

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HOWARD 4 PAD**

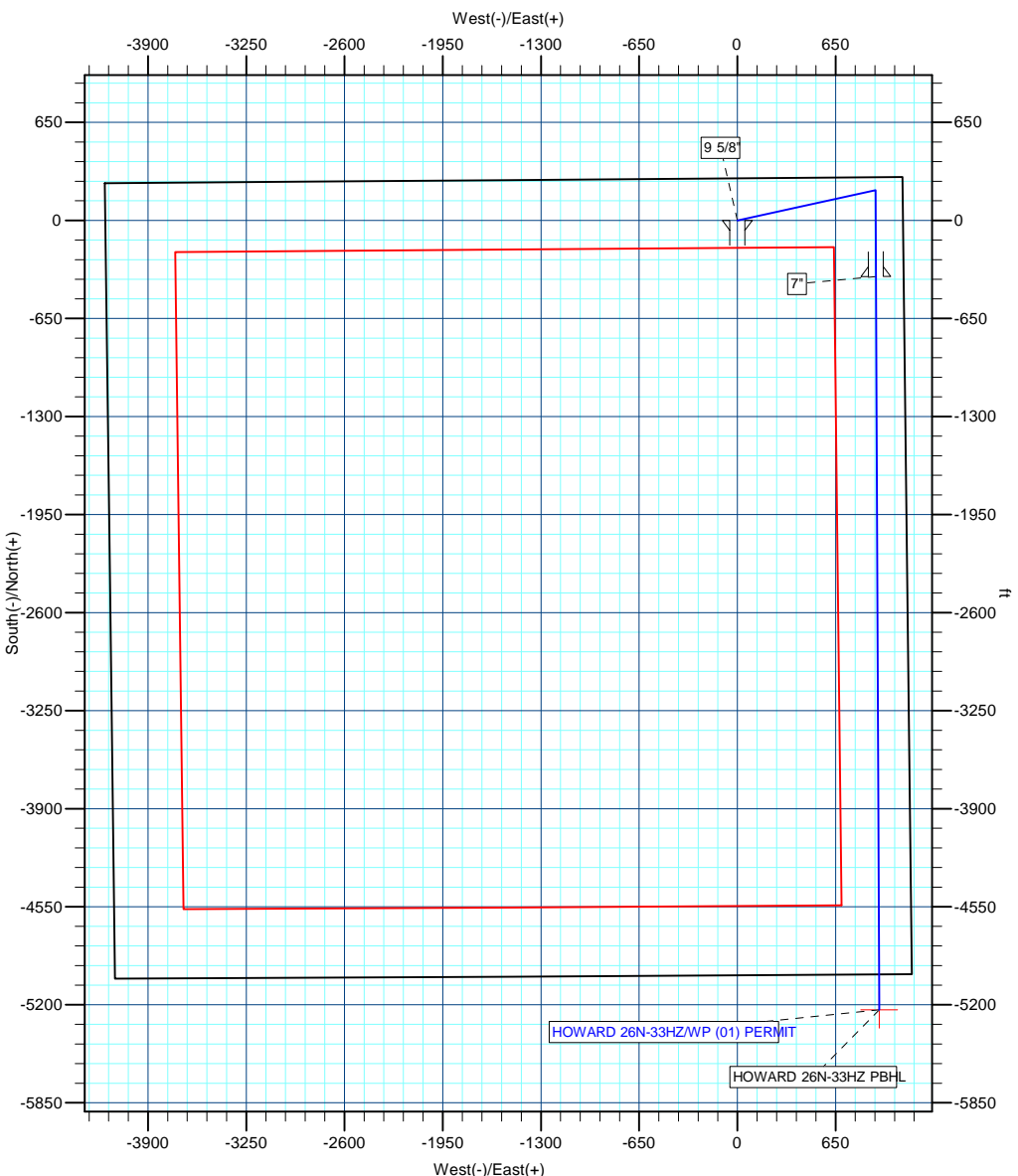
**HOWARD 26N-33HZ**

**Wellbore #1**

**Plan: WP (01) PERMIT**

## **Standard Planning Report**

**10 December, 2012**



Azimuths to True North  
 Magnetic North: 8.7°  
 Magnetic Field  
 Strength: 52764.3nT  
 Dip Angle: 66.68°  
 Date: 12/10/2012  
 Model: IGRF2010

Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD HOWARD 4 PAD  
 Well: HOWARD 26N-33HZ  
 Wellbore: Wellbore #1  
 Design: WP (01) PERMIT  
 Latitude: 40.028639  
 Longitude: -104.890031  
 GL: 4983.00  
 KB: 17'RKB+4983'GL @ 5000.00ft

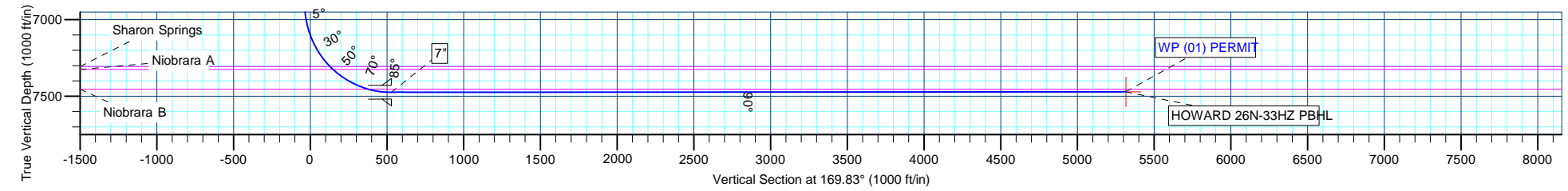
| WELL DETAILS: HOWARD 26N-33HZ |       |            |                          |                                  |                          |      |
|-------------------------------|-------|------------|--------------------------|----------------------------------|--------------------------|------|
| +N/-S                         | +E/-W | Northing   | Ground Level:<br>Easting | 4983.00<br>Latitude<br>40.028639 | Longitude<br>-104.890031 | Slot |
| 0.00                          | 0.00  | 1253866.75 | 3170811.90               |                                  |                          |      |

| 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    |
| 1100.00         | 0.00  | 0.00   | 1100.00 | 0.00     | 0.00   | 0.00  | 0.00   | 0.00    |
| 1600.55         | 10.01 | 77.66  | 1598.01 | 9.32     | 42.61  | 2.00  | 77.66  | -1.66   |
| 6480.88         | 10.01 | 77.66  | 6404.03 | 190.68   | 871.39 | 0.00  | 0.00   | -33.85  |
| 6981.43         | 0.00  | 0.00   | 6902.04 | 200.00   | 914.00 | 2.00  | 180.00 | -35.50  |
| 7881.91         | 90.05 | 179.74 | 7475.00 | -373.42  | 916.60 | 10.00 | 179.74 | 529.38  |
| 2741.67         | 90.05 | 179.74 | 7471.00 | -5233.14 | 938.60 | 0.00  | 0.00   | 5316.65 |

| WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG) |         |          |        |           |             |       |
|---|---------|----------|--------|-----------|-------------|-------|
| Name  | TVD     | +N/-S    | +E/-W  | Latitude  | Longitude   | Shape |
| HOWARD 26N-33HZ PBHL                                    | 7471.00 | -5233.14 | 938.60 | 40.014273 | -104.886680 | Point |

| FORMATION TOP DETAILS |         |                |
|-----------------------|---------|----------------|
| TVDPath               | MDPath  | Formation      |
| 4780.00               | 4831.74 | Sussex         |
| 7306.00               | 7429.76 | Sharon Springs |
| 7325.00               | 7457.22 | Niobrara A     |
| 7454.00               | 7725.83 | Niobrara B     |

| CASING DETAILS |         |        |       |
|----------------|---------|--------|-------|
| TVD            | MD      | Name   | Size  |
| 900.00         | 900.00  | 9 5/8" | 9-5/8 |
| 7475.00        | 7881.91 | 7"     | 7     |



# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                            |
|------------------|-----------------------------|-------------------------------------|----------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well HOWARD 26N-33HZ       |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17'RKB+4983'GL @ 5000.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17'RKB+4983'GL @ 5000.00ft |
| <b>Site:</b>     | WELD_HOWARD 4 PAD           | <b>North Reference:</b>             | True                       |
| <b>Well:</b>     | HOWARD 26N-33HZ             | <b>Survey Calculation Method:</b>   | Minimum Curvature          |
| <b>Wellbore:</b> | Wellbore #1                 |                                     |                            |
| <b>Design:</b>   | WP (01) PERMIT              |                                     |                            |

|                    |                             |                      |                |
|--------------------|-----------------------------|----------------------|----------------|
| <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_HOWARD 4 PAD |                     |                   |                                 |
| <b>Site Position:</b>        |                   | <b>Northing:</b>    | 1,253,776.80 usft | <b>Latitude:</b> 40.028392      |
| <b>From:</b>                 | Lat/Long          | <b>Easting:</b>     | 3,170,813.08 usft | <b>Longitude:</b> -104.890029   |
| <b>Position Uncertainty:</b> | 0.00 ft           | <b>Slot Radius:</b> | 13-3/16 "         | <b>Grid Convergence:</b> 0.39 ° |

|                             |                 |          |                            |                                  |
|-----------------------------|-----------------|----------|----------------------------|----------------------------------|
| <b>Well</b>                 | HOWARD 26N-33HZ |          |                            |                                  |
| <b>Well Position</b>        | <b>+N/-S</b>    | 89.96 ft | <b>Northing:</b>           | 1,253,866.75 usft                |
|                             | <b>+E/-W</b>    | -0.56 ft | <b>Easting:</b>            | 3,170,811.90 usft                |
| <b>Position Uncertainty</b> |                 | 0.00 ft  | <b>Wellhead Elevation:</b> | <b>Ground Level:</b> 4,983.00 ft |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Wellbore #1       |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 12/10/2012         | 8.70                   | 66.68                | 52,764                     |

|                          |                              |                   |                      |                      |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| <b>Design</b>            | WP (01) PERMIT               |                   |                      |                      |
| <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                 | 169.83               |

| <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    |                 |
| 1,100.00             | 0.00            | 0.00        | 1,100.00            | 0.00       | 0.00       | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 1,600.55             | 10.01           | 77.66       | 1,598.01            | 9.32       | 42.61      | 2.00                    | 2.00                   | 0.00                  | 77.66   |                 |
| 6,480.88             | 10.01           | 77.66       | 6,404.03            | 190.68     | 871.39     | 0.00                    | 0.00                   | 0.00                  | 0.00    |                 |
| 6,981.43             | 0.00            | 0.00        | 6,902.04            | 200.00     | 914.00     | 2.00                    | -2.00                  | 0.00                  | 180.00  |                 |
| 7,881.91             | 90.05           | 179.74      | 7,475.00            | -373.42    | 916.60     | 10.00                   | 10.00                  | 0.00                  | 179.74  |                 |
| 12,741.67            | 90.05           | 179.74      | 7,471.00            | -5,233.14  | 938.60     | 0.00                    | 0.00                   | 0.00                  | 0.00    | HOWARD 26N-33HZ |

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## Planning Report

|                  |                             |                                     |                            |
|------------------|-----------------------------|-------------------------------------|----------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well HOWARD 26N-33HZ       |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17'RKB+4983'GL @ 5000.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17'RKB+4983'GL @ 5000.00ft |
| <b>Site:</b>     | WELD_HOWARD 4 PAD           | <b>North Reference:</b>             | True                       |
| <b>Well:</b>     | HOWARD 26N-33HZ             | <b>Survey Calculation Method:</b>   | Minimum Curvature          |
| <b>Wellbore:</b> | Wellbore #1                 |                                     |                            |
| <b>Design:</b>   | WP (01) PERMIT              |                                     |                            |

| 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                  |
| 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                  |
| 1,100.00                         | 0.00            | 0.00        | 1,100.00            | 0.00       | 0.00       | 0.00                  | 0.00                    | 0.00                   | 0.00                  |
| Start Build 2.00                 |                 |             |                     |            |            |                       |                         |                        |                       |
| 1,200.00                         | 2.00            | 77.66       | 1,199.98            | 0.37       | 1.70       | -0.07                 | 2.00                    | 2.00                   | 0.00                  |
| 1,300.00                         | 4.00            | 77.66       | 1,299.84            | 1.49       | 6.82       | -0.26                 | 2.00                    | 2.00                   | 0.00                  |
| 1,400.00                         | 6.00            | 77.66       | 1,399.45            | 3.35       | 15.33      | -0.60                 | 2.00                    | 2.00                   | 0.00                  |
| 1,500.00                         | 8.00            | 77.66       | 1,498.70            | 5.96       | 27.24      | -1.06                 | 2.00                    | 2.00                   | 0.00                  |
| 1,600.55                         | 10.01           | 77.66       | 1,598.01            | 9.32       | 42.61      | -1.66                 | 2.00                    | 2.00                   | 0.00                  |
| Start 4880.32 hold at 1600.55 MD |                 |             |                     |            |            |                       |                         |                        |                       |
| 1,700.00                         | 10.01           | 77.66       | 1,695.94            | 13.02      | 59.50      | -2.31                 | 0.00                    | 0.00                   | 0.00                  |
| 1,800.00                         | 10.01           | 77.66       | 1,794.42            | 16.74      | 76.48      | -2.97                 | 0.00                    | 0.00                   | 0.00                  |
| 1,900.00                         | 10.01           | 77.66       | 1,892.90            | 20.45      | 93.46      | -3.63                 | 0.00                    | 0.00                   | 0.00                  |
| 2,000.00                         | 10.01           | 77.66       | 1,991.38            | 24.17      | 110.44     | -4.29                 | 0.00                    | 0.00                   | 0.00                  |
| 2,100.00                         | 10.01           | 77.66       | 2,089.85            | 27.88      | 127.43     | -4.95                 | 0.00                    | 0.00                   | 0.00                  |
| 2,200.00                         | 10.01           | 77.66       | 2,188.33            | 31.60      | 144.41     | -5.61                 | 0.00                    | 0.00                   | 0.00                  |
| 2,300.00                         | 10.01           | 77.66       | 2,286.81            | 35.32      | 161.39     | -6.27                 | 0.00                    | 0.00                   | 0.00                  |
| 2,400.00                         | 10.01           | 77.66       | 2,385.28            | 39.03      | 178.37     | -6.93                 | 0.00                    | 0.00                   | 0.00                  |
| 2,500.00                         | 10.01           | 77.66       | 2,483.76            | 42.75      | 195.35     | -7.59                 | 0.00                    | 0.00                   | 0.00                  |
| 2,600.00                         | 10.01           | 77.66       | 2,582.24            | 46.46      | 212.34     | -8.25                 | 0.00                    | 0.00                   | 0.00                  |
| 2,700.00                         | 10.01           | 77.66       | 2,680.72            | 50.18      | 229.32     | -8.91                 | 0.00                    | 0.00                   | 0.00                  |
| 2,800.00                         | 10.01           | 77.66       | 2,779.19            | 53.90      | 246.30     | -9.57                 | 0.00                    | 0.00                   | 0.00                  |
| 2,900.00                         | 10.01           | 77.66       | 2,877.67            | 57.61      | 263.28     | -10.23                | 0.00                    | 0.00                   | 0.00                  |
| 3,000.00                         | 10.01           | 77.66       | 2,976.15            | 61.33      | 280.27     | -10.89                | 0.00                    | 0.00                   | 0.00                  |
| 3,100.00                         | 10.01           | 77.66       | 3,074.63            | 65.04      | 297.25     | -11.55                | 0.00                    | 0.00                   | 0.00                  |
| 3,200.00                         | 10.01           | 77.66       | 3,173.10            | 68.76      | 314.23     | -12.21                | 0.00                    | 0.00                   | 0.00                  |
| 3,300.00                         | 10.01           | 77.66       | 3,271.58            | 72.48      | 331.21     | -12.86                | 0.00                    | 0.00                   | 0.00                  |
| 3,400.00                         | 10.01           | 77.66       | 3,370.06            | 76.19      | 348.19     | -13.52                | 0.00                    | 0.00                   | 0.00                  |
| 3,500.00                         | 10.01           | 77.66       | 3,468.54            | 79.91      | 365.18     | -14.18                | 0.00                    | 0.00                   | 0.00                  |
| 3,600.00                         | 10.01           | 77.66       | 3,567.01            | 83.62      | 382.16     | -14.84                | 0.00                    | 0.00                   | 0.00                  |
| 3,700.00                         | 10.01           | 77.66       | 3,665.49            | 87.34      | 399.14     | -15.50                | 0.00                    | 0.00                   | 0.00                  |
| 3,800.00                         | 10.01           | 77.66       | 3,763.97            | 91.06      | 416.12     | -16.16                | 0.00                    | 0.00                   | 0.00                  |
| 3,900.00                         | 10.01           | 77.66       | 3,862.45            | 94.77      | 433.10     | -16.82                | 0.00                    | 0.00                   | 0.00                  |
| 4,000.00                         | 10.01           | 77.66       | 3,960.92            | 98.49      | 450.09     | -17.48                | 0.00                    | 0.00                   | 0.00                  |
| 4,100.00                         | 10.01           | 77.66       | 4,059.40            | 102.20     | 467.07     | -18.14                | 0.00                    | 0.00                   | 0.00                  |
| 4,200.00                         | 10.01           | 77.66       | 4,157.88            | 105.92     | 484.05     | -18.80                | 0.00                    | 0.00                   | 0.00                  |
| 4,300.00                         | 10.01           | 77.66       | 4,256.36            | 109.63     | 501.03     | -19.46                | 0.00                    | 0.00                   | 0.00                  |
| 4,400.00                         | 10.01           | 77.66       | 4,354.83            | 113.35     | 518.01     | -20.12                | 0.00                    | 0.00                   | 0.00                  |
| 4,500.00                         | 10.01           | 77.66       | 4,453.31            | 117.07     | 535.00     | -20.78                | 0.00                    | 0.00                   | 0.00                  |
| 4,600.00                         | 10.01           | 77.66       | 4,551.79            | 120.78     | 551.98     | -21.44                | 0.00                    | 0.00                   | 0.00                  |
| 4,700.00                         | 10.01           | 77.66       | 4,650.27            | 124.50     | 568.96     | -22.10                | 0.00                    | 0.00                   | 0.00                  |
| 4,800.00                         | 10.01           | 77.66       | 4,748.74            | 128.21     | 585.94     | -22.76                | 0.00                    | 0.00                   | 0.00                  |
| 4,831.74                         | 10.01           | 77.66       | 4,780.00            | 129.39     | 591.33     | -22.97                | 0.00                    | 0.00                   | 0.00                  |
| Sussex                           |                 |             |                     |            |            |                       |                         |                        |                       |

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## Planning Report

|                  |                             |                                     |                            |
|------------------|-----------------------------|-------------------------------------|----------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well HOWARD 26N-33HZ       |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17°RKB+4983'GL @ 5000.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17°RKB+4983'GL @ 5000.00ft |
| <b>Site:</b>     | WELD_HOWARD 4 PAD           | <b>North Reference:</b>             | True                       |
| <b>Well:</b>     | HOWARD 26N-33HZ             | <b>Survey Calculation Method:</b>   | Minimum Curvature          |
| <b>Wellbore:</b> | Wellbore #1                 |                                     |                            |
| <b>Design:</b>   | WP (01) PERMIT              |                                     |                            |

| 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) |
| 4,900.00                                     | 10.01           | 77.66       | 4,847.22            | 131.93     | 602.92     | -23.42                | 0.00                    | 0.00                   | 0.00                  |
| 5,000.00                                     | 10.01           | 77.66       | 4,945.70            | 135.65     | 619.91     | -24.08                | 0.00                    | 0.00                   | 0.00                  |
| 5,100.00                                     | 10.01           | 77.66       | 5,044.18            | 139.36     | 636.89     | -24.74                | 0.00                    | 0.00                   | 0.00                  |
| 5,200.00                                     | 10.01           | 77.66       | 5,142.65            | 143.08     | 653.87     | -25.40                | 0.00                    | 0.00                   | 0.00                  |
| 5,300.00                                     | 10.01           | 77.66       | 5,241.13            | 146.79     | 670.85     | -26.06                | 0.00                    | 0.00                   | 0.00                  |
| 5,400.00                                     | 10.01           | 77.66       | 5,339.61            | 150.51     | 687.83     | -26.72                | 0.00                    | 0.00                   | 0.00                  |
| 5,500.00                                     | 10.01           | 77.66       | 5,438.08            | 154.23     | 704.82     | -27.38                | 0.00                    | 0.00                   | 0.00                  |
| 5,600.00                                     | 10.01           | 77.66       | 5,536.56            | 157.94     | 721.80     | -28.04                | 0.00                    | 0.00                   | 0.00                  |
| 5,700.00                                     | 10.01           | 77.66       | 5,635.04            | 161.66     | 738.78     | -28.70                | 0.00                    | 0.00                   | 0.00                  |
| 5,800.00                                     | 10.01           | 77.66       | 5,733.52            | 165.37     | 755.76     | -29.36                | 0.00                    | 0.00                   | 0.00                  |
| 5,900.00                                     | 10.01           | 77.66       | 5,831.99            | 169.09     | 772.74     | -30.01                | 0.00                    | 0.00                   | 0.00                  |
| 6,000.00                                     | 10.01           | 77.66       | 5,930.47            | 172.81     | 789.73     | -30.67                | 0.00                    | 0.00                   | 0.00                  |
| 6,100.00                                     | 10.01           | 77.66       | 6,028.95            | 176.52     | 806.71     | -31.33                | 0.00                    | 0.00                   | 0.00                  |
| 6,200.00                                     | 10.01           | 77.66       | 6,127.43            | 180.24     | 823.69     | -31.99                | 0.00                    | 0.00                   | 0.00                  |
| 6,300.00                                     | 10.01           | 77.66       | 6,225.90            | 183.95     | 840.67     | -32.65                | 0.00                    | 0.00                   | 0.00                  |
| 6,400.00                                     | 10.01           | 77.66       | 6,324.38            | 187.67     | 857.65     | -33.31                | 0.00                    | 0.00                   | 0.00                  |
| 6,480.88                                     | 10.01           | 77.66       | 6,404.03            | 190.68     | 871.39     | -33.85                | 0.00                    | 0.00                   | 0.00                  |
| <b>Start Drop -2.00</b>                      |                 |             |                     |            |            |                       |                         |                        |                       |
| 6,500.00                                     | 9.63            | 77.66       | 6,422.87            | 191.37     | 874.58     | -33.97                | 2.00                    | -2.00                  | 0.00                  |
| 6,600.00                                     | 7.63            | 77.66       | 6,521.73            | 194.58     | 889.23     | -34.54                | 2.00                    | -2.00                  | 0.00                  |
| 6,700.00                                     | 5.63            | 77.66       | 6,621.06            | 197.05     | 900.51     | -34.98                | 2.00                    | -2.00                  | 0.00                  |
| 6,800.00                                     | 3.63            | 77.66       | 6,720.73            | 198.77     | 908.39     | -35.28                | 2.00                    | -2.00                  | 0.00                  |
| 6,900.00                                     | 1.63            | 77.66       | 6,820.62            | 199.75     | 912.87     | -35.46                | 2.00                    | -2.00                  | 0.00                  |
| 6,981.43                                     | 0.00            | 0.00        | 6,902.04            | 200.00     | 914.00     | -35.50                | 2.00                    | -2.00                  | 0.00                  |
| <b>Start Build 10.00</b>                     |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,000.00                                     | 1.86            | 179.74      | 6,920.60            | 199.70     | 914.00     | -35.20                | 10.00                   | 10.00                  | 0.00                  |
| 7,050.00                                     | 6.86            | 179.74      | 6,970.44            | 195.90     | 914.02     | -31.46                | 10.00                   | 10.00                  | 0.00                  |
| 7,100.00                                     | 11.86           | 179.74      | 7,019.76            | 187.78     | 914.06     | -23.46                | 10.00                   | 10.00                  | 0.00                  |
| 7,150.00                                     | 16.86           | 179.74      | 7,068.19            | 175.38     | 914.11     | -11.25                | 10.00                   | 10.00                  | 0.00                  |
| 7,200.00                                     | 21.86           | 179.74      | 7,115.34            | 158.82     | 914.19     | 5.07                  | 10.00                   | 10.00                  | 0.00                  |
| 7,250.00                                     | 26.86           | 179.74      | 7,160.88            | 138.20     | 914.28     | 25.38                 | 10.00                   | 10.00                  | 0.00                  |
| 7,300.00                                     | 31.86           | 179.74      | 7,204.45            | 113.70     | 914.39     | 49.52                 | 10.00                   | 10.00                  | 0.00                  |
| 7,350.00                                     | 36.86           | 179.74      | 7,245.71            | 85.49      | 914.52     | 77.30                 | 10.00                   | 10.00                  | 0.00                  |
| 7,400.00                                     | 41.86           | 179.74      | 7,284.36            | 53.79      | 914.66     | 108.53                | 10.00                   | 10.00                  | 0.00                  |
| 7,429.76                                     | 44.83           | 179.74      | 7,306.00            | 33.37      | 914.75     | 128.65                | 10.00                   | 10.00                  | 0.00                  |
| <b>Sharon Springs</b>                        |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,450.00                                     | 46.86           | 179.74      | 7,320.10            | 18.85      | 914.82     | 142.95                | 10.00                   | 10.00                  | 0.00                  |
| 7,457.22                                     | 47.58           | 179.74      | 7,325.00            | 13.55      | 914.84     | 148.17                | 10.00                   | 10.00                  | 0.00                  |
| <b>Niobrara A</b>                            |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,500.00                                     | 51.86           | 179.74      | 7,352.65            | -19.08     | 914.99     | 180.31                | 10.00                   | 10.00                  | 0.00                  |
| 7,550.00                                     | 56.86           | 179.74      | 7,381.78            | -59.70     | 915.18     | 220.33                | 10.00                   | 10.00                  | 0.00                  |
| 7,600.00                                     | 61.86           | 179.74      | 7,407.26            | -102.70    | 915.37     | 262.69                | 10.00                   | 10.00                  | 0.00                  |
| 7,650.00                                     | 66.86           | 179.74      | 7,428.89            | -147.76    | 915.57     | 307.08                | 10.00                   | 10.00                  | 0.00                  |
| 7,700.00                                     | 71.86           | 179.74      | 7,446.51            | -194.54    | 915.79     | 353.15                | 10.00                   | 10.00                  | 0.00                  |
| 7,725.83                                     | 74.44           | 179.74      | 7,454.00            | -219.26    | 915.90     | 377.51                | 10.00                   | 10.00                  | 0.00                  |
| <b>Niobrara B</b>                            |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,750.00                                     | 76.86           | 179.74      | 7,459.99            | -242.67    | 916.00     | 400.57                | 10.00                   | 10.00                  | 0.00                  |
| 7,800.00                                     | 81.86           | 179.74      | 7,469.22            | -291.79    | 916.23     | 448.96                | 10.00                   | 10.00                  | 0.00                  |
| 7,850.00                                     | 86.86           | 179.74      | 7,474.14            | -341.53    | 916.45     | 497.96                | 10.00                   | 10.00                  | 0.00                  |
| 7,881.91                                     | 90.05           | 179.74      | 7,475.00            | -373.43    | 916.60     | 529.38                | 10.00                   | 10.00                  | 0.00                  |
| <b>Start 4859.77 hold at 7881.91 MD - 7"</b> |                 |             |                     |            |            |                       |                         |                        |                       |
| 7,900.00                                     | 90.05           | 179.74      | 7,474.98            | -391.52    | 916.68     | 547.20                | 0.00                    | 0.00                   | 0.00                  |
| 8,000.00                                     | 90.05           | 179.74      | 7,474.90            | -491.52    | 917.13     | 645.71                | 0.00                    | 0.00                   | 0.00                  |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                            |
|------------------|-----------------------------|-------------------------------------|----------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well HOWARD 26N-33HZ       |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17'RKB+4983'GL @ 5000.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17'RKB+4983'GL @ 5000.00ft |
| <b>Site:</b>     | WELD_HOWARD 4 PAD           | <b>North Reference:</b>             | True                       |
| <b>Well:</b>     | HOWARD 26N-33HZ             | <b>Survey Calculation Method:</b>   | Minimum Curvature          |
| <b>Wellbore:</b> | Wellbore #1                 |                                     |                            |
| <b>Design:</b>   | WP (01) PERMIT              |                                     |                            |

| 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) |
| 8,100.00                              | 90.05           | 179.74      | 7,474.82            | -591.52    | 917.58     | 744.22                | 0.00                    | 0.00                   | 0.00                  |
| 8,200.00                              | 90.05           | 179.74      | 7,474.74            | -691.51    | 918.04     | 842.72                | 0.00                    | 0.00                   | 0.00                  |
| 8,300.00                              | 90.05           | 179.74      | 7,474.65            | -791.51    | 918.49     | 941.23                | 0.00                    | 0.00                   | 0.00                  |
| 8,400.00                              | 90.05           | 179.74      | 7,474.57            | -891.51    | 918.94     | 1,039.74              | 0.00                    | 0.00                   | 0.00                  |
| 8,500.00                              | 90.05           | 179.74      | 7,474.49            | -991.51    | 919.39     | 1,138.25              | 0.00                    | 0.00                   | 0.00                  |
| 8,600.00                              | 90.05           | 179.74      | 7,474.41            | -1,091.51  | 919.85     | 1,236.76              | 0.00                    | 0.00                   | 0.00                  |
| 8,700.00                              | 90.05           | 179.74      | 7,474.33            | -1,191.51  | 920.30     | 1,335.26              | 0.00                    | 0.00                   | 0.00                  |
| 8,800.00                              | 90.05           | 179.74      | 7,474.24            | -1,291.51  | 920.75     | 1,433.77              | 0.00                    | 0.00                   | 0.00                  |
| 8,900.00                              | 90.05           | 179.74      | 7,474.16            | -1,391.51  | 921.21     | 1,532.28              | 0.00                    | 0.00                   | 0.00                  |
| 9,000.00                              | 90.05           | 179.74      | 7,474.08            | -1,491.51  | 921.66     | 1,630.79              | 0.00                    | 0.00                   | 0.00                  |
| 9,100.00                              | 90.05           | 179.74      | 7,474.00            | -1,591.51  | 922.11     | 1,729.30              | 0.00                    | 0.00                   | 0.00                  |
| 9,200.00                              | 90.05           | 179.74      | 7,473.91            | -1,691.50  | 922.56     | 1,827.81              | 0.00                    | 0.00                   | 0.00                  |
| 9,300.00                              | 90.05           | 179.74      | 7,473.83            | -1,791.50  | 923.02     | 1,926.31              | 0.00                    | 0.00                   | 0.00                  |
| 9,400.00                              | 90.05           | 179.74      | 7,473.75            | -1,891.50  | 923.47     | 2,024.82              | 0.00                    | 0.00                   | 0.00                  |
| 9,500.00                              | 90.05           | 179.74      | 7,473.67            | -1,991.50  | 923.92     | 2,123.33              | 0.00                    | 0.00                   | 0.00                  |
| 9,600.00                              | 90.05           | 179.74      | 7,473.59            | -2,091.50  | 924.38     | 2,221.84              | 0.00                    | 0.00                   | 0.00                  |
| 9,700.00                              | 90.05           | 179.74      | 7,473.50            | -2,191.50  | 924.83     | 2,320.35              | 0.00                    | 0.00                   | 0.00                  |
| 9,800.00                              | 90.05           | 179.74      | 7,473.42            | -2,291.50  | 925.28     | 2,418.86              | 0.00                    | 0.00                   | 0.00                  |
| 9,900.00                              | 90.05           | 179.74      | 7,473.34            | -2,391.50  | 925.73     | 2,517.36              | 0.00                    | 0.00                   | 0.00                  |
| 10,000.00                             | 90.05           | 179.74      | 7,473.26            | -2,491.50  | 926.19     | 2,615.87              | 0.00                    | 0.00                   | 0.00                  |
| 10,100.00                             | 90.05           | 179.74      | 7,473.17            | -2,591.49  | 926.64     | 2,714.38              | 0.00                    | 0.00                   | 0.00                  |
| 10,200.00                             | 90.05           | 179.74      | 7,473.09            | -2,691.49  | 927.09     | 2,812.89              | 0.00                    | 0.00                   | 0.00                  |
| 10,300.00                             | 90.05           | 179.74      | 7,473.01            | -2,791.49  | 927.54     | 2,911.40              | 0.00                    | 0.00                   | 0.00                  |
| 10,400.00                             | 90.05           | 179.74      | 7,472.93            | -2,891.49  | 928.00     | 3,009.90              | 0.00                    | 0.00                   | 0.00                  |
| 10,500.00                             | 90.05           | 179.74      | 7,472.84            | -2,991.49  | 928.45     | 3,108.41              | 0.00                    | 0.00                   | 0.00                  |
| 10,600.00                             | 90.05           | 179.74      | 7,472.76            | -3,091.49  | 928.90     | 3,206.92              | 0.00                    | 0.00                   | 0.00                  |
| 10,700.00                             | 90.05           | 179.74      | 7,472.68            | -3,191.49  | 929.36     | 3,305.43              | 0.00                    | 0.00                   | 0.00                  |
| 10,800.00                             | 90.05           | 179.74      | 7,472.60            | -3,291.49  | 929.81     | 3,403.94              | 0.00                    | 0.00                   | 0.00                  |
| 10,900.00                             | 90.05           | 179.74      | 7,472.52            | -3,391.49  | 930.26     | 3,502.45              | 0.00                    | 0.00                   | 0.00                  |
| 11,000.00                             | 90.05           | 179.74      | 7,472.43            | -3,491.49  | 930.71     | 3,600.95              | 0.00                    | 0.00                   | 0.00                  |
| 11,100.00                             | 90.05           | 179.74      | 7,472.35            | -3,591.48  | 931.17     | 3,699.46              | 0.00                    | 0.00                   | 0.00                  |
| 11,200.00                             | 90.05           | 179.74      | 7,472.27            | -3,691.48  | 931.62     | 3,797.97              | 0.00                    | 0.00                   | 0.00                  |
| 11,300.00                             | 90.05           | 179.74      | 7,472.19            | -3,791.48  | 932.07     | 3,896.48              | 0.00                    | 0.00                   | 0.00                  |
| 11,400.00                             | 90.05           | 179.74      | 7,472.10            | -3,891.48  | 932.53     | 3,994.99              | 0.00                    | 0.00                   | 0.00                  |
| 11,500.00                             | 90.05           | 179.74      | 7,472.02            | -3,991.48  | 932.98     | 4,093.50              | 0.00                    | 0.00                   | 0.00                  |
| 11,600.00                             | 90.05           | 179.74      | 7,471.94            | -4,091.48  | 933.43     | 4,192.00              | 0.00                    | 0.00                   | 0.00                  |
| 11,700.00                             | 90.05           | 179.74      | 7,471.86            | -4,191.48  | 933.88     | 4,290.51              | 0.00                    | 0.00                   | 0.00                  |
| 11,800.00                             | 90.05           | 179.74      | 7,471.78            | -4,291.48  | 934.34     | 4,389.02              | 0.00                    | 0.00                   | 0.00                  |
| 11,900.00                             | 90.05           | 179.74      | 7,471.69            | -4,391.48  | 934.79     | 4,487.53              | 0.00                    | 0.00                   | 0.00                  |
| 12,000.00                             | 90.05           | 179.74      | 7,471.61            | -4,491.47  | 935.24     | 4,586.04              | 0.00                    | 0.00                   | 0.00                  |
| 12,100.00                             | 90.05           | 179.74      | 7,471.53            | -4,591.47  | 935.69     | 4,684.55              | 0.00                    | 0.00                   | 0.00                  |
| 12,200.00                             | 90.05           | 179.74      | 7,471.45            | -4,691.47  | 936.15     | 4,783.05              | 0.00                    | 0.00                   | 0.00                  |
| 12,300.00                             | 90.05           | 179.74      | 7,471.36            | -4,791.47  | 936.60     | 4,881.56              | 0.00                    | 0.00                   | 0.00                  |
| 12,400.00                             | 90.05           | 179.74      | 7,471.28            | -4,891.47  | 937.05     | 4,980.07              | 0.00                    | 0.00                   | 0.00                  |
| 12,500.00                             | 90.05           | 179.74      | 7,471.20            | -4,991.47  | 937.51     | 5,078.58              | 0.00                    | 0.00                   | 0.00                  |
| 12,600.00                             | 90.05           | 179.74      | 7,471.12            | -5,091.47  | 937.96     | 5,177.09              | 0.00                    | 0.00                   | 0.00                  |
| 12,700.00                             | 90.05           | 179.74      | 7,471.03            | -5,191.47  | 938.41     | 5,275.59              | 0.00                    | 0.00                   | 0.00                  |
| 12,741.67                             | 90.05           | 179.74      | 7,471.00            | -5,233.14  | 938.60     | 5,316.65              | 0.00                    | 0.00                   | 0.00                  |
| TD at 12741.67 - HOWARD 26N-33HZ PBHL |                 |             |                     |            |            |                       |                         |                        |                       |

# Andarko Petroleum Corporation

## Planning Report

|                  |                             |                                     |                            |
|------------------|-----------------------------|-------------------------------------|----------------------------|
| <b>Database:</b> | edmp                        | <b>Local Co-ordinate Reference:</b> | Well HOWARD 26N-33HZ       |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 17'RKB+4983'GL @ 5000.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 17'RKB+4983'GL @ 5000.00ft |
| <b>Site:</b>     | WELD_HOWARD 4 PAD           | <b>North Reference:</b>             | True                       |
| <b>Well:</b>     | HOWARD 26N-33HZ             | <b>Survey Calculation Method:</b>   | Minimum Curvature          |
| <b>Wellbore:</b> | Wellbore #1                 |                                     |                            |
| <b>Design:</b>   | WP (01) PERMIT              |                                     |                            |

| 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                   |           |          |          |           |        |              |              |           |             |
| HOWARD 26N-33HZ PE        | 0.00      | 0.00     | 7,471.00 | -5,233.14 | 938.60 | 1,248,640.20 | 3,171,786.47 | 40.014273 | -104.886680 |
| - plan hits target center |           |          |          |           |        |              |              |           |             |
| - Point                   |           |          |          |           |        |              |              |           |             |

| Casing Points  |                |        |  |                 |               |
|----------------|----------------|--------|--|-----------------|---------------|
| Measured Depth | Vertical Depth | Name   |  | Casing Diameter | Hole Diameter |
| (ft)           | (ft)           |        |  | (")             | (")           |
| 900.00         | 900.00         | 9 5/8" |  | 9-5/8           | 12-1/4        |
| 7,881.91       | 7,475.00       | 7"     |  | 7               | 7-1/2         |

| Formations     |                |                |  |     |               |
|----------------|----------------|----------------|--|-----|---------------|
| Measured Depth | Vertical Depth | Name           |  | Dip | Dip Direction |
| (ft)           | (ft)           |                |  | (°) | (°)           |
| 4,831.74       | 4,780.00       | Sussex         |  |     |               |
| 7,429.76       | 7,306.00       | Sharon Springs |  |     |               |
| 7,457.22       | 7,325.00       | Niobrara A     |  |     |               |
| 7,725.83       | 7,454.00       | Niobrara B     |  |     |               |

| Plan Annotations |                |                   |        |                                  |  |
|------------------|----------------|-------------------|--------|----------------------------------|--|
| Measured Depth   | Vertical Depth | Local Coordinates |        | Comment                          |  |
| (ft)             | (ft)           | +N/-S             | +E/-W  |                                  |  |
| (ft)             | (ft)           | (ft)              | (ft)   |                                  |  |
| 1,100.00         | 1,100.00       | 0.00              | 0.00   | Start Build 2.00                 |  |
| 1,600.55         | 1,598.01       | 9.32              | 42.61  | Start 4880.32 hold at 1600.55 MD |  |
| 6,480.88         | 6,404.03       | 190.68            | 871.39 | Start Drop -2.00                 |  |
| 6,981.43         | 6,902.04       | 200.00            | 914.00 | Start Build 10.00                |  |
| 7,881.91         | 7,475.00       | -373.42           | 916.60 | Start 4859.77 hold at 7881.91 MD |  |
| 12,741.67        | 7,471.00       | -5,233.14         | 938.60 | TD at 12741.67                   |  |