

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 21-T1N-R67W

Howard 4N-33HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

28 December, 2012

Well Coordinates: 1,254,437.59 N, 3,168,140.91 E (40° 01' 48.92" N, 104° 53' 58.40" W)

Ground Level: 5,025.00 ft

Local Coordinate Origin:

Centered on Well Howard 4N-33HZ

Viewing Datum:

RKB=17 @ 5042.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)

Site: Sec. 21-T1N-R67W

Well: Howard 4N-33HZ

Wellbore: Plan A Rev 0

Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

HALLIBURTON

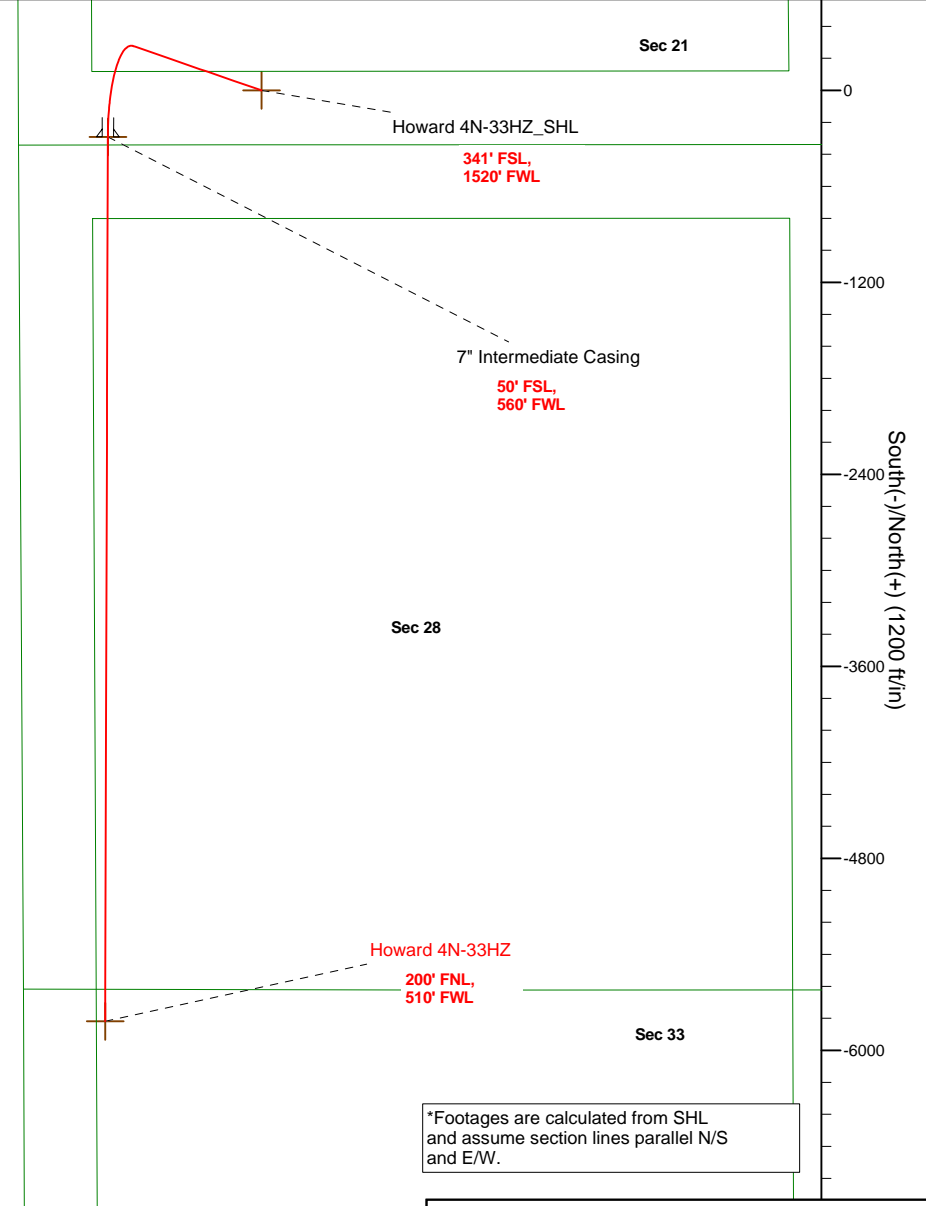
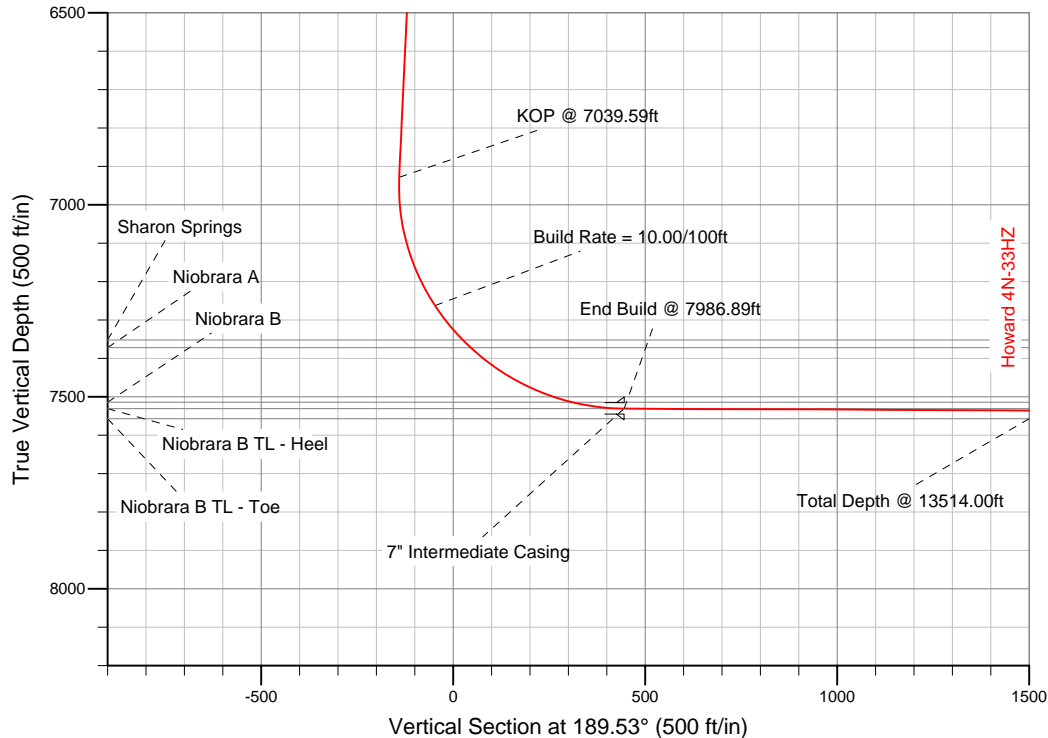
Sperry Drilling

SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSec | Target |
|-----|----------|-------|--------|---------|----------|---------|-------|---------|---------|--------------------|
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 2 | 3500.00 | 0.00 | 0.00 | 3500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 3 | 4278.94 | 15.58 | 289.08 | 4269.37 | 34.40 | -99.47 | 2.00 | 289.08 | -17.45 | |
| 4 | 7039.59 | 15.58 | 289.08 | 6928.61 | 276.70 | -800.16 | 0.00 | 0.00 | -140.40 | |
| 5 | 7986.89 | 89.73 | 180.17 | 7531.00 | -291.00 | -960.00 | 10.00 | -108.32 | 445.92 | Howard 4N-33HZ_CP |
| 6 | 13514.00 | 89.73 | 180.17 | 7557.00 | -5818.02 | -976.73 | 0.00 | 0.00 | 5899.44 | Howard 4N-33HZ_BHL |

WELLBORE TARGET DETAILS (LAT/LONG)

| Name | TVD | +N/-S | +E/-W | Latitude | Longitude | Shape |
|--------------------|---------|----------|---------|-----------|-------------|-------|
| Howard 4N-33HZ_SHL | 0.00 | 0.00 | 0.00 | 40.030256 | -104.899555 | Point |
| Howard 4N-33HZ_CP | 7531.00 | -291.00 | -960.00 | 40.029457 | -104.902983 | Point |
| Howard 4N-33HZ_BHL | 7557.00 | -5818.02 | -976.73 | 40.014285 | -104.903042 | Point |



*Footages are calculated from SHL and assume section lines parallel N/S and E/W.

WELL DETAILS: Howard 4N-33HZ

Ground Level: 5025.00 RKB=17 @ 5042.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Howard 4N-33HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 12/28/2012
Reviewed: _____ Date: _____

Plan Report for Howard 4N-33HZ - Plan A Rev 0 Permit

| 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) | Toolface Azimuth (°) |
|--------------------------------|--------------------|----------------|---------------------------|---------------|---------------|-----------------------------|-----------------------------|----------------------------|---------------------------|----------------------------|
| 0.00 | 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 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 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 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 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 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 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 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 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 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 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 | 0.00 |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 0.00 | 0.00 | 2,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 0.00 | 0.00 | 2,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 0.00 | 0.00 | 2,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 0.00 | 0.00 | 2,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 0.00 | 0.00 | 2,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 0.00 | 0.00 | 2,600.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 0.00 | 0.00 | 2,700.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 0.00 | 0.00 | 2,800.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 0.00 | 0.00 | 2,900.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 0.00 | 0.00 | 3,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 0.00 | 0.00 | 3,100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 0.00 | 0.00 | 3,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 0.00 | 0.00 | 3,300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 0.00 | 0.00 | 3,400.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 0.00 | 0.00 | 3,500.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Begin Nudge @ 3500.00ft | | | | | | | | | | |
| 3,600.00 | 2.00 | 289.08 | 3,599.98 | 0.57 | -1.65 | -0.29 | 2.00 | 2.00 | 0.00 | 289.08 |
| 3,700.00 | 4.00 | 289.08 | 3,699.84 | 2.28 | -6.60 | -1.16 | 2.00 | 2.00 | 0.00 | 0.00 |
| 3,800.00 | 6.00 | 289.08 | 3,799.45 | 5.13 | -14.83 | -2.60 | 2.00 | 2.00 | 0.00 | 0.00 |
| 3,900.00 | 8.00 | 289.08 | 3,898.70 | 9.11 | -26.35 | -4.62 | 2.00 | 2.00 | 0.00 | 0.00 |
| 4,000.00 | 10.00 | 289.08 | 3,997.47 | 14.22 | -41.13 | -7.22 | 2.00 | 2.00 | 0.00 | 0.00 |
| 4,100.00 | 12.00 | 289.08 | 4,095.62 | 20.46 | -59.16 | -10.38 | 2.00 | 2.00 | 0.00 | 0.00 |
| 4,200.00 | 14.00 | 289.08 | 4,193.06 | 27.81 | -80.42 | -14.11 | 2.00 | 2.00 | 0.00 | 0.00 |
| 4,278.94 | 15.58 | 289.08 | 4,269.38 | 34.40 | -99.47 | -17.45 | 2.00 | 2.00 | 0.00 | 0.00 |
| End Nudge @ 4278.94ft | | | | | | | | | | |
| 4,300.00 | 15.58 | 289.08 | 4,289.66 | 36.24 | -104.81 | -18.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 15.58 | 289.08 | 4,385.99 | 45.02 | -130.19 | -22.84 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 15.58 | 289.08 | 4,482.32 | 53.80 | -155.58 | -27.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 15.58 | 289.08 | 4,578.64 | 62.58 | -180.96 | -31.75 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 15.58 | 289.08 | 4,674.97 | 71.35 | -206.34 | -36.21 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 15.58 | 289.08 | 4,771.30 | 80.13 | -231.72 | -40.66 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,852.64 | 15.58 | 289.08 | 4,822.00 | 84.75 | -245.08 | -43.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | | |
| 4,900.00 | 15.58 | 289.08 | 4,867.62 | 88.91 | -257.10 | -45.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 15.58 | 289.08 | 4,963.95 | 97.68 | -282.48 | -49.57 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 15.58 | 289.08 | 5,060.27 | 106.46 | -307.86 | -54.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 15.58 | 289.08 | 5,156.60 | 115.24 | -333.25 | -58.47 | 0.00 | 0.00 | 0.00 | 0.00 |

Plan Report for Howard 4N-33HZ - Plan A Rev 0 Permit

| 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) | Toolface Azimuth (°) |
|--|-----------------|-------------|---------------------|-----------|-----------|-----------------------|-----------------------|----------------------|---------------------|----------------------|
| 5,300.00 | 15.58 | 289.08 | 5,252.93 | 124.01 | -358.63 | -62.93 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 15.58 | 289.08 | 5,349.25 | 132.79 | -384.01 | -67.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,500.00 | 15.58 | 289.08 | 5,445.58 | 141.57 | -409.39 | -71.83 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 15.58 | 289.08 | 5,541.91 | 150.35 | -434.77 | -76.29 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 15.58 | 289.08 | 5,638.23 | 159.12 | -460.15 | -80.74 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 15.58 | 289.08 | 5,734.56 | 167.90 | -485.53 | -85.20 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 15.58 | 289.08 | 5,830.88 | 176.68 | -510.92 | -89.65 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 15.58 | 289.08 | 5,927.21 | 185.45 | -536.30 | -94.10 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 15.58 | 289.08 | 6,023.54 | 194.23 | -561.68 | -98.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 15.58 | 289.08 | 6,119.86 | 203.01 | -587.06 | -103.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 15.58 | 289.08 | 6,216.19 | 211.78 | -612.44 | -107.46 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 15.58 | 289.08 | 6,312.52 | 220.56 | -637.82 | -111.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 15.58 | 289.08 | 6,408.84 | 229.34 | -663.21 | -116.37 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 15.58 | 289.08 | 6,505.17 | 238.11 | -688.59 | -120.82 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 15.58 | 289.08 | 6,601.49 | 246.89 | -713.97 | -125.28 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 15.58 | 289.08 | 6,697.82 | 255.67 | -739.35 | -129.73 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 15.58 | 289.08 | 6,794.15 | 264.45 | -764.73 | -134.19 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 15.58 | 289.08 | 6,890.47 | 273.22 | -790.11 | -138.64 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7,039.59 | 15.58 | 289.08 | 6,928.61 | 276.70 | -800.16 | -140.40 | 0.00 | 0.00 | 0.00 | 0.00 |
| KOP @ 7039.59ft | | | | | | | | | | |
| 7,100.00 | 14.81 | 266.06 | 6,986.96 | 278.82 | -815.54 | -139.95 | 10.00 | -1.28 | -38.10 | -108.32 |
| 7,200.00 | 18.36 | 232.70 | 7,083.00 | 268.37 | -840.88 | -125.45 | 10.00 | 3.56 | -33.36 | -86.09 |
| 7,300.00 | 25.51 | 213.65 | 7,175.81 | 240.83 | -865.40 | -94.23 | 10.00 | 7.14 | -19.05 | -54.03 |
| 7,400.00 | 34.05 | 203.07 | 7,262.59 | 197.04 | -888.36 | -47.24 | 10.00 | 8.54 | -10.58 | -36.30 |
| Build Rate = 10.00/100ft | | | | | | | | | | |
| 7,500.00 | 43.16 | 196.43 | 7,340.69 | 138.33 | -909.06 | 14.09 | 10.00 | 9.11 | -6.64 | -27.09 |
| 7,515.70 | 44.62 | 195.60 | 7,352.00 | 127.87 | -912.06 | 24.90 | 10.00 | 9.30 | -5.31 | -21.88 |
| Sharon Springs | | | | | | | | | | |
| 7,544.47 | 47.31 | 194.18 | 7,372.00 | 107.88 | -917.37 | 45.49 | 10.00 | 9.35 | -4.94 | -21.28 |
| Niobrara A | | | | | | | | | | |
| 7,600.00 | 52.55 | 191.75 | 7,407.73 | 66.48 | -926.86 | 87.89 | 10.00 | 9.43 | -4.36 | -20.29 |
| 7,700.00 | 62.07 | 188.14 | 7,461.69 | -16.32 | -941.24 | 171.93 | 10.00 | 9.53 | -3.62 | -18.73 |
| 7,800.00 | 71.68 | 185.11 | 7,500.92 | -107.57 | -951.74 | 263.66 | 10.00 | 9.61 | -3.03 | -16.77 |
| 7,847.35 | 76.25 | 183.80 | 7,514.00 | -152.92 | -955.27 | 308.97 | 10.00 | 9.64 | -2.76 | -15.58 |
| Niobrara B | | | | | | | | | | |
| 7,900.00 | 81.33 | 182.41 | 7,524.23 | -204.48 | -958.06 | 360.27 | 10.00 | 9.66 | -2.65 | -15.22 |
| 7,986.89 | 89.73 | 180.17 | 7,531.00 | -291.00 | -960.00 | 445.92 | 10.00 | 9.67 | -2.57 | -14.94 |
| End Build @ 7986.89ft - Niobrara B TL - Heel - 7" Intermediate Casing - Howard 4N-33HZ_CP | | | | | | | | | | |
| 8,000.00 | 89.73 | 180.17 | 7,531.06 | -304.11 | -960.04 | 458.86 | 0.00 | 0.00 | 0.00 | -14.77 |
| 8,100.00 | 89.73 | 180.17 | 7,531.53 | -404.10 | -960.34 | 557.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,200.00 | 89.73 | 180.17 | 7,532.00 | -504.10 | -960.64 | 656.19 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,300.00 | 89.73 | 180.17 | 7,532.47 | -604.10 | -960.95 | 754.86 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,400.00 | 89.73 | 180.17 | 7,532.94 | -704.10 | -961.25 | 853.53 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,500.00 | 89.73 | 180.17 | 7,533.41 | -804.10 | -961.55 | 952.20 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,600.00 | 89.73 | 180.17 | 7,533.88 | -904.10 | -961.86 | 1,050.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,700.00 | 89.73 | 180.17 | 7,534.35 | -1,004.10 | -962.16 | 1,149.54 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,800.00 | 89.73 | 180.17 | 7,534.82 | -1,104.09 | -962.46 | 1,248.20 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8,900.00 | 89.73 | 180.17 | 7,535.30 | -1,204.09 | -962.76 | 1,346.87 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,000.00 | 89.73 | 180.17 | 7,535.77 | -1,304.09 | -963.07 | 1,445.54 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,100.00 | 89.73 | 180.17 | 7,536.24 | -1,404.09 | -963.37 | 1,544.21 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,200.00 | 89.73 | 180.17 | 7,536.71 | -1,504.09 | -963.67 | 1,642.88 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,300.00 | 89.73 | 180.17 | 7,537.18 | -1,604.09 | -963.97 | 1,741.55 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,400.00 | 89.73 | 180.17 | 7,537.65 | -1,704.08 | -964.28 | 1,840.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,500.00 | 89.73 | 180.17 | 7,538.12 | -1,804.08 | -964.58 | 1,938.88 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,600.00 | 89.73 | 180.17 | 7,538.59 | -1,904.08 | -964.88 | 2,037.55 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,700.00 | 89.73 | 180.17 | 7,539.06 | -2,004.08 | -965.18 | 2,136.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,800.00 | 89.73 | 180.17 | 7,539.53 | -2,104.08 | -965.49 | 2,234.89 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9,900.00 | 89.73 | 180.17 | 7,540.00 | -2,204.08 | -965.79 | 2,333.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,000.00 | 89.73 | 180.17 | 7,540.47 | -2,304.08 | -966.09 | 2,432.23 | 0.00 | 0.00 | 0.00 | 0.00 |

Plan Report for Howard 4N-33HZ - Plan A Rev 0 Permit

| 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) | Toolface Azimuth (°) |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|----------------------|
| 10,100.00 | 89.73 | 180.17 | 7,540.94 | -2,404.07 | -966.39 | 2,530.89 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,200.00 | 89.73 | 180.17 | 7,541.41 | -2,504.07 | -966.70 | 2,629.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,300.00 | 89.73 | 180.17 | 7,541.88 | -2,604.07 | -967.00 | 2,728.23 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,400.00 | 89.73 | 180.17 | 7,542.35 | -2,704.07 | -967.30 | 2,826.90 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,500.00 | 89.73 | 180.17 | 7,542.82 | -2,804.07 | -967.61 | 2,925.57 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,600.00 | 89.73 | 180.17 | 7,543.29 | -2,904.07 | -967.91 | 3,024.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,700.00 | 89.73 | 180.17 | 7,543.76 | -3,004.06 | -968.21 | 3,122.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,800.00 | 89.73 | 180.17 | 7,544.23 | -3,104.06 | -968.51 | 3,221.57 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10,900.00 | 89.73 | 180.17 | 7,544.70 | -3,204.06 | -968.82 | 3,320.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,000.00 | 89.73 | 180.17 | 7,545.17 | -3,304.06 | -969.12 | 3,418.91 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,100.00 | 89.73 | 180.17 | 7,545.64 | -3,404.06 | -969.42 | 3,517.58 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,200.00 | 89.73 | 180.17 | 7,546.11 | -3,504.06 | -969.72 | 3,616.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,300.00 | 89.73 | 180.17 | 7,546.59 | -3,604.05 | -970.03 | 3,714.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,400.00 | 89.73 | 180.17 | 7,547.06 | -3,704.05 | -970.33 | 3,813.58 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,500.00 | 89.73 | 180.17 | 7,547.53 | -3,804.05 | -970.63 | 3,912.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,600.00 | 89.73 | 180.17 | 7,548.00 | -3,904.05 | -970.93 | 4,010.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,700.00 | 89.73 | 180.17 | 7,548.47 | -4,004.05 | -971.24 | 4,109.59 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,800.00 | 89.73 | 180.17 | 7,548.94 | -4,104.05 | -971.54 | 4,208.26 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11,900.00 | 89.73 | 180.17 | 7,549.41 | -4,204.05 | -971.84 | 4,306.93 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,000.00 | 89.73 | 180.17 | 7,549.88 | -4,304.04 | -972.14 | 4,405.60 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,100.00 | 89.73 | 180.17 | 7,550.35 | -4,404.04 | -972.45 | 4,504.26 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,200.00 | 89.73 | 180.17 | 7,550.82 | -4,504.04 | -972.75 | 4,602.93 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,300.00 | 89.73 | 180.17 | 7,551.29 | -4,604.04 | -973.05 | 4,701.60 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,400.00 | 89.73 | 180.17 | 7,551.76 | -4,704.04 | -973.35 | 4,800.27 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,500.00 | 89.73 | 180.17 | 7,552.23 | -4,804.04 | -973.66 | 4,898.94 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,600.00 | 89.73 | 180.17 | 7,552.70 | -4,904.03 | -973.96 | 4,997.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,700.00 | 89.73 | 180.17 | 7,553.17 | -5,004.03 | -974.26 | 5,096.28 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,800.00 | 89.73 | 180.17 | 7,553.64 | -5,104.03 | -974.57 | 5,194.94 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12,900.00 | 89.73 | 180.17 | 7,554.11 | -5,204.03 | -974.87 | 5,293.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,000.00 | 89.73 | 180.17 | 7,554.58 | -5,304.03 | -975.17 | 5,392.28 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,100.00 | 89.73 | 180.17 | 7,555.05 | -5,404.03 | -975.47 | 5,490.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,200.00 | 89.73 | 180.17 | 7,555.52 | -5,504.03 | -975.78 | 5,589.62 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,300.00 | 89.73 | 180.17 | 7,555.99 | -5,604.02 | -976.08 | 5,688.29 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,400.00 | 89.73 | 180.17 | 7,556.46 | -5,704.02 | -976.38 | 5,786.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,500.00 | 89.73 | 180.17 | 7,556.93 | -5,804.02 | -976.68 | 5,885.62 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13,514.00 | 89.73 | 180.17 | 7,557.00 | -5,818.02 | -976.73 | 5,899.44 | 0.00 | 0.00 | 0.00 | 0.00 |

Niobrara B TL - Toe - Howard 4N-33HZ_BHL

Plan Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | +E/-W (ft) | Comment |
|---------------------|---------------------|------------------------------|------------|--------------------------|
| 3,500.00 | 3,500.00 | 0.00 | 0.00 | Begin Nudge @ 3500.00ft |
| 4,278.94 | 4,269.38 | 34.40 | -99.47 | End Nudge @ 4278.94ft |
| 7,039.59 | 6,928.61 | 276.70 | -800.16 | KOP @ 7039.59ft |
| 7,400.00 | 7,262.59 | 197.04 | -888.36 | Build Rate = 10.00/100ft |
| 7,986.89 | 7,531.00 | -291.00 | -960.00 | End Build @ 7986.89ft |
| 13,514.00 | 7,557.00 | -5,818.02 | -976.73 | Total Depth @ 13514.00ft |

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin +N/_S (ft) | +E/-W (ft) | Start TVD (ft) |
|------------|--------------------|-------------|-------------|-------------------|------------|----------------|
| Target | Howard 4N-33HZ_BHL | 189.53 | Slot | 0.00 | 0.00 | 0.00 |

Plan Report for Howard 4N-33HZ - Plan A Rev 0 Permit

Survey tool program

| From (ft) | To (ft) | Survey/Plan | Survey Tool |
|--------------|------------|---------------------|-------------|
| 0.00 | 7,986.89 | Plan A Rev 0 Permit | MWD |
| 7,986.89 | 13,514.00 | Plan A Rev 0 Permit | MWD |

Casing Details

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---------------------------|---------------------------|------------------------|---------------------------|-------------------------|
| 7,986.89 | 7,531.00 | 7" Intermediate Casing | 7 | 8-3/4 |

Formation Details

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---------------------------|---------------------------|----------------------|-----------|------------|-------------------------|
| 4,852.64 | 4,822.00 | Sussex | | 0.00 | |
| 7,515.70 | 7,352.00 | Sharon Springs | | 0.00 | |
| 7,544.47 | 7,372.00 | Niobrara A | | 0.00 | |
| 7,847.35 | 7,514.00 | Niobrara B | | 0.00 | |
| 7,986.89 | 7,531.00 | Niobrara B TL - Heel | | 0.00 | |
| 13,514.00 | 7,557.00 | Niobrara B TL - Toe | | 0.00 | |

Targets associated with this wellbore

| Target Name | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Shape |
|--------------------|-------------|---------------|---------------|-------|
| Howard 4N-33HZ_BHL | 7,557.00 | -5,818.02 | -976.73 | Point |
| Howard 4N-33HZ_SHL | 0.00 | 0.00 | 0.00 | Point |
| Howard 4N-33HZ_CP | 7,531.00 | -291.00 | -960.00 | Point |

North Reference Sheet for Sec. 21-T1N-R67W - Howard 4N-33HZ - Plan A Rev 0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
 Vertical Depths are relative to RKB=17 @ 5042.00ft (Drilling Rig). Northing and Easting are relative to Howard 4N-33HZ
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)
 Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°
 False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996421

Grid Coordinates of Well: 1,254,437.59 ft N, 3,168,140.91 ft E
 Geographical Coordinates of Well: 40° 01' 48.92" N, 104° 53' 58.40" W
 Grid Convergence at Surface is: 0.39°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,514.00ft
 the Bottom Hole Displacement is 5,899.44ft in the Direction of 189.53° (True).

Magnetic Convergence at surface is: -8.36° (27 December 2012, , BGGM2012)

