 2073.00    | 0.17        | 319.38           | 2072.36     | -16.68       | 15.58      | -17.53     | 0.15             | 456154.37          | 636789.59                   | N 32 15 13.20 W 104 1 28.41 | 128.41                   |
|            | 2168.00    | 0.32        | 247.37           | 2167.36     | -16.68       | 15.59      | -17.87     | 0.33             | 456154.38          | 636789.25                   | N 32 15 13.20 W 104 1 28.42 | 128.42                   |
|            | 2262.00    | 0.19        | 183.32           | 2261.36     | -16.44       | 15.33      | -18.12     | 0.31             | 456154.12          | 636789.00                   | N 32 15 13.20 W 104 1 28.42 | 128.42                   |
|            | 2356.00    | 0.27        | 220.79           | 2355.36     | -16.13       | 15.01      | -18.28     | 0.18             | 456153.80          | 636788.85                   | N 32 15 13.19 W 104 1 28.42 | 128.42                   |
|            | 2450.00    | 0.14        | 253.09           | 2449.36     | -15.95       | 14.81      | -18.53     | 0.18             | 456153.60          | 636788.59                   | N 32 15 13.19 W 104 1 28.42 | 128.42                   |
|            | 2546.00    | 0.15        | 228.91           | 2545.36     | -15.84       | 14.69      | -18.74     | 0.06             | 456153.48          | 636788.38                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 2641.00    | 0.22        | 34.91            | 2640.36     | -15.91       | 14.76      | -18.73     | 0.39             | 456153.55          | 636788.39                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 2736.00    | 0.16        | 119.18           | 2735.36     | -15.98       | 14.84      | -18.51     | 0.27             | 456153.63          | 636788.61                   | N 32 15 13.19 W 104 1 28.42 | 128.42                   |
|            | 2830.00    | 0.19        | 242.76           | 2829.36     | -15.85       | 14.71      | -18.53     | 0.33             | 456153.50          | 636788.59                   | N 32 15 13.19 W 104 1 28.42 | 128.42                   |
|            | 2931.00    | 0.24        | 215.35           | 2930.36     | -15.62       | 14.46      | -18.80     | 0.11             | 456153.25          | 636788.32                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 3026.00    | 0.18        | 170.35           | 3025.36     | -15.31       | 14.15      | -18.89     | 0.18             | 456152.94          | 636788.23                   | N 32 15 13.18 W 104 1 28.43 | 128.43                   |
|            | 3120.00    | 0.15        | 136.42           | 3119.36     | -15.07       | 13.92      | -18.78     | 0.11             | 456152.70          | 636788.34                   | N 32 15 13.18 W 104 1 28.43 | 128.43                   |
|            | 3215.00    | 0.18        | 345.48           | 3214.36     | -15.12       | 13.97      | -18.73     | 0.34             | 456152.76          | 636788.39                   | N 32 15 13.18 W 104 1 28.43 | 128.43                   |
|            | 3310.00    | 0.20        | 282.97           | 3309.36     | -15.32       | 14.15      | -18.93     | 0.21             | 456152.94          | 636788.19                   | N 32 15 13.18 W 104 1 28.43 | 128.43                   |
|            | 3404.00    | 0.11        | 315.59           | 3403.36     | -15.43       | 14.25      | -19.16     | 0.13             | 456153.04          | 636787.97                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 3500.00    | 0.10        | 250.01           | 3499.36     | -15.48       | 14.29      | -19.30     | 0.12             | 456153.08          | 636787.82                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 3595.00    | 0.11        | 185.09           | 3594.35     | -15.36       | 14.17      | -19.39     | 0.12             | 456152.96          | 636787.74                   | N 32 15 13.19 W 104 1 28.43 | 128.43                   |
|            | 3689.00    | 0.18        | 185.81           | 3688.35     | -15.13       | 13.93      | -19.41     | 0.07             | 456152.72          | 636787.71                   | N 32 15 13.18 W 104 1 28.43 | 128.43                   |
|            | 3784.00    | 0.20        | 260.27           | 3783.35     | -14.96       | 13.76      | -19.59     | 0.24             | 456152.55          | 636787.53                   | N 32 15 13.18 W 104 1 28.44 | 128.44                   |
|            | 3878.00    | 0.10        | 318.60           | 3877.35     | -15.01       | 13.79      | -19.80     | 0.18             | 456152.58          | 636787.32                   | N 32 15 13.18 W 104 1 28.44 | 128.44                   |
|            | 3973.00    | 0.09        | 70.92            | 3972.35     | -15.10       | 13.88      | -19.79     | 0.17             | 456152.67          | 636787.33                   | N 32 15 13.18 W 104 1 28.44 | 128.44                   |
|            | 4067.00    | 0.41        | 204.59           | 4066.35     | -14.82       | 13.60      | -19.86     | 0.51             | 456152.39          | 636787.26                   | N 32 15 13.18 W 104 1 28.44 | 128.44                   |
|            | 4162.00    | 1.34        | 179.44           | 4161.34     | -13.41       | 12.18      | -19.99     | 1.04             | 456150.97          | 636787.13                   | N 32 15 13.17 W 104 1 28.44 | 128.44                   |
|            | 4256.00    | 2.24        | 138.68           | 4255.30     | -10.86       | 9.70       | -18.76     | 1.60             | 456148.49          | 636786.36                   | N 32 15 13.14 W 104 1 28.43 | 128.43                   |
| 4350.00    | 2.90       | 128.39      | 4349.20          | -7.82       | 6.84         | -15.69     | 0.85       | 456145.63        | 636785.43          | N 32 15 13.11 W 104 1 28.39 | 128.39                      |                          |
| 4446.00    | 3.69       | 120.66      | 4445.04          | -4.45       | 3.76         | -11.13     | 0.94       | 456142.55        | 636785.99          | N 32 15 13.08 W 104 1 28.34 | 128.34                      |                          |
| 4541.00    | 4.66       | 116.14      | 4539.79          | -0.81       | 0.50         | -5.03      | 1.08       | 456139.29        | 636802.09          | N 32 15 13.05 W 104 1 28.27 | 128.27                      |                          |
| 4635.00    | 5.82       | 104.74      | 4633.40          | 2.58        | -2.40        | 3.01       | 1.65       | 456136.39        | 636801.12          | N 32 15 13.02 W 104 1 28.17 | 128.17                      |                          |
| 4730.00    | 6.59       | 95.67       | 4727.84          | 4.98        | -4.16        | 13.09      | 1.31       | 456134.63        | 636802.21          | N 32 15 13.00 W 104 1 28.06 | 128.06                      |                          |
| 4824.00    | 7.96       | 88.43       | 4821.09          | 6.08        | -4.52        | 24.96      | 1.75       | 456134.28        | 636802.08          | N 32 15 13.00 W 104 1 27.92 | 127.92                      |                          |
| 4919.00    | 8.20       | 80.76       | 4915.15          | 5.65        | -3.25        | 38.23      | 1.16       | 456135.54        | 636805.68          | N 32 15 13.01 W 104 1 27.76 | 127.76                      |                          |
| 5013.00    | 8.49       | 75.74       | 5008.15          | 3.71        | -0.46        | 51.57      | 0.83       | 456138.33        | 636807.89          | N 32 15 13.04 W 104 1 27.61 | 127.61                      |                          |
| 5108.00    | 8.44       | 66.96       | 5102.12          | 0.09        | 3.99         | 64.78      | 1.36       | 456142.78        | 636809.07          | N 32 15 13.08 W 104 1 27.45 | 127.45                      |                          |
| 5202.00    | 8.68       | 61.38       | 5195.08          | -5.20       | 10.09        | 77.36      | 0.92       | 456148.88        | 636809.87          | N 32 15 13.14 W 104 1 27.31 | 127.31                      |                          |
| 5297.00    | 9.92       | 63.29       | 5288.83          | -11.44      | 17.20        | 90.96      | 1.34       | 456155.99        | 636809.07          | N 32 15 13.21 W 104 1 27.15 | 127.15                      |                          |
| 5392.00    | 10.09      | 62.25       | 5382.38          | -18.05      | 24.76        | 105.63     | 0.26       | 456163.55        | 636912.74          | N 32 15 13.29 W 104 1 26.98 | 126.98                      |                          |
| 5487.00    | 9.75       | 61.73       | 5475.96          | -24.81      | 32.44        | 120.08     | 0.37       | 456171.23        | 636927.19          | N 32 15 13.36 W 104 1 26.81 | 126.81                      |                          |
| 5581.00    | 9.90       | 62.02       | 5568.58          | -31.47      | 40.00        | 134.23     | 0.17       | 456178.79        | 636941.34          | N 32 15 13.44 W 104 1 26.64 | 126.64                      |                          |
| 5675.00    | 9.81       | 61.61       | 5661.20          | -38.16      | 47.60        | 148.41     | 0.12       | 456186.39        | 636955.52          | N 32 15 13.51 W 104 1 26.48 | 126.48                      |                          |
| 5770.00    | 10.30      | 59.32       | 5754.74          | -45.41      | 55.78        | 162.83     | 0.67       | 456194.57        | 636969.94          | N 32 15 13.59 W 104 1 26.31 | 126.31                      |                          |
| 5864.00    | 10.14      | 59.73       | 5847.24          | -52.95      | 64.24        | 177.21     | 0.19       | 456203.03        | 636984.31          | N 32 15 13.67 W 104 1 26.14 | 126.14                      |                          |
| 5959.00    | 10.14      | 61.17       | 5940.76          | -60.27      | 72.49        | 191.76     | 0.27       | 456211.27        | 636998.86          | N 32 15 13.76 W 104 1 25.97 | 125.97                      |                          |
| 6053.00    | 9.82       | 64.85       | 6033.34          | -66.73      | 79.89        | 206.26     | 0.76       | 456218.67        | 637013.36          | N 32 15 13.83 W 104 1 25.80 | 125.80                      |                          |
| 6147.00    | 9.92       | 69.54       | 6125.95          | -72.02      | 86.12        | 221.10     | 0.86       | 456224.91        | 637028.20          | N 32 15 13.89 W 104 1 25.63 | 125.63                      |                          |
| 6242.00    | 9.79       | 73.75       | 6219.55          | -75.16      | 91.24        | 236.52     | 0.77       | 456230.03        | 637043.62          | N 32 15 13.94 W 104 1 25.45 | 125.45                      |                          |
| 6337.00    | 9.99       | 73.23       | 6313.14          | -79.81      | 95.88        | 252.17     | 0.23       | 456234.66        | 637059.27          | N 32 15 13.99 W 104 1 25.27 | 125.27                      |                          |
| 6432.00    | 9.55       | 73.69       | 6409.40          | -86.98      | 105.02       | 282.91     | 0.24       | 456243.80        | 637090.01          | N 32 15 14.08 W 104 1 24.91 | 124.91                      |                          |
| 6526.00    | 9.55       | 73.69       | 6409.40          | -86.98      | 105.02       | 282.91     | 0.24       | 456243.80        | 637090.01          | N 32 15 14.08 W 104 1 24.91 | 124.91                      |                          |
| 6620.00    | 9.78       | 82.18       | 6592.07          | -89.28      | 108.29       | 298.31     | 1.53       | 456247.07        | 637105.40          | N 32 15 14.11 W 104 1 24.73 | 124.73                      |                          |
| 6715.00    | 9.69       | 85.37       | 6685.70          | -90.02      | 110.03       | 314.27     | 0.58       | 456248.82        | 637121.36          | N 32 15 14.12 W 104 1 24.55 | 124.55                      |                          |
| 6809.00    | 9.77       | 73.79       | 6778.38          | -91.90      | 112.90       | 329.81     | 2.08       | 456251.68        | 637136.91          | N 32 15 14.15 W 104 1 24.36 | 124.36                      |                          |
| 6903.00    | 9.48       | 64.77       | 6871.04          | -96.49      | 118.43       | 344.48     | 1.63       | 456257.21        | 637151.57          | N 32 15 14.21 W 104 1 24.19 | 124.19                      |                          |
| 6998.00    | 9.69       |             |                  |             |              |            |            |                  |                    |                             |                             |                          |

| 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 ° ' ") |
|------------------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
| KOP Actual                         | 7565.00    | 9.75        | 85.05            | 7523.72     | -138.82      | 167.02     | 442.44     | 1.64             | 456305.80          | 637249.52         | N 32 15 14.68 W 104     | 1 23.05                  |
|                                    | 7659.00    | 9.41        | 94.75            | 7616.42     | -137.88      | 167.07     | 458.03     | 1.75             | 456305.85          | 637265.11         | N 32 15 14.68 W 104     | 1 22.87                  |
|                                    | 7754.00    | 9.60        | 102.66           | 7710.12     | -134.53      | 164.69     | 473.50     | 1.39             | 456303.47          | 637280.58         | N 32 15 14.66 W 104     | 1 22.69                  |
|                                    | 7848.00    | 9.53        | 104.73           | 7802.81     | -129.89      | 161.00     | 488.67     | 0.37             | 456299.77          | 637295.75         | N 32 15 14.62 W 104     | 1 22.51                  |
|                                    | 7947.00    | 10.42       | 105.57           | 7900.31     | -124.37      | 156.51     | 505.22     | 0.91             | 456295.29          | 637312.30         | N 32 15 14.58 W 104     | 1 22.32                  |
|                                    | 8042.00    | 12.21       | 126.27           | 7993.50     | -115.10      | 148.26     | 521.60     | 4.64             | 456287.03          | 637328.68         | N 32 15 14.50 W 104     | 1 22.13                  |
|                                    | 8137.00    | 20.05       | 153.66           | 8084.81     | -93.58       | 127.66     | 536.97     | 11.29            | 456266.44          | 637344.05         | N 32 15 14.29 W 104     | 1 21.95                  |
| 100' FNL<br>Crossed                | 8142.00    | 20.30       | 154.65           | 8089.51     | -91.98       | 126.11     | 537.73     | 8.44             | 456264.89          | 637344.80         | N 32 15 14.28 W 104     | 1 21.94                  |
| 2nd Bone<br>Spring<br>Intersection | 8231.00    | 25.44       | 168.85           | 8171.55     | -58.64       | 93.35      | 548.05     | 8.44             | 456232.14          | 637355.12         | N 32 15 13.95 W 104     | 1 21.82                  |
|                                    | 8326.00    | 33.22       | 174.16           | 8254.32     | -12.33       | 47.37      | 554.65     | 8.63             | 456186.15          | 637361.73         | N 32 15 13.50 W 104     | 1 21.75                  |
|                                    | 8421.00    | 42.18       | 177.39           | 8329.42     | 45.69        | -10.50     | 558.76     | 9.66             | 456128.29          | 637365.83         | N 32 15 12.92 W 104     | 1 21.70                  |
|                                    | 8484.00    | 44.69       | 180.05           | 8375.16     | 88.95        | -53.80     | 559.70     | 4.93             | 456085.00          | 637366.78         | N 32 15 12.50 W 104     | 1 21.69                  |
| Exit Target Box                    | 8493.72    | 45.90       | 179.96           | 8382.00     | 95.84        | -60.70     | 559.70     | 12.51            | 456078.09          | 637366.78         | N 32 15 12.43 W 104     | 1 21.69                  |
|                                    | 8579.00    | 56.56       | 179.28           | 8435.32     | 162.14       | -127.10    | 560.17     | 12.51            | 456011.70          | 637367.25         | N 32 15 11.77 W 104     | 1 21.69                  |
|                                    | 8674.00    | 71.42       | 177.94           | 8476.87     | 247.21       | -212.21    | 562.30     | 15.69            | 455926.60          | 637369.38         | N 32 15 10.93 W 104     | 1 21.67                  |
|                                    | 8768.00    | 88.08       | 175.18           | 8493.54     | 339.38       | -304.20    | 567.89     | 17.96            | 455834.61          | 637374.97         | N 32 15 10.02 W 104     | 1 21.61                  |
|                                    | 8818.00    | 90.24       | 175.58           | 8494.27     | 389.36       | -354.03    | 571.92     | 4.39             | 455784.79          | 637378.99         | N 32 15 9.52 W 104      | 1 21.56                  |
|                                    | 8920.00    | 91.45       | 175.70           | 8492.77     | 491.34       | -455.73    | 579.67     | 1.19             | 455683.10          | 637386.74         | N 32 15 8.52 W 104      | 1 21.47                  |
|                                    | 9013.00    | 91.10       | 175.36           | 8490.70     | 584.31       | -548.42    | 586.92     | 0.52             | 455590.42          | 637393.99         | N 32 15 7.60 W 104      | 1 21.39                  |
|                                    | 9106.00    | 88.97       | 176.56           | 8490.64     | 677.30       | -641.18    | 593.47     | 2.63             | 455497.66          | 637400.54         | N 32 15 6.68 W 104      | 1 21.32                  |
|                                    | 9200.00    | 89.14       | 176.43           | 8492.19     | 771.28       | -734.99    | 599.22     | 0.23             | 455403.86          | 637406.29         | N 32 15 5.75 W 104      | 1 21.26                  |
|                                    | 9293.00    | 89.11       | 176.20           | 8493.61     | 864.27       | -827.79    | 605.19     | 0.25             | 455311.07          | 637412.26         | N 32 15 4.84 W 104      | 1 21.19                  |
|                                    | 9386.00    | 89.24       | 175.59           | 8494.95     | 957.26       | -920.54    | 611.85     | 0.67             | 455218.33          | 637418.92         | N 32 15 3.92 W 104      | 1 21.12                  |
|                                    | 9479.00    | 89.38       | 175.76           | 8496.07     | 1050.24      | -1013.27   | 618.86     | 0.24             | 455125.60          | 637425.93         | N 32 15 3.00 W 104      | 1 21.04                  |
|                                    | 9572.00    | 89.45       | 177.74           | 8497.02     | 1143.23      | -1106.11   | 624.13     | 2.13             | 455032.77          | 637431.20         | N 32 15 2.08 W 104      | 1 20.98                  |
|                                    | 9666.00    | 89.86       | 180.50           | 8497.59     | 1237.12      | -1200.09   | 625.58     | 2.97             | 454938.80          | 637432.65         | N 32 15 1.15 W 104      | 1 20.96                  |
|                                    | 9759.00    | 89.42       | 182.46           | 8498.17     | 1329.74      | -1293.05   | 623.18     | 2.16             | 454845.85          | 637430.24         | N 32 15 0.23 W 104      | 1 21.00                  |
|                                    | 9853.00    | 89.83       | 184.04           | 8498.79     | 1423.06      | -1386.89   | 617.85     | 1.74             | 454752.01          | 637424.92         | N 32 14 59.30 W 104     | 1 21.06                  |
|                                    | 9946.00    | 89.42       | 184.70           | 8499.40     | 1515.16      | -1479.62   | 610.76     | 0.84             | 454659.29          | 637417.83         | N 32 14 58.39 W 104     | 1 21.15                  |
|                                    | 10039.00   | 89.86       | 184.51           | 8499.98     | 1607.20      | -1572.32   | 603.29     | 0.52             | 454566.60          | 637410.36         | N 32 14 57.47 W 104     | 1 21.24                  |
|                                    | 10133.00   | 89.24       | 182.08           | 8500.72     | 1700.51      | -1666.15   | 597.89     | 2.67             | 454472.77          | 637404.96         | N 32 14 56.54 W 104     | 1 21.30                  |
|                                    | 10227.00   | 89.79       | 180.13           | 8501.51     | 1794.18      | -1760.13   | 596.08     | 2.16             | 454378.81          | 637403.15         | N 32 14 55.61 W 104     | 1 21.33                  |
|                                    | 10322.00   | 89.97       | 181.93           | 8501.71     | 1888.87      | -1855.11   | 594.37     | 1.90             | 454283.84          | 637401.44         | N 32 14 54.67 W 104     | 1 21.35                  |
|                                    | 10417.00   | 89.24       | 181.50           | 8502.37     | 1983.45      | -1950.06   | 591.53     | 0.89             | 454188.89          | 637398.60         | N 32 14 53.73 W 104     | 1 21.39                  |
|                                    | 10477.00   | 89.37       | 181.56           | 8503.09     | 2043.21      | -2010.04   | 589.92     | 0.25             | 454128.92          | 637397.00         | N 32 14 53.14 W 104     | 1 21.41                  |
|                                    | 10511.00   | 89.45       | 181.60           | 8503.44     | 2077.07      | -2044.02   | 588.99     | 0.25             | 454094.94          | 637396.06         | N 32 14 52.80 W 104     | 1 21.42                  |
|                                    | 10606.00   | 90.10       | 184.16           | 8503.82     | 2171.45      | -2138.89   | 584.21     | 2.78             | 454000.07          | 637391.29         | N 32 14 51.86 W 104     | 1 21.48                  |
|                                    | 10700.00   | 89.45       | 184.30           | 8504.19     | 2264.57      | -2232.63   | 577.28     | 0.71             | 453906.34          | 637384.35         | N 32 14 50.94 W 104     | 1 21.56                  |
|                                    | 10795.00   | 89.76       | 184.07           | 8504.84     | 2358.69      | -2327.38   | 570.35     | 0.41             | 453811.60          | 637377.42         | N 32 14 50.00 W 104     | 1 21.65                  |
|                                    | 10890.00   | 89.62       | 184.01           | 8505.35     | 2452.84      | -2422.14   | 563.65     | 0.16             | 453716.85          | 637370.73         | N 32 14 49.06 W 104     | 1 21.73                  |
|                                    | 10984.00   | 88.76       | 180.76           | 8506.68     | 2546.30      | -2516.04   | 559.74     | 3.58             | 453622.96          | 637366.82         | N 32 14 48.13 W 104     | 1 21.78                  |
|                                    | 11079.00   | 88.11       | 177.11           | 8509.28     | 2641.16      | -2610.97   | 561.51     | 3.90             | 453528.08          | 637368.58         | N 32 14 47.19 W 104     | 1 21.76                  |
|                                    | 11174.00   | 88.42       | 176.59           | 8512.16     | 2736.11      | -2705.78   | 566.73     | 0.64             | 453433.23          | 637373.80         | N 32 14 46.25 W 104     | 1 21.70                  |
|                                    | 11268.00   | 89.24       | 176.68           | 8514.07     | 2830.09      | -2799.60   | 572.24     | 0.88             | 453339.42          | 637379.31         | N 32 14 45.33 W 104     | 1 21.64                  |
|                                    | 11363.00   | 90.17       | 176.56           | 8514.56     | 2925.09      | -2894.43   | 577.84     | 0.99             | 453244.60          | 637384.92         | N 32 14 44.39 W 104     | 1 21.58                  |
|                                    | 11457.00   | 90.21       | 176.77           | 8514.25     | 3019.08      | -2988.27   | 583.31     | 0.23             | 453150.76          | 637390.38         | N 32 14 43.46 W 104     | 1 21.52                  |
|                                    | 11552.00   | 90.52       | 177.57           | 8513.65     | 3114.07      | -3083.15   | 588.00     | 0.90             | 453055.89          | 637395.07         | N 32 14 42.52 W 104     | 1 21.47                  |
|                                    | 11646.00   | 90.86       | 178.33           | 8512.52     | 3208.03      | -3177.09   | 591.36     | 0.89             | 452961.97          | 637398.43         | N 32 14 41.59 W 104     | 1 21.43                  |
|                                    | 11741.00   | 90.79       | 178.87           | 8511.15     | 3302.95      | -3202.95   | 593.68     | 0.57             | 452867.01          | 637400.76         | N 32 14 40.65 W 104     | 1 21.41                  |
|                                    | 11836.00   | 90.21       | 178.50           | 8510.32     | 3397.87      | -3367.02   | 595.86     | 0.72             | 452772.05          | 637402.94         | N 32 14 39.71 W 104     | 1 21.38                  |
| Enter Target<br>Box                | 11861.00   | 90.47       | 178.40           | 8510.17     | 3422.85      | -3392.01   | 596.54     | 1.10             | 452747.06          | 637403.61         | N 32 14 39.46 W 104     | 1 21.38                  |
|                                    | 11930.00   | 91.17       | 178.11           | 8509.19     | 3491.81      | -3460.97   | 598.64     | 1.10             | 452678.11          | 637405.72         | N 32 14 38.78 W 104     | 1 21.35                  |
|                                    | 12025.00   | 91.07       | 177.98           | 8507.33     | 3586.75      | -3555.89   | 601.88     | 0.17             | 452583.19          | 637408.96         | N 32 14 37.84 W 104     | 1 21.32                  |
|                                    | 12119.00   | 91.03       | 178.53           | 8505.61     | 3680.68      | -3649.84   | 604.75     | 0.59             | 452489.26          | 637411.82         | N 32 14 36.91 W 104     | 1 21.29                  |
|                                    | 12214.00   | 91.24       | 178.45           | 8503.73     | 3775.60      | -3744.78   | 607.25     | 0.24             | 452394.32          | 637414.32         | N 32 14 35.97 W 104     | 1 21.26                  |
|                                    | 12309.00   | 90.90       | 178.97           | 8501.95     | 3870.51      | -3839.74   | 609.39     | 0.65             | 452299.36          | 637416.46         | N 32 14 35.03 W 104     | 1 21.24                  |
|                                    | 12403.00   | 91.24       | 178.95           | 8500.20     | 3964.39      | -3933.71   | 611.09     | 0.36             | 452205.40          | 637418.16         | N 32 14 34.10 W 104     | 1 21.23                  |
|                                    | 12498.00   | 90.86       | 179.23           | 8498.45     | 4059.27      | -4028.68   | 612.60     | 0.50             | 452110.44          | 637419.67         | N 32 14 33.16 W 104     | 1 21.21                  |
|                                    | 12593.00   | 90.62       | 178.51           | 8496.00     | 4249.08      | -4218.63   | 616.35     | 0.40             | 451920.51          | 637423.42         | N 32 14 31.28 W 104     | 1 21.17                  |
|                                    | 12688.00   | 90.89       | 178.64           | 8494.76     | 4343.00      | -4312.59   | 618.69     | 0.32             | 451826.56          | 637425.78         | N 32 14 30.35 W 104     | 1 21.15                  |
|                                    | 12791.00   | 90.72       | 177.90           | 8492.11     | 4531.88      | -4501.48   | 624.39     | 0.40             | 451637.68          | 637431.46         | N 32 14 28.48 W 104     | 1 21.09                  |
|                                    | 13066.00   | 90.79       | 178.30           | 8490.86     | 4626.83      | -4596.42   | 627.54     | 0.43             | 451542.75          | 637434.61         | N 32 14 27.54 W 104     | 1 21.06                  |
|                                    | 13255.00   | 91.07       | 179.72           | 8487.79     | 4815.60      | -4785.37   | 630.81     | 0.77             | 451353.82          | 637437.87         | N 32 14 25.67 W 104     | 1 21.02                  |
|                                    | 13350.00   | 89.83       | 180.34           | 8487.04     | 4910.40      | -4880.36   | 630.76     | 1.46             | 451258.83          | 637437.82         | N 32 14 24.73 W 104     | 1 21.03                  |
|                                    | 13445.00   | 89.14       | 180.93           | 8487.90     | 5005.14      | -4975.35   | 629.70     | 0.96             | 451163.85          | 637436.77         | N 32 14 23.79 W 104     | 1 21.04                  |
|                                    | 13539.00   | 89.17       | 181.31           | 8489.28     | 5098.81      | -5069.32   | 627.87     |                  |                    |                   |                         |                          |

| 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 ° ' ") |
|---------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
|                     | 17326.00   | 91.96       | 177.98           | 8493.92     | 8874.64      | -8851.58   | 645.22     | 1.41             | 447287.94          | 637452.29         | N 32 13 45.44 W 104     | 1 20.99                  |
|                     | 17421.00   | 91.86       | 177.56           | 8490.75     | 8969.56      | -8946.45   | 648.92     | 0.45             | 447193.08          | 637455.99         | N 32 13 44.50 W 104     | 1 20.95                  |
|                     | 17515.00   | 91.48       | 177.69           | 8488.01     | 9063.50      | -9040.33   | 652.81     | 0.43             | 447099.20          | 637459.88         | N 32 13 43.57 W 104     | 1 20.91                  |
|                     | 17609.00   | 91.00       | 178.16           | 8485.98     | 9157.44      | -9134.25   | 656.22     | 0.71             | 447005.30          | 637463.28         | N 32 13 42.64 W 104     | 1 20.88                  |
|                     | 17704.00   | 90.38       | 179.29           | 8484.84     | 9252.36      | -9229.22   | 658.33     | 1.36             | 446910.34          | 637465.39         | N 32 13 41.70 W 104     | 1 20.85                  |
|                     | 17799.00   | 89.86       | 180.13           | 8484.64     | 9347.20      | -9324.21   | 658.81     | 1.04             | 446815.35          | 637465.88         | N 32 13 40.76 W 104     | 1 20.85                  |
|                     | 17893.00   | 89.28       | 181.33           | 8485.34     | 9440.92      | -9418.20   | 657.61     | 1.42             | 446721.37          | 637464.68         | N 32 13 39.83 W 104     | 1 20.87                  |
|                     | 17988.00   | 90.14       | 182.26           | 8485.82     | 9535.50      | -9513.15   | 654.64     | 1.33             | 446626.42          | 637461.70         | N 32 13 38.89 W 104     | 1 20.91                  |
|                     | 18083.00   | 89.24       | 182.25           | 8486.34     | 9630.00      | -9608.07   | 650.90     | 0.95             | 446531.51          | 637457.97         | N 32 13 37.95 W 104     | 1 20.95                  |
|                     | 18177.00   | 89.28       | 182.36           | 8487.55     | 9723.49      | -9701.99   | 647.12     | 0.12             | 446437.60          | 637454.19         | N 32 13 37.02 W 104     | 1 21.00                  |
|                     | 18272.00   | 87.94       | 181.49           | 8489.86     | 9818.01      | -9798.91   | 643.93     | 1.68             | 446342.69          | 637451.00         | N 32 13 36.08 W 104     | 1 21.04                  |
|                     | 18367.00   | 89.45       | 181.31           | 8492.02     | 9912.62      | -9891.85   | 641.61     | 1.60             | 446247.76          | 637448.68         | N 32 13 35.15 W 104     | 1 21.07                  |
|                     | 18462.00   | 90.07       | 180.96           | 8492.42     | 10007.29     | -9986.83   | 639.73     | 0.75             | 446152.78          | 637446.79         | N 32 13 34.21 W 104     | 1 21.10                  |
|                     | 18557.00   | 90.31       | 179.55           | 8492.10     | 10102.08     | -10081.83  | 639.30     | 1.51             | 446057.80          | 637446.37         | N 32 13 33.27 W 104     | 1 21.10                  |
|                     | 18651.00   | 89.49       | 177.73           | 8492.27     | 10196.00     | -10175.79  | 641.53     | 2.12             | 445963.83          | 637444.60         | N 32 13 32.34 W 104     | 1 21.08                  |
|                     | 18746.00   | 89.83       | 177.49           | 8492.83     | 10290.97     | -10270.71  | 645.50     | 0.44             | 445868.93          | 637452.56         | N 32 13 31.40 W 104     | 1 21.04                  |
| 100' FSL<br>Crossed | 18790.00   | 89.94       | 177.32           | 8492.92     | 10334.97     | -10314.67  | 647.49     | 0.46             | 445824.98          | 637454.55         | N 32 13 30.96 W 104     | 1 21.02                  |
| Final MWD           | 18826.00   | 90.03       | 177.18           | 8492.93     | 10370.96     | -10350.62  | 649.22     | 0.46             | 445789.02          | 637456.28         | N 32 13 30.61 W 104     | 1 21.00                  |
| Proj to TD          | 18869.00   | 90.03       | 177.18           | 8492.90     | 10413.96     | -10393.57  | 651.33     | 0.00             | 445746.08          | 637458.40         | N 32 13 30.18 W 104     | 1 20.97                  |

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           | 26.500        | 1/98.425         | 30.000    | 30.000                  | NAL_NSG+MSHOT-Depth Only | Original Borehole / Oxy Length<br>CC 6-7 Federal Com 24H Gyro +<br>MWD 0-18869'MD                 |
|             | 1    | 26.500          | 26.500        | Act Stns         | 30.000    | 30.000                  | NAL_NSG+MSHOT-Depth Only | Original Borehole / Oxy Length<br>CC 6-7 Federal Com 24H Gyro +<br>MWD 0-18869'MD                 |
|             | 1    | 26.500          | 430.500       | Act Stns         | 30.000    | 30.000                  | NAL_NSG+MSHOT            | Original Borehole / Oxy Length<br>CC 6-7 Federal Com 24H Gyro +<br>Original Borehole / Oxy Length |
|             | 1    | 430.500         | 1030.000      | Act Stns         | 30.000    | 30.000                  | NAL_MWD_PLUS_0.5_DEG     | CC 6-7 Federal Com 24H Gyro +<br>Original Borehole / Oxy Length                                   |
|             | 1    | 1030.000        | 18869.000     | Act Stns         | 30.000    | 30.000                  | NAL_MWD_IFR1+MS          | Original Borehole / Oxy Length<br>CC 6-7 Federal Com 24H Gyro +                                   |

...Original Borehole/Oxy Length CC 6-7 Federal Com 24H Gyro + MWD 0-18869'MD