

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE SW SEC. 35 T8N R60W 6th P.M.

CINNAMON TEAL 35-15HC

ORIGINAL WELLBORE

13 April, 2018

Plan: PROPOSAL #3





Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE SW SEC. 35 T8N R60W 6th P.M.
Well: CINNAMON TEAL 35-15HC
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #3

| ANNOTATIONS | | | | | | | | | |
|-------------|----------|-------|--------|---------|---------|---------|---------|---|--|
| TVD | MD | Inc | Azi | +N/-S | +E/-W | VSec | Dep | Annotation | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | SHL: 550ft FSL & 2199ft FWL of Sec 35 | |
| 200.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | START NUDGE (2.5°/100ft BUR) | |
| 1331.50 | 1383.39 | 29.58 | 104.88 | -76.73 | 288.78 | 46.02 | 298.79 | EOB TO 29.58° INC | |
| 3740.54 | 4153.59 | 29.58 | 104.88 | -427.92 | 1610.59 | 256.69 | 1666.47 | END OF TANGENT | |
| 4872.04 | 5336.98 | 0.00 | 0.00 | -504.65 | 1899.37 | 302.72 | 1965.27 | EOD TO VERTICAL | |
| 5872.04 | 6336.98 | 0.00 | 0.00 | -504.65 | 1899.37 | 302.72 | 1965.27 | KOP (10°/100ft BUR) | |
| 6445.00 | 7236.98 | 90.00 | 348.20 | 56.20 | 1782.20 | 768.94 | 2538.22 | HZ LP *NEW*: 600ft FSL & 1295ft FEL of Sec 35 | |
| 6445.00 | 7676.43 | 90.00 | 1.38 | 492.87 | 1742.39 | 1152.63 | 2977.67 | EOT TO 1.38° AZ | |
| 6445.00 | 11347.88 | 90.00 | 1.38 | 4163.25 | 1831.01 | 4548.10 | 6649.12 | BHL: 600ft FNL & 1345ft FEL of Sec 35 | |

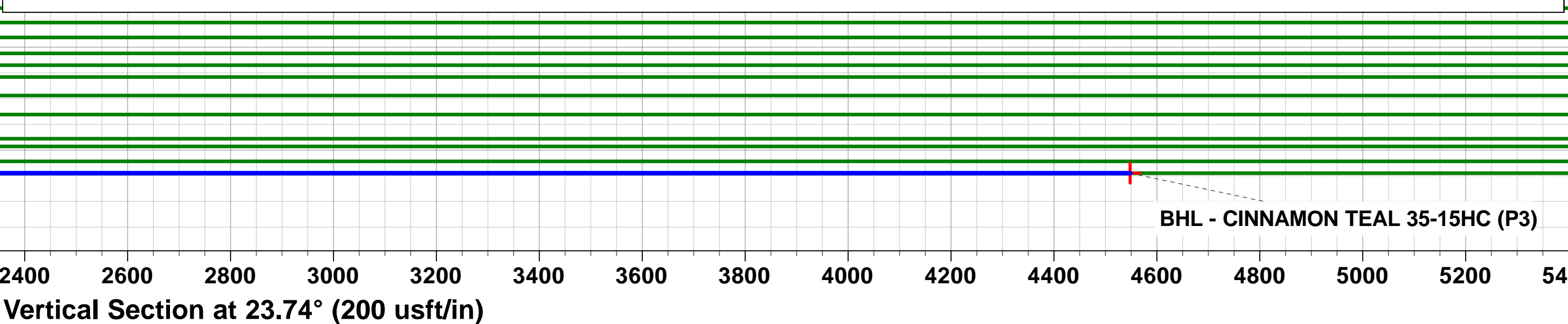
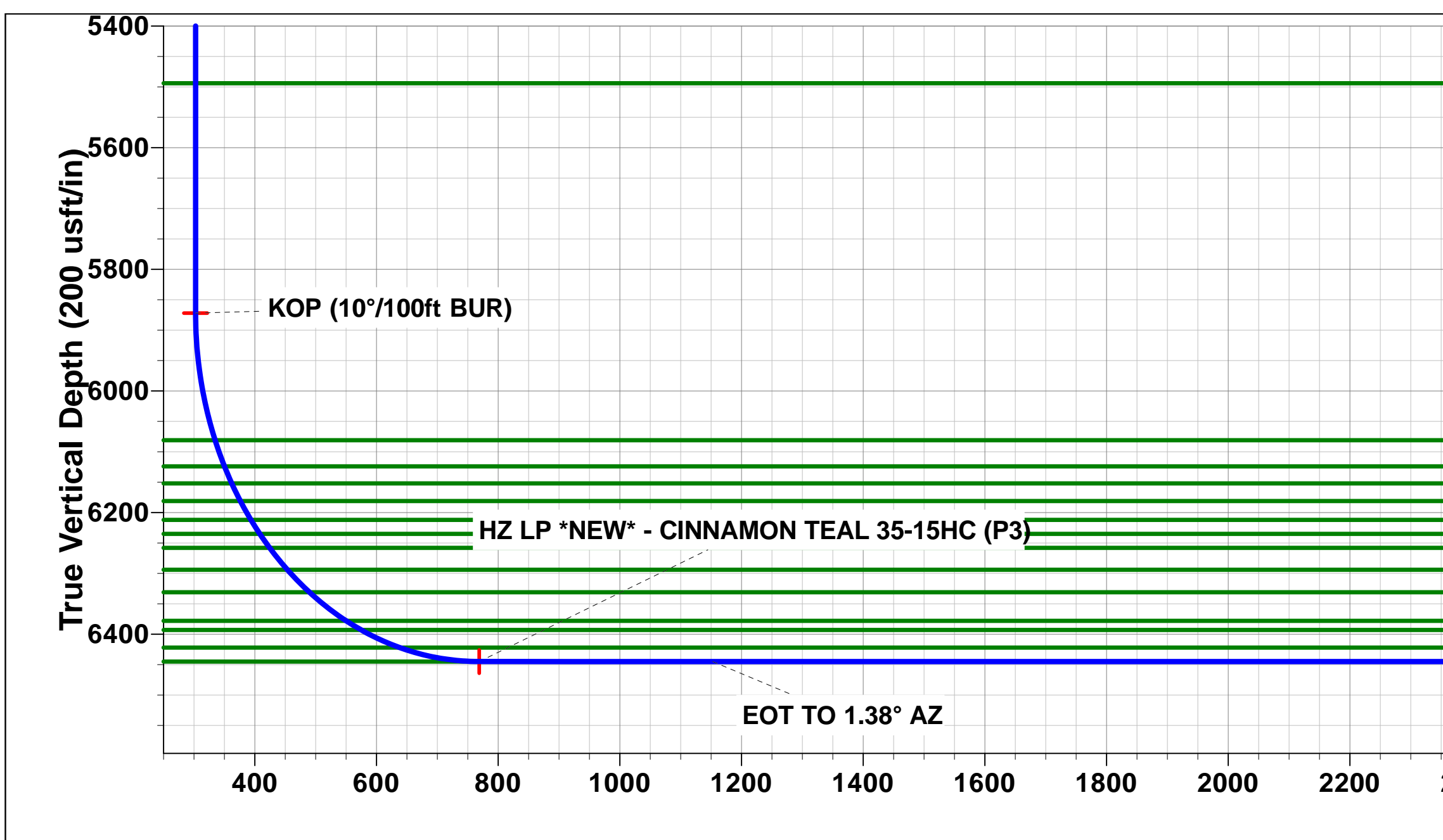
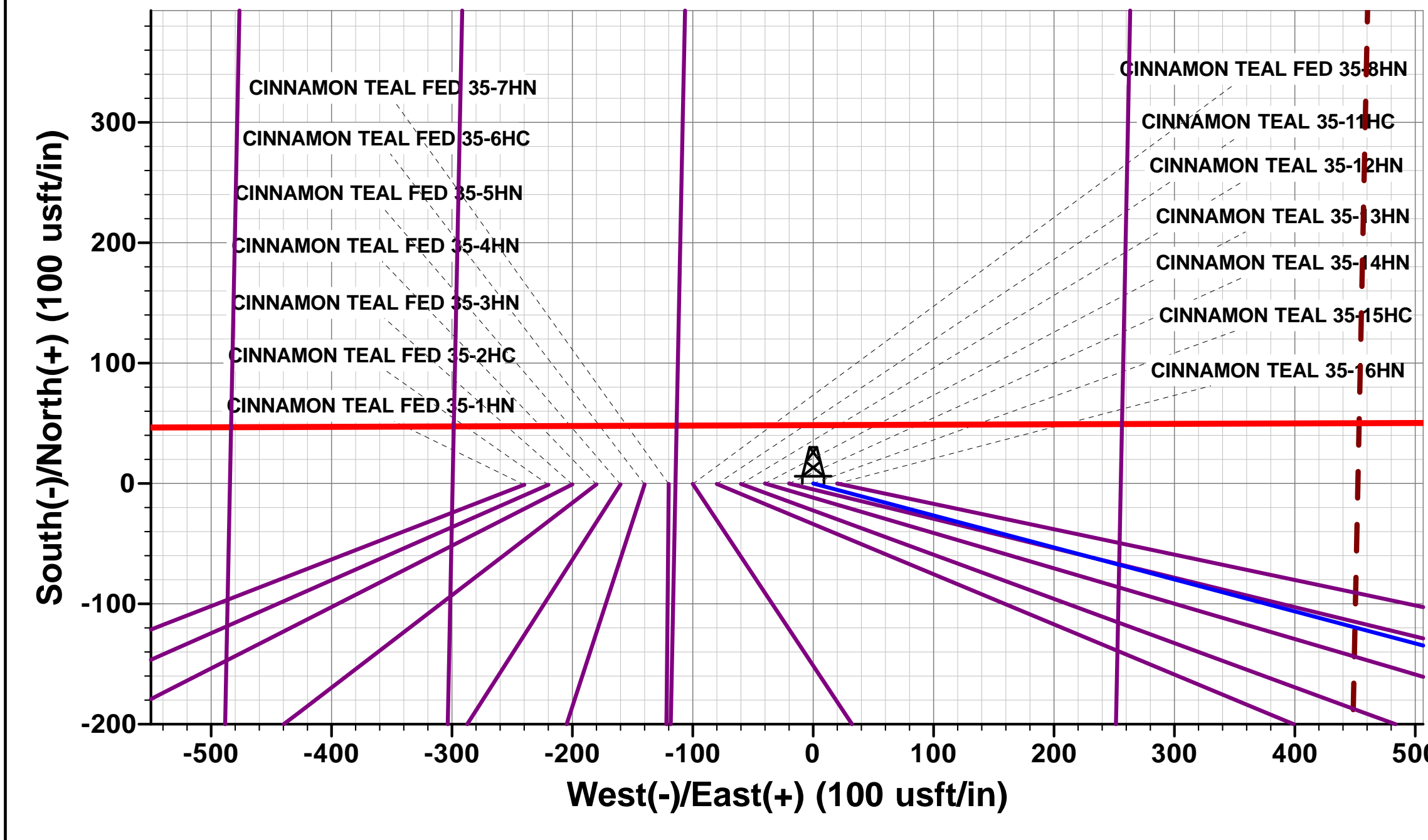
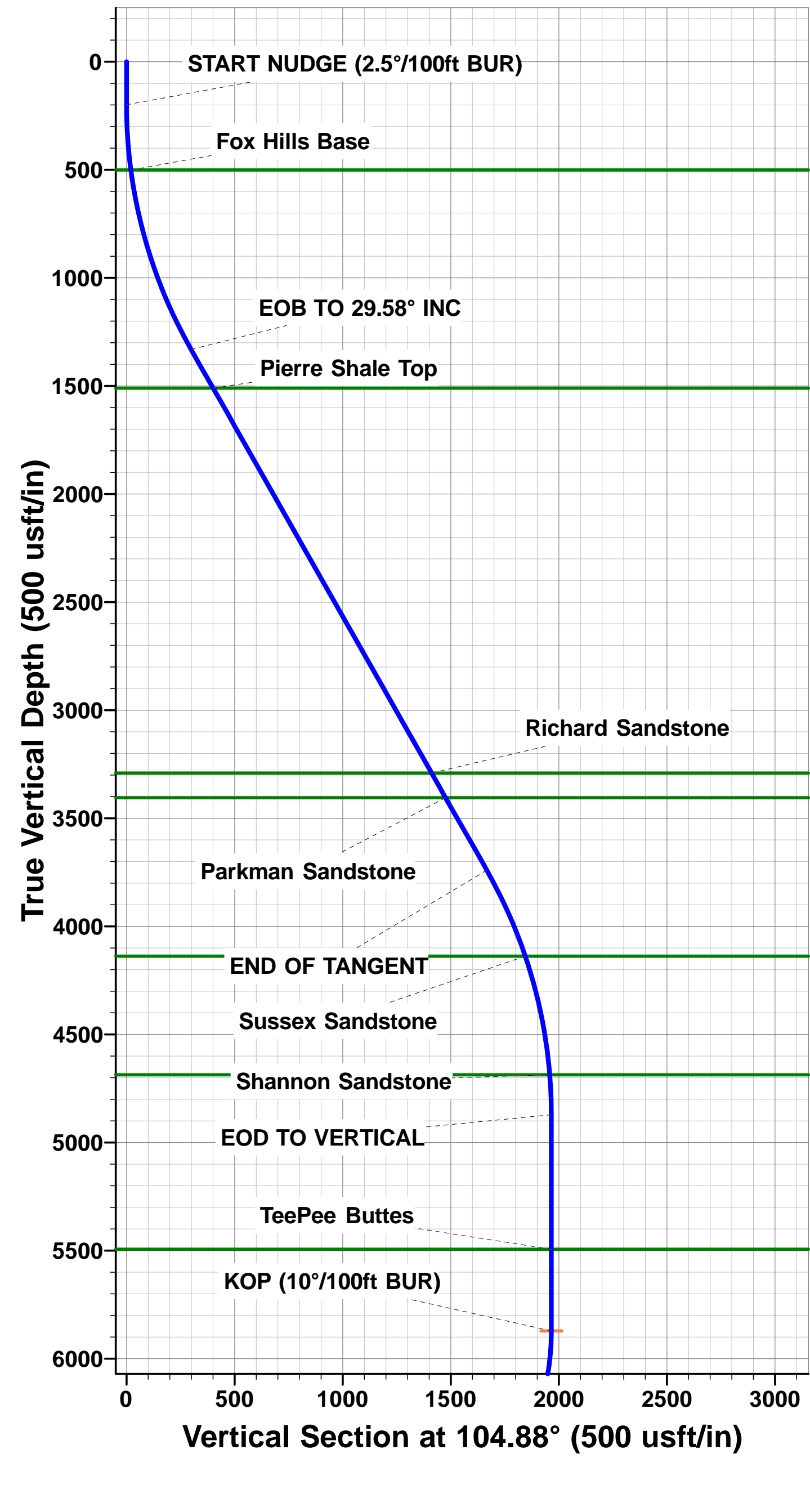
PROPOSED LOCAL COORDINATES:

SHL: 550ft FSL & 2199ft FWL Sec 35

HZ LP *NEW*: 600ft FSL & 1295ft FEL Sec 35

BHL: 600ft FNL & 1345ft FEL of Sec 35

| WELLBORE TARGET DETAILS (LAT/LONG) | | | | | |
|--|---------|---------|---------|-----------|-------------|
| Name | TVD | +N/-S | +E/-W | Latitude | Longitude |
| KOP - CINNAMON TEAL 35-15HC (P3) | 5872.04 | -504.65 | 1899.37 | 40.611676 | -104.054104 |
| HZ LP *NEW* - CINNAMON TEAL 35-15HC (P3) | 6445.00 | 56.20 | 1782.20 | 40.613215 | -104.054526 |
| BHL - CINNAMON TEAL 35-15HC (P3) | 6445.00 | 4163.25 | 1831.01 | 40.624488 | -104.054349 |



Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| | | | |
|--------------------|--------------------------------|----------------------|-----------------------------|
| Project | WELD COUNTY, COLORADO (NAD 83) | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Northern Zone | | Using geodetic scale factor |

| | | | | | |
|-----------------------|-----------|---------------------------------|-------------------|-------------------|-------------|
| Site | | SE SW SEC. 35 T8N R60W 6th P.M. | | | |
| Site Position: | | Northing: | 1,469,416.68 usft | Latitude: | 40.613058 |
| From: | Lat/Long | Easting: | 3,399,274.71 usft | Longitude: | -104.061809 |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 1.10000ft | Grid Convergence: | 0.93 ° |

| | | | | | | |
|----------------------|-----------------------|-------------|---------------------|-------------------|---------------|---------------|
| Well | CINNAMON TEAL 35-15HC | | | | | |
| Well Position | +N-S | 1.06 usft | Northing: | 1,469,421.63 usft | Latitude: | 40.613061 |
| | +E-W | 239.88 usft | Easting: | 3,399,514.54 usft | Longitude: | -104.060945 |
| Position Uncertainty | | 0.00 usft | Wellhead Elevation: | usft | Ground Level: | 4,924.00 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | ORIGINAL WELLBORE | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2015 | 18/09/2017 | 7.82 | 67.12 | 52,544 |

| | | | | |
|--------------------------|--------------------------------|--------------------|----------------------|----------------------|
| Design | PROPOSAL #3 | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PROTOTYPE | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (usft) | +N-S (usft) | +E-W (usft) | Direction (°) |
| | 6,445.00 | 0.00 | 0.00 | 23.74 |

| Plan Sections | | | | | | | | | | | |
|----------------------|---------|---------|----------------|-----------|-------------|-------------|------------------------|-----------------------|----------------------|---------|-------------------|
| MD (usft) | Inc (°) | Azi (°) | Vertical Depth | SS (usft) | +N-S (usft) | +E-W (usft) | Dogleg Rate (°/100usf) | Build Rate (°/100usf) | Turn Rate (°/100usf) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | -4,940.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 200.00 | 0.00 | 0.00 | 200.00 | -4,740.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,383.39 | 29.58 | 104.88 | 1,331.50 | -3,608.50 | -76.73 | 288.78 | 2.50 | 2.50 | 0.00 | 104.88 | |
| 4,153.59 | 29.58 | 104.88 | 3,740.54 | -1,199.46 | -427.92 | 1,610.59 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,336.98 | 0.00 | 0.00 | 4,872.04 | -67.96 | -504.65 | 1,899.37 | 2.50 | -2.50 | 0.00 | 180.00 | |
| 6,336.98 | 0.00 | 0.00 | 5,872.04 | 932.04 | -504.65 | 1,899.37 | 0.00 | 0.00 | 0.00 | 0.00 | KOP - CINNAMON |
| 7,236.98 | 90.00 | 348.20 | 6,445.00 | 1,505.00 | 56.20 | 1,782.20 | 10.00 | 10.00 | -1.31 | 348.20 | HZ LP *NEW* - CIN |
| 7,676.43 | 90.00 | 1.38 | 6,445.00 | 1,505.00 | 492.86 | 1,742.39 | 3.00 | 0.00 | 3.00 | 90.00 | |
| 11,347.88 | 90.00 | 1.38 | 6,445.00 | 1,505.00 | 4,163.25 | 1,831.01 | 0.00 | 0.00 | 0.00 | 0.00 | BHL - CINNAMON |

Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| Planned Survey | | | | | | | | | | |
|--|------------|------------|---------------|--------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| MD (usft) | Inc (°) | Azi (°) | TVD (usft) | SS (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| SHL: 550ft FSL & 2199ft FWL of Sec 35 | | | | | | | | | | |
| 0.00 | 0.00 | 0.00 | 0.00 | 4,940.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 4,840.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| START NUDGE (2.5°/100ft BUR) | | | | | | | | | | |
| 200.00 | 0.00 | 0.00 | 200.00 | 4,740.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 2.50 | 104.88 | 299.97 | 4,640.03 | -0.56 | 2.11 | 0.34 | 2.50 | 2.50 | 0.00 |
| 400.00 | 5.00 | 104.88 | 399.75 | 4,540.25 | -2.24 | 8.43 | 1.34 | 2.50 | 2.50 | 0.00 |
| 500.00 | 7.50 | 104.88 | 499.14 | 4,440.86 | -5.03 | 18.95 | 3.02 | 2.50 | 2.50 | 0.00 |
| Fox Hills Base | | | | | | | | | | |
| 501.87 | 7.55 | 104.88 | 501.00 | 4,439.00 | -5.10 | 19.19 | 3.06 | 2.50 | 2.50 | 0.00 |
| 600.00 | 10.00 | 104.88 | 597.97 | 4,342.03 | -8.94 | 33.65 | 5.36 | 2.50 | 2.50 | 0.00 |
| 700.00 | 12.50 | 104.88 | 696.04 | 4,243.96 | -13.95 | 52.50 | 8.37 | 2.50 | 2.50 | 0.00 |
| 800.00 | 15.00 | 104.88 | 793.17 | 4,146.83 | -20.05 | 75.47 | 12.03 | 2.50 | 2.50 | 0.00 |
| 900.00 | 17.50 | 104.88 | 889.17 | 4,050.83 | -27.24 | 102.52 | 16.34 | 2.50 | 2.50 | 0.00 |
| 1,000.00 | 20.00 | 104.88 | 983.85 | 3,956.15 | -35.49 | 133.58 | 21.29 | 2.50 | 2.50 | 0.00 |
| 1,100.00 | 22.50 | 104.88 | 1,077.05 | 3,862.95 | -44.80 | 168.61 | 26.87 | 2.50 | 2.50 | 0.00 |
| 1,200.00 | 25.00 | 104.88 | 1,168.57 | 3,771.43 | -55.14 | 207.53 | 33.08 | 2.50 | 2.50 | 0.00 |
| 1,300.00 | 27.50 | 104.88 | 1,258.25 | 3,681.75 | -66.49 | 250.27 | 39.89 | 2.50 | 2.50 | 0.00 |
| EOB TO 29.58° INC | | | | | | | | | | |
| 1,383.39 | 29.58 | 104.88 | 1,331.50 | 3,608.50 | -76.73 | 288.78 | 46.02 | 2.50 | 2.50 | 0.00 |
| 1,400.00 | 29.58 | 104.88 | 1,345.95 | 3,594.05 | -78.83 | 296.70 | 47.29 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 29.58 | 104.88 | 1,432.91 | 3,507.09 | -91.51 | 344.42 | 54.89 | 0.00 | 0.00 | 0.00 |
| Pierre Shale Top | | | | | | | | | | |
| 1,588.65 | 29.58 | 104.88 | 1,510.00 | 3,430.00 | -102.75 | 386.72 | 61.63 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 29.58 | 104.88 | 1,519.87 | 3,420.13 | -104.19 | 392.13 | 62.50 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 29.58 | 104.88 | 1,606.83 | 3,333.17 | -116.86 | 439.85 | 70.10 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 29.58 | 104.88 | 1,693.80 | 3,246.20 | -129.54 | 487.56 | 77.71 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 29.58 | 104.88 | 1,780.76 | 3,159.24 | -142.22 | 535.28 | 85.31 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 29.58 | 104.88 | 1,867.72 | 3,072.28 | -154.90 | 582.99 | 92.92 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 29.58 | 104.88 | 1,954.68 | 2,985.32 | -167.58 | 630.71 | 100.52 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 29.58 | 104.88 | 2,041.65 | 2,898.35 | -180.25 | 678.43 | 108.13 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 29.58 | 104.88 | 2,128.61 | 2,811.39 | -192.93 | 726.14 | 115.73 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 29.58 | 104.88 | 2,215.57 | 2,724.43 | -205.61 | 773.86 | 123.34 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 29.58 | 104.88 | 2,302.53 | 2,637.47 | -218.29 | 821.57 | 130.94 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 29.58 | 104.88 | 2,389.50 | 2,550.50 | -230.96 | 869.29 | 138.55 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 29.58 | 104.88 | 2,476.46 | 2,463.54 | -243.64 | 917.00 | 146.15 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 29.58 | 104.88 | 2,563.42 | 2,376.58 | -256.32 | 964.72 | 153.75 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 29.58 | 104.88 | 2,650.38 | 2,289.62 | -269.00 | 1,012.44 | 161.36 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 29.58 | 104.88 | 2,737.35 | 2,202.65 | -281.68 | 1,060.15 | 168.96 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 29.58 | 104.88 | 2,824.31 | 2,115.69 | -294.35 | 1,107.87 | 176.57 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 29.58 | 104.88 | 2,911.27 | 2,028.73 | -307.03 | 1,155.58 | 184.17 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 29.58 | 104.88 | 2,998.23 | 1,941.77 | -319.71 | 1,203.30 | 191.78 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 29.58 | 104.88 | 3,085.20 | 1,854.80 | -332.39 | 1,251.01 | 199.38 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 29.58 | 104.88 | 3,172.16 | 1,767.84 | -345.06 | 1,298.73 | 206.99 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 29.58 | 104.88 | 3,259.12 | 1,680.88 | -357.74 | 1,346.45 | 214.59 | 0.00 | 0.00 | 0.00 |
| Richard Sandstone | | | | | | | | | | |
| 3,636.66 | 29.58 | 104.88 | 3,291.00 | 1,649.00 | -362.39 | 1,363.94 | 217.38 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 29.58 | 104.88 | 3,346.08 | 1,593.92 | -370.42 | 1,394.16 | 222.20 | 0.00 | 0.00 | 0.00 |
| Parkman Sandstone | | | | | | | | | | |
| 3,767.75 | 29.58 | 104.88 | 3,405.00 | 1,535.00 | -379.01 | 1,426.49 | 227.35 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 29.58 | 104.88 | 3,433.05 | 1,506.95 | -383.10 | 1,441.88 | 229.80 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 29.58 | 104.88 | 3,520.01 | 1,419.99 | -395.77 | 1,489.59 | 237.41 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 29.58 | 104.88 | 3,606.97 | 1,333.03 | -408.45 | 1,537.31 | 245.01 | 0.00 | 0.00 | 0.00 |

Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| Planned Survey | | | | | | | | | | |
|-------------------------------|--------------|---------------|-----------------|------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| MD (usft) | Inc (°) | Azi (°) | TVD (usft) | SS (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 4,100.00 | 29.58 | 104.88 | 3,693.94 | 1,246.06 | -421.13 | 1,585.02 | 252.62 | 0.00 | 0.00 | 0.00 |
| END OF TANGENT | | | | | | | | | | |
| 4,153.59 | 29.58 | 104.88 | 3,740.54 | 1,199.46 | -427.92 | 1,610.59 | 256.69 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 28.42 | 104.88 | 3,781.13 | 1,158.87 | -433.70 | 1,632.34 | 260.16 | 2.50 | -2.50 | 0.00 |
| 4,300.00 | 25.92 | 104.88 | 3,870.08 | 1,069.92 | -445.43 | 1,676.48 | 267.19 | 2.50 | -2.50 | 0.00 |
| 4,400.00 | 23.42 | 104.88 | 3,960.94 | 979.06 | -456.15 | 1,716.82 | 273.62 | 2.50 | -2.50 | 0.00 |
| 4,500.00 | 20.92 | 104.88 | 4,053.54 | 886.46 | -465.84 | 1,753.30 | 279.44 | 2.50 | -2.50 | 0.00 |
| Sussex Sandstone | | | | | | | | | | |
| 4,589.77 | 18.68 | 104.88 | 4,138.00 | 802.00 | -473.65 | 1,782.69 | 284.12 | 2.50 | -2.50 | 0.00 |
| 4,600.00 | 18.42 | 104.88 | 4,147.70 | 792.30 | -474.48 | 1,785.83 | 284.62 | 2.50 | -2.50 | 0.00 |
| 4,700.00 | 15.92 | 104.88 | 4,243.23 | 696.77 | -482.07 | 1,814.37 | 289.17 | 2.50 | -2.50 | 0.00 |
| 4,800.00 | 13.42 | 104.88 | 4,339.96 | 600.04 | -488.57 | 1,838.85 | 293.07 | 2.50 | -2.50 | 0.00 |
| 4,900.00 | 10.92 | 104.88 | 4,437.70 | 502.30 | -493.98 | 1,859.23 | 296.32 | 2.50 | -2.50 | 0.00 |
| 5,000.00 | 8.42 | 104.88 | 4,536.27 | 403.73 | -498.30 | 1,875.47 | 298.91 | 2.50 | -2.50 | 0.00 |
| 5,100.00 | 5.92 | 104.88 | 4,635.48 | 304.52 | -501.51 | 1,887.54 | 300.83 | 2.50 | -2.50 | 0.00 |
| Shannon Sandstone | | | | | | | | | | |
| 5,151.74 | 4.63 | 104.88 | 4,687.00 | 253.00 | -502.73 | 1,892.14 | 301.56 | 2.50 | -2.50 | 0.00 |
| 5,200.00 | 3.42 | 104.88 | 4,735.14 | 204.86 | -503.60 | 1,895.41 | 302.09 | 2.50 | -2.50 | 0.00 |
| 5,300.00 | 0.92 | 104.88 | 4,835.06 | 104.94 | -504.57 | 1,899.08 | 302.67 | 2.50 | -2.50 | 0.00 |
| EOD TO VERTICAL | | | | | | | | | | |
| 5,336.98 | 0.00 | 0.00 | 4,872.04 | 67.96 | -504.65 | 1,899.37 | 302.72 | 2.50 | -2.50 | -283.61 |
| 5,400.00 | 0.00 | 0.00 | 4,935.06 | 4.94 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 0.00 | 0.00 | 5,035.06 | -95.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,135.06 | -195.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,235.06 | -295.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,335.06 | -395.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,435.06 | -495.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| TeePee Buttes | | | | | | | | | | |
| 5,958.94 | 0.00 | 0.00 | 5,494.00 | -554.00 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 5,535.06 | -595.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 5,635.06 | -695.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 5,735.06 | -795.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 5,835.06 | -895.06 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| KOP (10°/100ft BUR) | | | | | | | | | | |
| 6,336.98 | 0.00 | 0.00 | 5,872.04 | -932.04 | -504.65 | 1,899.37 | 302.72 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 6.30 | 348.20 | 5,934.93 | -994.93 | -501.26 | 1,898.66 | 305.53 | 10.00 | 10.00 | 0.00 |
| 6,500.00 | 16.30 | 348.20 | 6,032.87 | -1,092.87 | -482.10 | 1,894.66 | 321.46 | 10.00 | 10.00 | 0.00 |
| Sharon Springs | | | | | | | | | | |
| 6,550.87 | 21.39 | 348.20 | 6,081.00 | -1,141.00 | -466.02 | 1,891.30 | 334.83 | 10.00 | 10.00 | 0.00 |
| Niobrara Top | | | | | | | | | | |
| 6,597.86 | 26.09 | 348.20 | 6,124.00 | -1,184.00 | -447.51 | 1,887.43 | 350.22 | 10.00 | 10.00 | 0.00 |
| 6,600.00 | 26.30 | 348.20 | 6,125.92 | -1,185.92 | -446.59 | 1,887.24 | 350.98 | 10.00 | 10.00 | 0.00 |
| Niobrara A Chalk | | | | | | | | | | |
| 6,629.48 | 29.25 | 348.20 | 6,152.00 | -1,212.00 | -433.14 | 1,884.43 | 362.16 | 10.00 | 10.00 | 0.00 |
| Niobrara A Chalk Base | | | | | | | | | | |
| 6,663.30 | 32.63 | 348.20 | 6,181.00 | -1,241.00 | -416.12 | 1,880.88 | 376.31 | 10.00 | 10.00 | 0.00 |
| 6,700.00 | 36.30 | 348.20 | 6,211.25 | -1,271.25 | -395.79 | 1,876.63 | 393.21 | 10.00 | 10.00 | 0.00 |
| Niobrara B1 Chalk Top | | | | | | | | | | |
| 6,700.93 | 36.39 | 348.20 | 6,212.00 | -1,272.00 | -395.26 | 1,876.52 | 393.65 | 10.00 | 10.00 | 0.00 |
| Niobrara B1 Chalk Base | | | | | | | | | | |
| 6,730.06 | 39.31 | 348.20 | 6,235.00 | -1,295.00 | -377.76 | 1,872.86 | 408.20 | 10.00 | 10.00 | 0.00 |
| Niobrara B2 Chalk Top | | | | | | | | | | |

Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| Planned Survey | | | | | | | | | | |
|---|------------|------------|---------------|--------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| MD (usft) | Inc (°) | Azi (°) | TVD (usft) | SS (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 6,760.46 | 42.35 | 348.20 | 6,258.00 | -1,318.00 | -358.31 | 1,868.80 | 424.37 | 10.00 | 10.00 | 0.00 |
| 6,800.00 | 46.30 | 348.20 | 6,286.28 | -1,346.28 | -331.27 | 1,863.15 | 446.84 | 10.00 | 10.00 | 0.00 |
| Niobrara B2 Chalk Base | | | | | | | | | | |
| 6,811.29 | 47.43 | 348.20 | 6,294.00 | -1,354.00 | -323.21 | 1,861.46 | 453.55 | 10.00 | 10.00 | 0.00 |
| Niobrara C Chalk Top | | | | | | | | | | |
| 6,869.27 | 53.23 | 348.20 | 6,331.00 | -1,391.00 | -279.54 | 1,852.34 | 489.85 | 10.00 | 10.00 | 0.00 |
| 6,900.00 | 56.30 | 348.20 | 6,348.73 | -1,408.73 | -254.97 | 1,847.21 | 510.27 | 10.00 | 10.00 | 0.00 |
| Niobrara C Chalk Base | | | | | | | | | | |
| 6,957.12 | 62.01 | 348.20 | 6,378.00 | -1,438.00 | -206.98 | 1,837.18 | 550.16 | 10.00 | 10.00 | 0.00 |
| Niobrara D Chalk Top | | | | | | | | | | |
| 6,990.99 | 65.40 | 348.20 | 6,393.00 | -1,453.00 | -177.26 | 1,830.97 | 574.87 | 10.00 | 10.00 | 0.00 |
| 7,000.00 | 66.30 | 348.20 | 6,396.68 | -1,456.68 | -169.22 | 1,829.29 | 581.55 | 10.00 | 10.00 | 0.00 |
| Ft. Hays | | | | | | | | | | |
| 7,074.09 | 73.71 | 348.20 | 6,422.00 | -1,482.00 | -101.11 | 1,815.06 | 638.17 | 10.00 | 10.00 | 0.00 |
| 7,100.00 | 76.30 | 348.20 | 6,428.70 | -1,488.70 | -76.61 | 1,809.95 | 658.53 | 10.00 | 10.00 | 0.00 |
| 7,200.00 | 86.30 | 348.20 | 6,443.81 | -1,503.81 | 20.02 | 1,789.76 | 738.87 | 10.00 | 10.00 | 0.00 |
| HZ LP *NEW*: 600ft FSL & 1295ft FEL of Sec 35 - Codell (Target) | | | | | | | | | | |
| 7,236.98 | 90.00 | 348.20 | 6,445.00 | -1,505.00 | 56.20 | 1,782.20 | 768.94 | 10.00 | 10.00 | 0.00 |
| 7,300.00 | 90.00 | 350.09 | 6,445.00 | -1,505.00 | 118.09 | 1,770.33 | 820.81 | 3.00 | 0.00 | 3.00 |
| 7,400.00 | 90.00 | 353.09 | 6,445.00 | -1,505.00 | 217.00 | 1,755.71 | 905.47 | 3.00 | 0.00 | 3.00 |
| 7,500.00 | 90.00 | 356.09 | 6,445.00 | -1,505.00 | 316.54 | 1,746.28 | 992.79 | 3.00 | 0.00 | 3.00 |
| 7,600.00 | 90.00 | 359.09 | 6,445.00 | -1,505.00 | 416.44 | 1,742.08 | 1,082.55 | 3.00 | 0.00 | 3.00 |
| EOT TO 1.38° AZ | | | | | | | | | | |
| 7,676.43 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 492.87 | 1,742.39 | 1,152.63 | 3.00 | 0.00 | 3.00 |
| 7,700.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 516.43 | 1,742.96 | 1,174.43 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 616.40 | 1,745.38 | 1,266.91 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 716.37 | 1,747.79 | 1,359.39 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 816.34 | 1,750.20 | 1,451.88 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 916.31 | 1,752.62 | 1,544.36 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,016.29 | 1,755.03 | 1,636.84 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,116.26 | 1,757.45 | 1,729.33 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,216.23 | 1,759.86 | 1,821.81 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,316.20 | 1,762.27 | 1,914.29 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,416.17 | 1,764.69 | 2,006.78 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,516.14 | 1,767.10 | 2,099.26 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,616.11 | 1,769.51 | 2,191.74 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,716.08 | 1,771.93 | 2,284.23 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,816.05 | 1,774.34 | 2,376.71 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 1,916.02 | 1,776.76 | 2,469.19 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,015.99 | 1,779.17 | 2,561.68 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,115.97 | 1,781.58 | 2,654.16 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,215.94 | 1,784.00 | 2,746.64 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,315.91 | 1,786.41 | 2,839.13 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,415.88 | 1,788.82 | 2,931.61 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,515.85 | 1,791.24 | 3,024.09 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,615.82 | 1,793.65 | 3,116.58 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,715.79 | 1,796.07 | 3,209.06 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,815.76 | 1,798.48 | 3,301.54 | 0.00 | 0.00 | 0.00 |
| 10,100.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 2,915.73 | 1,800.89 | 3,394.02 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,015.70 | 1,803.31 | 3,486.51 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,115.67 | 1,805.72 | 3,578.99 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,215.64 | 1,808.13 | 3,671.47 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,315.62 | 1,810.55 | 3,763.96 | 0.00 | 0.00 | 0.00 |

Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| Planned Survey | | | | | | | | | | |
|--|--------------|-------------|-----------------|------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|
| MD (usft) | Inc (°) | Azi (°) | TVD (usft) | SS (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 10,600.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,415.59 | 1,812.96 | 3,856.44 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,515.56 | 1,815.38 | 3,948.92 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,615.53 | 1,817.79 | 4,041.41 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,715.50 | 1,820.20 | 4,133.89 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,815.47 | 1,822.62 | 4,226.37 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 3,915.44 | 1,825.03 | 4,318.86 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 4,015.41 | 1,827.44 | 4,411.34 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 4,115.38 | 1,829.86 | 4,503.82 | 0.00 | 0.00 | 0.00 |
| BHL: 600ft FNL & 1345ft FEL of Sec 35 | | | | | | | | | | |
| 11,347.88 | 90.00 | 1.38 | 6,445.00 | -1,505.00 | 4,163.25 | 1,831.01 | 4,548.10 | 0.00 | 0.00 | 0.00 |

| Formations | | | | | |
|--------------|---------------|------------------------|-----------|------------|-------------------------|
| MD (usft) | TVD (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
| 501.87 | 501.00 | Fox Hills Base | | 0.00 | |
| 1,588.65 | 1,510.00 | Pierre Shale Top | | 0.00 | |
| 3,636.66 | 3,291.00 | Richard Sandstone | | 0.00 | |
| 3,767.75 | 3,405.00 | Parkman Sandstone | | 0.00 | |
| 4,589.77 | 4,138.00 | Sussex Sandstone | | 0.00 | |
| 5,151.74 | 4,687.00 | Shannon Sandstone | | 0.00 | |
| 5,958.94 | 5,494.00 | TeePee Buttes | | 0.00 | |
| 6,550.87 | 6,081.00 | Sharon Springs | | 0.00 | |
| 6,597.86 | 6,124.00 | Niobrara Top | | 0.00 | |
| 6,629.48 | 6,152.00 | Niobrara A Chalk | | 0.00 | |
| 6,663.30 | 6,181.00 | Niobrara A Chalk Base | | 0.00 | |
| 6,700.93 | 6,212.00 | Niobrara B1 Chalk Top | | 0.00 | |
| 6,730.06 | 6,235.00 | Niobrara B1 Chalk Base | | 0.00 | |
| 6,760.46 | 6,258.00 | Niobrara B2 Chalk Top | | 0.00 | |
| 6,811.29 | 6,294.00 | Niobrara B2 Chalk Base | | 0.00 | |
| 6,869.27 | 6,331.00 | Niobrara C Chalk Top | | 0.00 | |
| 6,957.12 | 6,378.00 | Niobrara C Chalk Base | | 0.00 | |
| 6,990.99 | 6,393.00 | Niobrara D Chalk Top | | 0.00 | |
| 7,074.09 | 6,422.00 | Ft. Hays | | 0.00 | |
| 7,236.98 | 6,445.00 | Codell (Target) | | 0.00 | |

Planning Report



| | | | |
|------------------|---------------------------------|-------------------------------------|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well CINNAMON TEAL 35-15HC |
| Company: | MALLARD EXPLORATION | TVD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Project: | WELD COUNTY, COLORADO (NAD 83) | MD Reference: | KB-EST @ 4940.00usft (Original Well Elev) |
| Site: | SE SW SEC. 35 T8N R60W 6th P.M. | North Reference: | True |
| Well: | CINNAMON TEAL 35-15HC | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | ORIGINAL WELLBORE | | |
| Design: | PROPOSAL #3 | | |

| Plan Annotations | | | | |
|------------------|---------------|-------------------|-----------------|---|
| MD (usft) | TVD (usft) | Local Coordinates | | Comment |
| | | +N/-S (usft) | +E/-W (usft) | |
| 0.00 | 0.00 | 0.00 | 0.00 | SHL: 550ft FSL & 2199ft FWL of Sec 35 |
| 200.00 | 200.00 | 0.00 | 0.00 | START NUDGE (2.5°/100ft BUR) |
| 1,383.39 | 1,331.50 | -76.73 | 288.78 | EOB TO 29.58° INC |
| 4,153.59 | 3,740.54 | -427.92 | 1,610.59 | END OF TANGENT |
| 5,336.98 | 4,872.04 | -504.65 | 1,899.37 | EOD TO VERTICAL |
| 6,336.98 | 5,872.04 | -504.65 | 1,899.37 | KOP (10°/100ft BUR) |
| 7,236.98 | 6,445.00 | 56.20 | 1,782.20 | HZ LP *NEW*: 600ft FSL & 1295ft FEL of Sec 35 |
| 7,676.43 | 6,445.00 | 492.87 | 1,742.39 | EOT TO 1.38° AZ |
| 11,347.88 | 6,445.00 | 4,163.25 | 1,831.01 | BHL: 600ft FNL & 1345ft FEL of Sec 35 |