

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_HOWARD 20-29 PAD**

**Howard 23-29**

**Howard 23-29**

**Plan: Howard 23-29 (wp01)**

## **Standard Planning Report**

**10 May, 2011**



Project: COLORADO NORTHERN ZONE - 83  
Site: WELD\_HOWARD 20-29 PAD  
Well: Howard 23-29  
Wellbore: Howard 23-29  
Section:  
SHL:  
Design: Howard 23-29 (wp01)  
Latitude: 40.017875  
Longitude: -104.909643  
GL: 5023.00  
KB: 15' RKB + 5023' GL @ 5038.00ft

## FORMATION TOP DETAILS

| TVDPath | MDPath  | Formation |
|---------|---------|-----------|
| 3888.00 | 4061.20 | PK Depth  |
| 4838.00 | 5051.80 | SX Depth  |
| 7356.00 | 7571.83 | NIO Depth |
| 7775.00 | 7990.83 | CD Depth  |
| 7854.00 | 8069.83 | GH Depth  |
| 8208.00 | 8423.83 | J Depth   |



Azimuths to True North  
Magnetic North: 8.92°

Magnetic Field  
Strength: 52924.0snT  
Dip Angle: 66.72°  
Date: 5/6/2011  
Model: IGRF2010

## WELL DETAILS: Howard 23-29

| +N/-S | +E/-W | Northing   | Ground Level:<br>Easting | 5023.00<br>Latitude | Longitude   | Slot |
|-------|-------|------------|--------------------------|---------------------|-------------|------|
| 0.00  | 0.00  | 1249908.62 | 3165346.06               | 40.017875           | -104.909643 |      |

## CASING DETAILS

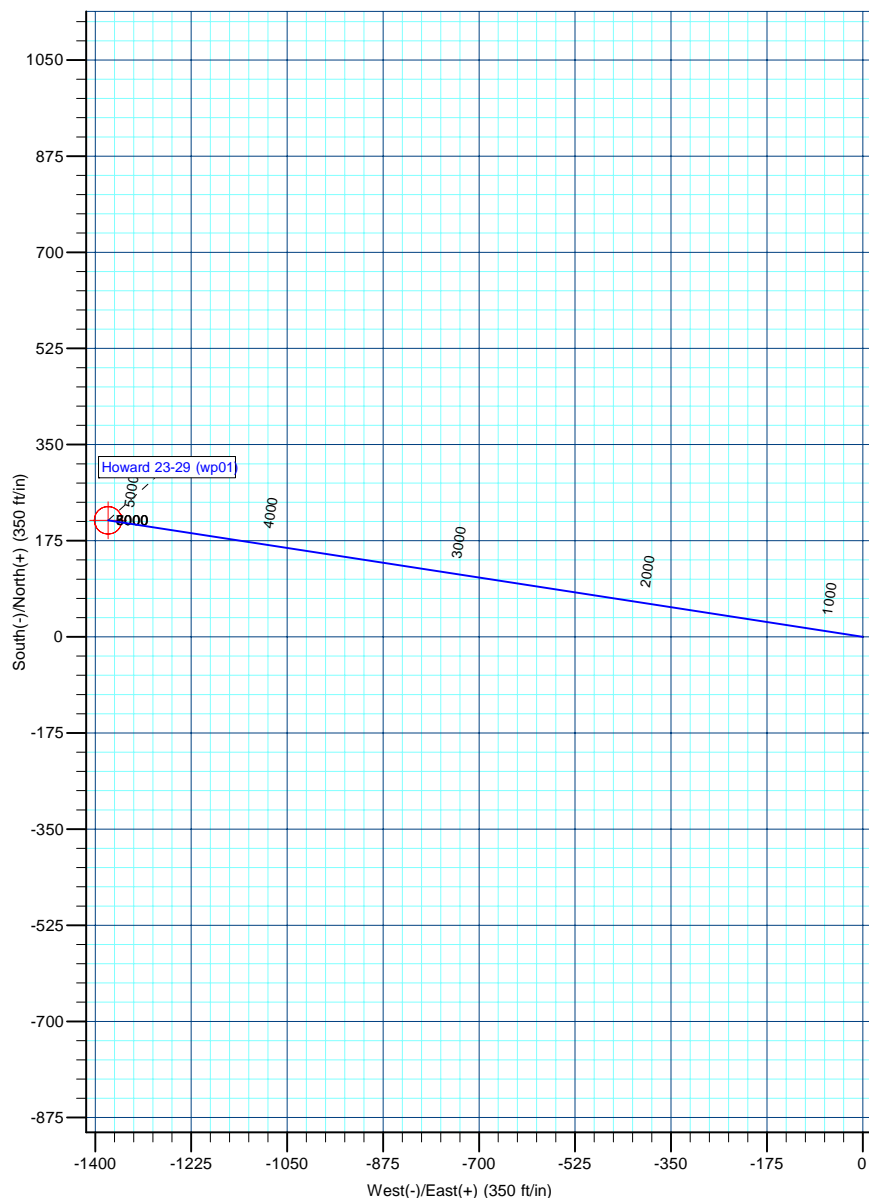
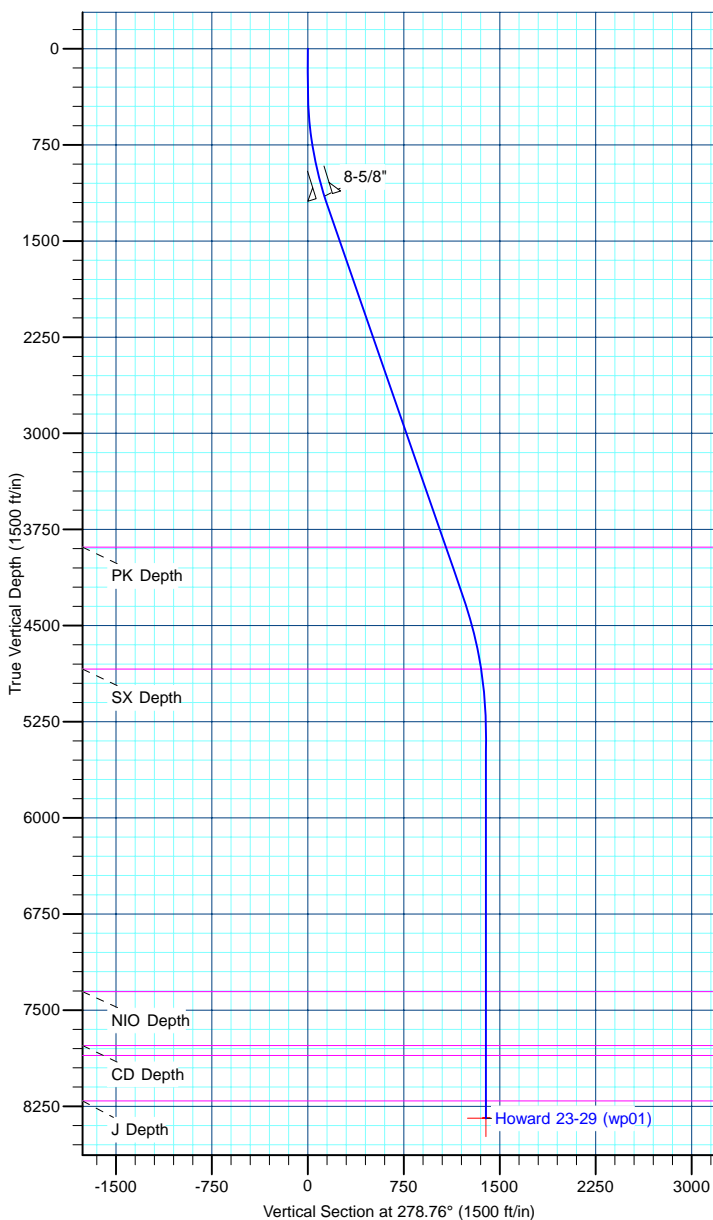
| TVD     | MD      | Name   | Size  |
|---------|---------|--------|-------|
| 1150.00 | 1162.99 | 8-5/8" | 8-5/8 |

## DESIGN TARGET DETAILS

| Name             | TVD     | +N/-S  | +E/-W    | Northing   | Easting    | Latitude  | Longitude   | Shape                  |
|------------------|---------|--------|----------|------------|------------|-----------|-------------|------------------------|
| Howard 23-29 BHL | 8343.00 | 212.06 | -1376.58 | 1250111.51 | 3163968.10 | 40.018457 | -104.914558 | Circle (Radius: 25.00) |

## 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    |
| 300.00  | 0.00  | 0.00   | 300.00  | 0.00   | 0.00     | 0.00 | 0.00   | 0.00    |
| 1258.51 | 19.17 | 278.76 | 1240.73 | 24.19  | -157.01  | 2.00 | 278.76 | 158.86  |
| 4463.39 | 19.17 | 278.76 | 4267.88 | 184.42 | -1197.14 | 0.00 | 0.00   | 1211.27 |
| 5558.83 | 0.00  | 0.00   | 5343.00 | 212.06 | -1376.58 | 1.75 | 180.00 | 1392.82 |
| 8558.83 | 0.00  | 0.00   | 8343.00 | 212.06 | -1376.58 | 0.00 | 0.00   | 1392.82 |



|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 23-29              |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | Howard 23-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | Howard 23-29                |                                     |                                |
| <b>Design:</b>   | Howard 23-29 (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      |                      |                |

| Site                  |  |  |          |  |  | WELD_HOWARD 20-29 PAD |  |  |                 |  |  |                   |  |  |             |  |  |
|-----------------------|--|--|----------|--|--|-----------------------|--|--|-----------------|--|--|-------------------|--|--|-------------|--|--|
| Site Position:        |  |  |          |  |  | Northing:             |  |  | 1,249,878.45 ft |  |  | Latitude:         |  |  | 40.017791   |  |  |
| From:                 |  |  | Lat/Long |  |  | Easting:              |  |  | 3,165,409.00 ft |  |  | Longitude:        |  |  | -104.909419 |  |  |
| Position Uncertainty: |  |  | 0.00 ft  |  |  | Slot Radius:          |  |  | 0 "             |  |  | Grid Convergence: |  |  | 0.38        |  |  |

|                      |              |           |                     |                 |               |             |
|----------------------|--------------|-----------|---------------------|-----------------|---------------|-------------|
| Well                 | Howard 23-29 |           |                     |                 |               |             |
| Well Position        | +N-S         | 30.58 ft  | Northing:           | 1,249,908.61 ft | Latitude:     | 40.017875   |
|                      | +E-W         | -62.74 ft | Easting:            | 3,165,346.06 ft | Longitude:    | -104.909643 |
| Position Uncertainty |              | 0.00 ft   | Wellhead Elevation: |                 | Ground Level: | 5,023.00 ft |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Howard 23-29      |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2010          | 5/6/2011           | 8.92                   | 66.72                | 52,924                     |

|                          |                              |                   |                      |                      |  |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|--|
| <b>Design</b>            | Howard 23-29 (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                 | 278.76               |  |

| <b>Plan Sections</b> |                 |             |                     |            |            |                       |                      |                     |         |                  |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|------------------|
| Measured Depth (ft)  | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target           |
| 0.00                 | 0.00            | 0.00        | 0.00                | 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    |                  |
| 1,258.51             | 19.17           | 278.76      | 1,240.73            | 24.19      | -157.01    | 2.00                  | 2.00                 | 0.00                | 278.76  |                  |
| 4,463.39             | 19.17           | 278.76      | 4,267.88            | 184.42     | -1,197.14  | 0.00                  | 0.00                 | 0.00                | 0.00    |                  |
| 5,558.83             | 0.00            | 0.00        | 5,343.00            | 212.06     | -1,376.58  | 1.75                  | -1.75                | 0.00                | 180.00  |                  |
| 8,558.83             | 0.00            | 0.00        | 8,343.00            | 212.06     | -1,376.58  | 0.00                  | 0.00                 | 0.00                | 0.00    | Howard 23-29 BHL |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 23-29              |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | Howard 23-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | Howard 23-29                |                                     |                                |
| <b>Design:</b>   | Howard 23-29 (wp01)         |                                     |                                |

| Planned Survey      |                 |             |                     |            |            |                       |                       |                      |                     |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 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              | 2.00            | 278.76      | 399.98              | 0.27       | -1.72      | 1.75                  | 2.00                  | 2.00                 | 0.00                |
| 500.00              | 4.00            | 278.76      | 499.84              | 1.06       | -6.90      | 6.98                  | 2.00                  | 2.00                 | 0.00                |
| 600.00              | 6.00            | 278.76      | 599.45              | 2.39       | -15.51     | 15.69                 | 2.00                  | 2.00                 | 0.00                |
| 700.00              | 8.00            | 278.76      | 698.70              | 4.24       | -27.55     | 27.88                 | 2.00                  | 2.00                 | 0.00                |
| 800.00              | 10.00           | 278.76      | 797.47              | 6.63       | -43.02     | 43.52                 | 2.00                  | 2.00                 | 0.00                |
| 900.00              | 12.00           | 278.76      | 895.62              | 9.53       | -61.87     | 62.60                 | 2.00                  | 2.00                 | 0.00                |
| 1,000.00            | 14.00           | 278.76      | 993.06              | 12.96      | -84.10     | 85.10                 | 2.00                  | 2.00                 | 0.00                |
| 1,100.00            | 16.00           | 278.76      | 1,089.64            | 16.90      | -109.68    | 110.98                | 2.00                  | 2.00                 | 0.00                |
| 1,162.99            | 17.26           | 278.76      | 1,150.00            | 19.64      | -127.50    | 129.00                | 2.00                  | 2.00                 | 0.00                |
| 8-5/8"              |                 |             |                     |            |            |                       |                       |                      |                     |
| 1,200.00            | 18.00           | 278.76      | 1,185.27            | 21.35      | -138.58    | 140.21                | 2.00                  | 2.00                 | 0.00                |
| 1,258.51            | 19.17           | 278.76      | 1,240.73            | 24.19      | -157.01    | 158.86                | 2.00                  | 2.00                 | 0.00                |
| 1,300.00            | 19.17           | 278.76      | 1,279.92            | 26.26      | -170.47    | 172.48                | 0.00                  | 0.00                 | 0.00                |
| 1,400.00            | 19.17           | 278.76      | 1,374.37            | 31.26      | -202.93    | 205.32                | 0.00                  | 0.00                 | 0.00                |
| 1,500.00            | 19.17           | 278.76      | 1,468.82            | 36.26      | -235.38    | 238.16                | 0.00                  | 0.00                 | 0.00                |
| 1,600.00            | 19.17           | 278.76      | 1,563.28            | 41.26      | -267.84    | 271.00                | 0.00                  | 0.00                 | 0.00                |
| 1,700.00            | 19.17           | 278.76      | 1,657.73            | 46.26      | -300.29    | 303.84                | 0.00                  | 0.00                 | 0.00                |
| 1,800.00            | 19.17           | 278.76      | 1,752.19            | 51.26      | -332.75    | 336.67                | 0.00                  | 0.00                 | 0.00                |
| 1,900.00            | 19.17           | 278.76      | 1,846.64            | 56.26      | -365.20    | 369.51                | 0.00                  | 0.00                 | 0.00                |
| 2,000.00            | 19.17           | 278.76      | 1,941.10            | 61.26      | -397.66    | 402.35                | 0.00                  | 0.00                 | 0.00                |
| 2,100.00            | 19.17           | 278.76      | 2,035.55            | 66.26      | -430.11    | 435.19                | 0.00                  | 0.00                 | 0.00                |
| 2,200.00            | 19.17           | 278.76      | 2,130.01            | 71.26      | -462.57    | 468.02                | 0.00                  | 0.00                 | 0.00                |
| 2,300.00            | 19.17           | 278.76      | 2,224.46            | 76.26      | -495.02    | 500.86                | 0.00                  | 0.00                 | 0.00                |
| 2,400.00            | 19.17           | 278.76      | 2,318.92            | 81.26      | -527.48    | 533.70                | 0.00                  | 0.00                 | 0.00                |
| 2,500.00            | 19.17           | 278.76      | 2,413.37            | 86.26      | -559.93    | 566.54                | 0.00                  | 0.00                 | 0.00                |
| 2,600.00            | 19.17           | 278.76      | 2,507.83            | 91.26      | -592.39    | 599.37                | 0.00                  | 0.00                 | 0.00                |
| 2,700.00            | 19.17           | 278.76      | 2,602.28            | 96.26      | -624.84    | 632.21                | 0.00                  | 0.00                 | 0.00                |
| 2,800.00            | 19.17           | 278.76      | 2,696.74            | 101.26     | -657.30    | 665.05                | 0.00                  | 0.00                 | 0.00                |
| 2,900.00            | 19.17           | 278.76      | 2,791.19            | 106.26     | -689.75    | 697.89                | 0.00                  | 0.00                 | 0.00                |
| 3,000.00            | 19.17           | 278.76      | 2,885.65            | 111.26     | -722.20    | 730.72                | 0.00                  | 0.00                 | 0.00                |
| 3,100.00            | 19.17           | 278.76      | 2,980.10            | 116.26     | -754.66    | 763.56                | 0.00                  | 0.00                 | 0.00                |
| 3,200.00            | 19.17           | 278.76      | 3,074.55            | 121.26     | -787.11    | 796.40                | 0.00                  | 0.00                 | 0.00                |
| 3,300.00            | 19.17           | 278.76      | 3,169.01            | 126.25     | -819.57    | 829.24                | 0.00                  | 0.00                 | 0.00                |
| 3,400.00            | 19.17           | 278.76      | 3,263.46            | 131.25     | -852.02    | 862.07                | 0.00                  | 0.00                 | 0.00                |
| 3,500.00            | 19.17           | 278.76      | 3,357.92            | 136.25     | -884.48    | 894.91                | 0.00                  | 0.00                 | 0.00                |
| 3,600.00            | 19.17           | 278.76      | 3,452.37            | 141.25     | -916.93    | 927.75                | 0.00                  | 0.00                 | 0.00                |
| 3,700.00            | 19.17           | 278.76      | 3,546.83            | 146.25     | -949.39    | 960.59                | 0.00                  | 0.00                 | 0.00                |
| 3,800.00            | 19.17           | 278.76      | 3,641.28            | 151.25     | -981.84    | 993.43                | 0.00                  | 0.00                 | 0.00                |
| 3,900.00            | 19.17           | 278.76      | 3,735.74            | 156.25     | -1,014.30  | 1,026.26              | 0.00                  | 0.00                 | 0.00                |
| 4,000.00            | 19.17           | 278.76      | 3,830.19            | 161.25     | -1,046.75  | 1,059.10              | 0.00                  | 0.00                 | 0.00                |
| 4,061.20            | 19.17           | 278.76      | 3,888.00            | 164.31     | -1,066.62  | 1,079.20              | 0.00                  | 0.00                 | 0.00                |
| PK Depth            |                 |             |                     |            |            |                       |                       |                      |                     |
| 4,100.00            | 19.17           | 278.76      | 3,924.65            | 166.25     | -1,079.21  | 1,091.94              | 0.00                  | 0.00                 | 0.00                |
| 4,200.00            | 19.17           | 278.76      | 4,019.10            | 171.25     | -1,111.66  | 1,124.78              | 0.00                  | 0.00                 | 0.00                |
| 4,300.00            | 19.17           | 278.76      | 4,113.56            | 176.25     | -1,144.12  | 1,157.61              | 0.00                  | 0.00                 | 0.00                |
| 4,400.00            | 19.17           | 278.76      | 4,208.01            | 181.25     | -1,176.57  | 1,190.45              | 0.00                  | 0.00                 | 0.00                |
| 4,463.39            | 19.17           | 278.76      | 4,267.88            | 184.42     | -1,197.14  | 1,211.27              | 0.00                  | 0.00                 | 0.00                |
| 4,500.00            | 18.53           | 278.76      | 4,302.53            | 186.22     | -1,208.84  | 1,223.09              | 1.75                  | -1.75                | 0.00                |
| 4,600.00            | 16.78           | 278.76      | 4,397.82            | 190.84     | -1,238.81  | 1,253.42              | 1.75                  | -1.75                | 0.00                |
| 4,700.00            | 15.03           | 278.76      | 4,493.99            | 195.01     | -1,265.89  | 1,280.82              | 1.75                  | -1.75                | 0.00                |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 23-29              |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | Howard 23-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | Howard 23-29                |                                     |                                |
| <b>Design:</b>   | Howard 23-29 (wp01)         |                                     |                                |

| Planned Survey          |                 |             |                     |            |            |                       |                       |                      |                     |
|-------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft)     | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 4,800.00                | 13.28           | 278.76      | 4,590.95            | 198.73     | -1,290.06  | 1,305.28              | 1.75                  | -1.75                | 0.00                |
| 4,900.00                | 11.53           | 278.76      | 4,688.61            | 202.00     | -1,311.29  | 1,326.76              | 1.75                  | -1.75                | 0.00                |
| 5,000.00                | 9.78            | 278.76      | 4,786.88            | 204.82     | -1,329.56  | 1,345.24              | 1.75                  | -1.75                | 0.00                |
| 5,051.80                | 8.87            | 278.76      | 4,838.00            | 206.10     | -1,337.86  | 1,353.64              | 1.75                  | -1.75                | 0.00                |
| <b>SX Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 5,100.00                | 8.03            | 278.76      | 4,885.67            | 207.18     | -1,344.86  | 1,360.72              | 1.75                  | -1.75                | 0.00                |
| 5,200.00                | 6.28            | 278.76      | 4,984.89            | 209.07     | -1,357.17  | 1,373.18              | 1.75                  | -1.75                | 0.00                |
| 5,300.00                | 4.53            | 278.76      | 5,084.44            | 210.51     | -1,366.48  | 1,382.60              | 1.75                  | -1.75                | 0.00                |
| 5,400.00                | 2.78            | 278.76      | 5,184.23            | 211.48     | -1,372.78  | 1,388.97              | 1.75                  | -1.75                | 0.00                |
| 5,500.00                | 1.03            | 278.76      | 5,284.18            | 211.98     | -1,376.06  | 1,392.29              | 1.75                  | -1.75                | 0.00                |
| 5,558.83                | 0.00            | 0.00        | 5,343.00            | 212.06     | -1,376.58  | 1,392.82              | 1.75                  | -1.75                | 0.00                |
| 5,600.00                | 0.00            | 0.00        | 5,384.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 5,700.00                | 0.00            | 0.00        | 5,484.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 5,800.00                | 0.00            | 0.00        | 5,584.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 5,900.00                | 0.00            | 0.00        | 5,684.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,000.00                | 0.00            | 0.00        | 5,784.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,100.00                | 0.00            | 0.00        | 5,884.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,200.00                | 0.00            | 0.00        | 5,984.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,300.00                | 0.00            | 0.00        | 6,084.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,400.00                | 0.00            | 0.00        | 6,184.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,500.00                | 0.00            | 0.00        | 6,284.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,600.00                | 0.00            | 0.00        | 6,384.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,700.00                | 0.00            | 0.00        | 6,484.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,800.00                | 0.00            | 0.00        | 6,584.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 6,900.00                | 0.00            | 0.00        | 6,684.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,000.00                | 0.00            | 0.00        | 6,784.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,100.00                | 0.00            | 0.00        | 6,884.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,200.00                | 0.00            | 0.00        | 6,984.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,300.00                | 0.00            | 0.00        | 7,084.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,400.00                | 0.00            | 0.00        | 7,184.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,500.00                | 0.00            | 0.00        | 7,284.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,571.83                | 0.00            | 0.00        | 7,356.00            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| <b>NIO Depth</b>        |                 |             |                     |            |            |                       |                       |                      |                     |
| 7,600.00                | 0.00            | 0.00        | 7,384.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,700.00                | 0.00            | 0.00        | 7,484.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,800.00                | 0.00            | 0.00        | 7,584.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,900.00                | 0.00            | 0.00        | 7,684.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 7,990.83                | 0.00            | 0.00        | 7,775.00            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| <b>CD Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 8,000.00                | 0.00            | 0.00        | 7,784.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,069.83                | 0.00            | 0.00        | 7,854.00            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| <b>GH Depth</b>         |                 |             |                     |            |            |                       |                       |                      |                     |
| 8,100.00                | 0.00            | 0.00        | 7,884.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,200.00                | 0.00            | 0.00        | 7,984.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,300.00                | 0.00            | 0.00        | 8,084.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,400.00                | 0.00            | 0.00        | 8,184.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,423.83                | 0.00            | 0.00        | 8,208.00            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| <b>J Depth</b>          |                 |             |                     |            |            |                       |                       |                      |                     |
| 8,500.00                | 0.00            | 0.00        | 8,284.17            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| 8,558.83                | 0.00            | 0.00        | 8,343.00            | 212.06     | -1,376.58  | 1,392.82              | 0.00                  | 0.00                 | 0.00                |
| <b>Howard 23-29 BHL</b> |                 |             |                     |            |            |                       |                       |                      |                     |

|                  |                             |                                     |                                |
|------------------|-----------------------------|-------------------------------------|--------------------------------|
| <b>Database:</b> | edm5000p                    | <b>Local Co-ordinate Reference:</b> | Well Howard 23-29              |
| <b>Company:</b>  | US ROCKIES REGION PLANNING  | <b>TVD Reference:</b>               | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Project:</b>  | COLORADO NORTHERN ZONE - 83 | <b>MD Reference:</b>                | 15' RKB + 5023' GL @ 5038.00ft |
| <b>Site:</b>     | WELD_HOWARD 20-29 PAD       | <b>North Reference:</b>             | True                           |
| <b>Well:</b>     | Howard 23-29                | <b>Survey Calculation Method:</b>   | Minimum Curvature              |
| <b>Wellbore:</b> | Howard 23-29                |                                     |                                |
| <b>Design:</b>   | Howard 23-29 (wp01)         |                                     |                                |

#### Design Targets

##### Target Name

| - hit/miss target         | Dip Angle<br>(°) | Dip Dir.<br>(°) | TVD<br>(ft) | +N/-S<br>(ft) | +E/-W<br>(ft) | Northing<br>(ft) | Easting<br>(ft) | Latitude  | Longitude   |
|---------------------------|------------------|-----------------|-------------|---------------|---------------|------------------|-----------------|-----------|-------------|
| - Shape                   |                  |                 |             |               |               |                  |                 |           |             |
| Howard 23-29 BHL          | 0.00             | 0.00            | 8,343.00    | 212.06        | -1,376.58     | 1,250,111.51     | 3,163,968.10    | 40.018457 | -104.914558 |
| - plan hits target center |                  |                 |             |               |               |                  |                 |           |             |
| - Circle (radius 25.00)   |                  |                 |             |               |               |                  |                 |           |             |

#### Casing Points

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Name   | Casing<br>Diameter<br>(") | Hole<br>Diameter<br>(") |
|---------------------------|---------------------------|--------|---------------------------|-------------------------|
| 1,162.99                  | 1,150.00                  | 8-5/8" | 8-5/8                     | 11                      |

#### Formations

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Name      | Lithology | Dip<br>(°) | Dip<br>Direction<br>(°) |
|---------------------------|---------------------------|-----------|-----------|------------|-------------------------|
| 4,061.20                  | 3,888.00                  | PK Depth  |           |            |                         |
| 5,051.80                  | 4,838.00                  | SX Depth  |           |            |                         |
| 7,571.83                  | 7,356.00                  | NIO Depth |           |            |                         |
| 7,990.83                  | 7,775.00                  | CD Depth  |           |            |                         |
| 8,069.83                  | 7,854.00                  | GH Depth  |           |            |                         |
| 8,423.83                  | 8,208.00                  | J Depth   |           |            |                         |