

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_UNDERHILL 16-17HZ PAD**

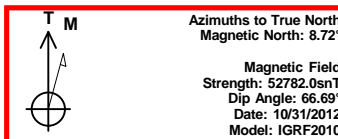
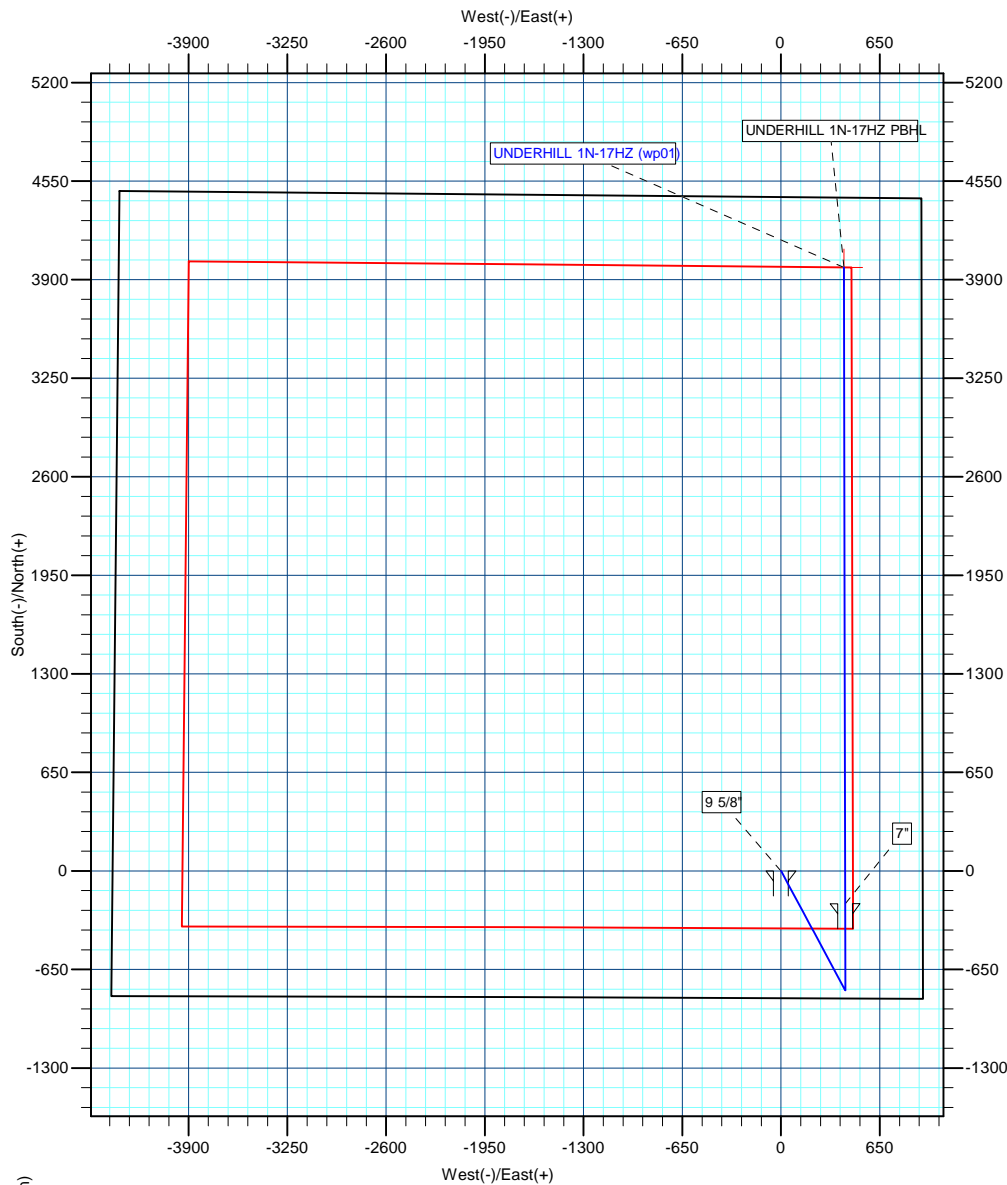
**UNDERHILL 1N-17HZ**

**UNDERHILL 1N-17HZ**

**Plan: UNDERHILL 1N-17HZ (wp01)**

## **Standard Planning Report**

**05 November, 2012**



Project: COLORADO NORTHERN ZONE - 83  
Site: WELD UNDERHILL 16-17HZ PAD  
Well: UNDERHILL 1N-17HZ  
Wellbore: UNDERHILL 1N-17HZ  
Section: Sec. 17 T1N R67W  
SHL: 839' FSL 933' FEL  
Design: UNDERHILL 1N-17HZ (wp01)  
Latitude: 40.046087  
Longitude: -104.908391  
GL: 5103.00  
KB: 17' RKB + 5103' GL @ 5120.00ft

WELL DETAILS: UNDERHILL 1N-17HZ

| +N/-S | +E/-W | Northing   | Ground Level:<br>Easting | 5103.00<br>Latitude | Longitude   | Slot |
|-------|-------|------------|--------------------------|---------------------|-------------|------|
| 0.00  | 0.00  | 1260187.66 | 3165628.15               | 40.046087           | -104.908391 |      |

SECTION DETAILS

| MD      | Inc   | Azi    | TVD     | +N/-S   | +E/-W  | Dleg  | TFace  | VSect   |
|---------|-------|--------|---------|---------|--------|-------|--------|---------|
| 0.00    | 0.00  | 0.00   | 0.00    | 0.00    | 0.00   | 0.00  | 0.00   | 0.00    |
| 1050.00 | 0.00  | 0.00   | 1050.00 | 0.00    | 0.00   | 0.00  | 0.00   | 0.00    |
| 1659.81 | 12.20 | 151.77 | 1655.22 | -56.97  | 30.58  | 2.00  | 151.77 | -53.50  |
| 5281.11 | 12.20 | 151.77 | 5194.78 | -731.03 | 392.42 | 0.00  | 0.00   | -686.49 |
| 5890.92 | 0.00  | 0.00   | 5800.00 | -788.00 | 423.00 | 2.00  | 180.00 | -739.99 |
| 7050.97 | 0.00  | 0.00   | 6960.05 | -788.00 | 423.00 | 0.00  | 0.00   | -739.99 |
| 7948.58 | 89.76 | 359.90 | 7533.00 | -217.44 | 422.00 | 10.00 | 359.90 | -172.60 |
| 2147.25 | 89.78 | 359.89 | 7550.00 | 3981.19 | 414.28 | 0.00  | -33.72 | 4002.69 |

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

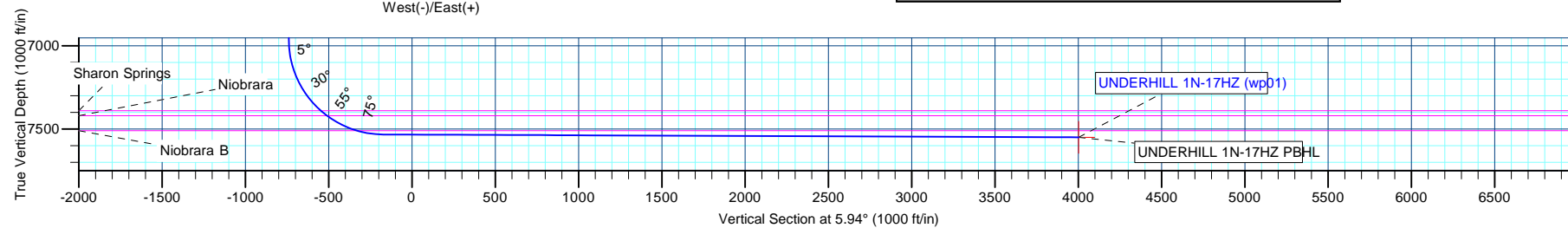
| Name                   | TVD     | +N/-S   | +E/-W  | Latitude  | Longitude   | Shape |
|------------------------|---------|---------|--------|-----------|-------------|-------|
| UNDERHILL 1N-17HZ PBHL | 7550.00 | 3981.19 | 414.28 | 40.057016 | -104.906911 | Point |

FORMATION TOP DETAILS

| TVDPath | MDPath  | Formation      |
|---------|---------|----------------|
| 4645.00 | 4718.63 | Sussex         |
| 5254.00 | 5341.56 | Shannon        |
| 7390.00 | 7537.23 | Sharon Springs |
| 7420.00 | 7584.92 | Niobrara       |
| 7510.00 | 7788.05 | Niobrara B     |

CASING DETAILS

| TVD     | MD      | Name   | Size  |
|---------|---------|--------|-------|
| 917.00  | 917.00  | 9 5/8" | 9-5/8 |
| 7533.00 | 7948.58 | 7"     | 7     |



# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well UNDERHILL 1N-17HZ         |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Site:</b>     | WELD_UNDERHILL 16-17HZ PAD  | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | UNDERHILL 1N-17HZ           | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | UNDERHILL 1N-17HZ           |                                     |                                |
| <b>Design:</b>   | UNDERHILL 1N-17HZ (wp01)    |                                     |                                |

|                    |                             |                      |                |
|--------------------|-----------------------------|----------------------|----------------|
| <b>Project</b>     | COLORADO NORTHERN ZONE - 83 |                      |                |
| <b>Map System:</b> | US State Plane 1983         | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983   |                      |                |
| <b>Map Zone:</b>   | Colorado Northern Zone      |                      |                |

|                              |  |                     |                   |                                 |
|------------------------------|--|---------------------|-------------------|---------------------------------|
| <b>Site</b>                  | WELD_UNDERHILL 16-17HZ PAD, Sec. 17 T1N R67W |                     |                   |                                 |
| <b>Site Position:</b>        |  | <b>Northing:</b>    | 1,260,179.32 usft | <b>Latitude:</b> 40.046063      |
| <b>From:</b>                 | Lat/Long                                     | <b>Easting:</b>     | 3,165,687.56 usft | <b>Longitude:</b> -104.908179   |
| <b>Position Uncertainty:</b> | 0.00 ft                                      | <b>Slot Radius:</b> | 13-3/16 "         | <b>Grid Convergence:</b> 0.38 ° |

|                             |                   |           |                            |                                  |
|-----------------------------|-------------------|-----------|----------------------------|----------------------------------|
| <b>Well</b>                 | UNDERHILL 1N-17HZ |           |                            |                                  |
| <b>Well Position</b>        | <b>+N/-S</b>      | 8.73 ft   | <b>Northing:</b>           | 1,260,187.66 usft                |
|                             | <b>+E/-W</b>      | -59.35 ft | <b>Easting:</b>            | 3,165,628.15 usft                |
| <b>Position Uncertainty</b> |                   | 0.00 ft   | <b>Wellhead Elevation:</b> | <b>Latitude:</b> 40.046087       |
|                             |                   |           |                            | <b>Longitude:</b> -104.908391    |
|                             |                   |           |                            | <b>Ground Level:</b> 5,103.00 ft |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | UNDERHILL 1N-17HZ |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 10/31/2012         | 8.72                   | 66.69                | 52,782                     |

|                          |                              |                   |                      |                      |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| <b>Design</b>            | UNDERHILL 1N-17HZ (wp01)     |                   |                      |                      |
| <b>Audit Notes:</b>      |                              |                   |                      |                      |
| <b>Version:</b>          | <b>Phase:</b>                | PLAN              | <b>Tie On Depth:</b> | 0.00                 |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (ft)</b> | <b>+N/-S (ft)</b> | <b>+E/-W (ft)</b>    | <b>Direction (°)</b> |
|                          | 0.00                         | 0.00              | 0.00                 | 5.94                 |

| <b>Plan Sections</b> |                 |             |                     |            |            |                         |                        |                       |         |                  |
|----------------------|-----------------|-------------|---------------------|------------|------------|-------------------------|------------------------|-----------------------|---------|------------------|
| Measured Depth (ft)  | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target           |
| 0.00                 | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 1,050.00             | 0.00            | 0.00        | 1,050.00            | 0.00       | 0.00       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 1,659.81             | 12.20           | 151.77      | 1,655.22            | -56.97     | 30.58      | 2.00                    | 2.00                   | 0.00                  | 151.77  |                  |
| 5,281.11             | 12.20           | 151.77      | 5,194.78            | -731.03    | 392.42     | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 5,890.92             | 0.00            | 0.00        | 5,800.00            | -788.00    | 423.00     | 2.00                    | -2.00                  | 0.00                  | 180.00  |                  |
| 7,050.97             | 0.00            | 0.00        | 6,960.05            | -788.00    | 423.00     | 0.00                    | 0.00                   | 0.00                  | 0.00    |                  |
| 7,948.58             | 89.76           | 359.90      | 7,533.00            | -217.44    | 422.00     | 10.00                   | 10.00                  | 0.00                  | 359.90  |                  |
| 12,147.25            | 89.78           | 359.89      | 7,550.00            | 3,981.19   | 414.28     | 0.00                    | 0.00                   | 0.00                  | -33.72  | UNDERHILL 1N-17H |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well UNDERHILL 1N-17HZ         |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Site:</b>     | WELD_UNDERHILL 16-17HZ PAD  | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | UNDERHILL 1N-17HZ           | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | UNDERHILL 1N-17HZ           |                                     |                                |
| <b>Design:</b>   | UNDERHILL 1N-17HZ (wp01)    |                                     |                                |

| Planned Survey                   |                 |             |                     |            |            |                       |                         |                        |                       |
|----------------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft)              | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 0.00                             | 0.00            | 0.00        | 0.00                | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 100.00                           | 0.00            | 0.00        | 100.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 200.00                           | 0.00            | 0.00        | 200.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 300.00                           | 0.00            | 0.00        | 300.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 400.00                           | 0.00            | 0.00        | 400.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 500.00                           | 0.00            | 0.00        | 500.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 600.00                           | 0.00            | 0.00        | 600.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 700.00                           | 0.00            | 0.00        | 700.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 800.00                           | 0.00            | 0.00        | 800.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 900.00                           | 0.00            | 0.00        | 900.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 917.00                           | 0.00            | 0.00        | 917.00              | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 9 5/8"                           |                 |             |                     |            |            |                       |                         |                        |                       |
| 1,000.00                         | 0.00            | 0.00        | 1,000.00            | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| 1,050.00                         | 0.00            | 0.00        | 1,050.00            | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| Start Build 2.00                 |                 |             |                     |            |            |                       |                         |                        |                       |
| 1,100.00                         | 1.00            | 151.77      | 1,100.00            | -0.38      | 0.21       | -0.36                 | 2.00                    | 2.00                   | 0.00                  |
| 1,200.00                         | 3.00            | 151.77      | 1,199.93            | -3.46      | 1.86       | -3.25                 | 2.00                    | 2.00                   | 0.00                  |
| 1,300.00                         | 5.00            | 151.77      | 1,299.68            | -9.60      | 5.16       | -9.02                 | 2.00                    | 2.00                   | 0.00                  |
| 1,400.00                         | 7.00            | 151.77      | 1,399.13            | -18.81     | 10.10      | -17.67                | 2.00                    | 2.00                   | 0.00                  |
| 1,500.00                         | 9.00            | 151.77      | 1,498.15            | -31.08     | 16.68      | -29.18                | 2.00                    | 2.00                   | 0.00                  |
| 1,600.00                         | 11.00           | 151.77      | 1,596.63            | -46.37     | 24.89      | -43.55                | 2.00                    | 2.00                   | 0.00                  |
| 1,659.81                         | 12.20           | 151.77      | 1,655.22            | -56.97     | 30.58      | -53.50                | 2.00                    | 2.00                   | 0.00                  |
| Start 3621.30 hold at 1659.81 MD |                 |             |                     |            |            |                       |                         |                        |                       |
| 1,700.00                         | 12.20           | 151.77      | 1,694.50            | -64.45     | 34.60      | -60.52                | 0.00                    | 0.00                   | 0.00                  |
| 1,800.00                         | 12.20           | 151.77      | 1,792.24            | -83.06     | 44.59      | -78.00                | 0.00                    | 0.00                   | 0.00                  |
| 1,900.00                         | 12.20           | 151.77      | 1,889.98            | -101.68    | 54.58      | -95.48                | 0.00                    | 0.00                   | 0.00                  |
| 2,000.00                         | 12.20           | 151.77      | 1,987.73            | -120.29    | 64.57      | -112.96               | 0.00                    | 0.00                   | 0.00                  |
| 2,100.00                         | 12.20           | 151.77      | 2,085.47            | -138.91    | 74.56      | -130.44               | 0.00                    | 0.00                   | 0.00                  |
| 2,200.00                         | 12.20           | 151.77      | 2,183.21            | -157.52    | 84.56      | -147.92               | 0.00                    | 0.00                   | 0.00                  |
| 2,300.00                         | 12.20           | 151.77      | 2,280.96            | -176.13    | 94.55      | -165.40               | 0.00                    | 0.00                   | 0.00                  |
| 2,400.00                         | 12.20           | 151.77      | 2,378.70            | -194.75    | 104.54     | -182.88               | 0.00                    | 0.00                   | 0.00                  |
| 2,500.00                         | 12.20           | 151.77      | 2,476.44            | -213.36    | 114.53     | -200.36               | 0.00                    | 0.00                   | 0.00                  |
| 2,600.00                         | 12.20           | 151.77      | 2,574.18            | -231.97    | 124.52     | -217.84               | 0.00                    | 0.00                   | 0.00                  |
| 2,700.00                         | 12.20           | 151.77      | 2,671.93            | -250.59    | 134.52     | -235.32               | 0.00                    | 0.00                   | 0.00                  |
| 2,800.00                         | 12.20           | 151.77      | 2,769.67            | -269.20    | 144.51     | -252.80               | 0.00                    | 0.00                   | 0.00                  |
| 2,900.00                         | 12.20           | 151.77      | 2,867.41            | -287.82    | 154.50     | -270.28               | 0.00                    | 0.00                   | 0.00                  |
| 3,000.00                         | 12.20           | 151.77      | 2,965.16            | -306.43    | 164.49     | -287.76               | 0.00                    | 0.00                   | 0.00                  |
| 3,100.00                         | 12.20           | 151.77      | 3,062.90            | -325.04    | 174.48     | -305.24               | 0.00                    | 0.00                   | 0.00                  |
| 3,200.00                         | 12.20           | 151.77      | 3,160.64            | -343.66    | 184.48     | -322.72               | 0.00                    | 0.00                   | 0.00                  |
| 3,300.00                         | 12.20           | 151.77      | 3,258.39            | -362.27    | 194.47     | -340.20               | 0.00                    | 0.00                   | 0.00                  |
| 3,400.00                         | 12.20           | 151.77      | 3,356.13            | -380.88    | 204.46     | -357.68               | 0.00                    | 0.00                   | 0.00                  |
| 3,500.00                         | 12.20           | 151.77      | 3,453.87            | -399.50    | 214.45     | -375.16               | 0.00                    | 0.00                   | 0.00                  |
| 3,600.00                         | 12.20           | 151.77      | 3,551.61            | -418.11    | 224.44     | -392.64               | 0.00                    | 0.00                   | 0.00                  |
| 3,700.00                         | 12.20           | 151.77      | 3,649.36            | -436.73    | 234.44     | -410.12               | 0.00                    | 0.00                   | 0.00                  |
| 3,800.00                         | 12.20           | 151.77      | 3,747.10            | -455.34    | 244.43     | -427.60               | 0.00                    | 0.00                   | 0.00                  |
| 3,900.00                         | 12.20           | 151.77      | 3,844.84            | -473.95    | 254.42     | -445.08               | 0.00                    | 0.00                   | 0.00                  |
| 4,000.00                         | 12.20           | 151.77      | 3,942.59            | -492.57    | 264.41     | -462.55               | 0.00                    | 0.00                   | 0.00                  |
| 4,100.00                         | 12.20           | 151.77      | 4,040.33            | -511.18    | 274.40     | -480.03               | 0.00                    | 0.00                   | 0.00                  |
| 4,200.00                         | 12.20           | 151.77      | 4,138.07            | -529.79    | 284.39     | -497.51               | 0.00                    | 0.00                   | 0.00                  |
| 4,300.00                         | 12.20           | 151.77      | 4,235.82            | -548.41    | 294.39     | -514.99               | 0.00                    | 0.00                   | 0.00                  |
| 4,400.00                         | 12.20           | 151.77      | 4,333.56            | -567.02    | 304.38     | -532.47               | 0.00                    | 0.00                   | 0.00                  |
| 4,500.00                         | 12.20           | 151.77      | 4,431.30            | -585.64    | 314.37     | -549.95               | 0.00                    | 0.00                   | 0.00                  |
| 4,600.00                         | 12.20           | 151.77      | 4,529.04            | -604.25    | 324.36     | -567.43               | 0.00                    | 0.00                   | 0.00                  |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well UNDERHILL 1N-17HZ         |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Site:</b>     | WELD_UNDERHILL 16-17HZ PAD  | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | UNDERHILL 1N-17HZ           | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | UNDERHILL 1N-17HZ           |                                     |                                |
| <b>Design:</b>   | UNDERHILL 1N-17HZ (wp01)    |                                     |                                |

| Planned Survey                          |                 |             |                     |            |            |                       |                         |                        |                       |
|---|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (ft)                     | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,700.00                                | 12.20           | 151.77      | 4,626.79            | -622.86    | 334.35     | -584.91               | 0.00                    | 0.00                   | 0.00                  |
| 4,718.63                                | 12.20           | 151.77      | 4,645.00            | -626.33    | 336.22     | -588.17               | 0.00                    | 0.00                   | 0.00                  |
| <b>Sussex</b>                           |                 |             |                     |            |            |                       |                         |                        |                       |
| 4,800.00                                | 12.20           | 151.77      | 4,724.53            | -641.48    | 344.35     | -602.39               | 0.00                    | 0.00                   | 0.00                  |
| 4,900.00                                | 12.20           | 151.77      | 4,822.27            | -660.09    | 354.34     | -619.87               | 0.00                    | 0.00                   | 0.00                  |
| 5,000.00                                | 12.20           | 151.77      | 4,920.02            | -678.70    | 364.33     | -637.35               | 0.00                    | 0.00                   | 0.00                  |
| 5,100.00                                | 12.20           | 151.77      | 5,017.76            | -697.32    | 374.32     | -654.83               | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00                                | 12.20           | 151.77      | 5,115.50            | -715.93    | 384.31     | -672.31               | 0.00                    | 0.00                   | 0.00                  |
| 5,281.11                                | 12.20           | 151.77      | 5,194.78            | -731.03    | 392.42     | -686.49               | 0.00                    | 0.00                   | 0.00                  |
| <b>Start Drop -2.00</b>                 |                 |             |                     |            |            |                       |                         |                        |                       |
| 5,300.00                                | 11.82           | 151.77      | 5,213.26            | -734.49    | 394.28     | -689.74               | 2.00                    | -2.00                  | 0.00                  |
| 5,341.56                                | 10.99           | 151.77      | 5,254.00            | -741.73    | 398.16     | -696.54               | 2.00                    | -2.00                  | 0.00                  |
| <b>Shannon</b>                          |                 |             |                     |            |            |                       |                         |                        |                       |
| 5,400.00                                | 9.82            | 151.77      | 5,311.48            | -751.03    | 403.15     | -705.27               | 2.00                    | -2.00                  | 0.00                  |
| 5,500.00                                | 7.82            | 151.77      | 5,410.29            | -764.54    | 410.40     | -717.95               | 2.00                    | -2.00                  | 0.00                  |
| 5,600.00                                | 5.82            | 151.77      | 5,509.58            | -775.00    | 416.02     | -727.78               | 2.00                    | -2.00                  | 0.00                  |
| 5,700.00                                | 3.82            | 151.77      | 5,609.22            | -782.40    | 419.99     | -734.73               | 2.00                    | -2.00                  | 0.00                  |
| 5,800.00                                | 1.82            | 151.77      | 5,709.09            | -786.73    | 422.32     | -738.79               | 2.00                    | -2.00                  | 0.00                  |
| 5,890.92                                | 0.00            | 0.00        | 5,800.00            | -788.00    | 423.00     | -739.99               | 2.00                    | -2.00                  | 0.00                  |
| <b>Start 1160.05 hold at 5890.92 MD</b> |                 |             |                     |            |            |                       |                         |                        |                       |
| 5,900.00                                | 0.00            | 0.00        | 5,809.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,000.00                                | 0.00            | 0.00        | 5,909.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,100.00                                | 0.00            | 0.00        | 6,009.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,200.00                                | 0.00            | 0.00        | 6,109.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,300.00                                | 0.00            | 0.00        | 6,209.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,400.00                                | 0.00            | 0.00        | 6,309.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,500.00                                | 0.00            | 0.00        | 6,409.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,600.00                                | 0.00            | 0.00        | 6,509.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,700.00                                | 0.00            | 0.00        | 6,609.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,800.00                                | 0.00            | 0.00        | 6,709.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 6,900.00                                | 0.00            | 0.00        | 6,809.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 7,000.00                                | 0.00            | 0.00        | 6,909.08            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| 7,050.97                                | 0.00            | 0.00        | 6,960.05            | -788.00    | 423.00     | -739.99               | 0.00                    | 0.00                   | 0.00                  |
| <b>Start Build 10.00</b>                |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,100.00                                | 4.90            | 359.90      | 7,009.02            | -785.90    | 423.00     | -737.90               | 10.00                   | 10.00                  | 0.00                  |
| 7,150.00                                | 9.90            | 359.90      | 7,058.58            | -779.46    | 422.99     | -731.50               | 10.00                   | 10.00                  | 0.00                  |
| 7,200.00                                | 14.90           | 359.90      | 7,107.40            | -768.73    | 422.97     | -720.82               | 10.00                   | 10.00                  | 0.00                  |
| 7,250.00                                | 19.90           | 359.90      | 7,155.10            | -753.78    | 422.94     | -705.96               | 10.00                   | 10.00                  | 0.00                  |
| 7,300.00                                | 24.90           | 359.90      | 7,201.31            | -734.73    | 422.91     | -687.01               | 10.00                   | 10.00                  | 0.00                  |
| 7,350.00                                | 29.90           | 359.90      | 7,245.69            | -711.72    | 422.87     | -664.14               | 10.00                   | 10.00                  | 0.00                  |
| 7,400.00                                | 34.90           | 359.90      | 7,287.89            | -684.94    | 422.82     | -637.50               | 10.00                   | 10.00                  | 0.00                  |
| 7,450.00                                | 39.90           | 359.90      | 7,327.59            | -654.58    | 422.77     | -607.31               | 10.00                   | 10.00                  | 0.00                  |
| 7,500.00                                | 44.90           | 359.90      | 7,364.50            | -620.87    | 422.71     | -573.79               | 10.00                   | 10.00                  | 0.00                  |
| 7,537.23                                | 48.63           | 359.90      | 7,390.00            | -593.76    | 422.66     | -546.82               | 10.00                   | 10.00                  | 0.00                  |
| <b>Sharon Springs</b>                   |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,550.00                                | 49.90           | 359.90      | 7,398.34            | -584.08    | 422.64     | -537.20               | 10.00                   | 10.00                  | 0.00                  |
| 7,584.92                                | 53.39           | 359.90      | 7,420.00            | -556.70    | 422.60     | -509.97               | 10.00                   | 10.00                  | 0.00                  |
| <b>Niobrara</b>                         |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,600.00                                | 54.90           | 359.90      | 7,428.83            | -544.47    | 422.57     | -497.81               | 10.00                   | 10.00                  | 0.00                  |
| 7,650.00                                | 59.90           | 359.90      | 7,455.76            | -502.36    | 422.50     | -455.94               | 10.00                   | 10.00                  | 0.00                  |
| 7,700.00                                | 64.90           | 359.90      | 7,478.91            | -458.07    | 422.42     | -411.89               | 10.00                   | 10.00                  | 0.00                  |
| 7,750.00                                | 69.90           | 359.90      | 7,498.12            | -411.92    | 422.34     | -366.00               | 10.00                   | 10.00                  | 0.00                  |
| 7,788.05                                | 73.71           | 359.90      | 7,510.00            | -375.78    | 422.28     | -330.06               | 10.00                   | 10.00                  | 0.00                  |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well UNDERHILL 1N-17HZ         |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Site:</b>     | WELD_UNDERHILL 16-17HZ PAD  | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | UNDERHILL 1N-17HZ           | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | UNDERHILL 1N-17HZ           |                                     |                                |
| <b>Design:</b>   | UNDERHILL 1N-17HZ (wp01)    |                                     |                                |

### Planned Survey

| Measured Depth (ft)                            | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-------------------------|------------------------|-----------------------|
| <b>Niobrara B</b>                              |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,800.00                                       | 74.90           | 359.90      | 7,513.23            | -364.28    | 422.26     | -318.62               | 10.00                   | 10.00                  | 0.00                  |
| 7,850.00                                       | 79.90           | 359.90      | 7,524.13            | -315.50    | 422.18     | -270.11               | 10.00                   | 10.00                  | 0.00                  |
| 7,900.00                                       | 84.90           | 359.90      | 7,530.74            | -265.95    | 422.09     | -220.83               | 10.00                   | 10.00                  | 0.00                  |
| 7,948.58                                       | 89.76           | 359.90      | 7,533.00            | -217.44    | 422.00     | -172.59               | 10.00                   | 10.00                  | 0.00                  |
| <b>Start DLS 0.00 TFO -33.72 - 7"</b>          |                 |             |                     |            |            |                       |                         |                        |                       |
| 8,000.00                                       | 89.76           | 359.90      | 7,533.22            | -166.02    | 421.91     | -121.46               | 0.00                    | 0.00                   | 0.00                  |
| 8,100.00                                       | 89.76           | 359.90      | 7,533.64            | -66.02     | 421.74     | -22.01                | 0.00                    | 0.00                   | 0.00                  |
| 8,200.00                                       | 89.76           | 359.90      | 7,534.06            | 33.98      | 421.56     | 77.43                 | 0.00                    | 0.00                   | 0.00                  |
| 8,300.00                                       | 89.76           | 359.90      | 7,534.47            | 133.98     | 421.39     | 176.87                | 0.00                    | 0.00                   | 0.00                  |
| 8,400.00                                       | 89.76           | 359.90      | 7,534.89            | 233.98     | 421.21     | 276.32                | 0.00                    | 0.00                   | 0.00                  |
| 8,500.00                                       | 89.76           | 359.90      | 7,535.30            | 333.98     | 421.03     | 375.76                | 0.00                    | 0.00                   | 0.00                  |
| 8,600.00                                       | 89.76           | 359.90      | 7,535.72            | 433.98     | 420.86     | 475.20                | 0.00                    | 0.00                   | 0.00                  |
| 8,700.00                                       | 89.76           | 359.90      | 7,536.13            | 533.98     | 420.68     | 574.65                | 0.00                    | 0.00                   | 0.00                  |
| 8,800.00                                       | 89.76           | 359.90      | 7,536.55            | 633.97     | 420.50     | 674.09                | 0.00                    | 0.00                   | 0.00                  |
| 8,900.00                                       | 89.76           | 359.90      | 7,536.96            | 733.97     | 420.32     | 773.54                | 0.00                    | 0.00                   | 0.00                  |
| 9,000.00                                       | 89.76           | 359.90      | 7,537.37            | 833.97     | 420.14     | 872.98                | 0.00                    | 0.00                   | 0.00                  |
| 9,100.00                                       | 89.76           | 359.90      | 7,537.78            | 933.97     | 419.96     | 972.42                | 0.00                    | 0.00                   | 0.00                  |
| 9,200.00                                       | 89.76           | 359.90      | 7,538.19            | 1,033.97   | 419.79     | 1,071.87              | 0.00                    | 0.00                   | 0.00                  |
| 9,300.00                                       | 89.77           | 359.90      | 7,538.60            | 1,133.97   | 419.60     | 1,171.31              | 0.00                    | 0.00                   | 0.00                  |
| 9,400.00                                       | 89.77           | 359.90      | 7,539.01            | 1,233.97   | 419.42     | 1,270.75              | 0.00                    | 0.00                   | 0.00                  |
| 9,500.00                                       | 89.77           | 359.90      | 7,539.42            | 1,333.97   | 419.24     | 1,370.19              | 0.00                    | 0.00                   | 0.00                  |
| 9,600.00                                       | 89.77           | 359.90      | 7,539.83            | 1,433.97   | 419.06     | 1,469.64              | 0.00                    | 0.00                   | 0.00                  |
| 9,700.00                                       | 89.77           | 359.90      | 7,540.24            | 1,533.97   | 418.88     | 1,569.08              | 0.00                    | 0.00                   | 0.00                  |
| 9,800.00                                       | 89.77           | 359.90      | 7,540.64            | 1,633.96   | 418.70     | 1,668.52              | 0.00                    | 0.00                   | 0.00                  |
| 9,900.00                                       | 89.77           | 359.90      | 7,541.05            | 1,733.96   | 418.51     | 1,767.97              | 0.00                    | 0.00                   | 0.00                  |
| 10,000.00                                      | 89.77           | 359.89      | 7,541.46            | 1,833.96   | 418.33     | 1,867.41              | 0.00                    | 0.00                   | 0.00                  |
| 10,100.00                                      | 89.77           | 359.89      | 7,541.86            | 1,933.96   | 418.15     | 1,966.85              | 0.00                    | 0.00                   | 0.00                  |
| 10,200.00                                      | 89.77           | 359.89      | 7,542.26            | 2,033.96   | 417.96     | 2,066.30              | 0.00                    | 0.00                   | 0.00                  |
| 10,300.00                                      | 89.77           | 359.89      | 7,542.67            | 2,133.96   | 417.78     | 2,165.74              | 0.00                    | 0.00                   | 0.00                  |
| 10,400.00                                      | 89.77           | 359.89      | 7,543.07            | 2,233.96   | 417.59     | 2,265.18              | 0.00                    | 0.00                   | 0.00                  |
| 10,500.00                                      | 89.77           | 359.89      | 7,543.47            | 2,333.96   | 417.41     | 2,364.62              | 0.00                    | 0.00                   | 0.00                  |
| 10,600.00                                      | 89.77           | 359.89      | 7,543.87            | 2,433.96   | 417.22     | 2,464.07              | 0.00                    | 0.00                   | 0.00                  |
| 10,700.00                                      | 89.77           | 359.89      | 7,544.28            | 2,533.96   | 417.03     | 2,563.51              | 0.00                    | 0.00                   | 0.00                  |
| 10,800.00                                      | 89.77           | 359.89      | 7,544.68            | 2,633.95   | 416.85     | 2,662.95              | 0.00                    | 0.00                   | 0.00                  |
| 10,900.00                                      | 89.77           | 359.89      | 7,545.07            | 2,733.95   | 416.66     | 2,762.39              | 0.00                    | 0.00                   | 0.00                  |
| 11,000.00                                      | 89.77           | 359.89      | 7,545.47            | 2,833.95   | 416.47     | 2,861.84              | 0.00                    | 0.00                   | 0.00                  |
| 11,100.00                                      | 89.77           | 359.89      | 7,545.87            | 2,933.95   | 416.28     | 2,961.28              | 0.00                    | 0.00                   | 0.00                  |
| 11,200.00                                      | 89.77           | 359.89      | 7,546.27            | 3,033.95   | 416.09     | 3,060.72              | 0.00                    | 0.00                   | 0.00                  |
| 11,300.00                                      | 89.77           | 359.89      | 7,546.67            | 3,133.95   | 415.90     | 3,160.16              | 0.00                    | 0.00                   | 0.00                  |
| 11,400.00                                      | 89.77           | 359.89      | 7,547.06            | 3,233.95   | 415.71     | 3,259.61              | 0.00                    | 0.00                   | 0.00                  |
| 11,500.00                                      | 89.77           | 359.89      | 7,547.46            | 3,333.95   | 415.52     | 3,359.05              | 0.00                    | 0.00                   | 0.00                  |
| 11,600.00                                      | 89.77           | 359.89      | 7,547.85            | 3,433.95   | 415.33     | 3,458.49              | 0.00                    | 0.00                   | 0.00                  |
| 11,700.00                                      | 89.77           | 359.89      | 7,548.25            | 3,533.95   | 415.14     | 3,557.93              | 0.00                    | 0.00                   | 0.00                  |
| 11,800.00                                      | 89.77           | 359.89      | 7,548.64            | 3,633.94   | 414.95     | 3,657.38              | 0.00                    | 0.00                   | 0.00                  |
| 11,900.00                                      | 89.78           | 359.89      | 7,549.03            | 3,733.94   | 414.76     | 3,756.82              | 0.00                    | 0.00                   | 0.00                  |
| 12,000.00                                      | 89.78           | 359.89      | 7,549.42            | 3,833.94   | 414.57     | 3,856.26              | 0.00                    | 0.00                   | 0.00                  |
| 12,100.00                                      | 89.78           | 359.89      | 7,549.82            | 3,933.94   | 414.37     | 3,955.70              | 0.00                    | 0.00                   | 0.00                  |
| 12,147.25                                      | 89.78           | 359.89      | 7,550.00            | 3,981.19   | 414.28     | 4,002.69              | 0.00                    | 0.00                   | 0.00                  |
| <b>TD at 12147.25 - UNDERHILL 1N-17HZ PBHL</b> |                 |             |                     |            |            |                       |                         |                        |                       |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well UNDERHILL 1N-17HZ         |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17' RKB + 5103' GL @ 5120.00ft |
| <b>Site:</b>     | WELD_UNDERHILL 16-17HZ PAD  | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | UNDERHILL 1N-17HZ           | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | UNDERHILL 1N-17HZ           |                                     |                                |
| <b>Design:</b>   | UNDERHILL 1N-17HZ (wp01)    |                                     |                                |

| Design Targets            |           |          |          |          |        |              |              |           |             |
|---------------------------|-----------|----------|----------|----------|--------|--------------|--------------|-----------|-------------|
| Target Name               | Dip Angle | Dip Dir. | TVD      | +N/-S    | +E/-W  | Northing     | Easting      | Latitude  | Longitude   |
| - hit/miss target         | (°)       | (°)      | (ft)     | (ft)     | (ft)   | (usft)       | (usft)       |           |             |
| - Shape                   |           |          |          |          |        |              |              |           |             |
| UNDERHILL 1N-17HZ F       | 0.00      | 0.00     | 7,550.00 | 3,981.19 | 414.28 | 1,264,171.52 | 3,166,015.86 | 40.057016 | -104.906911 |
| - plan hits target center |           |          |          |          |        |              |              |           |             |
| - Point                   |           |          |          |          |        |              |              |           |             |

| Casing Points  |                |        |  |                 |               |
|----------------|----------------|--------|--|-----------------|---------------|
| Measured Depth | Vertical Depth | Name   |  | Casing Diameter | Hole Diameter |
| (ft)           | (ft)           |        |  | (")             | (")           |
| 917.00         | 917.00         | 9 5/8" |  | 9-5/8           | 12-1/4        |
| 7,948.58       | 7,533.00       | 7"     |  | 7               | 7-1/2         |

| Formations     |                |                |  |           |     |               |
|----------------|----------------|----------------|--|-----------|-----|---------------|
| Measured Depth | Vertical Depth | Name           |  | Lithology | Dip | Dip Direction |
| (ft)           | (ft)           |                |  |           | (°) | (°)           |
| 4,718.63       | 4,645.00       | Sussex         |  |           |     |               |
| 5,341.56       | 5,254.00       | Shannon        |  |           |     |               |
| 7,537.23       | 7,390.00       | Sharon Springs |  |           |     |               |
| 7,584.92       | 7,420.00       | Niobrara       |  |           |     |               |
| 7,788.05       | 7,510.00       | Niobrara B     |  |           |     |               |

| Plan Annotations |                |                   |        |                                  |  |
|------------------|----------------|-------------------|--------|----------------------------------|--|
| Measured Depth   | Vertical Depth | Local Coordinates |        | Comment                          |  |
| (ft)             | (ft)           | +N/-S             | +E/-W  |                                  |  |
| (ft)             | (ft)           | (ft)              | (ft)   |                                  |  |
| 1,050.00         | 1,050.00       | 0.00              | 0.00   | Start Build 2.00                 |  |
| 1,659.81         | 1,655.22       | -56.97            | 30.58  | Start 3621.30 hold at 1659.81 MD |  |
| 5,281.11         | 5,194.78       | -731.03           | 392.42 | Start Drop -2.00                 |  |
| 5,890.92         | 5,800.00       | -788.00           | 423.00 | Start 1160.05 hold at 5890.92 MD |  |
| 7,050.97         | 6,960.05       | -788.00           | 423.00 | Start Build 10.00                |  |
| 7,948.58         | 7,533.00       | -217.44           | 422.00 | Start DLS 0.00 TFO -33.72        |  |
| 12,147.25        | 7,550.00       | 3,981.19          | 414.28 | TD at 12147.25                   |  |