

# **ANADARKO PETROLEUM CORP**

**WELD COUNTY (NAD 83)**

**NE NE SEC. 7 T1N R67W 6th P.M.**

**RANGER 7-20HZ**

**JOB # 2019-199-461**

**13 June, 2019**

**Survey: FINAL SURVEYS**





Project: WELD COUNTY (NAD 83)  
Site: NE NE SEC. 7 T1N R67W 6th P.M.  
Well: RANGER 7-20HZ  
Wellbore: JOB # 2019-199-461  
Design: FINAL SURVEYS

#### ANNOTATIONS

| TVD     | MD       | Inc   | Azi    | +N/-S    | +E/-W   | VSec     | Departure | Annotation                              |
|---------|----------|-------|--------|----------|---------|----------|-----------|---|
| 1799.33 | 1842.00  | 19.64 | 92.56  | 1.01     | 322.90  | 1.30     | 327.29    | TIE ON TO SURFACE SURVEYS               |
| 2225.58 | 2296.00  | 21.29 | 91.99  | -1.89    | 479.00  | -1.48    | 483.36    | ~ ENTER TGT BOX (2296' MD)              |
| 7070.42 | 7253.00  | 1.89  | 18.86  | -40.45   | 1190.31 | -39.41   | 1223.39   | KOP                                     |
| 7732.82 | 8120.00  | 65.43 | 357.29 | 443.72   | 1198.72 | 444.76   | 1708.16   | ~ ENTER RADIUS HEEL (8120' MD)          |
| 7836.70 | 8533.00  | 86.39 | 0.06   | 840.76   | 1194.21 | 841.80   | 2104.99   | HEEL:40.073096; -104.932390             |
| 7835.27 | 8885.00  | 90.56 | 0.32   | 1192.66  | 1194.52 | 1193.70  | 2456.90   | ~ EXIT RADIUS HEEL (8885' MD)           |
| 7842.01 | 18766.00 | 90.28 | 359.45 | 11069.66 | 1216.83 | 11070.72 | 12336.80  | ~ ENTER RADIUS TOE (18766' MD)          |
| 7840.46 | 19026.00 | 89.79 | 359.11 | 11329.64 | 1215.49 | 11330.70 | 12596.79  | LAST SURVEY JUNE 12, 2019               |
| 7840.67 | 19084.00 | 89.79 | 359.11 | 11387.63 | 1214.59 | 11388.69 | 12654.79  | PROJECTION TO TD:40.102048; -104.932315 |

#### AS DRILLED LOCAL COORDINATES:

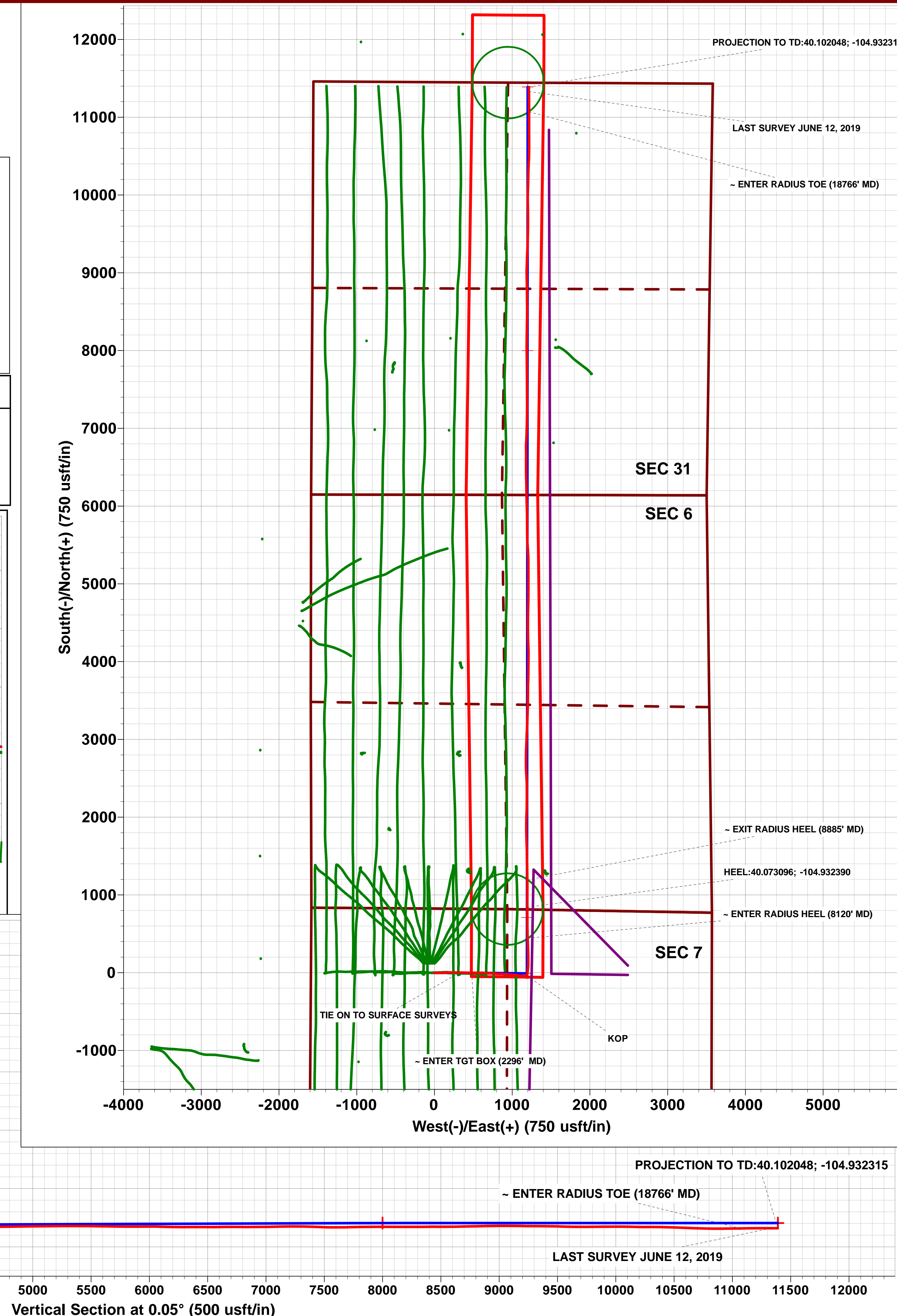
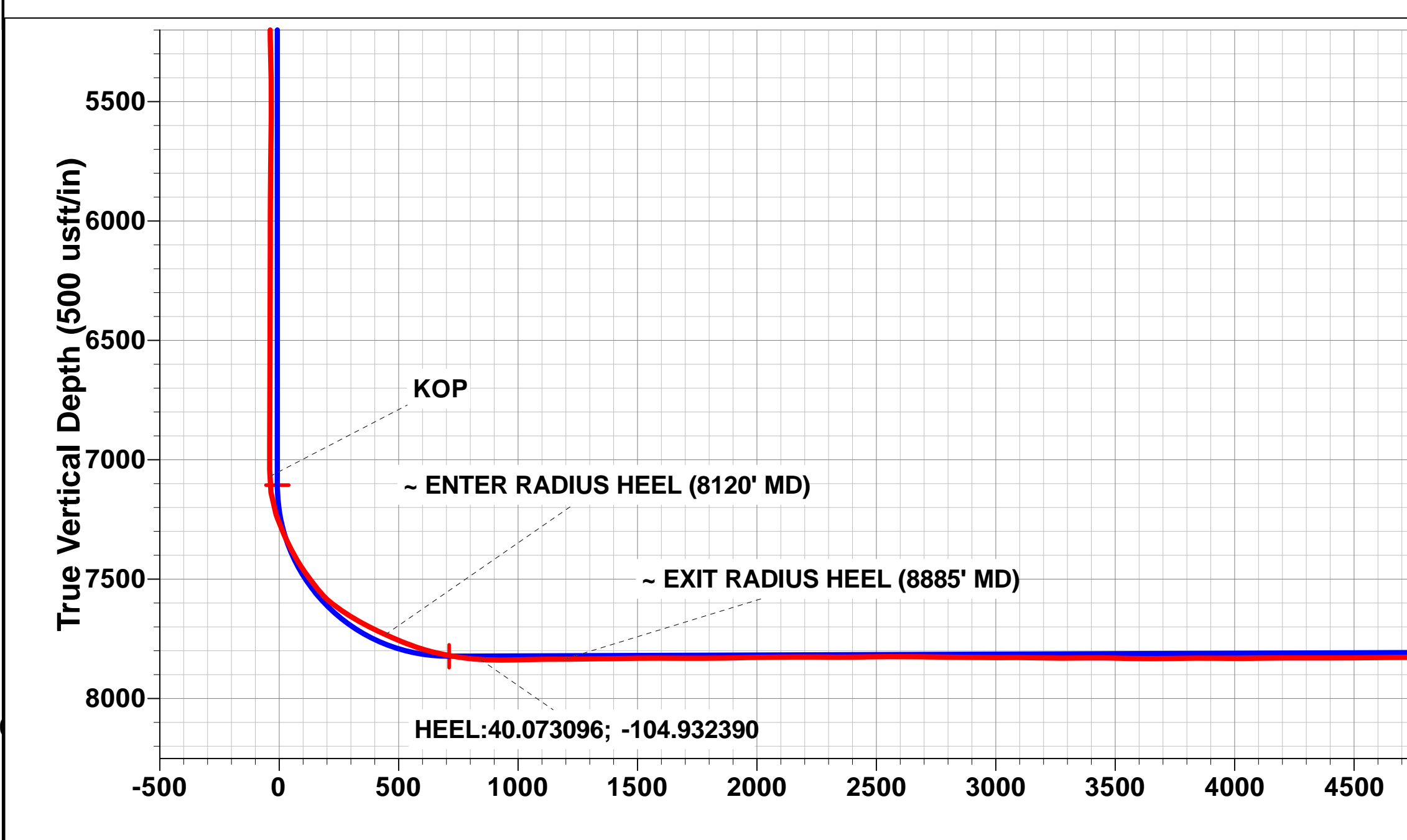
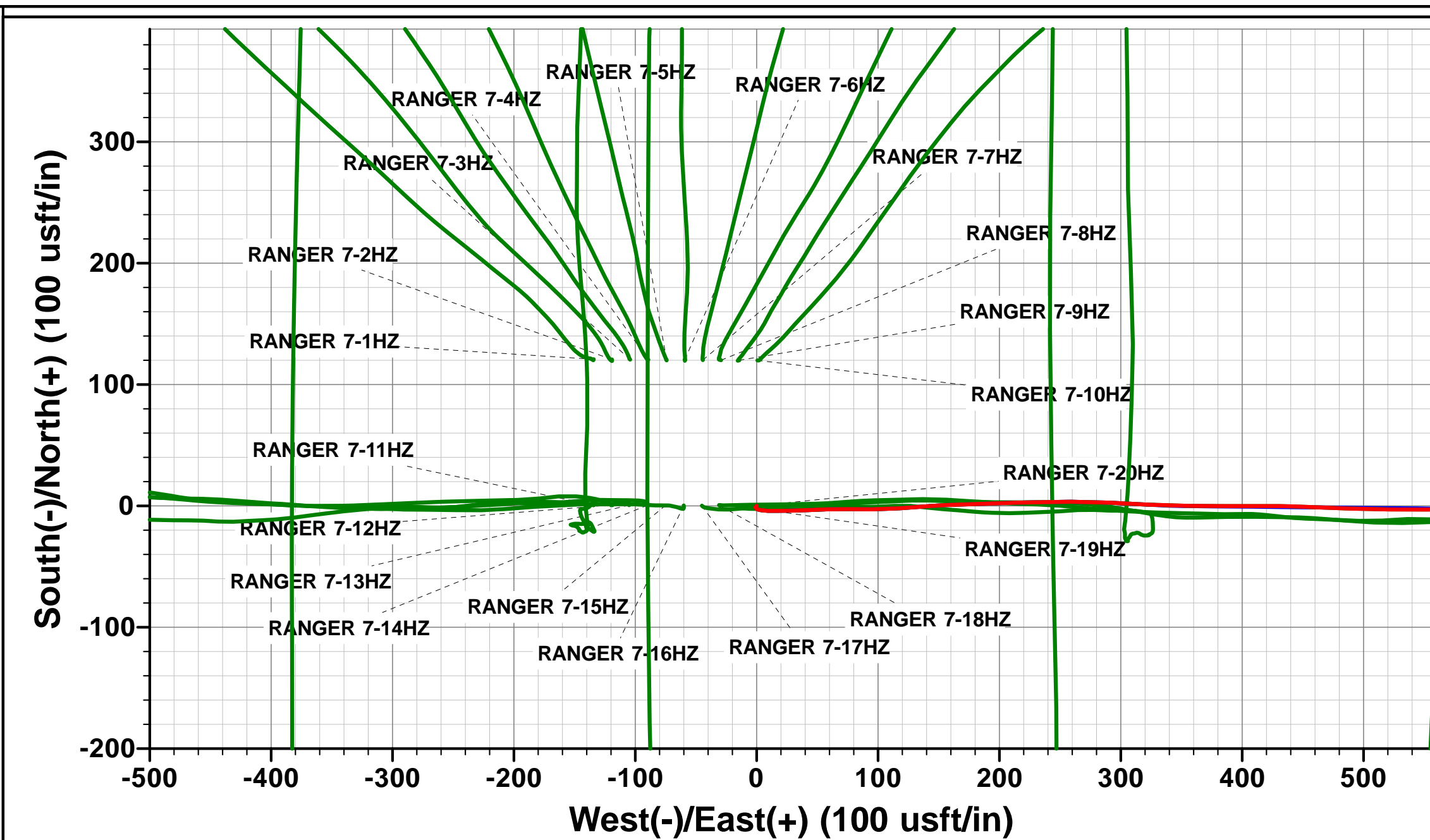
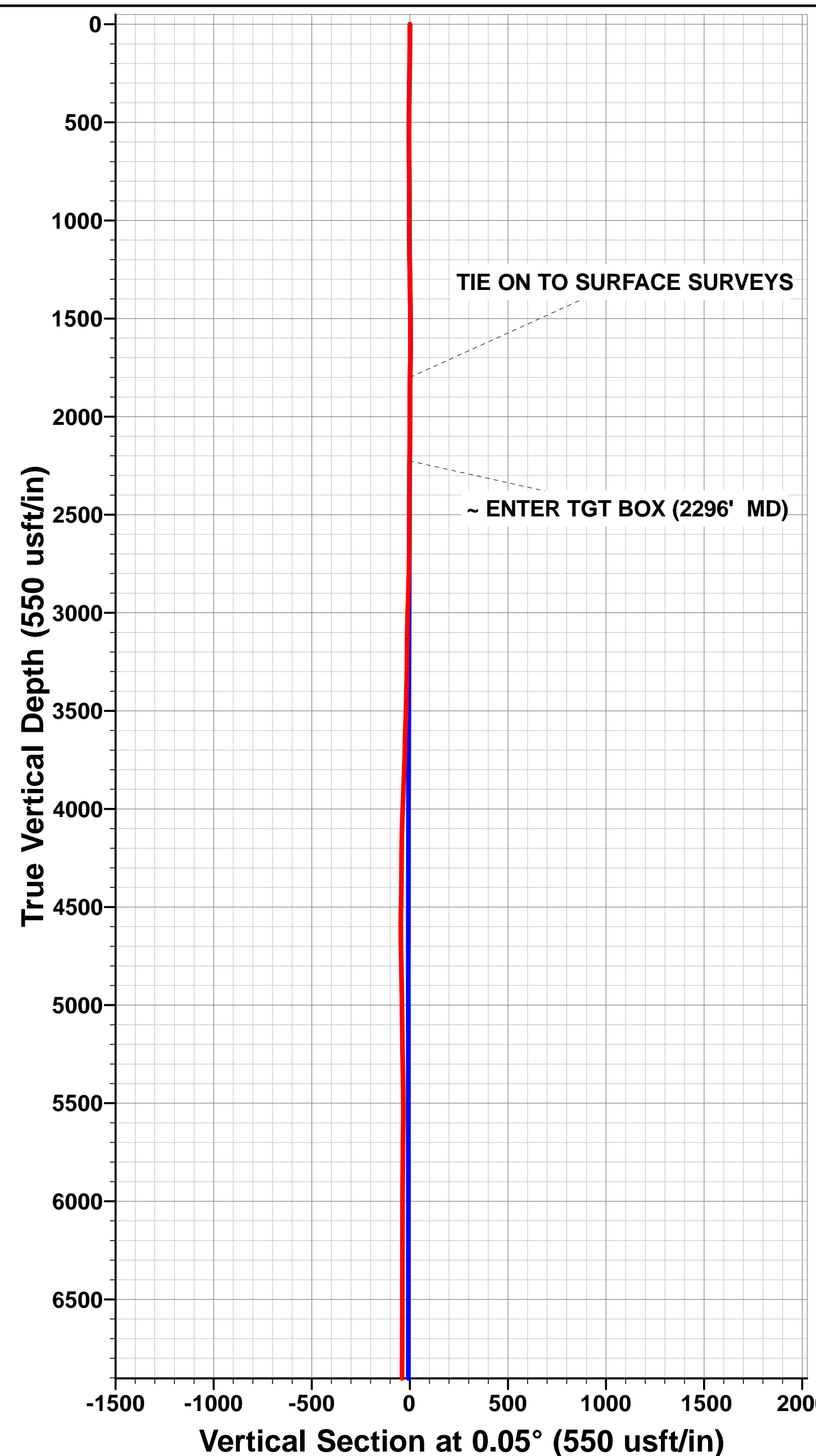
SHL: 825ft FNL & 1589ft FWL Sec 7

HEEL:30.79ft FSL & 2374.29ft FEL Sec 6

BHL: 51.81ft FNL & 2363.91ft FEL Sec 31

#### WELLBORE TARGET DETAILS (LAT/LONG)

| Name                      | TVD     | +N/-S    | +E/-W   | Latitude  | Longitude   |
|---------------------------|---------|----------|---------|-----------|-------------|
| BHL - RANGER 7-20HZ (P2)  | 7796.00 | 11389.44 | 1199.50 | 40.102053 | -104.932369 |
| HEEL - RANGER 7-20HZ (P2) | 7823.00 | 709.97   | 1190.50 | 40.072737 | -104.932403 |
| KOP - RANGER 7-20HZ (P2)  | 7106.81 | -8.85    | 1189.87 | 40.070764 | -104.932405 |



## Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Company:</b>  | ANADARKO PETROLEUM CORP        | <b>Local Co-ordinate Reference:</b> | Well RANGER 7-20HZ           |
| <b>Project:</b>  | WELD COUNTY (NAD 83)           | <b>TVD Reference:</b>               | KB 20' @ 5132.00usft (PD461) |
| <b>Site:</b>     | NE NE SEC. 7 T1N R67W 6th P.M. | <b>MD Reference:</b>                | KB 20' @ 5132.00usft (PD461) |
| <b>Well:</b>     | RANGER 7-20HZ                  | <b>North Reference:</b>             | True                         |
| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

|                    |  |                             |                |
|--------------------|--|-----------------------------|----------------|
| <b>Project</b>     | WELD COUNTY (NAD 83)                           |                             |                |
| <b>Map System:</b> | Universal Transverse Mercator (US Survey Feet) | <b>System Datum:</b>        | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983                      |                             |                |
| <b>Map Zone:</b>   | Zone 13N (108 W to 102 W)                      | Using geodetic scale factor |                |

|                       |                                |              |                    |                   |             |
|-----------------------|--------------------------------|--------------|--------------------|-------------------|-------------|
| Site                  | NE NE SEC. 7 T1N R67W 6th P.M. |              |                    |                   |             |
| Site Position:        |                                | Northing:    | 14,552,637.41 usft | Latitude:         | 40.071120   |
| From:                 | Lat/Long                       | Easting:     | 1,658,003.48 usft  | Longitude:        | -104.937136 |
| Position Uncertainty: | 0.00 usft                      | Slot Radius: | 1.10 ft            | Grid Convergence: | 0.04 °      |

| Well                 | RANGER 7-20HZ |           |                     |                    |               |               |
|----------------------|---------------|-----------|---------------------|--------------------|---------------|---------------|
| Well Position        | +N/-S         | 0.00 usft | Northing:           | 14,552,516.73 usft | Latitude:     | 40.070788     |
|                      | +E/-W         | 0.00 usft | Easting:            | 1,658,137.77 usft  | Longitude:    | -104.936656   |
| Position Uncertainty |               | 0.00 usft | Wellhead Elevation: | usft               | Ground Level: | 5,112.00 usft |

|                  |                    |                    |                        |                      |                            |
|------------------|--------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | JOB # 2019-199-461 |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b>  | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2015           | 08/03/2019         | 8.09                   | 66.52                | 52,004                     |

| Design            | FINAL SURVEYS              |                 |                 |                  |      |
|-------------------|----------------------------|-----------------|-----------------|------------------|------|
| Audit Notes:      |                            |                 |                 |                  |      |
| Version:          | 1.0                        | Phase:          | ACTUAL          | Tie On Depth:    | 0.00 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Direction<br>(°) |      |
|                   | 0.00                       | 0.00            | 0.00            | 0.05             |      |

|                       |                  |                                    |                       |                                    |  |
|-----------------------|------------------|------------------------------------|-----------------------|------------------------------------|--|
| <b>Survey Program</b> | <b>Date</b>      | 13/06/2019                         |                       |                                    |  |
| <b>From (usft)</b>    | <b>To (usft)</b> | <b>Survey (Wellbore)</b>           | <b>Tool Name</b>      | <b>Description</b>                 |  |
| 129.00                | 19,084.00        | FINAL SURVEYS (JOB # 2019-199-461) | APC_ISCWSA REV 2 MWD+ | Fixed:v2:crustal field declination |  |

|                              |                        |                    |                              |                            |                     |                     |                                |                                |                               |                              |
|------------------------------|------------------------|--------------------|------------------------------|----------------------------|---------------------|---------------------|--------------------------------|--------------------------------|-------------------------------|------------------------------|
| <b>Survey</b>                |                        |                    |                              |                            |                     |                     |                                |                                |                               |                              |
| <b>Measured Depth (usft)</b> | <b>Inclination (°)</b> | <b>Azimuth (°)</b> | <b>Vertical Depth (usft)</b> | <b>Subsea Depth (usft)</b> | <b>+N/-S (usft)</b> | <b>+E/-W (usft)</b> | <b>Vertical Section (usft)</b> | <b>Dogleg Rate (°/100usft)</b> | <b>Build Rate (°/100usft)</b> | <b>Turn Rate (°/100usft)</b> |
| 0.00                         | 0.00                   | 0.00               | 0.00                         | 5,132.00                   | 0.00                | 0.00                | 0.00                           | 0.00                           | 0.00                          | 0.00                         |
| 129.00                       | 0.48                   | 226.51             | 129.00                       | 5,003.00                   | -0.37               | -0.39               | -0.37                          | 0.37                           | 0.37                          | 0.00                         |
| 224.00                       | 0.79                   | 215.08             | 223.99                       | 4,908.01                   | -1.18               | -1.06               | -1.18                          | 0.35                           | 0.33                          | -12.03                       |
| 319.00                       | 1.85                   | 117.88             | 318.97                       | 4,813.03                   | -2.43               | -0.08               | -2.43                          | 2.21                           | 1.12                          | -102.32                      |
| 414.00                       | 3.12                   | 99.24              | 413.88                       | 4,718.12                   | -3.57               | 3.83                | -3.56                          | 1.57                           | 1.34                          | -19.62                       |
| 509.00                       | 3.74                   | 91.24              | 508.71                       | 4,623.29                   | -4.05               | 9.48                | -4.04                          | 0.82                           | 0.65                          | -8.42                        |
| 604.00                       | 5.84                   | 89.05              | 603.38                       | 4,528.62                   | -4.04               | 17.41               | -4.02                          | 2.22                           | 2.21                          | -2.31                        |
| 699.00                       | 7.69                   | 89.22              | 697.71                       | 4,434.29                   | -3.87               | 28.60               | -3.84                          | 1.95                           | 1.95                          | 0.18                         |
| 793.00                       | 8.66                   | 87.11              | 790.76                       | 4,341.24                   | -3.43               | 41.96               | -3.39                          | 1.08                           | 1.03                          | -2.24                        |
| 889.00                       | 10.28                  | 87.82              | 885.44                       | 4,246.56                   | -2.74               | 57.73               | -2.69                          | 1.69                           | 1.69                          | 0.74                         |
| 984.00                       | 11.51                  | 91.60              | 978.73                       | 4,153.27                   | -2.68               | 75.68               | -2.61                          | 1.50                           | 1.29                          | 3.98                         |
| 1,079.00                     | 12.44                  | 88.87              | 1,071.66                     | 4,060.34                   | -2.74               | 95.39               | -2.66                          | 1.15                           | 0.98                          | -2.87                        |
| 1,174.00                     | 14.59                  | 87.03              | 1,164.03                     | 3,967.97                   | -1.92               | 117.57              | -1.82                          | 2.31                           | 2.26                          | -1.94                        |

## Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
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| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

| Survey                            |                 |              |                       |                     |              |               |                         |                         |                        |                       |
|-----------------------------------|-----------------|--------------|-----------------------|---------------------|--------------|---------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)             | Inclination (°) | Azimuth (°)  | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft)  | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 1,269.00                          | 15.86           | 85.09        | 1,255.69              | 3,876.31            | -0.19        | 142.45        | -0.06                   | 1.44                    | 1.34                   | -2.04                 |
| 1,365.00                          | 16.70           | 88.70        | 1,347.84              | 3,784.16            | 1.25         | 169.31        | 1.39                    | 1.37                    | 0.87                   | 3.76                  |
| 1,460.00                          | 17.58           | 87.64        | 1,438.62              | 3,693.38            | 2.15         | 197.29        | 2.32                    | 0.98                    | 0.93                   | -1.12                 |
| 1,554.00                          | 18.85           | 89.05        | 1,527.91              | 3,604.09            | 2.98         | 226.66        | 3.18                    | 1.43                    | 1.35                   | 1.50                  |
| 1,650.00                          | 20.26           | 89.14        | 1,618.37              | 3,513.63            | 3.49         | 258.79        | 3.72                    | 1.47                    | 1.47                   | 0.09                  |
| 1,744.00                          | 19.12           | 93.62        | 1,706.88              | 3,425.12            | 2.76         | 290.43        | 3.02                    | 2.01                    | -1.21                  | 4.77                  |
| <b>TIE ON TO SURFACE SURVEYS</b>  |                 |              |                       |                     |              |               |                         |                         |                        |                       |
| <b>1,842.00</b>                   | <b>19.64</b>    | <b>92.56</b> | <b>1,799.33</b>       | <b>3,332.67</b>     | <b>1.01</b>  | <b>322.90</b> | <b>1.30</b>             | <b>0.64</b>             | <b>0.53</b>            | <b>-1.08</b>          |
| 1,943.00                          | 19.05           | 90.60        | 1,894.63              | 3,237.37            | 0.08         | 356.34        | 0.39                    | 0.87                    | -0.58                  | -1.94                 |
| 2,037.00                          | 20.20           | 90.43        | 1,983.16              | 3,148.84            | -0.20        | 387.91        | 0.14                    | 1.22                    | 1.22                   | -0.18                 |
| 2,131.00                          | 19.49           | 89.28        | 2,071.58              | 3,060.42            | -0.12        | 419.82        | 0.24                    | 0.86                    | -0.76                  | -1.22                 |
| 2,225.00                          | 21.81           | 92.84        | 2,159.54              | 2,972.46            | -0.79        | 452.95        | -0.40                   | 2.81                    | 2.47                   | 3.79                  |
| <b>~ ENTER TGT BOX (2296' MD)</b> |                 |              |                       |                     |              |               |                         |                         |                        |                       |
| <b>2,296.00</b>                   | <b>21.29</b>    | <b>91.99</b> | <b>2,225.58</b>       | <b>2,906.42</b>     | <b>-1.89</b> | <b>479.00</b> | <b>-1.48</b>            | <b>0.86</b>             | <b>-0.74</b>           | <b>-1.19</b>          |
| 2,319.00                          | 21.12           | 91.71        | 2,247.02              | 2,884.98            | -2.16        | 487.31        | -1.74                   | 0.86                    | -0.73                  | -1.23                 |
| 2,414.00                          | 20.01           | 90.76        | 2,335.97              | 2,796.03            | -2.89        | 520.67        | -2.44                   | 1.22                    | -1.17                  | -1.00                 |
| 2,509.00                          | 19.18           | 89.53        | 2,425.46              | 2,706.54            | -2.98        | 552.53        | -2.50                   | 0.98                    | -0.87                  | -1.29                 |
| 2,603.00                          | 18.32           | 88.78        | 2,514.47              | 2,617.53            | -2.54        | 582.74        | -2.03                   | 0.95                    | -0.91                  | -0.80                 |
| 2,699.00                          | 19.73           | 92.59        | 2,605.23              | 2,526.77            | -2.95        | 614.02        | -2.41                   | 1.96                    | 1.47                   | 3.97                  |
| 2,793.00                          | 18.44           | 92.16        | 2,694.06              | 2,437.94            | -4.22        | 644.73        | -3.66                   | 1.38                    | -1.37                  | -0.46                 |
| 2,981.00                          | 18.62           | 94.38        | 2,872.32              | 2,259.68            | -7.64        | 704.37        | -7.02                   | 0.39                    | 0.10                   | 1.18                  |
| 3,076.00                          | 19.92           | 95.30        | 2,961.99              | 2,170.01            | -10.29       | 735.60        | -9.65                   | 1.41                    | 1.37                   | 0.97                  |
| 3,170.00                          | 21.19           | 93.28        | 3,050.01              | 2,081.99            | -12.74       | 768.51        | -12.07                  | 1.55                    | 1.35                   | -2.15                 |
| 3,263.00                          | 19.49           | 93.06        | 3,137.21              | 1,994.79            | -14.53       | 800.79        | -13.83                  | 1.83                    | -1.83                  | -0.24                 |
| 3,357.00                          | 20.10           | 91.49        | 3,225.65              | 1,906.35            | -15.79       | 832.59        | -15.06                  | 0.86                    | 0.65                   | -1.67                 |
| 3,452.00                          | 20.64           | 91.80        | 3,314.71              | 1,817.29            | -16.74       | 865.65        | -15.98                  | 0.58                    | 0.57                   | 0.33                  |
| 3,545.00                          | 18.97           | 92.32        | 3,402.21              | 1,729.79            | -17.87       | 897.13        | -17.08                  | 1.81                    | -1.80                  | 0.56                  |
| 3,638.00                          | 20.77           | 95.91        | 3,489.67              | 1,642.33            | -20.18       | 928.64        | -19.37                  | 2.34                    | 1.94                   | 3.86                  |
| 3,732.00                          | 18.29           | 95.52        | 3,578.26              | 1,553.74            | -23.31       | 959.91        | -22.47                  | 2.64                    | -2.64                  | -0.41                 |
| 3,825.00                          | 20.09           | 93.71        | 3,666.09              | 1,465.91            | -25.75       | 990.38        | -24.88                  | 2.04                    | 1.94                   | -1.95                 |
| 3,920.00                          | 17.74           | 93.24        | 3,755.95              | 1,376.05            | -27.62       | 1,021.11      | -26.73                  | 2.48                    | -2.47                  | -0.49                 |
| 4,014.00                          | 18.25           | 98.96        | 3,845.36              | 1,286.64            | -30.73       | 1,049.95      | -29.81                  | 1.96                    | 0.54                   | 6.09                  |
| 4,108.00                          | 15.82           | 98.47        | 3,935.23              | 1,196.77            | -34.91       | 1,077.17      | -33.97                  | 2.59                    | -2.59                  | -0.52                 |
| 4,202.00                          | 13.39           | 97.88        | 4,026.18              | 1,105.82            | -38.29       | 1,100.63      | -37.32                  | 2.59                    | -2.59                  | -0.63                 |
| 4,298.00                          | 11.55           | 96.68        | 4,119.91              | 1,012.09            | -40.93       | 1,121.18      | -39.95                  | 1.94                    | -1.92                  | -1.25                 |
| 4,392.00                          | 9.72            | 94.85        | 4,212.30              | 919.70              | -42.69       | 1,138.44      | -41.70                  | 1.98                    | -1.95                  | -1.95                 |
| 4,485.00                          | 7.99            | 92.26        | 4,304.18              | 827.82              | -43.61       | 1,152.72      | -42.61                  | 1.91                    | -1.86                  | -2.78                 |
| 4,580.00                          | 6.69            | 91.21        | 4,398.40              | 733.60              | -43.99       | 1,164.85      | -42.97                  | 1.38                    | -1.37                  | -1.11                 |
| 4,673.00                          | 5.43            | 108.12       | 4,490.89              | 641.11              | -45.47       | 1,174.45      | -44.45                  | 2.34                    | -1.35                  | 18.18                 |
| 4,767.00                          | 1.19            | 90.64        | 4,584.71              | 547.29              | -46.87       | 1,179.66      | -45.84                  | 4.58                    | -4.51                  | -18.60                |
| 4,861.00                          | 0.92            | 43.92        | 4,678.70              | 453.30              | -46.33       | 1,181.15      | -45.30                  | 0.93                    | -0.29                  | -49.70                |
| 4,955.00                          | 1.08            | 357.84       | 4,772.69              | 359.31              | -44.91       | 1,181.65      | -43.87                  | 0.85                    | 0.17                   | -49.02                |
| 5,048.00                          | 1.16            | 336.26       | 4,865.67              | 266.33              | -43.17       | 1,181.23      | -42.14                  | 0.46                    | 0.09                   | -23.20                |
| 5,141.00                          | 1.02            | 329.06       | 4,958.65              | 173.35              | -41.60       | 1,180.43      | -40.57                  | 0.21                    | -0.15                  | -7.74                 |
| 5,234.00                          | 0.81            | 325.43       | 5,051.64              | 80.36               | -40.35       | 1,179.63      | -39.32                  | 0.23                    | -0.23                  | -3.90                 |
| 5,328.00                          | 0.65            | 303.94       | 5,145.63              | -13.63              | -39.50       | 1,178.81      | -38.47                  | 0.33                    | -0.17                  | -22.86                |
| 5,422.00                          | 1.51            | 320.31       | 5,239.61              | -107.61             | -38.25       | 1,177.58      | -37.22                  | 0.96                    | 0.91                   | 17.41                 |
| 5,517.00                          | 1.41            | 314.79       | 5,334.58              | -202.58             | -36.46       | 1,175.95      | -35.44                  | 0.18                    | -0.11                  | -5.81                 |
| 5,612.00                          | 1.25            | 309.09       | 5,429.56              | -297.56             | -34.99       | 1,174.31      | -33.96                  | 0.22                    | -0.17                  | -6.00                 |
| 5,704.00                          | 0.29            | 83.29        | 5,521.55              | -389.55             | -34.33       | 1,173.77      | -33.30                  | 1.59                    | -1.04                  | 145.87                |
| 5,798.00                          | 1.72            | 117.70       | 5,615.54              | -483.54             | -34.95       | 1,175.25      | -33.93                  | 1.58                    | 1.52                   | 36.61                 |
| 5,918.00                          | 1.21            | 123.78       | 5,735.50              | -603.50             | -36.50       | 1,177.90      | -35.47                  | 0.44                    | -0.42                  | 5.07                  |
| 6,011.00                          | 1.03            | 114.45       | 5,828.48              | -696.48             | -37.39       | 1,179.48      | -36.36                  | 0.27                    | -0.19                  | -10.03                |



## Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
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| <b>Site:</b>     | NE NE SEC. 7 T1N R67W 6th P.M. | <b>MD Reference:</b>                | KB 20' @ 5132.00usft (PD461) |
| <b>Well:</b>     | RANGER 7-20HZ                  | <b>North Reference:</b>             | True                         |
| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

| Survey                                |                 |             |                       |                     |              |              |                         |                         |                        |                       |
|---------------------------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)                 | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 6,104.00                              | 0.65            | 110.55      | 5,921.47              | -789.47             | -37.92       | 1,180.73     | -36.89                  | 0.41                    | -0.41                  | -4.19                 |
| 6,198.00                              | 0.43            | 107.52      | 6,015.46              | -883.46             | -38.21       | 1,181.57     | -37.18                  | 0.24                    | -0.23                  | -3.22                 |
| 6,292.00                              | 0.31            | 96.12       | 6,109.46              | -977.46             | -38.35       | 1,182.16     | -37.31                  | 0.15                    | -0.13                  | -12.13                |
| 6,386.00                              | 0.40            | 138.50      | 6,203.46              | -1,071.46           | -38.62       | 1,182.63     | -37.59                  | 0.29                    | 0.10                   | 45.09                 |
| 6,479.00                              | 0.69            | 95.52       | 6,296.46              | -1,164.46           | -38.92       | 1,183.40     | -37.88                  | 0.52                    | 0.31                   | -46.22                |
| 6,572.00                              | 0.56            | 114.65      | 6,389.45              | -1,257.45           | -39.16       | 1,184.37     | -38.13                  | 0.26                    | -0.14                  | 20.57                 |
| 6,759.00                              | 0.42            | 101.14      | 6,576.44              | -1,444.44           | -39.67       | 1,185.87     | -38.64                  | 0.10                    | -0.07                  | -7.22                 |
| 6,853.00                              | 0.44            | 109.02      | 6,670.44              | -1,538.44           | -39.86       | 1,186.55     | -38.82                  | 0.07                    | 0.02                   | 8.38                  |
| 6,946.00                              | 0.57            | 108.34      | 6,763.44              | -1,631.44           | -40.12       | 1,187.33     | -39.08                  | 0.14                    | 0.14                   | -0.73                 |
| 7,039.00                              | 0.72            | 102.02      | 6,856.43              | -1,724.43           | -40.39       | 1,188.34     | -39.35                  | 0.18                    | 0.16                   | -6.80                 |
| 7,133.00                              | 0.60            | 98.65       | 6,950.43              | -1,818.43           | -40.58       | 1,189.40     | -39.54                  | 0.13                    | -0.13                  | -3.59                 |
| 7,226.00                              | 0.34            | 126.96      | 7,043.42              | -1,911.42           | -40.82       | 1,190.11     | -39.78                  | 0.37                    | -0.28                  | 30.44                 |
| <b>KOP</b>                            |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 7,253.00                              | 1.89            | 18.86       | 7,070.42              | -1,938.42           | -40.45       | 1,190.31     | -39.41                  | 7.48                    | 5.73                   | -400.36               |
| 7,320.00                              | 6.88            | 12.16       | 7,137.20              | -2,005.20           | -35.48       | 1,191.52     | -34.44                  | 7.48                    | 7.45                   | -10.00                |
| 7,413.00                              | 18.89           | 6.85        | 7,227.70              | -2,095.70           | -15.01       | 1,194.50     | -13.97                  | 12.96                   | 12.91                  | -5.71                 |
| 7,506.00                              | 24.61           | 7.26        | 7,314.04              | -2,182.04           | 19.17        | 1,198.74     | 20.22                   | 6.15                    | 6.15                   | 0.44                  |
| 7,600.00                              | 28.74           | 6.79        | 7,398.02              | -2,266.02           | 61.05        | 1,203.89     | 62.10                   | 4.40                    | 4.39                   | -0.50                 |
| 7,694.00                              | 35.78           | 359.72      | 7,477.48              | -2,345.48           | 111.05       | 1,206.43     | 112.10                  | 8.49                    | 7.49                   | -7.52                 |
| 7,787.00                              | 39.39           | 359.27      | 7,551.17              | -2,419.17           | 167.76       | 1,205.92     | 168.81                  | 3.89                    | 3.88                   | -0.48                 |
| 7,880.00                              | 54.28           | 359.09      | 7,614.61              | -2,482.61           | 235.40       | 1,204.94     | 236.45                  | 16.01                   | 16.01                  | -0.19                 |
| 7,973.00                              | 59.65           | 359.18      | 7,665.29              | -2,533.29           | 313.32       | 1,203.77     | 314.37                  | 5.77                    | 5.77                   | 0.10                  |
| 8,067.00                              | 63.55           | 357.10      | 7,710.00              | -2,578.00           | 395.94       | 1,201.06     | 396.99                  | 4.58                    | 4.15                   | -2.21                 |
| <b>~ ENTER RADIUS HEEL (8120' MD)</b> |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 8,120.00                              | 65.43           | 357.29      | 7,732.82              | -2,600.82           | 443.72       | 1,198.72     | 444.76                  | 3.56                    | 3.55                   | 0.36                  |
| 8,160.00                              | 66.85           | 357.43      | 7,749.00              | -2,617.00           | 480.26       | 1,197.03     | 481.30                  | 3.56                    | 3.55                   | 0.35                  |
| 8,253.00                              | 70.51           | 359.93      | 7,782.81              | -2,650.81           | 566.85       | 1,195.06     | 567.89                  | 4.66                    | 3.94                   | 2.69                  |
| 8,347.00                              | 76.89           | 359.70      | 7,809.18              | -2,677.18           | 657.02       | 1,194.77     | 658.07                  | 6.79                    | 6.79                   | -0.24                 |
| 8,439.00                              | 81.27           | 359.77      | 7,826.61              | -2,694.61           | 747.34       | 1,194.35     | 748.38                  | 4.76                    | 4.76                   | 0.08                  |
| <b>HEEL:40.073096; -104.932390</b>    |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 8,533.00                              | 86.39           | 0.06        | 7,836.70              | -2,704.70           | 840.76       | 1,194.21     | 841.80                  | 5.46                    | 5.45                   | 0.31                  |
| 8,627.00                              | 90.58           | 359.77      | 7,839.19              | -2,707.19           | 934.71       | 1,194.07     | 935.75                  | 4.47                    | 4.46                   | -0.31                 |
| 8,721.00                              | 91.91           | 359.94      | 7,837.15              | -2,705.15           | 1,028.68     | 1,193.83     | 1,029.72                | 1.43                    | 1.41                   | 0.18                  |
| 8,813.00                              | 89.99           | 0.37        | 7,835.62              | -2,703.62           | 1,120.66     | 1,194.08     | 1,121.70                | 2.14                    | -2.09                  | 0.47                  |
| <b>~ EXIT RADIUS HEEL (8885' MD)</b>  |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 8,885.00                              | 90.56           | 0.32        | 7,835.27              | -2,703.27           | 1,192.66     | 1,194.52     | 1,193.70                | 0.80                    | 0.80                   | -0.06                 |
| 8,906.00                              | 90.73           | 0.31        | 7,835.04              | -2,703.04           | 1,213.66     | 1,194.63     | 1,214.70                | 0.80                    | 0.80                   | -0.06                 |
| 8,999.00                              | 90.17           | 358.58      | 7,834.31              | -2,702.31           | 1,306.65     | 1,193.73     | 1,307.69                | 1.96                    | -0.60                  | -1.86                 |
| 9,094.00                              | 91.10           | 358.45      | 7,833.25              | -2,701.25           | 1,401.61     | 1,191.27     | 1,402.65                | 0.99                    | 0.98                   | -0.14                 |
| 9,188.00                              | 90.96           | 358.95      | 7,831.56              | -2,699.56           | 1,495.57     | 1,189.14     | 1,496.61                | 0.55                    | -0.15                  | 0.53                  |
| 9,282.00                              | 89.60           | 359.51      | 7,831.11              | -2,699.11           | 1,589.56     | 1,187.88     | 1,590.59                | 1.56                    | -1.45                  | 0.60                  |
| 9,376.00                              | 89.48           | 357.02      | 7,831.86              | -2,699.86           | 1,683.50     | 1,185.03     | 1,684.54                | 2.65                    | -0.13                  | -2.65                 |
| 9,470.00                              | 90.42           | 359.40      | 7,831.94              | -2,699.94           | 1,777.45     | 1,182.09     | 1,778.48                | 2.72                    | 1.00                   | 2.53                  |
| 9,563.00                              | 91.01           | 358.97      | 7,830.78              | -2,698.78           | 1,870.43     | 1,180.77     | 1,871.46                | 0.78                    | 0.63                   | -0.46                 |
| 9,658.00                              | 91.41           | 2.41        | 7,828.77              | -2,696.77           | 1,965.39     | 1,181.92     | 1,966.42                | 3.64                    | 0.42                   | 3.62                  |
| 9,751.00                              | 90.17           | 1.74        | 7,827.49              | -2,695.49           | 2,058.32     | 1,185.28     | 2,059.35                | 1.52                    | -1.33                  | -0.72                 |
| 9,844.00                              | 90.73           | 0.50        | 7,826.76              | -2,694.76           | 2,151.30     | 1,187.10     | 2,152.33                | 1.46                    | 0.60                   | -1.33                 |
| 9,938.00                              | 89.49           | 0.77        | 7,826.58              | -2,694.58           | 2,245.29     | 1,188.14     | 2,246.32                | 1.35                    | -1.32                  | 0.29                  |
| 10,032.00                             | 89.87           | 359.65      | 7,827.11              | -2,695.11           | 2,339.28     | 1,188.49     | 2,340.32                | 1.26                    | 0.40                   | -1.19                 |
| 10,125.00                             | 90.53           | 358.74      | 7,826.78              | -2,694.78           | 2,432.27     | 1,187.18     | 2,433.31                | 1.21                    | 0.71                   | -0.98                 |
| 10,218.00                             | 90.57           | 356.26      | 7,825.89              | -2,693.89           | 2,525.17     | 1,183.12     | 2,526.20                | 2.67                    | 0.04                   | -2.67                 |
| 10,311.00                             | 89.95           | 358.04      | 7,825.47              | -2,693.47           | 2,618.05     | 1,178.50     | 2,619.08                | 2.03                    | -0.67                  | 1.91                  |
| 10,405.00                             | 89.67           | 359.55      | 7,825.78              | -2,693.78           | 2,712.03     | 1,176.52     | 2,713.05                | 1.63                    | -0.30                  | 1.61                  |

## Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Company:</b>  | ANADARKO PETROLEUM CORP        | <b>Local Co-ordinate Reference:</b> | Well RANGER 7-20HZ           |
| <b>Project:</b>  | WELD COUNTY (NAD 83)           | <b>TVD Reference:</b>               | KB 20' @ 5132.00usft (PD461) |
| <b>Site:</b>     | NE NE SEC. 7 T1N R67W 6th P.M. | <b>MD Reference:</b>                | KB 20' @ 5132.00usft (PD461) |
| <b>Well:</b>     | RANGER 7-20HZ                  | <b>North Reference:</b>             | True                         |
| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

| Survey                |                 |             |                       |                     |              |              |                         |                         |                        |                       |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 10,500.00             | 88.40           | 1.85        | 7,827.38              | -2,695.38           | 2,807.00     | 1,177.68     | 2,808.03                | 2.77                    | -1.34                  | 2.42                  |
| 10,593.00             | 89.64           | 2.14        | 7,828.97              | -2,696.97           | 2,899.93     | 1,180.92     | 2,900.96                | 1.37                    | 1.33                   | 0.31                  |
| 10,688.00             | 90.65           | 1.85        | 7,828.73              | -2,696.73           | 2,994.87     | 1,184.23     | 2,995.90                | 1.11                    | 1.06                   | -0.31                 |
| 10,781.00             | 89.56           | 2.85        | 7,828.56              | -2,696.56           | 3,087.79     | 1,188.04     | 3,088.82                | 1.59                    | -1.17                  | 1.08                  |
| 10,874.00             | 88.75           | 2.55        | 7,829.93              | -2,697.93           | 3,180.67     | 1,192.42     | 3,181.71                | 0.93                    | -0.87                  | -0.32                 |
| 10,968.00             | 89.75           | 1.64        | 7,831.16              | -2,699.16           | 3,274.60     | 1,195.86     | 3,275.64                | 1.44                    | 1.06                   | -0.97                 |
| 11,063.00             | 91.22           | 1.87        | 7,830.36              | -2,698.36           | 3,369.55     | 1,198.77     | 3,370.59                | 1.57                    | 1.55                   | 0.24                  |
| 11,156.00             | 88.99           | 0.82        | 7,830.19              | -2,698.19           | 3,462.52     | 1,200.95     | 3,463.56                | 2.65                    | -2.40                  | -1.13                 |
| 11,249.00             | 88.64           | 0.30        | 7,832.11              | -2,700.11           | 3,555.49     | 1,201.86     | 3,556.54                | 0.67                    | -0.38                  | -0.56                 |
| 11,343.00             | 89.76           | 0.26        | 7,833.42              | -2,701.42           | 3,649.48     | 1,202.32     | 3,650.53                | 1.19                    | 1.19                   | -0.04                 |
| 11,437.00             | 91.46           | 2.59        | 7,832.42              | -2,700.42           | 3,743.44     | 1,204.65     | 3,744.49                | 3.07                    | 1.81                   | 2.48                  |
| 11,531.00             | 90.02           | 0.97        | 7,831.21              | -2,699.21           | 3,837.38     | 1,207.57     | 3,838.43                | 2.31                    | -1.53                  | -1.72                 |
| 11,625.00             | 89.20           | 0.13        | 7,831.85              | -2,699.85           | 3,931.37     | 1,208.48     | 3,932.42                | 1.25                    | -0.87                  | -0.89                 |
| 11,720.00             | 90.29           | 1.08        | 7,832.27              | -2,700.27           | 4,026.36     | 1,209.48     | 4,027.41                | 1.52                    | 1.15                   | 1.00                  |
| 11,814.00             | 90.83           | 359.23      | 7,831.35              | -2,699.35           | 4,120.35     | 1,209.73     | 4,121.40                | 2.05                    | 0.57                   | -1.97                 |
| 11,907.00             | 90.71           | 357.20      | 7,830.10              | -2,698.10           | 4,213.29     | 1,206.84     | 4,214.34                | 2.19                    | -0.13                  | -2.18                 |
| 12,002.00             | 89.25           | 358.81      | 7,830.13              | -2,698.13           | 4,308.23     | 1,203.53     | 4,309.28                | 2.29                    | -1.54                  | 1.69                  |
| 12,097.00             | 90.38           | 359.10      | 7,830.44              | -2,698.44           | 4,403.21     | 1,201.80     | 4,404.26                | 1.23                    | 1.19                   | 0.31                  |
| 12,191.00             | 90.67           | 0.40        | 7,829.58              | -2,697.58           | 4,497.20     | 1,201.39     | 4,498.25                | 1.42                    | 0.31                   | 1.38                  |
| 12,285.00             | 89.97           | 1.31        | 7,829.05              | -2,697.05           | 4,591.19     | 1,202.79     | 4,592.24                | 1.22                    | -0.74                  | 0.97                  |
| 12,378.00             | 90.83           | 0.70        | 7,828.41              | -2,696.41           | 4,684.17     | 1,204.42     | 4,685.22                | 1.13                    | 0.92                   | -0.66                 |
| 12,472.00             | 90.74           | 2.23        | 7,827.12              | -2,695.12           | 4,778.13     | 1,206.82     | 4,779.18                | 1.63                    | -0.10                  | 1.63                  |
| 12,565.00             | 90.52           | 359.88      | 7,826.09              | -2,694.09           | 4,871.10     | 1,208.54     | 4,872.16                | 2.54                    | -0.24                  | -2.53                 |
| 12,659.00             | 91.55           | 0.14        | 7,824.40              | -2,692.40           | 4,965.09     | 1,208.55     | 4,966.14                | 1.13                    | 1.10                   | 0.28                  |
| 12,753.00             | 89.63           | 359.73      | 7,823.43              | -2,691.43           | 5,059.08     | 1,208.45     | 5,060.13                | 2.09                    | -2.04                  | -0.44                 |
| 12,847.00             | 90.80           | 0.08        | 7,823.08              | -2,691.08           | 5,153.07     | 1,208.29     | 5,154.13                | 1.30                    | 1.24                   | 0.37                  |
| 12,941.00             | 90.05           | 359.96      | 7,822.38              | -2,690.38           | 5,247.07     | 1,208.32     | 5,248.12                | 0.81                    | -0.80                  | -0.13                 |
| 13,035.00             | 90.62           | 357.94      | 7,821.83              | -2,689.83           | 5,341.05     | 1,206.60     | 5,342.10                | 2.23                    | 0.61                   | -2.15                 |
| 13,128.00             | 89.94           | 355.89      | 7,821.37              | -2,689.37           | 5,433.91     | 1,201.60     | 5,434.95                | 2.32                    | -0.73                  | -2.20                 |
| 13,222.00             | 88.36           | 356.72      | 7,822.77              | -2,690.77           | 5,527.70     | 1,195.54     | 5,528.74                | 1.90                    | -1.68                  | 0.88                  |
| 13,316.00             | 89.74           | 0.10        | 7,824.33              | -2,692.33           | 5,621.63     | 1,192.93     | 5,622.67                | 3.88                    | 1.47                   | 3.60                  |
| 13,410.00             | 88.82           | 359.05      | 7,825.51              | -2,693.51           | 5,715.62     | 1,192.23     | 5,716.66                | 1.49                    | -0.98                  | -1.12                 |
| 13,504.00             | 89.62           | 359.85      | 7,826.79              | -2,694.79           | 5,809.60     | 1,191.33     | 5,810.64                | 1.20                    | 0.85                   | 0.85                  |
| 13,598.00             | 90.13           | 359.00      | 7,826.99              | -2,694.99           | 5,903.60     | 1,190.39     | 5,904.64                | 1.05                    | 0.54                   | -0.90                 |
| 13,692.00             | 90.72           | 358.42      | 7,826.30              | -2,694.30           | 5,997.57     | 1,188.27     | 5,998.61                | 0.88                    | 0.63                   | -0.62                 |
| 13,784.00             | 88.25           | 357.50      | 7,827.12              | -2,695.12           | 6,089.50     | 1,185.00     | 6,090.53                | 2.86                    | -2.68                  | -1.00                 |
| 13,879.00             | 88.76           | 359.64      | 7,829.60              | -2,697.60           | 6,184.43     | 1,182.63     | 6,185.46                | 2.31                    | 0.54                   | 2.25                  |
| 13,972.00             | 89.93           | 359.30      | 7,830.67              | -2,698.67           | 6,277.42     | 1,181.77     | 6,278.45                | 1.31                    | 1.26                   | -0.37                 |
| 14,065.00             | 90.73           | 358.44      | 7,830.13              | -2,698.13           | 6,370.40     | 1,179.93     | 6,371.43                | 1.26                    | 0.86                   | -0.92                 |
| 14,159.00             | 89.24           | 359.70      | 7,830.15              | -2,698.15           | 6,464.38     | 1,178.41     | 6,465.41                | 2.08                    | -1.59                  | 1.34                  |
| 14,251.00             | 90.28           | 0.41        | 7,830.54              | -2,698.54           | 6,556.38     | 1,178.50     | 6,557.41                | 1.37                    | 1.13                   | 0.77                  |
| 14,344.00             | 91.07           | 0.27        | 7,829.44              | -2,697.44           | 6,649.37     | 1,179.05     | 6,650.40                | 0.86                    | 0.85                   | -0.15                 |
| 14,436.00             | 89.24           | 358.96      | 7,829.20              | -2,697.20           | 6,741.36     | 1,178.43     | 6,742.39                | 2.45                    | -1.99                  | -1.42                 |
| 14,532.00             | 90.19           | 3.29        | 7,829.67              | -2,697.67           | 6,837.32     | 1,180.32     | 6,838.35                | 4.62                    | 0.99                   | 4.51                  |
| 14,626.00             | 90.46           | 2.75        | 7,829.14              | -2,697.14           | 6,931.19     | 1,185.27     | 6,932.22                | 0.64                    | 0.29                   | -0.57                 |
| 14,718.00             | 90.30           | 1.01        | 7,828.53              | -2,696.53           | 7,023.13     | 1,188.29     | 7,024.17                | 1.90                    | -0.17                  | -1.89                 |
| 14,811.00             | 91.95           | 0.47        | 7,826.70              | -2,694.70           | 7,116.10     | 1,189.49     | 7,117.14                | 1.87                    | 1.77                   | -0.58                 |
| 14,907.00             | 89.81           | 0.87        | 7,825.23              | -2,693.23           | 7,212.08     | 1,190.61     | 7,213.12                | 2.27                    | -2.23                  | 0.42                  |
| 15,000.00             | 89.47           | 0.68        | 7,825.81              | -2,693.81           | 7,305.07     | 1,191.87     | 7,306.11                | 0.42                    | -0.37                  | -0.20                 |
| 15,093.00             | 88.17           | 359.78      | 7,827.73              | -2,695.73           | 7,398.05     | 1,192.24     | 7,399.08                | 1.70                    | -1.40                  | -0.97                 |
| 15,186.00             | 87.74           | 358.63      | 7,831.05              | -2,699.05           | 7,490.98     | 1,190.95     | 7,492.01                | 1.32                    | -0.46                  | -1.24                 |
| 15,280.00             | 89.97           | 359.96      | 7,832.93              | -2,700.93           | 7,584.94     | 1,189.79     | 7,585.98                | 2.76                    | 2.37                   | 1.41                  |
| 15,374.00             | 91.04           | 359.94      | 7,832.10              | -2,700.10           | 7,678.94     | 1,189.71     | 7,679.97                | 1.14                    | 1.14                   | -0.02                 |

## Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Company:</b>  | ANADARKO PETROLEUM CORP        | <b>Local Co-ordinate Reference:</b> | Well RANGER 7-20HZ           |
| <b>Project:</b>  | WELD COUNTY (NAD 83)           | <b>TVD Reference:</b>               | KB 20' @ 5132.00usft (PD461) |
| <b>Site:</b>     | NE NE SEC. 7 T1N R67W 6th P.M. | <b>MD Reference:</b>                | KB 20' @ 5132.00usft (PD461) |
| <b>Well:</b>     | RANGER 7-20HZ                  | <b>North Reference:</b>             | True                         |
| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

| Survey                                  |                 |             |                       |                     |              |              |                         |                         |                        |                       |
|---|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)                   | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 15,469.00                               | 91.65           | 359.10      | 7,829.87              | -2,697.87           | 7,773.91     | 1,188.92     | 7,774.94                | 1.09                    | 0.64                   | -0.88                 |
| 15,563.00                               | 89.91           | 359.55      | 7,828.59              | -2,696.59           | 7,867.89     | 1,187.81     | 7,868.92                | 1.91                    | -1.85                  | 0.48                  |
| 15,657.00                               | 90.41           | 359.04      | 7,828.33              | -2,696.33           | 7,961.88     | 1,186.65     | 7,962.91                | 0.76                    | 0.53                   | -0.54                 |
| 15,750.00                               | 89.32           | 0.38        | 7,828.54              | -2,696.54           | 8,054.87     | 1,186.18     | 8,055.91                | 1.86                    | -1.17                  | 1.44                  |
| 15,843.00                               | 90.00           | 0.16        | 7,829.10              | -2,697.10           | 8,147.87     | 1,186.62     | 8,148.90                | 0.77                    | 0.73                   | -0.24                 |
| 15,939.00                               | 90.11           | 1.26        | 7,829.00              | -2,697.00           | 8,243.86     | 1,187.81     | 8,244.89                | 1.15                    | 0.11                   | 1.15                  |
| 16,033.00                               | 91.65           | 1.16        | 7,827.56              | -2,695.56           | 8,337.83     | 1,189.80     | 8,338.86                | 1.64                    | 1.64                   | -0.11                 |
| 16,127.00                               | 88.87           | 0.70        | 7,827.13              | -2,695.13           | 8,431.80     | 1,191.32     | 8,432.84                | 3.00                    | -2.96                  | -0.49                 |
| 16,220.00                               | 90.12           | 0.09        | 7,827.95              | -2,695.95           | 8,524.80     | 1,191.96     | 8,525.83                | 1.50                    | 1.34                   | -0.66                 |
| 16,314.00                               | 90.63           | 359.36      | 7,827.34              | -2,695.34           | 8,618.79     | 1,191.51     | 8,619.83                | 0.95                    | 0.54                   | -0.78                 |
| 16,407.00                               | 91.78           | 359.25      | 7,825.38              | -2,693.38           | 8,711.76     | 1,190.38     | 8,712.80                | 1.24                    | 1.24                   | -0.12                 |
| 16,502.00                               | 90.33           | 358.94      | 7,823.63              | -2,691.63           | 8,806.73     | 1,188.88     | 8,807.77                | 1.56                    | -1.53                  | -0.33                 |
| 16,596.00                               | 92.07           | 358.92      | 7,821.67              | -2,689.67           | 8,900.69     | 1,187.13     | 8,901.72                | 1.85                    | 1.85                   | -0.02                 |
| 16,690.00                               | 89.66           | 359.60      | 7,820.25              | -2,688.25           | 8,994.67     | 1,185.91     | 8,995.70                | 2.66                    | -2.56                  | 0.72                  |
| 16,785.00                               | 90.08           | 1.75        | 7,820.46              | -2,688.46           | 9,089.65     | 1,187.03     | 9,090.69                | 2.31                    | 0.44                   | 2.26                  |
| 16,878.00                               | 88.79           | 2.33        | 7,821.38              | -2,689.38           | 9,182.59     | 1,190.34     | 9,183.62                | 1.52                    | -1.39                  | 0.62                  |
| 16,973.00                               | 90.35           | 2.25        | 7,822.09              | -2,690.09           | 9,277.51     | 1,194.14     | 9,278.54                | 1.64                    | 1.64                   | -0.08                 |
| 17,066.00                               | 88.67           | 1.96        | 7,822.89              | -2,690.89           | 9,370.44     | 1,197.55     | 9,371.48                | 1.83                    | -1.81                  | -0.31                 |
| 17,159.00                               | 89.61           | 1.71        | 7,824.28              | -2,692.28           | 9,463.38     | 1,200.53     | 9,464.42                | 1.05                    | 1.01                   | -0.27                 |
| 17,252.00                               | 88.20           | 0.80        | 7,826.06              | -2,694.06           | 9,556.33     | 1,202.57     | 9,557.38                | 1.80                    | -1.52                  | -0.98                 |
| 17,345.00                               | 89.26           | 0.48        | 7,828.12              | -2,696.12           | 9,649.30     | 1,203.61     | 9,650.35                | 1.19                    | 1.14                   | -0.34                 |
| 17,439.00                               | 89.61           | 359.36      | 7,829.05              | -2,697.05           | 9,743.30     | 1,203.48     | 9,744.34                | 1.25                    | 0.37                   | -1.19                 |
| 17,532.00                               | 91.08           | 358.06      | 7,828.49              | -2,696.49           | 9,836.27     | 1,201.38     | 9,837.31                | 2.11                    | 1.58                   | -1.40                 |
| 17,626.00                               | 90.45           | 0.45        | 7,827.23              | -2,695.23           | 9,930.24     | 1,200.16     | 9,931.29                | 2.63                    | -0.67                  | 2.54                  |
| 17,720.00                               | 90.24           | 0.51        | 7,826.67              | -2,694.67           | 10,024.24    | 1,200.95     | 10,025.28               | 0.23                    | -0.22                  | 0.06                  |
| 17,814.00                               | 88.74           | 2.58        | 7,827.50              | -2,695.50           | 10,118.19    | 1,203.48     | 10,119.24               | 2.72                    | -1.60                  | 2.20                  |
| 17,908.00                               | 88.69           | 0.97        | 7,829.61              | -2,697.61           | 10,212.12    | 1,206.39     | 10,213.17               | 1.71                    | -0.05                  | -1.71                 |
| 18,002.00                               | 90.57           | 1.85        | 7,830.22              | -2,698.22           | 10,306.09    | 1,208.71     | 10,307.14               | 2.21                    | 2.00                   | 0.94                  |
| 18,098.00                               | 88.97           | 2.01        | 7,830.60              | -2,698.60           | 10,402.03    | 1,211.94     | 10,403.08               | 1.67                    | -1.67                  | 0.17                  |
| 18,191.00                               | 87.72           | 2.56        | 7,833.29              | -2,701.29           | 10,494.91    | 1,215.65     | 10,495.97               | 1.47                    | -1.34                  | 0.59                  |
| 18,285.00                               | 87.56           | 0.63        | 7,837.16              | -2,705.16           | 10,588.79    | 1,218.26     | 10,589.85               | 2.06                    | -0.17                  | -2.05                 |
| 18,380.00                               | 88.13           | 359.61      | 7,840.73              | -2,708.73           | 10,683.72    | 1,218.46     | 10,684.78               | 1.23                    | 0.60                   | -1.07                 |
| 18,473.00                               | 89.07           | 359.50      | 7,843.01              | -2,711.01           | 10,776.69    | 1,217.74     | 10,777.75               | 1.02                    | 1.01                   | -0.12                 |
| 18,565.00                               | 89.63           | 0.06        | 7,844.05              | -2,712.05           | 10,868.68    | 1,217.38     | 10,869.74               | 0.86                    | 0.61                   | 0.61                  |
| 18,657.00                               | 91.35           | 0.08        | 7,843.26              | -2,711.26           | 10,960.68    | 1,217.50     | 10,961.74               | 1.87                    | 1.87                   | 0.02                  |
| 18,752.00                               | 90.10           | 359.30      | 7,842.06              | -2,710.06           | 11,055.67    | 1,216.98     | 11,056.72               | 1.55                    | -1.32                  | -0.82                 |
| ~ ENTER RADIUS TOE (18766' MD)          |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 18,766.00                               | 90.28           | 359.45      | 7,842.01              | -2,710.01           | 11,069.66    | 1,216.83     | 11,070.72               | 1.68                    | 1.31                   | 1.05                  |
| 18,846.00                               | 91.33           | 0.29        | 7,840.89              | -2,708.89           | 11,149.65    | 1,216.64     | 11,150.71               | 1.68                    | 1.31                   | 1.05                  |
| 18,941.00                               | 89.67           | 359.53      | 7,840.06              | -2,708.06           | 11,244.65    | 1,216.50     | 11,245.70               | 1.92                    | -1.75                  | -0.80                 |
| LAST SURVEY JUNE 12, 2019               |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 19,026.00                               | 89.79           | 359.11      | 7,840.46              | -2,708.46           | 11,329.64    | 1,215.49     | 11,330.70               | 0.51                    | 0.14                   | -0.49                 |
| PROJECTION TO TD:40.102048; -104.932315 |                 |             |                       |                     |              |              |                         |                         |                        |                       |
| 19,084.00                               | 89.79           | 359.11      | 7,840.67              | -2,708.67           | 11,387.63    | 1,214.59     | 11,388.69               | 0.00                    | 0.00                   | 0.00                  |

# Survey Report



|                  |                                |                                     |                              |
|------------------|--------------------------------|-------------------------------------|------------------------------|
| <b>Company:</b>  | ANADARKO PETROLEUM CORP        | <b>Local Co-ordinate Reference:</b> | Well RANGER 7-20HZ           |
| <b>Project:</b>  | WELD COUNTY (NAD 83)           | <b>TVD Reference:</b>               | KB 20' @ 5132.00usft (PD461) |
| <b>Site:</b>     | NE NE SEC. 7 T1N R67W 6th P.M. | <b>MD Reference:</b>                | KB 20' @ 5132.00usft (PD461) |
| <b>Well:</b>     | RANGER 7-20HZ                  | <b>North Reference:</b>             | True                         |
| <b>Wellbore:</b> | JOB # 2019-199-461             | <b>Survey Calculation Method:</b>   | Minimum Curvature            |
| <b>Design:</b>   | FINAL SURVEYS                  | <b>Database:</b>                    | Database 1                   |

| Targets  |                  |                 |               |                 |                 |                    |                   |           |             |
|--|------------------|-----------------|---------------|-----------------|-----------------|--------------------|-------------------|-----------|-------------|
| Target Name<br>- hit/miss target<br>- Shape  | Dip Angle<br>(°) | Dip Dir.<br>(°) | TVD<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Northing<br>(usft) | Easting<br>(usft) | Latitude  | Longitude   |
| KOP - RANGER 7-20HZ<br>- survey misses target center by 29.53usft at 7291.64usft MD (7108.98 TVD, -38.29 N, 1190.89 E)<br>- Point    | 0.00             | 0.00            | 7,106.81      | -8.85           | 1,189.87        | 14,552,508.73      | 1,659,327.17      | 40.070764 | -104.932405 |
| INT TGT - RANGER 7-2<br>- survey misses target center by 33.85usft at 15693.95usft MD (7828.20 TVD, 7998.83 N, 1186.21 E)<br>- Point | 0.00             | 0.00            | 7,796.00      | 7,998.96        | 1,196.65        | 14,560,513.34      | 1,659,328.26      | 40.092746 | -104.932379 |
| HEEL - RANGER 7-20H<br>- survey misses target center by 13.15usft at 8403.53usft MD (7820.71 TVD, 712.36 N, 1194.50 E)<br>- Point    | 0.00             | 0.00            | 7,833.00      | 709.97          | 1,190.50        | 14,553,227.26      | 1,659,327.29      | 40.072737 | -104.932403 |
| BHL - RANGER 7-20HZ<br>- survey misses target center by 47.19usft at 19084.00usft MD (7840.67 TVD, 11387.63 N, 1214.59 E)<br>- Point | 0.00             | 0.00            | 7,796.00      | 11,389.44       | 1,199.50        | 14,563,902.47      | 1,659,328.69      | 40.102053 | -104.932369 |
| KOP - RANGER 7-20HZ<br>- survey misses target center by 28.16usft at 7289.54usft MD (7106.89 TVD, -38.45 N, 1190.85 E)<br>- Point    | 0.00             | 0.00            | 7,104.82      | -10.38          | 1,189.89        | 14,552,507.20      | 1,659,327.20      | 40.070759 | -104.932405 |
| HEEL - RANGER 7-20H<br>- survey misses target center by 4.83usft at 8401.64usft MD (7820.36 TVD, 710.50 N, 1194.51 E)<br>- Point     | 0.00             | 0.00            | 7,823.00      | 709.97          | 1,190.50        | 14,553,227.26      | 1,659,327.29      | 40.072737 | -104.932403 |
| BHL - RANGER 7-20HZ<br>- survey misses target center by 71.31usft at 19084.00usft MD (7840.67 TVD, 11387.63 N, 1214.59 E)<br>- Point | 0.00             | 0.00            | 7,771.00      | 11,389.44       | 1,199.50        | 14,563,902.47      | 1,659,328.69      | 40.102053 | -104.932369 |

| Survey Annotations          |                             |                   |                 |   |
|-----------------------------|-----------------------------|-------------------|-----------------|---|
| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                                 |
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |   |
| 1,842.00                    | 1,799.33                    | 1.01              | 322.90          | TIE ON TO SURFACE SURVEYS               |
| 2,296.00                    | 2,225.58                    | -1.89             | 479.00          | ~ ENTER TGT BOX (2296' MD)              |
| 7,253.00                    | 7,070.42                    | -40.45            | 1,190.31        | KOP                                     |
| 8,120.00                    | 7,732.82                    | 443.72            | 1,198.72        | ~ ENTER RADIUS HEEL (8120' MD)          |
| 8,533.00                    | 7,836.70                    | 840.76            | 1,194.21        | HEEL:40.073096; -104.932390             |
| 8,885.00                    | 7,835.27                    | 1,192.66          | 1,194.52        | ~ EXIT RADIUS HEEL (8885' MD)           |
| 18,766.00                   | 7,842.01                    | 11,069.66         | 1,216.83        | ~ ENTER RADIUS TOE (18766' MD)          |
| 19,026.00                   | 7,840.46                    | 11,329.64         | 1,215.49        | LAST SURVEY JUNE 12, 2019               |
| 19,084.00                   | 7,840.67                    | 11,387.63         | 1,214.59        | PROJECTION TO TD:40.102048; -104.932315 |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|