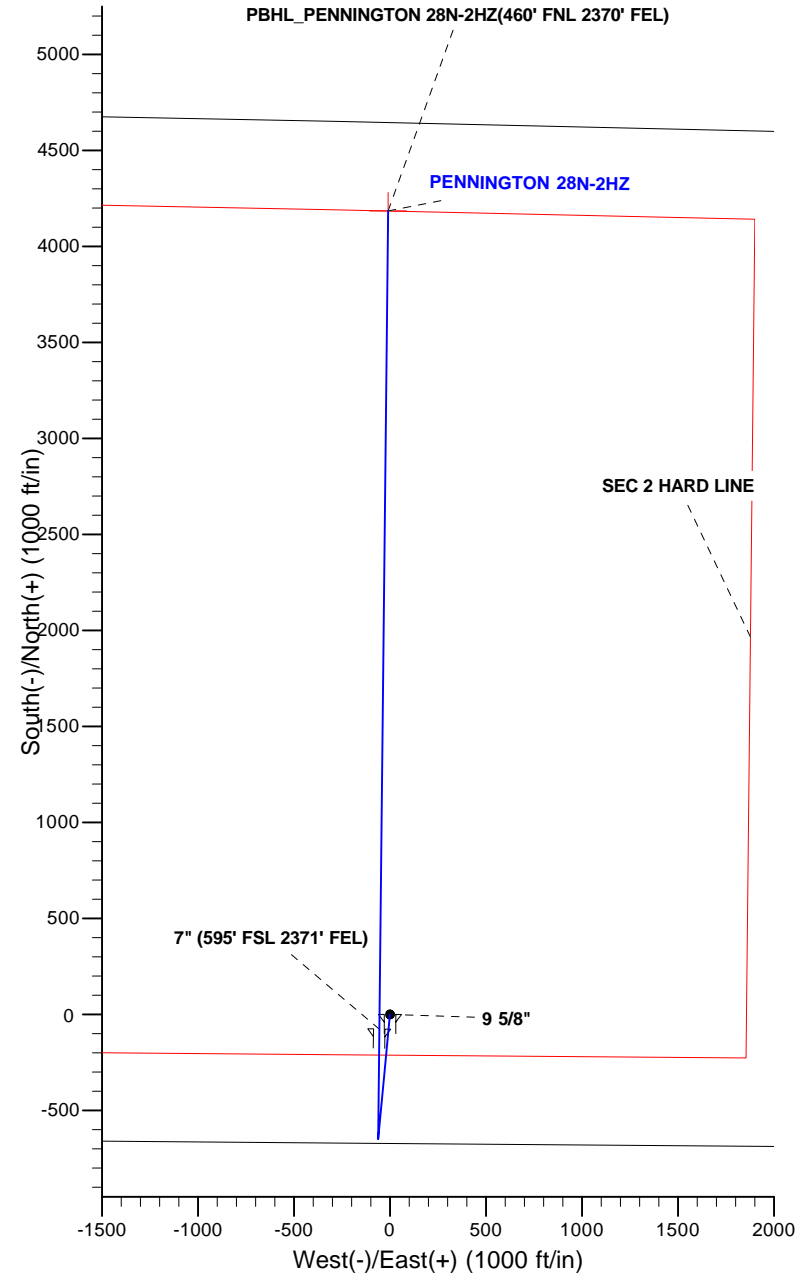
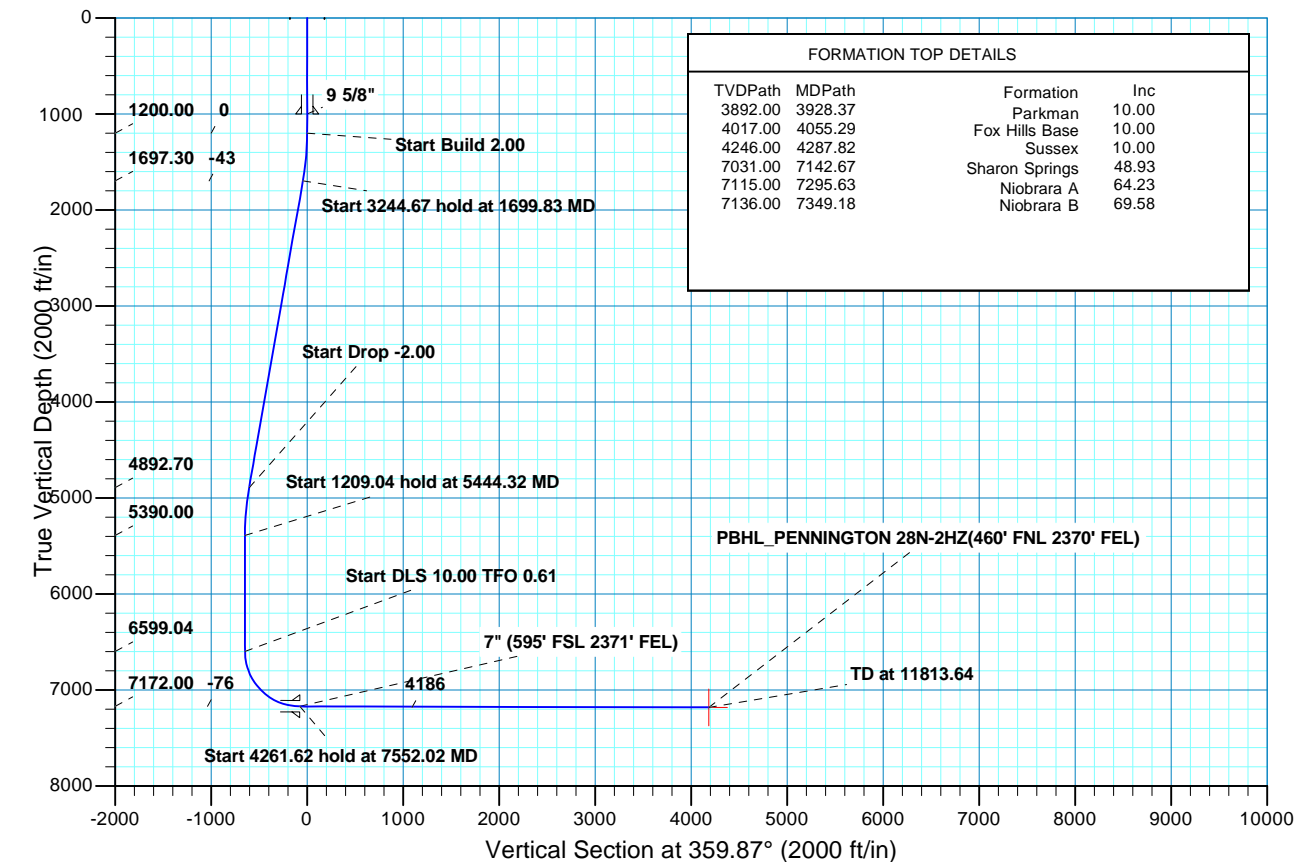


| WELL DETAILS: PENNINGTON 28N-2HZ | | | | | | | | | | |
|---|-------|--------|---------|---------|--------|------------|----------------|---|--------------|-------|
| GL 4860' & KB 17' @ 4877.00ft (ASSUMED) | | | | | | | | | | |
| | | | | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | |
| | | | | 0.00 | 0.00 | 1302373.07 | 3179789.65 | 40.1616190 | -104.8567160 | |
| SECTION DETAILS | | | | | | | | | | |
| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 1200.00 | 0.00 | 0.00 | 1200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1699.83 | 10.00 | 185.41 | 1697.30 | -43.30 | -4.10 | 2.00 | 185.41 | -43.29 | | |
| 4944.49 | 10.00 | 185.41 | 4892.70 | -604.03 | -57.20 | 0.00 | 0.00 | -603.90 | | |
| 5444.32 | 0.00 | 0.00 | 5390.00 | -647.33 | -61.30 | 2.00 | 180.00 | -647.19 | | |
| 6653.36 | 0.00 | 0.00 | 6599.04 | -647.33 | -61.30 | 0.00 | 0.00 | -647.19 | | |
| 7552.02 | 89.87 | 0.61 | 7172.00 | -75.75 | -55.17 | 10.00 | 0.61 | -75.62 | | |
| 11813.64 | 89.87 | 0.61 | 7182.00 | 4185.61 | -9.50 | 0.00 | 0.004185.62 | PBHL_PENNINGTON 28N-2HZ(460' FNL 2370' FEL) | | |
| | | | | | | | CASING DETAILS | | | |
| | | | | | | | TVD | MD | Name | Size |
| | | | | | | | 1000.00 | 1000.00 | 9 5/8" | 9.625 |
| | | | | | | | 7172.00 | 7552.02 | 7" | 7.000 |





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

PENNINGTON 15-2HZ

PENNINGTON 28N-2HZ

OH

Plan: PLAN #2 PRELIMINARY

Standard Planning Report

30 May, 2013

| | | | |
|------------------|-----------------------------|-------------------------------------|---|
| Database: | EDM5000-RobertS-Local | Local Co-ordinate Reference: | Well PENNINGTON 28N-2HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Site: | PENNINGTON 15-2HZ | North Reference: | True |
| Well: | PENNINGTON 28N-2HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Northern Zone | | |

| | | | | |
|------------------------------|---------------------------------------|---------------------|-------------------|---------------------------------|
| Site | PENNINGTON 15-2HZ, SECTION 2 T2N R67W | | | |
| Site Position: | | Northing: | 1,302,373.31 usft | Latitude: 40.1616190 |
| From: | Lat/Long | Easting: | 3,179,819.83 usft | Longitude: -104.8566080 |
| Position Uncertainty: | 0.00 ft | Slot Radius: | 13.200 in | Grid Convergence: 0.42 ° |

| | | | | |
|-----------------------------|---|-----------|----------------------------|----------------------------------|
| Well | PENNINGTON 28N-2HZ, 672' FSL, 2317' FEL | | | |
| Well Position | +N/-S | -0.01 ft | Northing: | 1,302,373.07 usft |
| | +E/-W | -30.18 ft | Easting: | 3,179,789.65 usft |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | Ground Level: 4,860.00 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | OH | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | BGGM2012 | 2013/05/28 | 8.68 | 66.75 | 52,690 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | PLAN #2 PRELIMINARY | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
| | 0.00 | 0.00 | 0.00 | 359.87 |

| Plan Sections | | | | | | | | | | |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|-----------------|
| 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 | |
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,699.83 | 10.00 | 185.41 | 1,697.30 | -43.30 | -4.10 | 2.00 | 2.00 | 0.00 | 185.41 | |
| 4,944.49 | 10.00 | 185.41 | 4,892.70 | -604.03 | -57.20 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,444.32 | 0.00 | 0.00 | 5,390.00 | -647.33 | -61.30 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,653.36 | 0.00 | 0.00 | 6,599.04 | -647.33 | -61.30 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,552.02 | 89.87 | 0.61 | 7,172.00 | -75.75 | -55.17 | 10.00 | 10.00 | 0.07 | 0.61 | |
| 11,813.64 | 89.87 | 0.61 | 7,182.00 | 4,185.61 | -9.50 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL_PENNINGTON |

| | | | |
|------------------|-----------------------------|-------------------------------------|---|
| Database: | EDM5000-RobertS-Local | Local Co-ordinate Reference: | Well PENNINGTON 28N-2HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Site: | PENNINGTON 15-2HZ | North Reference: | True |
| Well: | PENNINGTON 28N-2HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| 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 | 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 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 5/8" | | | | | | | | | |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 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 |
| Start Build 2.00 | | | | | | | | | |
| 1,300.00 | 2.00 | 185.41 | 1,299.98 | -1.74 | -0.16 | -1.74 | 2.00 | 2.00 | 0.00 |
| 1,400.00 | 4.00 | 185.41 | 1,399.84 | -6.95 | -0.66 | -6.95 | 2.00 | 2.00 | 0.00 |
| 1,500.00 | 6.00 | 185.41 | 1,499.45 | -15.62 | -1.48 | -15.62 | 2.00 | 2.00 | 0.00 |
| 1,600.00 | 8.00 | 185.41 | 1,598.70 | -27.76 | -2.63 | -27.75 | 2.00 | 2.00 | 0.00 |
| 1,699.83 | 10.00 | 185.41 | 1,697.30 | -43.30 | -4.10 | -43.29 | 2.00 | 2.00 | 0.00 |
| Start 3244.67 hold at 1699.83 MD | | | | | | | | | |
| 1,700.00 | 10.00 | 185.41 | 1,697.47 | -43.33 | -4.10 | -43.32 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 10.00 | 185.41 | 1,795.95 | -60.61 | -5.74 | -60.60 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 10.00 | 185.41 | 1,894.43 | -77.89 | -7.38 | -77.88 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 10.00 | 185.41 | 1,992.91 | -95.17 | -9.01 | -95.15 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 10.00 | 185.41 | 2,091.39 | -112.46 | -10.65 | -112.43 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 10.00 | 185.41 | 2,189.87 | -129.74 | -12.29 | -129.71 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 10.00 | 185.41 | 2,288.36 | -147.02 | -13.92 | -146.99 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 10.00 | 185.41 | 2,386.84 | -164.30 | -15.56 | -164.26 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 10.00 | 185.41 | 2,485.32 | -181.58 | -17.20 | -181.54 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 10.00 | 185.41 | 2,583.80 | -198.86 | -18.83 | -198.82 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 10.00 | 185.41 | 2,682.28 | -216.15 | -20.47 | -216.10 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 10.00 | 185.41 | 2,780.77 | -233.43 | -22.10 | -233.38 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 10.00 | 185.41 | 2,879.25 | -250.71 | -23.74 | -250.65 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 10.00 | 185.41 | 2,977.73 | -267.99 | -25.38 | -267.93 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 10.00 | 185.41 | 3,076.21 | -285.27 | -27.01 | -285.21 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 10.00 | 185.41 | 3,174.69 | -302.55 | -28.65 | -302.49 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 10.00 | 185.41 | 3,273.17 | -319.84 | -30.29 | -319.77 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 10.00 | 185.41 | 3,371.66 | -337.12 | -31.92 | -337.04 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 10.00 | 185.41 | 3,470.14 | -354.40 | -33.56 | -354.32 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 10.00 | 185.41 | 3,568.62 | -371.68 | -35.20 | -371.60 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 10.00 | 185.41 | 3,667.10 | -388.96 | -36.83 | -388.88 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 10.00 | 185.41 | 3,765.58 | -406.24 | -38.47 | -406.15 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 10.00 | 185.41 | 3,864.07 | -423.52 | -40.11 | -423.43 | 0.00 | 0.00 | 0.00 |
| 3,928.37 | 10.00 | 185.41 | 3,892.00 | -428.43 | -40.57 | -428.33 | 0.00 | 0.00 | 0.00 |
| Parkman | | | | | | | | | |
| 4,000.00 | 10.00 | 185.41 | 3,962.55 | -440.81 | -41.74 | -440.71 | 0.00 | 0.00 | 0.00 |
| 4,055.29 | 10.00 | 185.41 | 4,017.00 | -450.36 | -42.65 | -450.26 | 0.00 | 0.00 | 0.00 |
| Fox Hills Base | | | | | | | | | |
| 4,100.00 | 10.00 | 185.41 | 4,061.03 | -458.09 | -43.38 | -457.99 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 10.00 | 185.41 | 4,159.51 | -475.37 | -45.02 | -475.27 | 0.00 | 0.00 | 0.00 |
| 4,287.82 | 10.00 | 185.41 | 4,246.00 | -490.55 | -46.45 | -490.44 | 0.00 | 0.00 | 0.00 |
| Sussex | | | | | | | | | |

| | | | |
|------------------|-----------------------------|-------------------------------------|---|
| Database: | EDM5000-RobertS-Local | Local Co-ordinate Reference: | Well PENNINGTON 28N-2HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Site: | PENNINGTON 15-2HZ | North Reference: | True |
| Well: | PENNINGTON 28N-2HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| 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) |
| 4,300.00 | 10.00 | 185.41 | 4,257.99 | -492.65 | -46.65 | -492.54 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 10.00 | 185.41 | 4,356.47 | -509.93 | -48.29 | -509.82 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 10.00 | 185.41 | 4,454.96 | -527.21 | -49.93 | -527.10 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 10.00 | 185.41 | 4,553.44 | -544.50 | -51.56 | -544.38 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 10.00 | 185.41 | 4,651.92 | -561.78 | -53.20 | -561.66 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 10.00 | 185.41 | 4,750.40 | -579.06 | -54.84 | -578.93 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 10.00 | 185.41 | 4,848.88 | -596.34 | -56.47 | -596.21 | 0.00 | 0.00 | 0.00 |
| 4,944.49 | 10.00 | 185.41 | 4,892.70 | -604.03 | -57.20 | -603.90 | 0.00 | 0.00 | 0.00 |
| Start Drop -2.00 | | | | | | | | | |
| 5,000.00 | 8.89 | 185.41 | 4,947.46 | -613.10 | -58.06 | -612.96 | 2.00 | -2.00 | 0.00 |
| 5,100.00 | 6.89 | 185.41 | 5,046.50 | -626.75 | -59.35 | -626.62 | 2.00 | -2.00 | 0.00 |
| 5,200.00 | 4.89 | 185.41 | 5,145.97 | -636.96 | -60.32 | -636.83 | 2.00 | -2.00 | 0.00 |
| 5,300.00 | 2.89 | 185.41 | 5,245.74 | -643.71 | -60.96 | -643.57 | 2.00 | -2.00 | 0.00 |
| 5,400.00 | 0.89 | 185.41 | 5,345.68 | -646.99 | -61.27 | -646.85 | 2.00 | -2.00 | 0.00 |
| 5,444.32 | 0.00 | 0.00 | 5,390.00 | -647.33 | -61.30 | -647.19 | 2.00 | -2.00 | 0.00 |
| Start 1209.04 hold at 5444.32 MD | | | | | | | | | |
| 5,500.00 | 0.00 | 0.00 | 5,445.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 5,600.00 | 0.00 | 0.00 | 5,545.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,645.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,745.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 5,900.00 | 0.00 | 0.00 | 5,845.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,000.00 | 0.00 | 0.00 | 5,945.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,045.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,200.00 | 0.00 | 0.00 | 6,145.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,300.00 | 0.00 | 0.00 | 6,245.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,345.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,445.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,545.68 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| 6,653.36 | 0.00 | 0.00 | 6,599.04 | -647.33 | -61.30 | -647.19 | 0.00 | 0.00 | 0.00 |
| Start DLS 10.00 TFO 0.61 | | | | | | | | | |
| 6,700.00 | 4.66 | 0.61 | 6,645.62 | -645.43 | -61.28 | -645.29 | 10.00 | 10.00 | 0.00 |
| 6,800.00 | 14.66 | 0.61 | 6,744.08 | -628.67 | -61.10 | -628.53 | 10.00 | 10.00 | 0.00 |
| 6,900.00 | 24.66 | 0.61 | 6,838.13 | -595.06 | -60.74 | -594.92 | 10.00 | 10.00 | 0.00 |
| 7,000.00 | 34.66 | 0.61 | 6,924.91 | -545.64 | -60.21 | -545.50 | 10.00 | 10.00 | 0.00 |
| 7,100.00 | 44.66 | 0.61 | 7,001.80 | -481.90 | -59.53 | -481.76 | 10.00 | 10.00 | 0.00 |
| 7,142.67 | 48.93 | 0.61 | 7,031.00 | -450.80 | -59.19 | -450.67 | 10.00 | 10.00 | 0.00 |
| Sharon Springs | | | | | | | | | |
| 7,200.00 | 54.66 | 0.61 | 7,066.44 | -405.77 | -58.71 | -405.64 | 10.00 | 10.00 | 0.00 |
| 7,295.63 | 64.23 | 0.61 | 7,115.00 | -323.52 | -57.83 | -323.39 | 10.00 | 10.00 | 0.00 |
| Niobrara A | | | | | | | | | |
| 7,300.00 | 64.66 | 0.61 | 7,116.89 | -319.58 | -57.79 | -319.45 | 10.00 | 10.00 | 0.00 |
| 7,349.18 | 69.58 | 0.61 | 7,136.00 | -274.28 | -57.30 | -274.15 | 10.00 | 10.00 | 0.00 |
| Niobrara B | | | | | | | | | |
| 7,400.00 | 74.66 | 0.61 | 7,151.59 | -225.94 | -56.78 | -225.81 | 10.00 | 10.00 | 0.00 |
| 7,500.00 | 84.66 | 0.61 | 7,169.51 | -127.69 | -55.73 | -127.56 | 10.00 | 10.00 | 0.00 |
| 7,552.02 | 89.87 | 0.61 | 7,172.00 | -75.75 | -55.17 | -75.62 | 10.00 | 10.00 | 0.00 |
| Start 4261.62 hold at 7552.02 MD - 7" (595' FSL 2371' FEL) | | | | | | | | | |
| 7,600.00 | 89.87 | 0.61 | 7,172.11 | -27.77 | -54.66 | -27.65 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 89.87 | 0.61 | 7,172.34 | 72.22 | -53.59 | 72.34 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 89.87 | 0.61 | 7,172.58 | 172.22 | -52.52 | 172.33 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 89.87 | 0.61 | 7,172.81 | 272.21 | -51.44 | 272.33 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 89.87 | 0.61 | 7,173.05 | 372.20 | -50.37 | 372.32 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 89.87 | 0.61 | 7,173.28 | 472.20 | -49.30 | 472.31 | 0.00 | 0.00 | 0.00 |

| | | | |
|------------------|-----------------------------|-------------------------------------|---|
| Database: | EDM5000-RobertS-Local | Local Co-ordinate Reference: | Well PENNINGTON 28N-2HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Site: | PENNINGTON 15-2HZ | North Reference: | True |
| Well: | PENNINGTON 28N-2HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| 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) | |
| 8,200.00 | 89.87 | 0.61 | 7,173.52 | 572.19 | -48.23 | 572.30 | 0.00 | 0.00 | 0.00 | |
| 8,300.00 | 89.87 | 0.61 | 7,173.75 | 672.19 | -47.16 | 672.29 | 0.00 | 0.00 | 0.00 | |
| 8,400.00 | 89.87 | 0.61 | 7,173.99 | 772.18 | -46.09 | 772.28 | 0.00 | 0.00 | 0.00 | |
| 8,500.00 | 89.87 | 0.61 | 7,174.22 | 872.17 | -45.01 | 872.27 | 0.00 | 0.00 | 0.00 | |
| 8,600.00 | 89.87 | 0.61 | 7,174.46 | 972.17 | -43.94 | 972.26 | 0.00 | 0.00 | 0.00 | |
| 8,700.00 | 89.87 | 0.61 | 7,174.69 | 1,072.16 | -42.87 | 1,072.26 | 0.00 | 0.00 | 0.00 | |
| 8,800.00 | 89.87 | 0.61 | 7,174.93 | 1,172.16 | -41.80 | 1,172.25 | 0.00 | 0.00 | 0.00 | |
| 8,900.00 | 89.87 | 0.61 | 7,175.16 | 1,272.15 | -40.73 | 1,272.24 | 0.00 | 0.00 | 0.00 | |
| 9,000.00 | 89.87 | 0.61 | 7,175.40 | 1,372.14 | -39.66 | 1,372.23 | 0.00 | 0.00 | 0.00 | |
| 9,100.00 | 89.87 | 0.61 | 7,175.63 | 1,472.14 | -38.58 | 1,472.22 | 0.00 | 0.00 | 0.00 | |
| 9,200.00 | 89.87 | 0.61 | 7,175.86 | 1,572.13 | -37.51 | 1,572.21 | 0.00 | 0.00 | 0.00 | |
| 9,300.00 | 89.87 | 0.61 | 7,176.10 | 1,672.13 | -36.44 | 1,672.20 | 0.00 | 0.00 | 0.00 | |
| 9,400.00 | 89.87 | 0.61 | 7,176.33 | 1,772.12 | -35.37 | 1,772.20 | 0.00 | 0.00 | 0.00 | |
| 9,500.00 | 89.87 | 0.61 | 7,176.57 | 1,872.11 | -34.30 | 1,872.19 | 0.00 | 0.00 | 0.00 | |
| 9,600.00 | 89.87 | 0.61 | 7,176.80 | 1,972.11 | -33.23 | 1,972.18 | 0.00 | 0.00 | 0.00 | |
| 9,700.00 | 89.87 | 0.61 | 7,177.04 | 2,072.10 | -32.15 | 2,072.17 | 0.00 | 0.00 | 0.00 | |
| 9,800.00 | 89.87 | 0.61 | 7,177.27 | 2,172.10 | -31.08 | 2,172.16 | 0.00 | 0.00 | 0.00 | |
| 9,900.00 | 89.87 | 0.61 | 7,177.51 | 2,272.09 | -30.01 | 2,272.15 | 0.00 | 0.00 | 0.00 | |
| 10,000.00 | 89.87 | 0.61 | 7,177.74 | 2,372.08 | -28.94 | 2,372.14 | 0.00 | 0.00 | 0.00 | |
| 10,100.00 | 89.87 | 0.61 | 7,177.98 | 2,472.08 | -27.87 | 2,472.13 | 0.00 | 0.00 | 0.00 | |
| 10,200.00 | 89.87 | 0.61 | 7,178.21 | 2,572.07 | -26.79 | 2,572.13 | 0.00 | 0.00 | 0.00 | |
| 10,300.00 | 89.87 | 0.61 | 7,178.45 | 2,672.07 | -25.72 | 2,672.12 | 0.00 | 0.00 | 0.00 | |
| 10,400.00 | 89.87 | 0.61 | 7,178.68 | 2,772.06 | -24.65 | 2,772.11 | 0.00 | 0.00 | 0.00 | |
| 10,500.00 | 89.87 | 0.61 | 7,178.92 | 2,872.05 | -23.58 | 2,872.10 | 0.00 | 0.00 | 0.00 | |
| 10,600.00 | 89.87 | 0.61 | 7,179.15 | 2,972.05 | -22.51 | 2,972.09 | 0.00 | 0.00 | 0.00 | |
| 10,700.00 | 89.87 | 0.61 | 7,179.39 | 3,072.04 | -21.44 | 3,072.08 | 0.00 | 0.00 | 0.00 | |
| 10,800.00 | 89.87 | 0.61 | 7,179.62 | 3,172.04 | -20.36 | 3,172.07 | 0.00 | 0.00 | 0.00 | |
| 10,900.00 | 89.87 | 0.61 | 7,179.86 | 3,272.03 | -19.29 | 3,272.06 | 0.00 | 0.00 | 0.00 | |
| 11,000.00 | 89.87 | 0.61 | 7,180.09 | 3,372.02 | -18.22 | 3,372.06 | 0.00 | 0.00 | 0.00 | |
| 11,100.00 | 89.87 | 0.61 | 7,180.32 | 3,472.02 | -17.15 | 3,472.05 | 0.00 | 0.00 | 0.00 | |
| 11,200.00 | 89.87 | 0.61 | 7,180.56 | 3,572.01 | -16.08 | 3,572.04 | 0.00 | 0.00 | 0.00 | |
| 11,300.00 | 89.87 | 0.61 | 7,180.79 | 3,672.01 | -15.01 | 3,672.03 | 0.00 | 0.00 | 0.00 | |
| 11,400.00 | 89.87 | 0.61 | 7,181.03 | 3,772.00 | -13.93 | 3,772.02 | 0.00 | 0.00 | 0.00 | |
| 11,500.00 | 89.87 | 0.61 | 7,181.26 | 3,871.99 | -12.86 | 3,872.01 | 0.00 | 0.00 | 0.00 | |
| 11,600.00 | 89.87 | 0.61 | 7,181.50 | 3,971.99 | -11.79 | 3,972.00 | 0.00 | 0.00 | 0.00 | |
| 11,700.00 | 89.87 | 0.61 | 7,181.73 | 4,071.98 | -10.72 | 4,071.99 | 0.00 | 0.00 | 0.00 | |
| 11,800.00 | 89.87 | 0.61 | 7,181.97 | 4,171.98 | -9.65 | 4,171.99 | 0.00 | 0.00 | 0.00 | |
| 11,813.64 | 89.87 | 0.61 | 7,182.00 | 4,185.61 | -9.50 | 4,185.62 | 0.00 | 0.00 | 0.00 | |
| TD at 11813.64 - PBHL_PENNINGTON 28N-2HZ(460' FNL 2370' FEL) | | | | | | | | | | |

| Design Targets | | | | | | | | | | |
|---------------------------|---------------|--------------|----------|------------|------------|-----------------|----------------|------------|--------------|--|
| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (usft) | Easting (usft) | Latitude | Longitude | |
| - hit/miss target | | | | | | | | | | |
| - Shape | | | | | | | | | | |
| PBHL_PENNINGTON 2 | 0.00 | 0.00 | 7,182.00 | 4,185.61 | -9.50 | 1,306,558.50 | 3,179,749.79 | 40.1731090 | -104.8567500 | |
| - plan hits target center | | | | | | | | | | |
| - Point | | | | | | | | | | |

| | | | |
|------------------|-----------------------------|-------------------------------------|---|
| Database: | EDM5000-RobertS-Local | Local Co-ordinate Reference: | Well PENNINGTON 28N-2HZ |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Project: | COLORADO NORTHERN ZONE - 83 | MD Reference: | GL 4860' & KB 17' @ 4877.00ft (ASSUMED) |
| Site: | PENNINGTON 15-2HZ | North Reference: | True |
| Well: | PENNINGTON 28N-2HZ | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | OH | | |
| Design: | PLAN #2 PRELIMINARY | | |

| Casing Points | | | | | |
|---------------------|---------------------|-------------------------|----------------------|--------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (in) | Hole Diameter (in) | |
| 1,000.00 | 1,000.00 | 9 5/8" | 9.625 | 12.250 | |
| 7,552.02 | 7,172.00 | 7" (595' FSL 2371' FEL) | 7.000 | 7.500 | |

| Formations | | | | | | |
|---------------------|---------------------|----------------|-----------|---------|-------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) | |
| 3,928.37 | 3,892.00 | Parkman | | | | |
| 4,055.29 | 4,017.00 | Fox Hills Base | | | | |
| 4,287.82 | 4,246.00 | Sussex | | | | |
| 7,142.67 | 7,031.00 | Sharon Springs | | | | |
| 7,295.63 | 7,115.00 | Niobrara A | | | | |
| 7,349.18 | 7,136.00 | Niobrara B | | | | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|----------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 1,200.00 | 1,200.00 | 0.00 | 0.00 | Start Build 2.00 | |
| 1,699.83 | 1,697.30 | -43.30 | -4.10 | Start 3244.67 hold at 1699.83 MD | |
| 4,944.49 | 4,892.70 | -604.03 | -57.20 | Start Drop -2.00 | |
| 5,444.32 | 5,390.00 | -647.33 | -61.30 | Start 1209.04 hold at 5444.32 MD | |
| 6,653.36 | 6,599.04 | -647.33 | -61.30 | Start DLS 10.00 TFO 0.61 | |
| 7,552.02 | 7,172.00 | -75.75 | -55.17 | Start 4261.62 hold at 7552.02 MD | |
| 11,813.64 | 7,182.00 | 4,185.61 | -9.50 | TD at 11813.64 | |