



US ROCKIES REGION PLANNING

**COLORADO NOTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 4-1**

P_BERNHARDT 4-1

Plan: PLAN #1 11-04-09 RHS

Standard Planning Report

04 November, 2009



P_BERNHARDT 4-1
COLORADO NORTHERN ZONE - 83
SECTION 1 T4N R67W
1319 FNL 1987 FWL
LAT: 40° 20' 42.684 N
LONG: 104° 50' 28.788 W



Azimuths to True North
Magnetic North: 9.08°
Magnetic Field
Strength: 53283.2nT
Dip Angle: 67.06°
Date: 11/4/2009
Model: IGRF200510

WELL DETAILS: P_BERNHARDT 4-1

| +N/-S | +E/-W | Northing | Ground Level: | Easting | Latitude | Longitude | Slot |
|-------|-------|------------|---------------|------------|------------------|-------------------|------|
| 0.00 | 0.00 | 1369275.24 | 4825.00 | 3183593.04 | 40° 20' 42.684 N | 104° 50' 28.788 W | |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---------|---------|-------------|
| 2668.00 | 2736.71 | PARKMAN TOP |
| 4396.00 | 4578.32 | SUSSEX TOP |
| 4779.00 | 4986.51 | SHANNON TOP |
| 6990.00 | 7232.88 | NIO A TOP |
| 7313.00 | 7555.88 | CODELL TOP |
| 7763.00 | 8005.88 | JSAND TO |

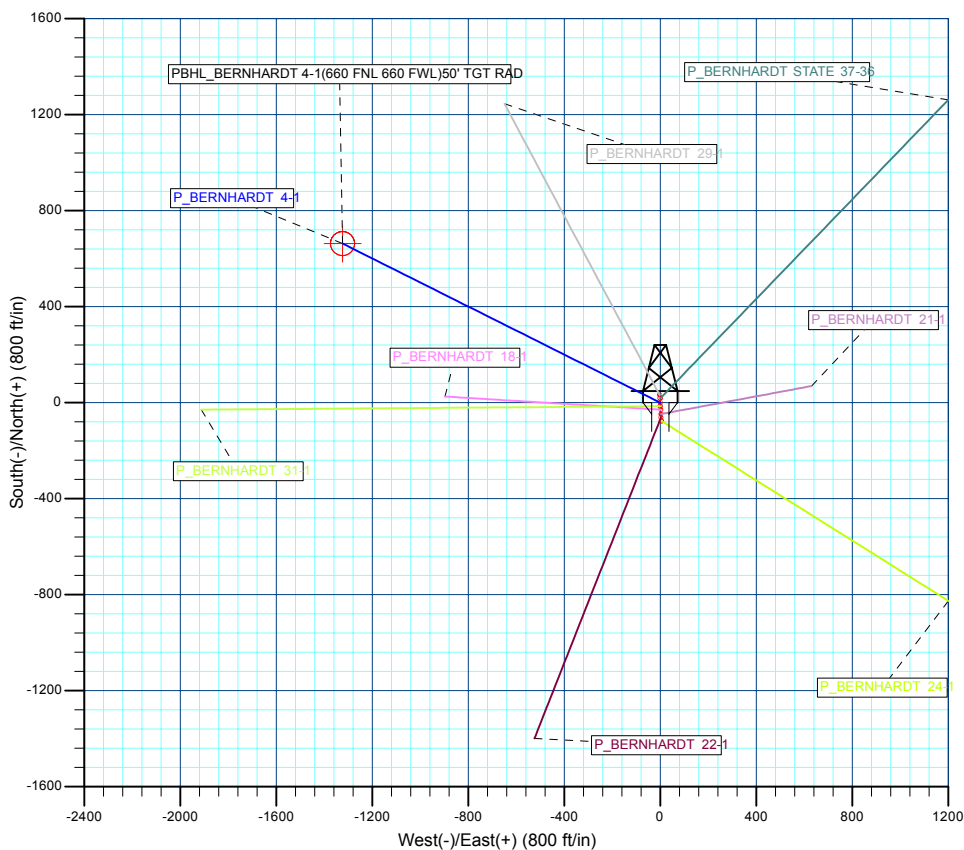
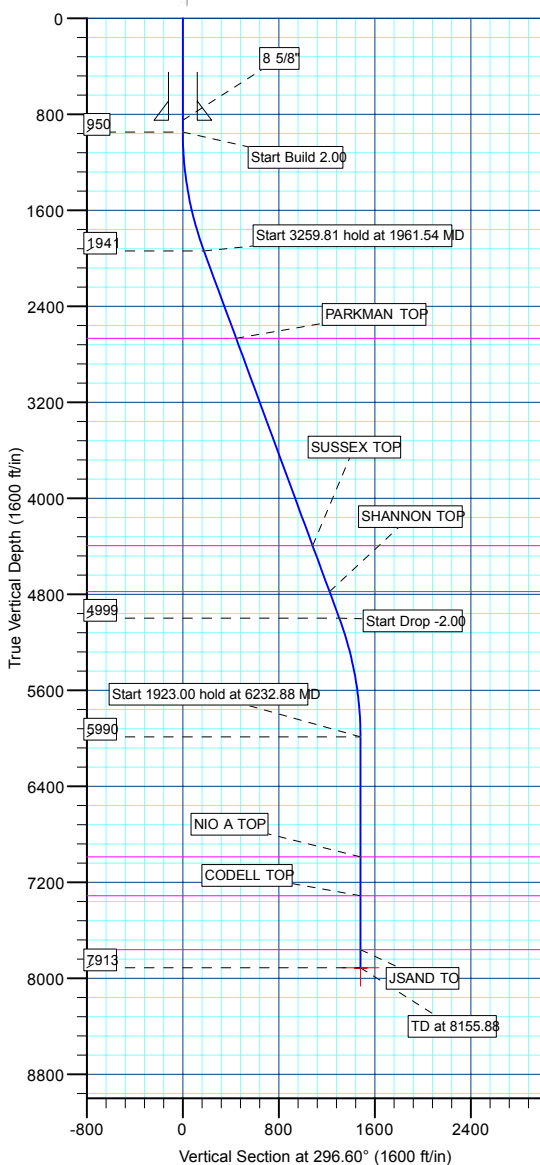
SECTION DETAILS

| MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | VSec | Target |
|---------|-------|--------|---------|--------|----------|------|--------|---------|-------------------------------------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 950.00 | 0.00 | 0.00 | 950.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1961.54 | 20.23 | 296.60 | 1940.65 | 79.14 | -158.03 | 2.00 | 296.60 | 176.74 | |
| 5221.35 | 20.23 | 296.60 | 4999.35 | 583.92 | -1165.94 | 0.00 | 0.00 | 1303.98 | |
| 6232.88 | 0.00 | 0.00 | 5990.00 | 663.06 | -1323.96 | 2.00 | 180.00 | 1480.72 | |
| 8155.88 | 0.00 | 0.00 | 7913.00 | 663.06 | -1323.96 | 0.00 | 0.00 | 1480.72 | PBHL_BERNHARDT 4-1(660 FNL 660 FWL) |

CASING DETAILS

| TVD | MD | Name | Size |
|--------|--------|--------|------|
| 850.00 | 850.00 | 8 5/8" | 8.62 |

KB ELEV: WELL @ 4840.00ft (Original Well Elev)
GRD ELEV: 4825.00



WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape |
|------|---------|--------|----------|------------|------------|------------------|-------------------|------------------------|
| PBHL | 7913.00 | 663.06 | -1323.96 | 1369928.45 | 3182264.20 | 40° 20' 49.236 N | 104° 50' 45.888 W | Circle (Radius: 50.00) |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 2003.21 Single User Db | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Project: | COLORADO NOTHERN ZONE - 83 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site: | WELD_BERNHARDT 8 PAD 4N67W1 | North Reference: | True |
| Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | P_BERNHARDT 4-1 | | |
| Design: | PLAN #1 11-04-09 RHS | | |

| | | | |
|--------------------|---|----------------------|----------------|
| Project | COLORADO NOTHERN 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 | WELD_BERNHARDT 8 PAD 4N67W1, SECTION 1 T4N R67W | | | |
| Site Position: | | Northing: | 1,369,246.13 ft | Latitude: 40° 20' 42.396 N |
| From: | Lat/Long | Easting: | 3,183,596.05 ft | Longitude: 104° 50' 28.752 W |
| Position Uncertainty: | 0.00 ft | Slot Radius: | in | Grid Convergence: 0.43 ° |

| | | | | |
|-----------------------------|-----------------|----------|----------------------------|-----------------|
| Well | P_BERNHARDT 4-1 | | | |
| Well Position | +N/-S | 29.13 ft | Northing: | 1,369,275.24 ft |
| | +E/-W | -2.79 ft | Easting: | 3,183,593.04 ft |
| Position Uncertainty | | 0.00 ft | Wellhead Elevation: | ft |
| | | | Ground Level: | 4,825.00 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | P_BERNHARDT 4-1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF200510 | 11/4/2009 | 9.08 | 67.06 | 53,283 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | PLAN #1 11-04-09 RHS | | | |
| 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 | 296.60 |

| 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 | |
| 950.00 | 0.00 | 0.00 | 950.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,961.54 | 20.23 | 296.60 | 1,940.65 | 79.14 | -158.03 | 2.00 | 2.00 | 0.00 | 296.60 | |
| 5,221.35 | 20.23 | 296.60 | 4,999.35 | 583.92 | -1,165.94 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 6,232.88 | 0.00 | 0.00 | 5,990.00 | 663.06 | -1,323.96 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 8,155.88 | 0.00 | 0.00 | 7,913.00 | 663.06 | -1,323.96 | 0.00 | 0.00 | 0.00 | 0.00 | PBHL_BERNHARD |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 2003.21 Single User Db | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Project: | COLORADO NOTHERN ZONE - 83 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site: | WELD_BERNHARDT 8 PAD 4N67W1 | North Reference: | True |
| Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | P_BERNHARDT 4-1 | | |
| Design: | PLAN #1 11-04-09 RHS | | |

| 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) |
| Start Build 2.00 | | | | | | | | | |
| 950.00 | 0.00 | 0.00 | 950.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 1.00 | 296.60 | 1,000.00 | 0.20 | -0.39 | 0.44 | 2.00 | 2.00 | 0.00 |
| 1,100.00 | 3.00 | 296.60 | 1,099.93 | 1.76 | -3.51 | 3.93 | 2.00 | 2.00 | 0.00 |
| 1,200.00 | 5.00 | 296.60 | 1,199.68 | 4.88 | -9.75 | 10.90 | 2.00 | 2.00 | 0.00 |
| 1,300.00 | 7.00 | 296.60 | 1,299.13 | 9.56 | -19.09 | 21.35 | 2.00 | 2.00 | 0.00 |
| 1,400.00 | 9.00 | 296.60 | 1,398.15 | 15.79 | -31.54 | 35.27 | 2.00 | 2.00 | 0.00 |
| 1,500.00 | 11.00 | 296.60 | 1,496.63 | 23.57 | -47.06 | 52.63 | 2.00 | 2.00 | 0.00 |
| 1,600.00 | 13.00 | 296.60 | 1,594.44 | 32.88 | -65.65 | 73.42 | 2.00 | 2.00 | 0.00 |
| 1,700.00 | 15.00 | 296.60 | 1,691.46 | 43.71 | -87.28 | 97.62 | 2.00 | 2.00 | 0.00 |
| 1,800.00 | 17.00 | 296.60 | 1,787.58 | 56.05 | -111.93 | 125.18 | 2.00 | 2.00 | 0.00 |
| 1,900.00 | 19.00 | 296.60 | 1,882.68 | 69.89 | -139.55 | 156.08 | 2.00 | 2.00 | 0.00 |
| Start 3259.81 hold at 1961.54 MD | | | | | | | | | |
| 1,961.54 | 20.23 | 296.60 | 1,940.65 | 79.14 | -158.03 | 176.74 | 2.00 | 2.00 | 0.00 |
| 2,000.00 | 20.23 | 296.60 | 1,976.74 | 85.10 | -169.92 | 190.04 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 20.23 | 296.60 | 2,070.57 | 100.58 | -200.84 | 224.62 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 20.23 | 296.60 | 2,164.40 | 116.07 | -231.76 | 259.20 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 20.23 | 296.60 | 2,258.23 | 131.55 | -262.68 | 293.78 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 20.23 | 296.60 | 2,352.06 | 147.04 | -293.60 | 328.36 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 20.23 | 296.60 | 2,445.89 | 162.52 | -324.51 | 362.94 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 20.23 | 296.60 | 2,539.72 | 178.01 | -355.43 | 397.52 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 20.23 | 296.60 | 2,633.55 | 193.49 | -386.35 | 432.10 | 0.00 | 0.00 | 0.00 |
| PARKMAN TOP | | | | | | | | | |
| 2,736.71 | 20.23 | 296.60 | 2,668.00 | 199.18 | -397.70 | 444.79 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 20.23 | 296.60 | 2,727.39 | 208.98 | -417.27 | 466.68 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 20.23 | 296.60 | 2,821.22 | 224.46 | -448.19 | 501.26 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 20.23 | 296.60 | 2,915.05 | 239.95 | -479.11 | 535.84 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 20.23 | 296.60 | 3,008.88 | 255.43 | -510.03 | 570.42 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 20.23 | 296.60 | 3,102.71 | 270.92 | -540.95 | 605.00 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 20.23 | 296.60 | 3,196.54 | 286.40 | -571.87 | 639.58 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 20.23 | 296.60 | 3,290.37 | 301.89 | -602.79 | 674.16 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 20.23 | 296.60 | 3,384.20 | 317.37 | -633.71 | 708.74 | 0.00 | 0.00 | 0.00 |
| 3,600.00 | 20.23 | 296.60 | 3,478.03 | 332.86 | -664.63 | 743.32 | 0.00 | 0.00 | 0.00 |
| 3,700.00 | 20.23 | 296.60 | 3,571.86 | 348.34 | -695.55 | 777.90 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 20.23 | 296.60 | 3,665.69 | 363.83 | -726.47 | 812.48 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 20.23 | 296.60 | 3,759.52 | 379.31 | -757.38 | 847.06 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 20.23 | 296.60 | 3,853.35 | 394.80 | -788.30 | 881.64 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 20.23 | 296.60 | 3,947.19 | 410.28 | -819.22 | 916.22 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 20.23 | 296.60 | 4,041.02 | 425.77 | -850.14 | 950.80 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 20.23 | 296.60 | 4,134.85 | 441.25 | -881.06 | 985.38 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 20.23 | 296.60 | 4,228.68 | 456.74 | -911.98 | 1,019.96 | 0.00 | 0.00 | 0.00 |
| 4,500.00 | 20.23 | 296.60 | 4,322.51 | 472.22 | -942.90 | 1,054.54 | 0.00 | 0.00 | 0.00 |
| SUSSEX TOP | | | | | | | | | |
| 4,578.32 | 20.23 | 296.60 | 4,396.00 | 484.35 | -967.12 | 1,081.62 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 20.23 | 296.60 | 4,416.34 | 487.71 | -973.82 | 1,089.12 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 20.23 | 296.60 | 4,510.17 | 503.19 | -1,004.74 | 1,123.70 | 0.00 | 0.00 | 0.00 |
| 4,800.00 | 20.23 | 296.60 | 4,604.00 | 518.68 | -1,035.66 | 1,158.28 | 0.00 | 0.00 | 0.00 |
| 4,900.00 | 20.23 | 296.60 | 4,697.83 | 534.16 | -1,066.58 | 1,192.86 | 0.00 | 0.00 | 0.00 |
| SHANNON TOP | | | | | | | | | |
| 4,986.51 | 20.23 | 296.60 | 4,779.00 | 547.56 | -1,093.32 | 1,222.77 | 0.00 | 0.00 | 0.00 |
| 5,000.00 | 20.23 | 296.60 | 4,791.66 | 549.65 | -1,097.50 | 1,227.44 | 0.00 | 0.00 | 0.00 |
| 5,100.00 | 20.23 | 296.60 | 4,885.49 | 565.13 | -1,128.42 | 1,262.02 | 0.00 | 0.00 | 0.00 |
| 5,200.00 | 20.23 | 296.60 | 4,979.32 | 580.61 | -1,159.34 | 1,296.60 | 0.00 | 0.00 | 0.00 |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 2003.21 Single User Db | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Project: | COLORADO NOTHERN ZONE - 83 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site: | WELD_BERNHARDT 8 PAD 4N67W1 | North Reference: | True |
| Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | P_BERNHARDT 4-1 | | |
| Design: | PLAN #1 11-04-09 RHS | | |

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) |
|--|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Start Drop -2.00 | | | | | | | | | |
| 5,221.35 | 20.23 | 296.60 | 4,999.35 | 583.92 | -1,165.94 | 1,303.98 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 18.66 | 296.60 | 5,073.52 | 595.64 | -1,189.35 | 1,330.16 | 2.00 | -2.00 | 0.00 |
| 5,400.00 | 16.66 | 296.60 | 5,168.80 | 609.23 | -1,216.47 | 1,360.50 | 2.00 | -2.00 | 0.00 |
| 5,500.00 | 14.66 | 296.60 | 5,265.09 | 621.31 | -1,240.60 | 1,387.48 | 2.00 | -2.00 | 0.00 |
| 5,600.00 | 12.66 | 296.60 | 5,362.25 | 631.88 | -1,261.71 | 1,411.09 | 2.00 | -2.00 | 0.00 |
| 5,700.00 | 10.66 | 296.60 | 5,460.19 | 640.93 | -1,279.77 | 1,431.30 | 2.00 | -2.00 | 0.00 |
| 5,800.00 | 8.66 | 296.60 | 5,558.76 | 648.44 | -1,294.77 | 1,448.07 | 2.00 | -2.00 | 0.00 |
| 5,900.00 | 6.66 | 296.60 | 5,657.87 | 654.41 | -1,306.69 | 1,461.40 | 2.00 | -2.00 | 0.00 |
| 6,000.00 | 4.66 | 296.60 | 5,757.38 | 658.83 | -1,315.50 | 1,471.26 | 2.00 | -2.00 | 0.00 |
| 6,100.00 | 2.66 | 296.60 | 5,857.17 | 661.68 | -1,321.21 | 1,477.64 | 2.00 | -2.00 | 0.00 |
| 6,200.00 | 0.66 | 296.60 | 5,957.12 | 662.98 | -1,323.79 | 1,480.53 | 2.00 | -2.00 | 0.00 |
| Start 1923.00 hold at 6232.88 MD | | | | | | | | | |
| 6,232.88 | 0.00 | 0.00 | 5,990.00 | 663.06 | -1,323.96 | 1,480.72 | 2.00 | -2.00 | 192.81 |
| 6,300.00 | 0.00 | 0.00 | 6,057.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,400.00 | 0.00 | 0.00 | 6,157.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,500.00 | 0.00 | 0.00 | 6,257.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,600.00 | 0.00 | 0.00 | 6,357.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,700.00 | 0.00 | 0.00 | 6,457.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,800.00 | 0.00 | 0.00 | 6,557.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 6,900.00 | 0.00 | 0.00 | 6,657.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,000.00 | 0.00 | 0.00 | 6,757.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,100.00 | 0.00 | 0.00 | 6,857.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,200.00 | 0.00 | 0.00 | 6,957.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| NIO A TOP | | | | | | | | | |
| 7,232.88 | 0.00 | 0.00 | 6,990.00 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,300.00 | 0.00 | 0.00 | 7,057.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,400.00 | 0.00 | 0.00 | 7,157.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,500.00 | 0.00 | 0.00 | 7,257.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| CODELL TOP | | | | | | | | | |
| 7,555.88 | 0.00 | 0.00 | 7,313.00 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,600.00 | 0.00 | 0.00 | 7,357.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,700.00 | 0.00 | 0.00 | 7,457.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,800.00 | 0.00 | 0.00 | 7,557.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 7,900.00 | 0.00 | 0.00 | 7,657.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 8,000.00 | 0.00 | 0.00 | 7,757.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| JSAND TO | | | | | | | | | |
| 8,005.88 | 0.00 | 0.00 | 7,763.00 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| 8,100.00 | 0.00 | 0.00 | 7,857.12 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |
| PBHL_BERNHARDT 4-1(660 FNL 660 FWL) | | | | | | | | | |
| 8,155.88 | 0.00 | 0.00 | 7,913.00 | 663.06 | -1,323.96 | 1,480.72 | 0.00 | 0.00 | 0.00 |

Design Targets

| Target Name | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|---------------------------|---------------|--------------|----------|------------|------------|---------------|--------------|------------------|-------------------|
| - hit/miss target | | | | | | | | | |
| - Shape | | | | | | | | | |
| PBHL_BERNHARDT | 0.00 | 0.00 | 7,913.00 | 663.06 | -1,323.96 | 1,369,928.45 | 3,182,264.20 | 40° 20' 49.236 N | 104° 50' 45.888 W |
| - plan hits target center | | | | | | | | | |
| - Circle (radius 50.00) | | | | | | | | | |

| | | | |
|------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Database: | EDM 2003.21 Single User Db | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Company: | US ROCKIES REGION PLANNING | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Project: | COLORADO NOTHERN ZONE - 83 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site: | WELD_BERNHARDT 8 PAD 4N67W1 | North Reference: | True |
| Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | P_BERNHARDT 4-1 | | |
| Design: | PLAN #1 11-04-09 RHS | | |

| Casing Points | | | | | |
|---------------------|---------------------|--------|----------------------|--------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (in) | Hole Diameter (in) | |
| 850.00 | 850.00 | 8 5/8" | 8.62 | 11.00 | |

| Formations | | | | | | |
|---------------------|---------------------|-------------|-----------|---------|-------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) | |
| 2,736.71 | 2,668.00 | PARKMAN TOP | | | | |
| 4,578.32 | 4,396.00 | SUSSEX TOP | | | | |
| 4,986.51 | 4,779.00 | SHANNON TOP | | | | |
| 7,232.88 | 6,990.00 | NIO A TOP | | | | |
| 7,555.88 | 7,313.00 | CODELL TOP | | | | |
| 8,005.88 | 7,763.00 | JSAND TO | | | | |

| Plan Annotations | | | | | |
|---------------------|---------------------|-------------------|------------|----------------------------------|--|
| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | | |
| | | +N/-S (ft) | +E/-W (ft) | Comment | |
| 950.00 | 950.00 | 0.00 | 0.00 | Start Build 2.00 | |
| 1,961.54 | 1,940.65 | 79.14 | -158.03 | Start 3259.81 hold at 1961.54 MD | |
| 5,221.35 | 4,999.35 | 583.92 | -1,165.94 | Start Drop -2.00 | |
| 6,232.88 | 5,990.00 | 663.06 | -1,323.96 | Start 1923.00 hold at 6232.88 MD | |
| 8,155.88 | 7,913.00 | 663.06 | -1,323.96 | TD at 8155.88 | |



US ROCKIES REGION PLANNING

**COLORADO NOTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 4-1**

**P_BERNHARDT 4-1
PLAN #1 11-04-09 RHS**

Anticollision Report

04 November, 2009



| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| | | | |
|-------------------------------------|---|-----------------------|---------------------|
| Reference | PLAN #1 11-04-09 RHS | | |
| Filter type: | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| Interpolation Method: | Stations | Error Model: | ISCWSA |
| Depth Range: | 0.00 to 20,000.00ft | Scan Method: | Closest Approach 3D |
| Results Limited by: | Maximum center-center distance of 10,000.00ft | Error Surface: | Elliptical Conic |
| Warning Levels Evaluated at: | 2.00 Sigma | | |

| | | | | |
|----------------------------|-----------------------|-----------------------------------|------------------|--------------------|
| Survey Tool Program | Date 11/4/2009 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
| 0.00 | 8,155.88 | PLAN #1 11-04-09 RHS (P_BERNHARDT | MWD | MWD - Standard |

| Summary | | | | | | |
|---|-------------------------------|----------------------------|-------------------------------|--------------------------------|-------------------|---------|
| Site Name | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
| Offset Well - Wellbore - Design | | | | | | |
| WELD_BERNHARDT 8 PAD 4N67W1 | | | | | | |
| P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 | 950.00 | 950.00 | 29.26 | 25.25 | 7.294 | CC |
| P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 | 1,000.00 | 1,000.08 | 29.43 | 25.20 | 6.963 | ES |
| P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 | 1,200.00 | 1,200.32 | 33.39 | 28.31 | 6.576 | SF |
| P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1 | 950.00 | 950.00 | 47.44 | 43.43 | 11.825 | CC |
| P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1 | 1,000.00 | 1,000.09 | 47.61 | 43.39 | 11.263 | ES |
| P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1 | 1,100.00 | 1,099.94 | 49.46 | 44.81 | 10.648 | SF |
| P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 | 950.00 | 950.00 | 61.99 | 57.98 | 15.452 | CC, ES |
| P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 | 1,100.00 | 1,096.88 | 67.44 | 62.84 | 14.659 | SF |
| P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 | 200.00 | 200.00 | 76.70 | 76.06 | 119.742 | CC, ES |
| P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 | 950.00 | 922.59 | 153.47 | 148.89 | 33.484 | SF |
| P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 | 950.00 | 950.00 | 32.90 | 28.89 | 8.201 | CC |
| P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 | 1,000.00 | 999.48 | 33.07 | 28.84 | 7.817 | ES |
| P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 | 1,200.00 | 1,197.22 | 37.47 | 32.36 | 7.336 | SF |
| P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 | 200.00 | 200.00 | 14.57 | 13.93 | 22.748 | CC |
| P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 | 300.00 | 299.96 | 14.69 | 13.61 | 13.623 | ES |
| P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 | 400.00 | 399.67 | 16.20 | 14.69 | 10.698 | SF |
| P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI | 200.00 | 200.00 | 18.21 | 17.57 | 28.435 | CC, ES |
| P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI | 400.00 | 398.77 | 23.70 | 22.17 | 15.481 | SF |

| | | | | | | | | | | | | |
|---|----------------------------|----------------------------|----------------------------|------------------------|--------------------|------------------------------|--|-------------------|-----------------------------|------------------------------|--------------------------------|--------------------------|
| Offset Design | | | | | | | | | | | | |
| WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04 | | | | | | | | | | | | |
| Survey Program: 0-MWD | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 174.53 | -29.13 | 2.79 | 29.26 | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | 174.53 | -29.13 | 2.79 | 29.26 | 29.07 | 0.19 | 153.175 |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | 174.53 | -29.13 | 2.79 | 29.26 | 28.62 | 0.64 | 45.684 |
| 300.00 | 300.00 | 300.00 | 300.00 | 0.55 | 0.55 | 174.53 | -29.13 | 2.79 | 29.26 | 28.17 | 1.09 | 26.845 |
| 400.00 | 400.00 | 400.00 | 400.00 | 0.77 | 0.77 | 174.53 | -29.13 | 2.79 | 29.26 | 27.72 | 1.54 | 19.007 |
| 500.00 | 500.00 | 500.00 | 500.00 | 0.99 | 0.99 | 174.53 | -29.13 | 2.79 | 29.26 | 27.28 | 1.99 | 14.712 |
| 600.00 | 600.00 | 600.00 | 600.00 | 1.22 | 1.22 | 174.53 | -29.13 | 2.79 | 29.26 | 26.83 | 2.44 | 12.000 |
| 700.00 | 700.00 | 700.00 | 700.00 | 1.44 | 1.44 | 174.53 | -29.13 | 2.79 | 29.26 | 26.38 | 2.89 | 10.132 |
| 800.00 | 800.00 | 800.00 | 800.00 | 1.67 | 1.67 | 174.53 | -29.13 | 2.79 | 29.26 | 25.93 | 3.34 | 8.768 |
| 900.00 | 900.00 | 900.00 | 900.00 | 1.89 | 1.89 | 174.53 | -29.13 | 2.79 | 29.26 | 25.48 | 3.79 | 7.727 |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 950.00 | 950.00 | 950.00 | 950.00 | 2.01 | 2.01 | 174.53 | -29.13 | 2.79 | 29.26 | 25.25 | 4.01 | 7.294 | CC |
| 1,000.00 | 1,000.00 | 1,000.08 | 1,000.08 | 2.11 | 2.11 | -121.94 | -29.10 | 2.35 | 29.43 | 25.20 | 4.23 | 6.963 | ES |
| 1,100.00 | 1,099.93 | 1,100.22 | 1,100.15 | 2.33 | 2.32 | -121.00 | -28.89 | -1.14 | 30.74 | 26.10 | 4.64 | 6.622 | |
| 1,200.00 | 1,199.68 | 1,200.32 | 1,200.00 | 2.55 | 2.53 | -119.34 | -28.47 | -8.12 | 33.39 | 28.31 | 5.08 | 6.576 | SF |
| 1,300.00 | 1,299.13 | 1,300.35 | 1,299.47 | 2.79 | 2.77 | -117.29 | -27.83 | -18.57 | 37.40 | 31.86 | 5.54 | 6.746 | |
| 1,400.00 | 1,398.15 | 1,400.27 | 1,398.42 | 3.05 | 3.03 | -115.14 | -26.99 | -32.46 | 42.80 | 36.74 | 6.06 | 7.062 | |
| 1,500.00 | 1,496.63 | 1,500.06 | 1,496.69 | 3.35 | 3.32 | -113.11 | -25.94 | -49.76 | 49.58 | 42.94 | 6.64 | 7.463 | |
| 1,600.00 | 1,594.44 | 1,599.72 | 1,594.36 | 3.69 | 3.66 | -112.21 | -24.74 | -69.53 | 57.75 | 50.45 | 7.30 | 7.907 | |
| 1,700.00 | 1,691.46 | 1,699.23 | 1,691.86 | 4.08 | 4.01 | -114.14 | -23.53 | -89.39 | 67.28 | 59.26 | 8.02 | 8.391 | |
| 1,800.00 | 1,787.58 | 1,798.48 | 1,789.11 | 4.54 | 4.39 | -117.83 | -22.33 | -109.19 | 78.45 | 69.68 | 8.77 | 8.948 | |
| 1,900.00 | 1,882.68 | 1,897.35 | 1,885.97 | 5.06 | 4.77 | -122.38 | -21.13 | -128.92 | 91.70 | 82.17 | 9.53 | 9.620 | |
| 1,961.54 | 1,940.65 | 1,957.94 | 1,945.34 | 5.41 | 5.01 | -125.34 | -20.40 | -141.02 | 101.09 | 91.09 | 10.00 | 10.105 | |
| 2,000.00 | 1,976.74 | 1,995.74 | 1,982.39 | 5.64 | 5.16 | -127.19 | -19.94 | -148.56 | 107.34 | 97.04 | 10.30 | 10.419 | |
| 2,100.00 | 2,070.57 | 2,094.04 | 2,078.70 | 6.26 | 5.55 | -131.11 | -18.75 | -168.18 | 123.99 | 112.91 | 11.08 | 11.194 | |
| 2,200.00 | 2,164.40 | 2,192.33 | 2,175.01 | 6.90 | 5.96 | -134.10 | -17.56 | -187.79 | 141.07 | 129.23 | 11.85 | 11.907 | |
| 2,300.00 | 2,258.23 | 2,290.63 | 2,271.32 | 7.56 | 6.36 | -136.44 | -16.37 | -207.41 | 158.45 | 145.83 | 12.62 | 12.556 | |
| 2,400.00 | 2,352.06 | 2,388.92 | 2,367.63 | 8.23 | 6.78 | -138.31 | -15.18 | -227.02 | 176.03 | 162.64 | 13.39 | 13.144 | |
| 2,500.00 | 2,445.89 | 2,487.22 | 2,463.94 | 8.90 | 7.19 | -139.85 | -13.99 | -246.64 | 193.77 | 179.60 | 14.17 | 13.677 | |
| 2,600.00 | 2,539.72 | 2,585.51 | 2,560.25 | 9.58 | 7.61 | -141.13 | -12.80 | -266.25 | 211.61 | 196.67 | 14.94 | 14.161 | |
| 2,700.00 | 2,633.55 | 2,683.80 | 2,656.56 | 10.27 | 8.03 | -142.20 | -11.61 | -285.87 | 229.55 | 213.82 | 15.72 | 14.601 | |
| 2,800.00 | 2,727.39 | 2,782.10 | 2,752.87 | 10.96 | 8.45 | -143.13 | -10.42 | -305.49 | 247.55 | 231.04 | 16.50 | 15.002 | |
| 2,900.00 | 2,821.22 | 2,880.39 | 2,849.18 | 11.66 | 8.87 | -143.92 | -9.22 | -325.10 | 265.60 | 248.32 | 17.28 | 15.369 | |
| 3,000.00 | 2,915.05 | 2,978.69 | 2,945.49 | 12.36 | 9.30 | -144.62 | -8.03 | -344.72 | 283.69 | 265.63 | 18.06 | 15.706 | |
| 3,100.00 | 3,008.88 | 3,076.98 | 3,041.80 | 13.06 | 9.72 | -145.23 | -6.84 | -364.33 | 301.83 | 282.98 | 18.85 | 16.016 | |
| 3,200.00 | 3,102.71 | 3,175.28 | 3,138.11 | 13.76 | 10.15 | -145.77 | -5.65 | -383.95 | 319.99 | 300.36 | 19.63 | 16.302 | |
| 3,300.00 | 3,196.54 | 3,273.57 | 3,234.41 | 14.47 | 10.58 | -146.26 | -4.46 | -403.56 | 338.17 | 317.76 | 20.41 | 16.566 | |
| 3,400.00 | 3,290.37 | 3,371.86 | 3,330.72 | 15.18 | 11.01 | -146.69 | -3.27 | -423.18 | 356.38 | 335.18 | 21.20 | 16.812 | |
| 3,500.00 | 3,384.20 | 3,470.16 | 3,427.03 | 15.88 | 11.44 | -147.09 | -2.08 | -442.80 | 374.61 | 352.62 | 21.98 | 17.040 | |
| 3,600.00 | 3,478.03 | 3,568.45 | 3,523.34 | 16.59 | 11.87 | -147.44 | -0.89 | -462.41 | 392.85 | 370.08 | 22.77 | 17.253 | |
| 3,700.00 | 3,571.86 | 3,666.75 | 3,619.65 | 17.30 | 12.30 | -147.77 | 0.30 | -482.03 | 411.10 | 387.55 | 23.56 | 17.452 | |
| 3,800.00 | 3,665.69 | 3,765.04 | 3,715.96 | 18.02 | 12.73 | -148.06 | 1.49 | -501.64 | 429.37 | 405.03 | 24.34 | 17.638 | |
| 3,900.00 | 3,759.52 | 3,863.34 | 3,812.27 | 18.73 | 13.16 | -148.34 | 2.68 | -521.26 | 447.64 | 422.51 | 25.13 | 17.813 | |
| 4,000.00 | 3,853.35 | 3,961.63 | 3,908.58 | 19.44 | 13.60 | -148.59 | 3.88 | -540.87 | 465.93 | 440.01 | 25.92 | 17.978 | |
| 4,100.00 | 3,947.19 | 4,059.92 | 4,004.89 | 20.16 | 14.03 | -148.82 | 5.07 | -560.49 | 484.22 | 457.52 | 26.70 | 18.133 | |
| 4,200.00 | 4,041.02 | 4,158.22 | 4,101.20 | 20.87 | 14.46 | -149.04 | 6.26 | -580.11 | 502.52 | 475.03 | 27.49 | 18.279 | |
| 4,300.00 | 4,134.85 | 4,256.51 | 4,197.51 | 21.58 | 14.90 | -149.24 | 7.45 | -599.72 | 520.83 | 492.55 | 28.28 | 18.417 | |
| 4,400.00 | 4,228.68 | 4,354.81 | 4,293.82 | 22.30 | 15.33 | -149.42 | 8.64 | -619.34 | 539.14 | 510.07 | 29.08 | 18.543 | |
| 4,500.00 | 4,322.51 | 4,453.10 | 4,390.13 | 23.02 | 15.76 | -149.60 | 9.83 | -638.95 | 557.46 | 527.59 | 29.87 | 18.662 | |
| 4,600.00 | 4,416.34 | 4,551.40 | 4,486.44 | 23.73 | 16.20 | -149.76 | 11.02 | -658.57 | 575.78 | 545.11 | 30.67 | 18.774 | |
| 4,700.00 | 4,510.17 | 4,649.69 | 4,582.75 | 24.45 | 16.63 | -149.92 | 12.21 | -678.18 | 594.11 | 562.64 | 31.47 | 18.881 | |
| 4,800.00 | 4,604.00 | 4,747.98 | 4,679.06 | 25.17 | 17.07 | -150.06 | 13.40 | -697.80 | 612.44 | 580.18 | 32.26 | 18.983 | |
| 4,900.00 | 4,697.83 | 4,846.28 | 4,775.37 | 25.88 | 17.50 | -150.20 | 14.59 | -717.41 | 630.77 | 597.71 | 33.06 | 19.079 | |
| 5,000.00 | 4,791.66 | 4,944.57 | 4,871.68 | 26.60 | 17.94 | -150.32 | 15.78 | -737.03 | 649.11 | 615.25 | 33.86 | 19.171 | |
| 5,100.00 | 4,885.49 | 5,042.87 | 4,967.99 | 27.32 | 18.38 | -150.44 | 16.98 | -756.65 | 667.45 | 632.80 | 34.66 | 19.259 | |
| 5,200.00 | 4,979.32 | 5,141.16 | 5,064.30 | 28.04 | 18.81 | -150.56 | 18.17 | -776.26 | 685.79 | 650.34 | 35.46 | 19.343 | |
| 5,221.35 | 4,999.35 | 5,162.14 | 5,084.86 | 28.19 | 18.90 | -150.58 | 18.42 | -780.45 | 689.71 | 654.08 | 35.63 | 19.360 | |
| 5,300.00 | 5,073.52 | 5,239.63 | 5,160.78 | 28.68 | 19.25 | -150.76 | 19.36 | -795.91 | 703.21 | 666.95 | 36.26 | 19.393 | |
| 5,400.00 | 5,168.80 | 5,338.56 | 5,257.72 | 29.18 | 19.69 | -150.83 | 20.56 | -815.66 | 717.69 | 680.66 | 37.03 | 19.379 | |
| 5,500.00 | 5,265.09 | 5,437.86 | 5,355.01 | 29.63 | 20.13 | -150.74 | 21.76 | -835.47 | 729.16 | 691.34 | 37.82 | 19.280 | |
| 5,600.00 | 5,362.25 | 5,526.79 | 5,442.30 | 30.03 | 20.46 | -150.58 | 22.79 | -852.45 | 738.17 | 699.69 | 38.48 | 19.181 | |
| 5,700.00 | 5,460.19 | 5,612.82 | 5,527.18 | 30.38 | 20.70 | -150.46 | 23.64 | -866.36 | 745.96 | 706.94 | 39.02 | 19.119 | |
| 5,800.00 | 5,558.76 | 5,700.00 | 5,613.60 | 30.68 | 20.93 | -150.38 | 24.34 | -877.86 | 752.55 | 713.08 | 39.47 | 19.066 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,900.00 | 5,657.87 | 5,784.95 | 5,698.09 | 30.94 | 21.11 | -150.33 | 24.86 | -886.54 | 757.94 | 718.11 | 39.83 | 19.029 | |
| 6,000.00 | 5,757.38 | 5,871.03 | 5,783.94 | 31.14 | 21.27 | -150.31 | 25.24 | -892.78 | 762.12 | 722.01 | 40.11 | 19.000 | |
| 6,100.00 | 5,857.17 | 5,957.10 | 5,869.94 | 31.30 | 21.40 | -150.33 | 25.46 | -896.44 | 765.09 | 724.78 | 40.31 | 18.981 | |
| 6,200.00 | 5,957.12 | 6,044.29 | 5,957.12 | 31.42 | 21.51 | -150.37 | 25.53 | -897.53 | 766.84 | 726.41 | 40.43 | 18.967 | |
| 6,232.88 | 5,990.00 | 6,077.17 | 5,990.00 | 31.44 | 21.55 | 146.22 | 25.53 | -897.53 | 767.00 | 726.53 | 40.47 | 18.953 | |
| 6,300.00 | 6,057.12 | 6,144.29 | 6,057.12 | 31.50 | 21.64 | 146.22 | 25.53 | -897.53 | 767.00 | 726.36 | 40.64 | 18.872 | |
| 6,400.00 | 6,157.12 | 6,244.29 | 6,157.12 | 31.59 | 21.77 | 146.22 | 25.53 | -897.53 | 767.00 | 726.08 | 40.92 | 18.745 | |
| 6,500.00 | 6,257.12 | 6,344.29 | 6,257.12 | 31.69 | 21.90 | 146.22 | 25.53 | -897.53 | 767.00 | 725.81 | 41.20 | 18.618 | |
| 6,600.00 | 6,357.12 | 6,444.29 | 6,357.12 | 31.78 | 22.04 | 146.22 | 25.53 | -897.53 | 767.00 | 725.52 | 41.48 | 18.492 | |
| 6,700.00 | 6,457.12 | 6,544.29 | 6,457.12 | 31.88 | 22.18 | 146.22 | 25.53 | -897.53 | 767.00 | 725.24 | 41.76 | 18.366 | |
| 6,800.00 | 6,557.12 | 6,644.29 | 6,557.12 | 31.98 | 22.31 | 146.22 | 25.53 | -897.53 | 767.00 | 724.95 | 42.05 | 18.241 | |
| 6,900.00 | 6,657.12 | 6,744.29 | 6,657.12 | 32.08 | 22.45 | 146.22 | 25.53 | -897.53 | 767.00 | 724.66 | 42.34 | 18.116 | |
| 7,000.00 | 6,757.12 | 6,844.29 | 6,757.12 | 32.18 | 22.59 | 146.22 | 25.53 | -897.53 | 767.00 | 724.37 | 42.63 | 17.992 | |
| 7,100.00 | 6,857.12 | 6,944.29 | 6,857.12 | 32.28 | 22.73 | 146.22 | 25.53 | -897.53 | 767.00 | 724.08 | 42.93 | 17.868 | |
| 7,200.00 | 6,957.12 | 7,044.29 | 6,957.12 | 32.38 | 22.88 | 146.22 | 25.53 | -897.53 | 767.00 | 723.78 | 43.22 | 17.745 | |
| 7,300.00 | 7,057.12 | 7,144.29 | 7,057.12 | 32.49 | 23.02 | 146.22 | 25.53 | -897.53 | 767.00 | 723.48 | 43.53 | 17.622 | |
| 7,400.00 | 7,157.12 | 7,244.29 | 7,157.12 | 32.59 | 23.17 | 146.22 | 25.53 | -897.53 | 767.00 | 723.17 | 43.83 | 17.500 | |
| 7,500.00 | 7,257.12 | 7,344.29 | 7,257.12 | 32.70 | 23.31 | 146.22 | 25.53 | -897.53 | 767.00 | 722.87 | 44.13 | 17.379 | |
| 7,600.00 | 7,357.12 | 7,444.29 | 7,357.12 | 32.81 | 23.46 | 146.22 | 25.53 | -897.53 | 767.00 | 722.56 | 44.44 | 17.259 | |
| 7,700.00 | 7,457.12 | 7,544.29 | 7,457.12 | 32.92 | 23.61 | 146.22 | 25.53 | -897.53 | 767.00 | 722.25 | 44.75 | 17.139 | |
| 7,800.00 | 7,557.12 | 7,644.29 | 7,557.12 | 33.03 | 23.76 | 146.22 | 25.53 | -897.53 | 767.00 | 721.94 | 45.07 | 17.020 | |
| 7,900.00 | 7,657.12 | 7,744.29 | 7,657.12 | 33.14 | 23.91 | 146.22 | 25.53 | -897.53 | 767.00 | 721.62 | 45.38 | 16.902 | |
| 8,000.00 | 7,757.12 | 7,844.29 | 7,757.12 | 33.25 | 24.07 | 146.22 | 25.53 | -897.53 | 767.00 | 721.30 | 45.70 | 16.784 | |
| 8,100.00 | 7,857.12 | 7,944.29 | 7,857.12 | 33.37 | 24.22 | 146.22 | 25.53 | -897.53 | 767.00 | 720.98 | 46.02 | 16.668 | |
| 8,155.88 | 7,913.00 | 7,959.17 | 7,872.00 | 33.43 | 24.24 | 146.22 | 25.53 | -897.53 | 768.10 | 721.97 | 46.13 | 16.651 | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1 11-04 | | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|--|--------------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Semi Major Axis Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 176.63 | -47.36 | 2.79 | 47.44 | | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | 176.63 | -47.36 | 2.79 | 47.44 | 47.25 | 0.19 | 248.332 | | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | 176.63 | -47.36 | 2.79 | 47.44 | 46.80 | 0.64 | 74.064 | | |
| 300.00 | 300.00 | 300.00 | 300.00 | 0.55 | 0.55 | 176.63 | -47.36 | 2.79 | 47.44 | 46.35 | 1.09 | 43.522 | | |
| 400.00 | 400.00 | 400.00 | 400.00 | 0.77 | 0.77 | 176.63 | -47.36 | 2.79 | 47.44 | 45.90 | 1.54 | 30.815 | | |
| 500.00 | 500.00 | 500.00 | 500.00 | 0.99 | 0.99 | 176.63 | -47.36 | 2.79 | 47.44 | 45.46 | 1.99 | 23.851 | | |
| 600.00 | 600.00 | 600.00 | 600.00 | 1.22 | 1.22 | 176.63 | -47.36 | 2.79 | 47.44 | 45.01 | 2.44 | 19.455 | | |
| 700.00 | 700.00 | 700.00 | 700.00 | 1.44 | 1.44 | 176.63 | -47.36 | 2.79 | 47.44 | 44.56 | 2.89 | 16.427 | | |
| 800.00 | 800.00 | 800.00 | 800.00 | 1.67 | 1.67 | 176.63 | -47.36 | 2.79 | 47.44 | 44.11 | 3.34 | 14.214 | | |
| 900.00 | 900.00 | 900.00 | 900.00 | 1.89 | 1.89 | 176.63 | -47.36 | 2.79 | 47.44 | 43.66 | 3.79 | 12.527 | | |
| 950.00 | 950.00 | 950.00 | 950.00 | 2.01 | 2.01 | 176.63 | -47.36 | 2.79 | 47.44 | 43.43 | 4.01 | 11.825 CC | | |
| 1,000.00 | 1,000.00 | 1,000.09 | 1,000.09 | 2.11 | 2.11 | -120.95 | -47.28 | 3.22 | 47.61 | 43.39 | 4.23 | 11.263 ES | | |
| 1,100.00 | 1,099.93 | 1,099.94 | 1,099.87 | 2.33 | 2.32 | -128.41 | -46.65 | 6.64 | 49.46 | 44.81 | 4.64 | 10.648 SF | | |
| 1,200.00 | 1,199.68 | 1,198.81 | 1,198.50 | 2.55 | 2.53 | -141.16 | -45.39 | 13.40 | 55.36 | 50.29 | 5.07 | 10.924 | | |
| 1,300.00 | 1,299.13 | 1,296.09 | 1,295.25 | 2.79 | 2.76 | -154.88 | -43.55 | 23.32 | 68.07 | 62.59 | 5.49 | 12.409 | | |
| 1,400.00 | 1,398.15 | 1,392.11 | 1,390.41 | 3.05 | 3.01 | -166.03 | -41.21 | 35.87 | 88.62 | 82.73 | 5.89 | 15.038 | | |
| 1,500.00 | 1,496.63 | 1,487.75 | 1,485.15 | 3.35 | 3.27 | -173.29 | -38.81 | 48.78 | 114.93 | 108.64 | 6.29 | 18.260 | | |
| 1,600.00 | 1,594.44 | 1,582.36 | 1,578.87 | 3.69 | 3.54 | -177.91 | -36.44 | 61.55 | 145.69 | 139.00 | 6.69 | 21.778 | | |
| 1,700.00 | 1,691.46 | 1,675.82 | 1,671.44 | 4.08 | 3.81 | 179.07 | -34.09 | 74.16 | 180.32 | 173.24 | 7.08 | 25.459 | | |
| 1,800.00 | 1,787.58 | 1,768.02 | 1,762.76 | 4.54 | 4.09 | 177.04 | -31.78 | 86.60 | 218.50 | 211.03 | 7.47 | 29.236 | | |
| 1,900.00 | 1,882.68 | 1,858.84 | 1,852.73 | 5.06 | 4.36 | 175.63 | -29.50 | 98.85 | 260.03 | 252.16 | 7.86 | 33.071 | | |
| 1,961.54 | 1,940.65 | 1,913.99 | 1,907.36 | 5.41 | 4.54 | 174.97 | -28.12 | 106.29 | 287.19 | 279.09 | 8.10 | 35.451 | | |
| 2,000.00 | 1,976.74 | 1,948.29 | 1,941.33 | 5.64 | 4.64 | 174.66 | -27.26 | 110.92 | 304.55 | 296.26 | 8.29 | 36.757 | | |
| 2,100.00 | 2,070.57 | 2,037.45 | 2,029.64 | 6.26 | 4.92 | 173.99 | -25.02 | 122.95 | 349.70 | 340.93 | 8.77 | 39.867 | | |
| 2,200.00 | 2,164.40 | 2,126.61 | 2,117.96 | 6.90 | 5.20 | 173.47 | -22.79 | 134.98 | 394.88 | 385.62 | 9.27 | 42.611 | | |
| 2,300.00 | 2,258.23 | 2,215.77 | 2,206.28 | 7.56 | 5.49 | 173.06 | -20.55 | 147.01 | 440.09 | 430.32 | 9.77 | 45.044 | | |
| 2,400.00 | 2,352.06 | 2,304.92 | 2,294.59 | 8.23 | 5.78 | 172.72 | -18.31 | 159.04 | 485.31 | 475.03 | 10.28 | 47.210 | | |
| 2,500.00 | 2,445.89 | 2,394.08 | 2,382.91 | 8.90 | 6.07 | 172.44 | -16.08 | 171.07 | 530.54 | 519.74 | 10.79 | 49.148 | | |
| 2,600.00 | 2,539.72 | 2,483.24 | 2,471.22 | 9.58 | 6.36 | 172.21 | -13.84 | 183.10 | 575.78 | 564.46 | 11.31 | 50.888 | | |
| 2,700.00 | 2,633.55 | 2,572.40 | 2,559.54 | 10.27 | 6.65 | 172.01 | -11.60 | 195.13 | 621.02 | 609.18 | 11.84 | 52.458 | | |
| 2,800.00 | 2,727.39 | 2,661.56 | 2,647.85 | 10.96 | 6.94 | 171.83 | -9.37 | 207.16 | 666.27 | 653.91 | 12.37 | 53.880 | | |
| 2,900.00 | 2,821.22 | 2,750.72 | 2,736.17 | 11.66 | 7.24 | 171.68 | -7.13 | 219.19 | 711.53 | 698.63 | 12.90 | 55.174 | | |
| 3,000.00 | 2,915.05 | 2,839.88 | 2,824.48 | 12.36 | 7.53 | 171.55 | -4.89 | 231.22 | 756.79 | 743.36 | 13.43 | 56.354 | | |
| 3,100.00 | 3,008.88 | 2,929.04 | 2,912.80 | 13.06 | 7.83 | 171.43 | -2.66 | 243.25 | 802.05 | 788.08 | 13.96 | 57.435 | | |
| 3,200.00 | 3,102.71 | 3,018.20 | 3,001.12 | 13.76 | 8.12 | 171.33 | -0.42 | 255.29 | 847.31 | 832.81 | 14.50 | 58.427 | | |
| 3,300.00 | 3,196.54 | 3,107.36 | 3,089.43 | 14.47 | 8.42 | 171.23 | 1.82 | 267.32 | 892.58 | 877.53 | 15.04 | 59.342 | | |
| 3,400.00 | 3,290.37 | 3,196.52 | 3,177.75 | 15.18 | 8.72 | 171.15 | 4.05 | 279.35 | 937.84 | 922.26 | 15.58 | 60.187 | | |
| 3,500.00 | 3,384.20 | 3,285.68 | 3,266.06 | 15.88 | 9.01 | 171.07 | 6.29 | 291.38 | 983.11 | 966.99 | 16.12 | 60.970 | | |
| 3,600.00 | 3,478.03 | 3,374.84 | 3,354.38 | 16.59 | 9.31 | 171.00 | 8.53 | 303.41 | 1,028.38 | 1,011.71 | 16.67 | 61.698 | | |
| 3,700.00 | 3,571.86 | 3,464.00 | 3,442.69 | 17.30 | 9.61 | 170.93 | 10.76 | 315.44 | 1,073.65 | 1,056.44 | 17.21 | 62.375 | | |
| 3,800.00 | 3,665.69 | 3,553.16 | 3,531.01 | 18.02 | 9.91 | 170.87 | 13.00 | 327.47 | 1,118.93 | 1,101.17 | 17.76 | 63.007 | | |
| 3,900.00 | 3,759.52 | 3,642.31 | 3,619.33 | 18.73 | 10.21 | 170.82 | 15.24 | 339.50 | 1,164.20 | 1,145.89 | 18.31 | 63.597 | | |
| 4,000.00 | 3,853.35 | 3,731.47 | 3,707.64 | 19.44 | 10.51 | 170.77 | 17.47 | 351.53 | 1,209.47 | 1,190.62 | 18.85 | 64.151 | | |
| 4,100.00 | 3,947.19 | 3,820.63 | 3,795.96 | 20.16 | 10.81 | 170.72 | 19.71 | 363.56 | 1,254.75 | 1,235.34 | 19.40 | 64.671 | | |
| 4,200.00 | 4,041.02 | 3,909.79 | 3,884.27 | 20.87 | 11.11 | 170.68 | 21.95 | 375.59 | 1,300.02 | 1,280.07 | 19.95 | 65.160 | | |
| 4,300.00 | 4,134.85 | 3,998.95 | 3,972.59 | 21.58 | 11.41 | 170.63 | 24.18 | 387.62 | 1,345.30 | 1,324.80 | 20.50 | 65.620 | | |
| 4,400.00 | 4,228.68 | 4,088.11 | 4,060.90 | 22.30 | 11.71 | 170.60 | 26.42 | 399.65 | 1,390.57 | 1,369.52 | 21.05 | 66.054 | | |
| 4,500.00 | 4,322.51 | 4,177.27 | 4,149.22 | 23.02 | 12.01 | 170.56 | 28.66 | 411.68 | 1,435.85 | 1,414.25 | 21.60 | 66.465 | | |
| 4,600.00 | 4,416.34 | 4,266.43 | 4,237.54 | 23.73 | 12.31 | 170.53 | 30.89 | 423.71 | 1,481.13 | 1,458.97 | 22.15 | 66.853 | | |
| 4,700.00 | 4,510.17 | 4,355.59 | 4,325.85 | 24.45 | 12.62 | 170.49 | 33.13 | 435.74 | 1,526.41 | 1,503.70 | 22.71 | 67.222 | | |
| 4,800.00 | 4,604.00 | 4,444.75 | 4,414.17 | 25.17 | 12.92 | 170.46 | 35.37 | 447.77 | 1,571.68 | 1,548.42 | 23.26 | 67.571 | | |
| 4,900.00 | 4,697.83 | 4,533.91 | 4,502.48 | 25.88 | 13.22 | 170.44 | 37.60 | 459.80 | 1,616.96 | 1,593.15 | 23.81 | 67.903 | | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NORTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1 11-04 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.00 | 4,791.66 | 4,623.07 | 4,590.80 | 26.60 | 13.52 | 170.41 | 39.84 | 471.83 | 1,662.24 | 1,637.87 | 24.37 | 68.219 | |
| 5,100.00 | 4,885.49 | 4,712.23 | 4,679.11 | 27.32 | 13.82 | 170.38 | 42.08 | 483.86 | 1,707.52 | 1,682.60 | 24.92 | 68.520 | |
| 5,200.00 | 4,979.32 | 4,801.39 | 4,767.43 | 28.04 | 14.13 | 170.36 | 44.31 | 495.89 | 1,752.80 | 1,727.32 | 25.47 | 68.807 | |
| 5,221.35 | 4,999.35 | 4,820.42 | 4,786.28 | 28.19 | 14.19 | 170.36 | 44.79 | 498.46 | 1,762.46 | 1,736.87 | 25.59 | 68.867 | |
| 5,300.00 | 5,073.52 | 4,891.02 | 4,856.21 | 28.68 | 14.43 | 170.46 | 46.56 | 507.99 | 1,797.12 | 1,770.97 | 26.15 | 68.722 | |
| 5,400.00 | 5,168.80 | 4,982.08 | 4,946.41 | 29.18 | 14.74 | 170.56 | 48.85 | 520.28 | 1,838.41 | 1,811.60 | 26.81 | 68.563 | |
| 5,500.00 | 5,265.09 | 5,074.50 | 5,037.96 | 29.63 | 15.05 | 170.63 | 51.17 | 532.75 | 1,876.54 | 1,849.10 | 27.44 | 68.383 | |
| 5,600.00 | 5,362.25 | 5,168.17 | 5,130.74 | 30.03 | 15.37 | 170.67 | 53.52 | 545.38 | 1,911.46 | 1,883.43 | 28.03 | 68.186 | |
| 5,700.00 | 5,460.19 | 5,262.96 | 5,224.64 | 30.38 | 15.69 | 170.69 | 55.89 | 558.17 | 1,943.15 | 1,914.56 | 28.59 | 67.974 | |
| 5,800.00 | 5,558.76 | 5,358.77 | 5,319.54 | 30.68 | 16.02 | 170.67 | 58.30 | 571.10 | 1,971.55 | 1,942.45 | 29.10 | 67.752 | |
| 5,900.00 | 5,657.87 | 5,455.48 | 5,415.33 | 30.94 | 16.35 | 170.63 | 60.72 | 584.15 | 1,996.64 | 1,967.07 | 29.57 | 67.519 | |
| 6,000.00 | 5,757.38 | 5,552.97 | 5,511.90 | 31.14 | 16.68 | 170.57 | 63.17 | 597.31 | 2,018.39 | 1,988.39 | 30.00 | 67.279 | |
| 6,100.00 | 5,857.17 | 5,742.95 | 5,700.52 | 31.30 | 17.17 | 170.38 | 67.26 | 619.33 | 2,035.57 | 2,005.02 | 30.55 | 66.632 | |
| 6,200.00 | 5,957.12 | 5,999.85 | 5,957.12 | 31.42 | 17.62 | 170.30 | 69.24 | 629.94 | 2,041.96 | 2,010.87 | 31.10 | 65.668 | |
| 6,232.88 | 5,990.00 | 6,032.73 | 5,990.00 | 31.44 | 17.67 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,010.98 | 31.17 | 65.514 | |
| 6,300.00 | 6,057.12 | 6,099.85 | 6,057.12 | 31.50 | 17.77 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,010.75 | 31.40 | 65.042 | |
| 6,400.00 | 6,157.12 | 6,199.85 | 6,157.12 | 31.59 | 17.93 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,010.40 | 31.74 | 64.331 | |
| 6,500.00 | 6,257.12 | 6,299.85 | 6,257.12 | 31.69 | 18.09 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,010.05 | 32.09 | 63.631 | |
| 6,600.00 | 6,357.12 | 6,399.85 | 6,357.12 | 31.78 | 18.26 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,009.70 | 32.45 | 62.940 | |
| 6,700.00 | 6,457.12 | 6,499.85 | 6,457.12 | 31.88 | 18.42 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,009.35 | 32.80 | 62.261 | |
| 6,800.00 | 6,557.12 | 6,599.85 | 6,557.12 | 31.98 | 18.59 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,008.99 | 33.16 | 61.591 | |
| 6,900.00 | 6,657.12 | 6,699.85 | 6,657.12 | 32.08 | 18.75 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,008.63 | 33.52 | 60.932 | |
| 7,000.00 | 6,757.12 | 6,799.85 | 6,757.12 | 32.18 | 18.92 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,008.27 | 33.88 | 60.283 | |
| 7,100.00 | 6,857.12 | 6,899.85 | 6,857.12 | 32.28 | 19.09 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,007.91 | 34.24 | 59.644 | |
| 7,200.00 | 6,957.12 | 6,999.85 | 6,957.12 | 32.38 | 19.26 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,007.54 | 34.60 | 59.015 | |
| 7,300.00 | 7,057.12 | 7,099.85 | 7,057.12 | 32.49 | 19.43 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,007.18 | 34.97 | 58.396 | |
| 7,400.00 | 7,157.12 | 7,199.85 | 7,157.12 | 32.59 | 19.60 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,006.81 | 35.34 | 57.787 | |
| 7,500.00 | 7,257.12 | 7,299.85 | 7,257.12 | 32.70 | 19.78 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,006.44 | 35.71 | 57.187 | |
| 7,600.00 | 7,357.12 | 7,399.85 | 7,357.12 | 32.81 | 19.95 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,006.06 | 36.08 | 56.597 | |
| 7,700.00 | 7,457.12 | 7,499.85 | 7,457.12 | 32.92 | 20.12 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,005.69 | 36.46 | 56.016 | |
| 7,800.00 | 7,557.12 | 7,599.85 | 7,557.12 | 33.03 | 20.30 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,005.32 | 36.83 | 55.445 | |
| 7,900.00 | 7,657.12 | 7,699.85 | 7,657.12 | 33.14 | 20.48 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,004.94 | 37.21 | 54.883 | |
| 8,000.00 | 7,757.12 | 7,799.85 | 7,757.12 | 33.25 | 20.66 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,004.56 | 37.59 | 54.330 | |
| 8,100.00 | 7,857.12 | 7,899.85 | 7,857.12 | 33.37 | 20.83 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,004.18 | 37.97 | 53.786 | |
| 8,135.01 | 7,892.13 | 7,934.87 | 7,892.13 | 33.41 | 20.90 | 106.90 | 69.24 | 629.94 | 2,042.15 | 2,004.05 | 38.10 | 53.597 | |
| 8,155.88 | 7,913.00 | 7,949.73 | 7,907.00 | 33.43 | 20.92 | 106.90 | 69.24 | 629.94 | 2,042.16 | 2,003.99 | 38.17 | 53.503 | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 11-04 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 177.42 | -61.93 | 2.79 | 61.99 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | 177.42 | -61.93 | 2.79 | 61.99 | 61.80 | 0.19 | 324.481 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | 177.42 | -61.93 | 2.79 | 61.99 | 61.35 | 0.64 | 96.775 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 0.55 | 0.55 | 177.42 | -61.93 | 2.79 | 61.99 | 60.90 | 1.09 | 56.868 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 0.77 | 0.77 | 177.42 | -61.93 | 2.79 | 61.99 | 60.45 | 1.54 | 40.264 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 0.99 | 0.99 | 177.42 | -61.93 | 2.79 | 61.99 | 60.00 | 1.99 | 31.165 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 1.22 | 1.22 | 177.42 | -61.93 | 2.79 | 61.99 | 59.55 | 2.44 | 25.420 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 1.44 | 1.44 | 177.42 | -61.93 | 2.79 | 61.99 | 59.10 | 2.89 | 21.464 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 1.67 | 1.67 | 177.42 | -61.93 | 2.79 | 61.99 | 58.65 | 3.34 | 18.573 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 1.89 | 1.89 | 177.42 | -61.93 | 2.79 | 61.99 | 58.21 | 3.79 | 16.369 | |
| 950.00 | 950.00 | 950.00 | 950.00 | 2.01 | 2.01 | 177.42 | -61.93 | 2.79 | 61.99 | 57.98 | 4.01 | 15.452 CC, ES | |
| 1,000.00 | 1,000.00 | 999.02 | 999.02 | 2.11 | 2.10 | -119.35 | -62.32 | 2.63 | 62.60 | 58.38 | 4.22 | 14.843 | |
| 1,100.00 | 1,099.93 | 1,096.88 | 1,096.88 | 2.33 | 2.27 | -120.63 | -65.43 | 1.41 | 67.44 | 62.84 | 4.60 | 14.659 SF | |
| 1,200.00 | 1,199.68 | 1,194.17 | 1,193.88 | 2.55 | 2.46 | -122.69 | -71.61 | -1.03 | 77.20 | 72.20 | 5.00 | 15.447 | |
| 1,300.00 | 1,299.13 | 1,290.53 | 1,289.73 | 2.79 | 2.66 | -124.91 | -80.74 | -4.62 | 91.93 | 86.52 | 5.41 | 16.987 | |
| 1,400.00 | 1,398.15 | 1,385.61 | 1,383.93 | 3.05 | 2.88 | -126.90 | -92.68 | -9.33 | 111.64 | 105.79 | 5.85 | 19.086 | |
| 1,500.00 | 1,496.63 | 1,479.08 | 1,476.08 | 3.35 | 3.13 | -128.50 | -107.26 | -15.07 | 136.24 | 129.92 | 6.32 | 21.570 | |
| 1,600.00 | 1,594.44 | 1,570.65 | 1,565.81 | 3.69 | 3.42 | -129.71 | -124.24 | -21.77 | 165.62 | 158.80 | 6.82 | 24.273 | |
| 1,700.00 | 1,691.46 | 1,660.04 | 1,652.79 | 4.08 | 3.75 | -130.57 | -143.38 | -29.31 | 199.65 | 192.27 | 7.38 | 27.067 | |
| 1,800.00 | 1,787.58 | 1,747.02 | 1,736.78 | 4.54 | 4.11 | -131.14 | -164.42 | -37.60 | 238.15 | 230.17 | 7.98 | 29.845 | |
| 1,900.00 | 1,882.68 | 1,831.39 | 1,817.55 | 5.06 | 4.50 | -131.47 | -187.08 | -46.53 | 280.95 | 272.31 | 8.64 | 32.526 | |
| 1,961.54 | 1,940.65 | 1,881.94 | 1,865.59 | 5.41 | 4.76 | -131.57 | -201.72 | -52.30 | 309.35 | 300.27 | 9.07 | 34.101 | |
| 2,000.00 | 1,976.74 | 1,913.07 | 1,895.03 | 5.64 | 4.92 | -131.89 | -211.12 | -56.00 | 327.72 | 318.36 | 9.36 | 34.999 | |
| 2,100.00 | 2,070.57 | 1,998.79 | 1,975.79 | 6.26 | 5.41 | -132.49 | -237.87 | -66.54 | 376.26 | 366.09 | 10.17 | 37.008 | |
| 2,200.00 | 2,164.40 | 2,086.13 | 2,058.05 | 6.90 | 5.92 | -132.96 | -265.18 | -77.31 | 424.87 | 413.87 | 11.00 | 38.614 | |
| 2,300.00 | 2,258.23 | 2,173.47 | 2,140.31 | 7.56 | 6.45 | -133.33 | -292.49 | -88.07 | 473.50 | 461.64 | 11.86 | 39.925 | |
| 2,400.00 | 2,352.06 | 2,260.81 | 2,222.57 | 8.23 | 6.99 | -133.63 | -319.79 | -98.83 | 522.14 | 509.41 | 12.73 | 41.008 | |
| 2,500.00 | 2,445.89 | 2,348.16 | 2,304.84 | 8.90 | 7.54 | -133.88 | -347.10 | -109.59 | 570.79 | 557.18 | 13.62 | 41.911 | |
| 2,600.00 | 2,539.72 | 2,435.50 | 2,387.10 | 9.58 | 8.09 | -134.09 | -374.41 | -120.35 | 619.45 | 604.94 | 14.52 | 42.673 | |
| 2,700.00 | 2,633.55 | 2,522.84 | 2,469.36 | 10.27 | 8.65 | -134.27 | -401.72 | -131.11 | 668.12 | 652.70 | 15.42 | 43.322 | |
| 2,800.00 | 2,727.39 | 2,610.18 | 2,551.62 | 10.96 | 9.21 | -134.43 | -429.02 | -141.87 | 716.79 | 700.45 | 16.33 | 43.881 | |
| 2,900.00 | 2,821.22 | 2,697.52 | 2,633.89 | 11.66 | 9.78 | -134.57 | -456.33 | -152.63 | 765.46 | 748.21 | 17.25 | 44.365 | |
| 3,000.00 | 2,915.05 | 2,784.87 | 2,716.15 | 12.36 | 10.35 | -134.69 | -483.64 | -163.39 | 814.13 | 795.96 | 18.18 | 44.789 | |
| 3,100.00 | 3,008.88 | 2,872.21 | 2,798.41 | 13.06 | 10.92 | -134.79 | -510.95 | -174.15 | 862.81 | 843.71 | 19.10 | 45.162 | |
| 3,200.00 | 3,102.71 | 2,959.55 | 2,880.67 | 13.76 | 11.50 | -134.89 | -538.25 | -184.92 | 911.49 | 891.46 | 20.04 | 45.493 | |
| 3,300.00 | 3,196.54 | 3,046.89 | 2,962.94 | 14.47 | 12.08 | -134.98 | -565.56 | -195.68 | 960.17 | 939.20 | 20.97 | 45.790 | |
| 3,400.00 | 3,290.37 | 3,134.23 | 3,045.20 | 15.18 | 12.65 | -135.05 | -592.87 | -206.44 | 1,008.86 | 986.95 | 21.91 | 46.056 | |
| 3,500.00 | 3,384.20 | 3,221.58 | 3,127.46 | 15.88 | 13.23 | -135.12 | -620.18 | -217.20 | 1,057.54 | 1,034.70 | 22.84 | 46.297 | |
| 3,600.00 | 3,478.03 | 3,308.92 | 3,209.72 | 16.59 | 13.82 | -135.19 | -647.48 | -227.96 | 1,106.23 | 1,082.44 | 23.78 | 46.515 | |
| 3,700.00 | 3,571.86 | 3,396.26 | 3,291.99 | 17.30 | 14.40 | -135.25 | -674.79 | -238.72 | 1,154.91 | 1,130.19 | 24.72 | 46.715 | |
| 3,800.00 | 3,665.69 | 3,483.60 | 3,374.25 | 18.02 | 14.98 | -135.30 | -702.10 | -249.48 | 1,203.60 | 1,177.94 | 25.66 | 46.899 | |
| 3,900.00 | 3,759.52 | 3,570.94 | 3,456.51 | 18.73 | 15.56 | -135.35 | -729.41 | -260.24 | 1,252.29 | 1,225.68 | 26.61 | 47.068 | |
| 4,000.00 | 3,853.35 | 3,658.28 | 3,538.77 | 19.44 | 16.15 | -135.40 | -756.71 | -271.00 | 1,300.98 | 1,273.43 | 27.55 | 47.224 | |
| 4,100.00 | 3,947.19 | 3,745.63 | 3,621.04 | 20.16 | 16.73 | -135.44 | -784.02 | -281.76 | 1,349.66 | 1,321.17 | 28.49 | 47.370 | |
| 4,200.00 | 4,041.02 | 3,832.97 | 3,703.30 | 20.87 | 17.32 | -135.48 | -811.33 | -292.52 | 1,398.35 | 1,368.92 | 29.44 | 47.505 | |
| 4,300.00 | 4,134.85 | 3,920.31 | 3,785.56 | 21.58 | 17.91 | -135.51 | -838.64 | -303.29 | 1,447.04 | 1,416.66 | 30.38 | 47.632 | |
| 4,400.00 | 4,228.68 | 4,007.65 | 3,867.82 | 22.30 | 18.49 | -135.55 | -865.94 | -314.05 | 1,495.74 | 1,464.41 | 31.32 | 47.751 | |
| 4,500.00 | 4,322.51 | 4,094.99 | 3,950.09 | 23.02 | 19.08 | -135.58 | -893.25 | -324.81 | 1,544.43 | 1,512.16 | 32.27 | 47.863 | |
| 4,600.00 | 4,416.34 | 4,182.34 | 4,032.35 | 23.73 | 19.67 | -135.61 | -920.56 | -335.57 | 1,593.12 | 1,559.91 | 33.21 | 47.969 | |
| 4,700.00 | 4,510.17 | 4,269.68 | 4,114.61 | 24.45 | 20.26 | -135.64 | -947.87 | -346.33 | 1,641.81 | 1,607.65 | 34.16 | 48.069 | |
| 4,800.00 | 4,604.00 | 4,357.02 | 4,196.87 | 25.17 | 20.85 | -135.67 | -975.17 | -357.09 | 1,690.50 | 1,655.40 | 35.10 | 48.164 | |
| 4,900.00 | 4,697.83 | 4,444.36 | 4,279.14 | 25.88 | 21.44 | -135.69 | -1,002.48 | -367.85 | 1,739.19 | 1,703.15 | 36.04 | 48.254 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 11-04 | | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|---|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 5,000.00 | 4,791.66 | 4,531.70 | 4,361.40 | 26.60 | 22.03 | -135.72 | -1,029.79 | -378.61 | 1,787.89 | 1,750.90 | 36.99 | 48.341 | | |
| 5,100.00 | 4,885.49 | 4,619.05 | 4,443.66 | 27.32 | 22.61 | -135.74 | -1,057.10 | -389.37 | 1,836.58 | 1,798.65 | 37.93 | 48.423 | | |
| 5,200.00 | 4,979.32 | 4,706.39 | 4,525.92 | 28.04 | 23.20 | -135.76 | -1,084.40 | -400.13 | 1,885.27 | 1,846.40 | 38.87 | 48.502 | | |
| 5,221.35 | 4,999.35 | 4,725.03 | 4,543.48 | 28.19 | 23.33 | -135.77 | -1,090.23 | -402.43 | 1,895.67 | 1,856.59 | 39.07 | 48.519 | | |
| 5,300.00 | 5,073.52 | 4,794.10 | 4,608.54 | 28.68 | 23.80 | -136.35 | -1,111.83 | -410.94 | 1,933.28 | 1,893.43 | 39.85 | 48.509 | | |
| 5,400.00 | 5,168.80 | 4,882.94 | 4,692.21 | 29.18 | 24.40 | -136.98 | -1,139.60 | -421.89 | 1,979.12 | 1,938.35 | 40.76 | 48.550 | | |
| 5,500.00 | 5,265.09 | 4,972.82 | 4,776.86 | 29.63 | 25.00 | -137.48 | -1,167.70 | -432.96 | 2,022.68 | 1,980.97 | 41.71 | 48.492 | | |
| 5,600.00 | 5,362.25 | 5,063.63 | 4,862.39 | 30.03 | 25.62 | -137.87 | -1,196.10 | -444.15 | 2,063.92 | 2,021.30 | 42.62 | 48.424 | | |
| 5,700.00 | 5,460.19 | 5,155.27 | 4,948.70 | 30.38 | 26.24 | -138.16 | -1,224.75 | -455.44 | 2,102.83 | 2,059.34 | 43.49 | 48.350 | | |
| 5,800.00 | 5,558.76 | 5,284.72 | 5,070.89 | 30.68 | 27.04 | -138.22 | -1,264.51 | -471.11 | 2,139.12 | 2,094.66 | 44.46 | 48.116 | | |
| 5,900.00 | 5,657.87 | 5,494.73 | 5,272.55 | 30.94 | 27.93 | -138.03 | -1,318.91 | -492.54 | 2,169.17 | 2,123.68 | 45.49 | 47.682 | | |
| 6,000.00 | 5,757.38 | 5,714.19 | 5,487.25 | 31.14 | 28.66 | -137.89 | -1,360.91 | -509.10 | 2,191.48 | 2,145.12 | 46.37 | 47.266 | | |
| 6,100.00 | 5,857.17 | 5,940.56 | 5,711.67 | 31.30 | 29.20 | -137.81 | -1,388.09 | -519.81 | 2,205.67 | 2,158.62 | 47.05 | 46.879 | | |
| 6,200.00 | 5,957.12 | 6,170.78 | 5,941.55 | 31.42 | 29.53 | -137.80 | -1,398.75 | -524.01 | 2,211.47 | 2,163.94 | 47.53 | 46.528 | | |
| 6,232.88 | 5,990.00 | 6,219.23 | 5,990.00 | 31.44 | 29.57 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,164.03 | 47.62 | 46.446 | | |
| 6,300.00 | 6,057.12 | 6,286.35 | 6,057.12 | 31.50 | 29.63 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,163.89 | 47.76 | 46.310 | | |
| 6,400.00 | 6,157.12 | 6,386.35 | 6,157.12 | 31.59 | 29.71 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,163.67 | 47.98 | 46.095 | | |
| 6,500.00 | 6,257.12 | 6,486.35 | 6,257.12 | 31.69 | 29.79 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,163.45 | 48.21 | 45.880 | | |
| 6,600.00 | 6,357.12 | 6,586.35 | 6,357.12 | 31.78 | 29.87 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,163.22 | 48.43 | 45.664 | | |
| 6,700.00 | 6,457.12 | 6,686.35 | 6,457.12 | 31.88 | 29.95 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,162.99 | 48.66 | 45.447 | | |
| 6,800.00 | 6,557.12 | 6,786.35 | 6,557.12 | 31.98 | 30.04 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,162.75 | 48.90 | 45.229 | | |
| 6,900.00 | 6,657.12 | 6,886.35 | 6,657.12 | 32.08 | 30.13 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,162.52 | 49.14 | 45.010 | | |
| 7,000.00 | 6,757.12 | 6,986.35 | 6,757.12 | 32.18 | 30.22 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,162.28 | 49.38 | 44.791 | | |
| 7,100.00 | 6,857.12 | 7,086.35 | 6,857.12 | 32.28 | 30.31 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,162.03 | 49.62 | 44.571 | | |
| 7,200.00 | 6,957.12 | 7,186.35 | 6,957.12 | 32.38 | 30.40 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,161.79 | 49.87 | 44.351 | | |
| 7,300.00 | 7,057.12 | 7,286.35 | 7,057.12 | 32.49 | 30.49 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,161.54 | 50.12 | 44.131 | | |
| 7,400.00 | 7,157.12 | 7,386.35 | 7,157.12 | 32.59 | 30.58 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,161.29 | 50.37 | 43.910 | | |
| 7,500.00 | 7,257.12 | 7,486.35 | 7,257.12 | 32.70 | 30.68 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,161.03 | 50.62 | 43.690 | | |
| 7,600.00 | 7,357.12 | 7,586.35 | 7,357.12 | 32.81 | 30.78 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,160.77 | 50.88 | 43.469 | | |
| 7,700.00 | 7,457.12 | 7,686.35 | 7,457.12 | 32.92 | 30.88 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,160.51 | 51.14 | 43.248 | | |
| 7,800.00 | 7,557.12 | 7,786.35 | 7,557.12 | 33.03 | 30.98 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,160.25 | 51.40 | 43.027 | | |
| 7,900.00 | 7,657.12 | 7,886.35 | 7,657.12 | 33.14 | 31.08 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,159.99 | 51.67 | 42.806 | | |
| 8,000.00 | 7,757.12 | 7,986.35 | 7,757.12 | 33.25 | 31.18 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,159.72 | 51.93 | 42.586 | | |
| 8,100.00 | 7,857.12 | 8,086.35 | 7,857.12 | 33.37 | 31.28 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,159.45 | 52.20 | 42.365 | | |
| 8,126.04 | 7,883.16 | 8,112.39 | 7,883.16 | 33.40 | 31.31 | 158.80 | -1,398.87 | -524.05 | 2,211.65 | 2,159.38 | 52.27 | 42.308 | | |
| 8,155.88 | 7,913.00 | 8,121.23 | 7,892.00 | 33.43 | 31.32 | 158.80 | -1,398.87 | -524.05 | 2,211.75 | 2,159.42 | 52.33 | 42.267 | | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 11-04 | | | | | | | | | | | | | Offset Site Error: 0.00 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|----------------------------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: 0.00 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Tooface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 175.83 | -76.50 | 5.57 | 76.70 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | 175.83 | -76.50 | 5.57 | 76.70 | 76.51 | 0.19 | 401.486 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | 175.83 | -76.50 | 5.57 | 76.70 | 76.06 | 0.64 | 119.742 CC, ES | |
| 300.00 | 300.00 | 298.40 | 298.38 | 0.55 | 0.52 | 174.83 | -77.40 | 7.01 | 77.73 | 76.66 | 1.07 | 72.674 | |
| 400.00 | 400.00 | 396.57 | 396.42 | 0.77 | 0.74 | 171.98 | -80.08 | 11.29 | 80.95 | 79.45 | 1.50 | 53.790 | |
| 500.00 | 500.00 | 494.28 | 493.77 | 0.99 | 0.98 | 167.74 | -84.52 | 18.37 | 86.72 | 84.75 | 1.97 | 44.011 | |
| 600.00 | 600.00 | 591.31 | 590.10 | 1.22 | 1.26 | 162.73 | -90.68 | 28.18 | 95.47 | 93.00 | 2.47 | 38.601 | |
| 700.00 | 700.00 | 687.45 | 685.10 | 1.44 | 1.58 | 157.58 | -98.48 | 40.63 | 107.56 | 104.55 | 3.02 | 35.620 | |
| 800.00 | 800.00 | 782.49 | 778.48 | 1.67 | 1.94 | 152.74 | -107.85 | 55.57 | 123.22 | 119.61 | 3.61 | 34.111 | |
| 900.00 | 900.00 | 876.24 | 869.98 | 1.89 | 2.36 | 148.45 | -118.70 | 72.88 | 142.49 | 138.24 | 4.25 | 33.531 | |
| 950.00 | 950.00 | 922.59 | 914.95 | 2.01 | 2.58 | 146.54 | -124.65 | 82.38 | 153.47 | 148.89 | 4.58 | 33.484 SF | |
| 1,000.00 | 1,000.00 | 968.43 | 959.25 | 2.11 | 2.81 | -151.76 | -130.92 | 92.37 | 165.70 | 161.40 | 4.30 | 38.513 | |
| 1,100.00 | 1,099.93 | 1,058.10 | 1,045.32 | 2.33 | 3.31 | -154.94 | -144.26 | 113.65 | 195.01 | 190.27 | 4.74 | 41.113 | |
| 1,200.00 | 1,199.68 | 1,144.65 | 1,127.62 | 2.55 | 3.85 | -157.71 | -158.49 | 136.34 | 230.70 | 225.53 | 5.17 | 44.617 | |
| 1,300.00 | 1,299.13 | 1,227.68 | 1,205.78 | 2.79 | 4.40 | -160.00 | -173.37 | 160.08 | 272.55 | 266.96 | 5.58 | 48.810 | |
| 1,400.00 | 1,398.15 | 1,306.84 | 1,279.51 | 3.05 | 4.97 | -161.85 | -188.68 | 184.49 | 320.24 | 314.26 | 5.98 | 53.535 | |
| 1,500.00 | 1,496.63 | 1,381.89 | 1,348.64 | 3.35 | 5.56 | -163.33 | -204.18 | 209.22 | 373.43 | 367.06 | 6.37 | 58.645 | |
| 1,600.00 | 1,594.44 | 1,453.06 | 1,413.48 | 3.69 | 6.15 | -164.50 | -219.76 | 234.08 | 431.75 | 425.02 | 6.74 | 64.080 | |
| 1,700.00 | 1,691.46 | 1,530.82 | 1,483.96 | 4.08 | 6.82 | -165.60 | -237.22 | 261.92 | 493.88 | 486.76 | 7.12 | 69.353 | |
| 1,800.00 | 1,787.58 | 1,606.35 | 1,552.42 | 4.54 | 7.48 | -166.47 | -254.17 | 288.96 | 558.79 | 551.30 | 7.49 | 74.583 | |
| 1,900.00 | 1,882.68 | 1,679.55 | 1,618.76 | 5.06 | 8.12 | -167.17 | -270.60 | 315.16 | 626.38 | 618.53 | 7.85 | 79.745 | |
| 1,961.54 | 1,940.65 | 1,723.39 | 1,658.50 | 5.41 | 8.50 | -167.52 | -280.44 | 330.86 | 669.26 | 661.19 | 8.07 | 82.898 | |
| 2,000.00 | 1,976.74 | 1,750.51 | 1,683.08 | 5.64 | 8.74 | -167.88 | -286.53 | 340.56 | 696.37 | 688.13 | 8.25 | 84.450 | |
| 2,100.00 | 2,070.57 | 1,821.01 | 1,746.97 | 6.26 | 9.36 | -168.69 | -302.35 | 365.80 | 766.91 | 758.21 | 8.70 | 88.137 | |
| 2,200.00 | 2,164.40 | 1,891.51 | 1,810.87 | 6.90 | 9.98 | -169.37 | -318.17 | 391.04 | 837.51 | 828.35 | 9.17 | 91.376 | |
| 2,300.00 | 2,258.23 | 1,962.00 | 1,874.77 | 7.56 | 10.61 | -169.94 | -334.00 | 416.28 | 908.16 | 898.53 | 9.64 | 94.233 | |
| 2,400.00 | 2,352.06 | 2,032.50 | 1,938.66 | 8.23 | 11.23 | -170.43 | -349.82 | 441.52 | 978.85 | 968.74 | 10.11 | 96.774 | |
| 2,500.00 | 2,445.89 | 2,103.00 | 2,002.56 | 8.90 | 11.86 | -170.85 | -365.64 | 466.75 | 1,049.58 | 1,038.98 | 10.60 | 99.043 | |
| 2,600.00 | 2,539.72 | 2,173.50 | 2,066.45 | 9.58 | 12.48 | -171.23 | -381.47 | 491.99 | 1,120.32 | 1,109.24 | 11.08 | 101.074 | |
| 2,700.00 | 2,633.55 | 2,244.00 | 2,130.35 | 10.27 | 13.11 | -171.55 | -397.29 | 517.23 | 1,191.09 | 1,179.52 | 11.57 | 102.906 | |
| 2,800.00 | 2,727.39 | 2,314.50 | 2,194.25 | 10.96 | 13.74 | -171.84 | -413.11 | 542.47 | 1,261.88 | 1,249.81 | 12.07 | 104.563 | |
| 2,900.00 | 2,821.22 | 2,385.00 | 2,258.14 | 11.66 | 14.37 | -172.10 | -428.94 | 567.71 | 1,332.68 | 1,320.11 | 12.56 | 106.068 | |
| 3,000.00 | 2,915.05 | 2,455.50 | 2,322.04 | 12.36 | 14.99 | -172.34 | -444.76 | 592.94 | 1,403.49 | 1,390.43 | 13.06 | 107.439 | |
| 3,100.00 | 3,008.88 | 2,525.99 | 2,385.94 | 13.06 | 15.62 | -172.55 | -460.58 | 618.18 | 1,474.31 | 1,460.75 | 13.56 | 108.694 | |
| 3,200.00 | 3,102.71 | 2,596.49 | 2,449.83 | 13.76 | 16.25 | -172.74 | -476.41 | 643.42 | 1,545.14 | 1,531.08 | 14.07 | 109.845 | |
| 3,300.00 | 3,196.54 | 2,666.99 | 2,513.73 | 14.47 | 16.88 | -172.91 | -492.23 | 668.66 | 1,615.98 | 1,601.41 | 14.57 | 110.904 | |
| 3,400.00 | 3,290.37 | 2,737.49 | 2,577.63 | 15.18 | 17.51 | -173.07 | -508.05 | 693.90 | 1,686.83 | 1,671.75 | 15.08 | 111.882 | |
| 3,500.00 | 3,384.20 | 2,807.99 | 2,641.52 | 15.88 | 18.14 | -173.22 | -523.88 | 719.13 | 1,757.68 | 1,742.10 | 15.58 | 112.788 | |
| 3,600.00 | 3,478.03 | 2,878.49 | 2,705.42 | 16.59 | 18.77 | -173.36 | -539.70 | 744.37 | 1,828.54 | 1,812.45 | 16.09 | 113.628 | |
| 3,700.00 | 3,571.86 | 2,948.99 | 2,769.31 | 17.30 | 19.40 | -173.48 | -555.52 | 769.61 | 1,899.40 | 1,882.80 | 16.60 | 114.409 | |
| 3,800.00 | 3,665.69 | 3,019.49 | 2,833.21 | 18.02 | 20.03 | -173.60 | -571.35 | 794.85 | 1,970.27 | 1,953.16 | 17.11 | 115.137 | |
| 3,900.00 | 3,759.52 | 3,089.98 | 2,897.11 | 18.73 | 20.66 | -173.71 | -587.17 | 820.09 | 2,041.14 | 2,023.52 | 17.62 | 115.818 | |
| 4,000.00 | 3,853.35 | 3,160.48 | 2,961.00 | 19.44 | 21.29 | -173.81 | -602.99 | 845.32 | 2,112.02 | 2,093.88 | 18.14 | 116.455 | |
| 4,100.00 | 3,947.19 | 3,230.98 | 3,024.90 | 20.16 | 21.93 | -173.91 | -618.82 | 870.56 | 2,182.90 | 2,164.25 | 18.65 | 117.052 | |
| 4,200.00 | 4,041.02 | 3,301.48 | 3,088.80 | 20.87 | 22.56 | -174.00 | -634.64 | 895.80 | 2,253.78 | 2,234.61 | 19.16 | 117.614 | |
| 4,300.00 | 4,134.85 | 3,371.98 | 3,152.69 | 21.58 | 23.19 | -174.08 | -650.46 | 921.04 | 2,324.66 | 2,304.98 | 19.68 | 118.142 | |
| 4,400.00 | 4,228.68 | 3,442.48 | 3,216.59 | 22.30 | 23.82 | -174.16 | -666.29 | 946.28 | 2,395.54 | 2,375.35 | 20.19 | 118.640 | |
| 4,500.00 | 4,322.51 | 3,512.98 | 3,280.48 | 23.02 | 24.45 | -174.23 | -682.11 | 971.52 | 2,466.43 | 2,445.72 | 20.71 | 119.111 | |
| 4,600.00 | 4,416.34 | 3,583.48 | 3,344.38 | 23.73 | 25.08 | -174.30 | -697.93 | 996.75 | 2,537.32 | 2,516.10 | 21.22 | 119.555 | |
| 4,700.00 | 4,510.17 | 3,653.97 | 3,408.28 | 24.45 | 25.71 | -174.37 | -713.76 | 1,021.99 | 2,608.21 | 2,586.47 | 21.74 | 119.976 | |
| 4,800.00 | 4,604.00 | 3,724.47 | 3,472.17 | 25.17 | 26.35 | -174.43 | -729.58 | 1,047.23 | 2,679.10 | 2,656.85 | 22.26 | 120.376 | |
| 4,900.00 | 4,697.83 | 3,794.97 | 3,536.07 | 25.88 | 26.98 | -174.49 | -745.40 | 1,072.47 | 2,750.00 | 2,727.22 | 22.77 | 120.755 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 11-04 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.00 | 4,791.66 | 3,865.47 | 3,599.97 | 26.60 | 27.61 | -174.55 | -761.23 | 1,097.71 | 2,820.89 | 2,797.60 | 23.29 | 121.116 | |
| 5,100.00 | 4,885.49 | 3,935.97 | 3,663.86 | 27.32 | 28.24 | -174.60 | -777.05 | 1,122.94 | 2,891.79 | 2,867.98 | 23.81 | 121.459 | |
| 5,200.00 | 4,979.32 | 4,006.47 | 3,727.76 | 28.04 | 28.87 | -174.65 | -792.87 | 1,148.18 | 2,962.69 | 2,938.36 | 24.33 | 121.786 | |
| 5,221.35 | 4,999.35 | 4,021.52 | 3,741.40 | 28.19 | 29.01 | -174.66 | -796.25 | 1,153.57 | 2,977.82 | 2,953.38 | 24.44 | 121.853 | |
| 5,300.00 | 5,073.52 | 4,077.72 | 3,792.34 | 28.68 | 29.51 | -174.84 | -808.87 | 1,173.69 | 3,032.82 | 3,007.76 | 25.06 | 121.002 | |
| 5,400.00 | 5,168.80 | 4,151.33 | 3,859.05 | 29.18 | 30.17 | -175.04 | -825.39 | 1,200.04 | 3,100.49 | 3,074.67 | 25.82 | 120.074 | |
| 5,500.00 | 5,265.09 | 4,227.24 | 3,927.86 | 29.63 | 30.85 | -175.21 | -842.43 | 1,227.22 | 3,165.57 | 3,139.01 | 26.56 | 119.196 | |
| 5,600.00 | 5,362.25 | 4,305.38 | 3,998.68 | 30.03 | 31.55 | -175.36 | -859.96 | 1,255.19 | 3,227.96 | 3,200.69 | 27.27 | 118.371 | |
| 5,700.00 | 5,460.19 | 4,385.64 | 4,071.42 | 30.38 | 32.27 | -175.49 | -877.98 | 1,283.92 | 3,287.60 | 3,259.64 | 27.96 | 117.597 | |
| 5,800.00 | 5,558.76 | 4,467.93 | 4,146.00 | 30.68 | 33.01 | -175.60 | -896.45 | 1,313.38 | 3,344.41 | 3,315.79 | 28.62 | 116.875 | |
| 5,900.00 | 5,657.87 | 4,552.15 | 4,222.33 | 30.94 | 33.77 | -175.70 | -915.35 | 1,343.53 | 3,398.32 | 3,369.07 | 29.24 | 116.204 | |
| 6,000.00 | 5,757.38 | 4,638.19 | 4,300.32 | 31.14 | 34.54 | -175.79 | -934.66 | 1,374.33 | 3,449.27 | 3,419.42 | 29.84 | 115.583 | |
| 6,100.00 | 5,857.17 | 4,725.95 | 4,379.86 | 31.30 | 35.33 | -175.86 | -954.36 | 1,405.75 | 3,497.19 | 3,466.78 | 30.41 | 115.011 | |
| 6,200.00 | 5,957.12 | 4,815.33 | 4,460.87 | 31.42 | 36.13 | -175.92 | -974.42 | 1,437.75 | 3,542.03 | 3,511.09 | 30.94 | 114.486 | |
| 6,232.88 | 5,990.00 | 4,845.05 | 4,487.81 | 31.44 | 36.40 | 120.67 | -981.09 | 1,448.39 | 3,556.09 | 3,524.98 | 31.11 | 114.321 | |
| 6,300.00 | 6,057.12 | 4,905.88 | 4,542.94 | 31.50 | 36.94 | 120.68 | -994.75 | 1,470.17 | 3,584.44 | 3,553.02 | 31.42 | 114.094 | |
| 6,400.00 | 6,157.12 | 4,996.52 | 4,625.09 | 31.59 | 37.75 | 120.70 | -1,015.09 | 1,502.61 | 3,626.68 | 3,594.79 | 31.89 | 113.725 | |
| 6,500.00 | 6,257.12 | 5,087.15 | 4,707.23 | 31.69 | 38.57 | 120.71 | -1,035.43 | 1,535.06 | 3,668.93 | 3,636.56 | 32.36 | 113.363 | |
| 6,600.00 | 6,357.12 | 5,177.79 | 4,789.38 | 31.78 | 39.38 | 120.73 | -1,055.77 | 1,567.51 | 3,711.17 | 3,678.33 | 32.84 | 113.006 | |
| 6,700.00 | 6,457.12 | 5,268.42 | 4,871.53 | 31.88 | 40.19 | 120.74 | -1,076.12 | 1,599.95 | 3,753.41 | 3,720.10 | 33.32 | 112.656 | |
| 6,800.00 | 6,557.12 | 5,359.06 | 4,953.67 | 31.98 | 41.01 | 120.76 | -1,096.46 | 1,632.40 | 3,795.66 | 3,761.86 | 33.80 | 112.310 | |
| 6,900.00 | 6,657.12 | 5,449.69 | 5,035.82 | 32.08 | 41.82 | 120.77 | -1,116.80 | 1,664.85 | 3,837.90 | 3,803.63 | 34.28 | 111.971 | |
| 7,000.00 | 6,757.12 | 5,540.25 | 5,117.96 | 32.18 | 42.63 | 120.79 | -1,137.14 | 1,697.29 | 3,879.10 | 3,844.50 | 34.76 | 111.625 | |
| 7,100.00 | 6,857.12 | 5,630.81 | 5,200.09 | 32.28 | 43.44 | 120.81 | -1,157.48 | 1,729.73 | 3,920.30 | 3,885.30 | 35.24 | 111.280 | |
| 7,200.00 | 6,957.12 | 5,721.37 | 5,282.21 | 32.38 | 44.25 | 120.83 | -1,177.82 | 1,762.17 | 3,961.50 | 3,926.10 | 35.72 | 110.935 | |
| 7,300.00 | 7,057.12 | 5,811.93 | 5,364.33 | 32.48 | 45.06 | 120.85 | -1,198.16 | 1,794.61 | 4,002.70 | 3,966.90 | 36.20 | 110.590 | |
| 7,400.00 | 7,157.12 | 5,902.49 | 5,446.39 | 32.59 | 45.87 | 120.91 | -1,218.50 | 1,827.05 | 4,043.90 | 3,999.10 | 36.68 | 110.245 | |
| 7,500.00 | 7,257.12 | 5,993.05 | 5,528.45 | 32.70 | 46.68 | 120.91 | -1,238.84 | 1,859.49 | 4,085.10 | 4,031.30 | 37.16 | 109.900 | |
| 7,600.00 | 7,357.12 | 6,083.61 | 5,610.51 | 32.81 | 47.49 | 120.91 | -1,259.18 | 1,891.93 | 4,126.30 | 4,063.70 | 37.64 | 109.555 | |
| 7,700.00 | 7,457.12 | 6,174.17 | 5,692.57 | 32.92 | 48.30 | 120.91 | -1,279.52 | 1,924.37 | 4,167.50 | 4,096.10 | 38.12 | 109.210 | |
| 7,800.00 | 7,557.12 | 6,264.73 | 5,774.63 | 33.03 | 49.11 | 120.91 | -1,299.86 | 1,956.81 | 4,208.70 | 4,128.50 | 38.60 | 108.865 | |
| 7,900.00 | 7,657.12 | 6,355.29 | 5,856.69 | 33.14 | 49.92 | 120.91 | -1,320.20 | 1,989.25 | 4,250.00 | 4,160.90 | 39.08 | 108.520 | |
| 8,000.00 | 7,757.12 | 6,445.85 | 5,938.75 | 33.25 | 50.73 | 120.91 | -1,340.54 | 2,021.69 | 4,291.20 | 4,193.30 | 39.56 | 108.175 | |
| 8,100.00 | 7,857.12 | 6,536.41 | 6,020.81 | 33.37 | 51.54 | 120.91 | -1,360.88 | 2,054.13 | 4,332.40 | 4,225.70 | 40.04 | 107.830 | |
| 8,121.58 | 7,878.70 | 6,561.15 | 6,045.55 | 33.39 | 51.55 | 120.91 | -1,363.50 | 2,057.00 | 4,337.00 | 4,230.00 | 40.10 | 107.780 | |
| 8,155.88 | 7,913.00 | 6,599.92 | 6,084.32 | 33.43 | 51.66 | 120.91 | -1,368.00 | 2,062.00 | 4,345.00 | 4,235.00 | 40.18 | 107.700 | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -4.86 | 32.79 | -2.79 | 32.90 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | -4.86 | 32.79 | -2.79 | 32.90 | 32.71 | 0.19 | 172.230 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | -4.86 | 32.79 | -2.79 | 32.90 | 32.26 | 0.64 | 51.367 | |
| 300.00 | 300.00 | 300.00 | 300.00 | 0.55 | 0.55 | -4.86 | 32.79 | -2.79 | 32.90 | 31.81 | 1.09 | 30.185 | |
| 400.00 | 400.00 | 400.00 | 400.00 | 0.77 | 0.77 | -4.86 | 32.79 | -2.79 | 32.90 | 31.37 | 1.54 | 21.372 | |
| 500.00 | 500.00 | 500.00 | 500.00 | 0.99 | 0.99 | -4.86 | 32.79 | -2.79 | 32.90 | 30.92 | 1.99 | 16.542 | |
| 600.00 | 600.00 | 600.00 | 600.00 | 1.22 | 1.22 | -4.86 | 32.79 | -2.79 | 32.90 | 30.47 | 2.44 | 13.493 | |
| 700.00 | 700.00 | 700.00 | 700.00 | 1.44 | 1.44 | -4.86 | 32.79 | -2.79 | 32.90 | 30.02 | 2.89 | 11.393 | |
| 800.00 | 800.00 | 800.00 | 800.00 | 1.67 | 1.67 | -4.86 | 32.79 | -2.79 | 32.90 | 29.57 | 3.34 | 9.858 | |
| 900.00 | 900.00 | 900.00 | 900.00 | 1.89 | 1.89 | -4.86 | 32.79 | -2.79 | 32.90 | 29.12 | 3.79 | 8.688 | |
| 950.00 | 950.00 | 950.00 | 950.00 | 2.01 | 2.01 | -4.86 | 32.79 | -2.79 | 32.90 | 28.89 | 4.01 | 8.201 CC | |
| 1,000.00 | 1,000.00 | 999.48 | 999.47 | 2.11 | 2.12 | 58.88 | 33.16 | -2.99 | 33.07 | 28.84 | 4.23 | 7.817 ES | |
| 1,100.00 | 1,099.93 | 1,098.40 | 1,098.33 | 2.33 | 2.34 | 61.50 | 36.18 | -4.59 | 34.47 | 29.81 | 4.66 | 7.392 | |
| 1,200.00 | 1,199.68 | 1,197.22 | 1,196.91 | 2.55 | 2.56 | 66.12 | 42.19 | -7.80 | 37.47 | 32.36 | 5.11 | 7.336 SF | |
| 1,300.00 | 1,299.13 | 1,295.88 | 1,295.04 | 2.79 | 2.80 | 71.75 | 51.19 | -12.60 | 42.33 | 36.76 | 5.57 | 7.594 | |
| 1,400.00 | 1,398.15 | 1,394.32 | 1,392.54 | 3.05 | 3.05 | 77.41 | 63.13 | -18.96 | 49.30 | 43.22 | 6.08 | 8.108 | |
| 1,500.00 | 1,496.63 | 1,492.48 | 1,489.25 | 3.35 | 3.34 | 82.49 | 77.98 | -26.88 | 58.50 | 51.85 | 6.65 | 8.803 | |
| 1,600.00 | 1,594.44 | 1,590.30 | 1,584.98 | 3.69 | 3.66 | 86.73 | 95.67 | -36.31 | 69.95 | 62.67 | 7.29 | 9.602 | |
| 1,700.00 | 1,691.46 | 1,687.72 | 1,679.59 | 4.08 | 4.02 | 90.14 | 116.15 | -47.22 | 83.62 | 75.60 | 8.02 | 10.432 | |
| 1,800.00 | 1,787.58 | 1,784.69 | 1,772.93 | 4.54 | 4.44 | 92.81 | 139.33 | -59.58 | 99.45 | 90.60 | 8.85 | 11.239 | |
| 1,900.00 | 1,882.68 | 1,881.24 | 1,864.93 | 5.06 | 4.91 | 94.90 | 165.18 | -73.36 | 117.38 | 107.59 | 9.79 | 11.989 | |
| 1,961.54 | 1,940.65 | 1,941.56 | 1,922.12 | 5.41 | 5.23 | 96.25 | 182.10 | -82.38 | 129.10 | 118.67 | 10.43 | 12.376 | |
| 2,000.00 | 1,976.74 | 1,979.23 | 1,957.83 | 5.64 | 5.44 | 97.28 | 192.67 | -88.01 | 136.52 | 125.67 | 10.85 | 12.585 | |
| 2,100.00 | 2,070.57 | 2,077.16 | 2,050.68 | 6.26 | 5.98 | 99.51 | 220.14 | -102.65 | 155.98 | 144.02 | 11.96 | 13.042 | |
| 2,200.00 | 2,164.40 | 2,175.09 | 2,143.53 | 6.90 | 6.54 | 101.23 | 247.61 | -117.30 | 175.61 | 162.51 | 13.10 | 13.402 | |
| 2,300.00 | 2,258.23 | 2,273.02 | 2,236.38 | 7.56 | 7.11 | 102.61 | 275.08 | -131.94 | 195.37 | 181.10 | 14.27 | 13.688 | |
| 2,400.00 | 2,352.06 | 2,370.95 | 2,329.23 | 8.23 | 7.69 | 103.74 | 302.56 | -146.58 | 215.22 | 199.76 | 15.46 | 13.921 | |
| 2,500.00 | 2,445.89 | 2,468.88 | 2,422.08 | 8.90 | 8.28 | 104.68 | 330.03 | -161.23 | 235.13 | 218.47 | 16.66 | 14.112 | |
| 2,600.00 | 2,539.72 | 2,566.81 | 2,514.93 | 9.58 | 8.87 | 105.47 | 357.50 | -175.87 | 255.10 | 237.22 | 17.88 | 14.271 | |
| 2,700.00 | 2,633.55 | 2,664.74 | 2,607.79 | 10.27 | 9.47 | 106.14 | 384.97 | -190.52 | 275.10 | 256.00 | 19.10 | 14.405 | |
| 2,800.00 | 2,727.39 | 2,762.67 | 2,700.64 | 10.96 | 10.07 | 106.73 | 412.45 | -205.16 | 295.14 | 274.81 | 20.33 | 14.519 | |
| 2,900.00 | 2,821.22 | 2,860.60 | 2,793.49 | 11.66 | 10.68 | 107.24 | 439.92 | -219.80 | 315.20 | 293.64 | 21.56 | 14.617 | |
| 3,000.00 | 2,915.05 | 2,958.53 | 2,886.34 | 12.36 | 11.29 | 107.68 | 467.39 | -234.45 | 335.28 | 312.48 | 22.81 | 14.702 | |
| 3,100.00 | 3,008.88 | 3,056.46 | 2,979.19 | 13.06 | 11.90 | 108.08 | 494.86 | -249.09 | 355.39 | 331.33 | 24.05 | 14.776 | |
| 3,200.00 | 3,102.71 | 3,154.40 | 3,072.04 | 13.76 | 12.51 | 108.44 | 522.34 | -263.74 | 375.50 | 350.20 | 25.30 | 14.842 | |
| 3,300.00 | 3,196.54 | 3,252.33 | 3,164.89 | 14.47 | 13.13 | 108.76 | 549.81 | -278.38 | 395.63 | 369.08 | 26.55 | 14.900 | |
| 3,400.00 | 3,290.37 | 3,350.26 | 3,257.74 | 15.18 | 13.74 | 109.05 | 577.28 | -293.02 | 415.77 | 387.96 | 27.81 | 14.951 | |
| 3,500.00 | 3,384.20 | 3,448.19 | 3,350.59 | 15.88 | 14.36 | 109.31 | 604.75 | -307.67 | 435.91 | 406.85 | 29.07 | 14.998 | |
| 3,600.00 | 3,478.03 | 3,546.12 | 3,443.44 | 16.59 | 14.98 | 109.55 | 632.23 | -322.31 | 456.07 | 425.75 | 30.32 | 15.040 | |
| 3,700.00 | 3,571.86 | 3,644.05 | 3,536.29 | 17.30 | 15.60 | 109.76 | 659.70 | -336.95 | 476.23 | 444.65 | 31.59 | 15.077 | |
| 3,800.00 | 3,665.69 | 3,741.98 | 3,629.14 | 18.02 | 16.22 | 109.96 | 687.17 | -351.60 | 496.40 | 463.55 | 32.85 | 15.112 | |
| 3,900.00 | 3,759.52 | 3,839.91 | 3,721.99 | 18.73 | 16.85 | 110.15 | 714.65 | -366.24 | 516.58 | 482.46 | 34.11 | 15.143 | |
| 4,000.00 | 3,853.35 | 3,937.84 | 3,814.84 | 19.44 | 17.47 | 110.32 | 742.12 | -380.89 | 536.75 | 501.38 | 35.38 | 15.172 | |
| 4,100.00 | 3,947.19 | 4,035.77 | 3,907.70 | 20.16 | 18.09 | 110.48 | 769.59 | -395.53 | 556.94 | 520.29 | 36.64 | 15.198 | |
| 4,200.00 | 4,041.02 | 4,133.70 | 4,000.55 | 20.87 | 18.72 | 110.63 | 797.06 | -410.17 | 577.12 | 539.21 | 37.91 | 15.223 | |
| 4,300.00 | 4,134.85 | 4,231.63 | 4,093.40 | 21.58 | 19.34 | 110.76 | 824.54 | -424.82 | 597.31 | 558.13 | 39.18 | 15.245 | |
| 4,400.00 | 4,228.68 | 4,329.57 | 4,186.25 | 22.30 | 19.96 | 110.89 | 852.01 | -439.46 | 617.51 | 577.06 | 40.45 | 15.266 | |
| 4,500.00 | 4,322.51 | 4,427.50 | 4,279.10 | 23.02 | 20.59 | 111.01 | 879.48 | -454.11 | 637.70 | 595.98 | 41.72 | 15.285 | |
| 4,600.00 | 4,416.34 | 4,525.43 | 4,371.95 | 23.73 | 21.22 | 111.13 | 906.95 | -468.75 | 657.90 | 614.91 | 42.99 | 15.303 | |
| 4,700.00 | 4,510.17 | 4,623.36 | 4,464.80 | 24.45 | 21.84 | 111.23 | 934.43 | -483.39 | 678.10 | 633.84 | 44.26 | 15.320 | |
| 4,800.00 | 4,604.00 | 4,721.29 | 4,557.65 | 25.17 | 22.47 | 111.33 | 961.90 | -498.04 | 698.31 | 652.77 | 45.53 | 15.336 | |
| 4,900.00 | 4,697.83 | 4,819.22 | 4,650.50 | 25.88 | 23.10 | 111.43 | 989.37 | -512.68 | 718.51 | 671.71 | 46.81 | 15.351 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.00 | 4,791.66 | 4,917.15 | 4,743.35 | 26.60 | 23.72 | 111.52 | 1,016.84 | -527.32 | 738.72 | 690.64 | 48.08 | 15.365 | |
| 5,100.00 | 4,885.49 | 5,015.08 | 4,836.20 | 27.32 | 24.35 | 111.60 | 1,044.32 | -541.97 | 758.93 | 709.57 | 49.35 | 15.378 | |
| 5,200.00 | 4,979.32 | 5,113.01 | 4,929.05 | 28.04 | 24.98 | 111.68 | 1,071.79 | -556.61 | 779.14 | 728.51 | 50.63 | 15.390 | |
| 5,221.35 | 4,999.35 | 5,133.92 | 4,948.87 | 28.19 | 25.11 | 111.70 | 1,077.65 | -559.74 | 783.45 | 732.55 | 50.90 | 15.392 | |
| 5,300.00 | 5,073.52 | 5,211.02 | 5,021.98 | 28.68 | 25.61 | 111.98 | 1,099.28 | -571.27 | 798.95 | 747.09 | 51.87 | 15.404 | |
| 5,400.00 | 5,168.80 | 5,311.92 | 5,117.76 | 29.18 | 26.20 | 112.12 | 1,127.28 | -586.19 | 817.45 | 764.48 | 52.97 | 15.431 | |
| 5,500.00 | 5,265.09 | 5,416.78 | 5,218.26 | 29.63 | 26.69 | 112.21 | 1,153.68 | -600.26 | 834.05 | 780.13 | 53.92 | 15.468 | |
| 5,600.00 | 5,362.25 | 5,522.23 | 5,320.35 | 30.03 | 27.12 | 112.29 | 1,176.93 | -612.65 | 848.58 | 793.81 | 54.77 | 15.493 | |
| 5,700.00 | 5,460.19 | 5,628.19 | 5,423.86 | 30.38 | 27.51 | 112.36 | 1,196.93 | -623.32 | 861.04 | 805.51 | 55.53 | 15.507 | |
| 5,800.00 | 5,558.76 | 5,734.61 | 5,528.57 | 30.68 | 27.85 | 112.42 | 1,213.61 | -632.21 | 871.39 | 815.21 | 56.18 | 15.510 | |
| 5,900.00 | 5,657.87 | 5,841.38 | 5,634.28 | 30.94 | 28.14 | 112.47 | 1,226.89 | -639.29 | 879.61 | 822.87 | 56.74 | 15.503 | |
| 6,000.00 | 5,757.38 | 5,948.44 | 5,740.75 | 31.14 | 28.38 | 112.51 | 1,236.70 | -644.52 | 885.68 | 828.49 | 57.19 | 15.487 | |
| 6,100.00 | 5,857.17 | 6,055.69 | 5,847.75 | 31.30 | 28.56 | 112.54 | 1,243.00 | -647.88 | 889.60 | 832.06 | 57.54 | 15.460 | |
| 6,200.00 | 5,957.12 | 6,163.05 | 5,955.06 | 31.42 | 28.69 | 112.56 | 1,245.77 | -649.35 | 891.36 | 833.57 | 57.79 | 15.423 | |
| 6,232.88 | 5,990.00 | 6,197.99 | 5,990.00 | 31.44 | 28.73 | 49.17 | 1,245.90 | -649.42 | 891.46 | 833.61 | 57.86 | 15.408 | |
| 6,300.00 | 6,057.12 | 6,265.11 | 6,057.12 | 31.50 | 28.80 | 49.17 | 1,245.90 | -649.42 | 891.46 | 833.48 | 57.98 | 15.374 | |
| 6,400.00 | 6,157.12 | 6,365.11 | 6,157.12 | 31.59 | 28.89 | 49.17 | 1,245.90 | -649.42 | 891.46 | 833.28 | 58.18 | 15.322 | |
| 6,500.00 | 6,257.12 | 6,465.11 | 6,257.12 | 31.69 | 28.99 | 49.17 | 1,245.90 | -649.42 | 891.46 | 833.08 | 58.38 | 15.270 | |
| 6,600.00 | 6,357.12 | 6,565.11 | 6,357.12 | 31.78 | 29.10 | 49.17 | 1,245.90 | -649.42 | 891.46 | 832.88 | 58.58 | 15.217 | |
| 6,700.00 | 6,457.12 | 6,665.11 | 6,457.12 | 31.88 | 29.20 | 49.17 | 1,245.90 | -649.42 | 891.46 | 832.67 | 58.79 | 15.164 | |
| 6,800.00 | 6,557.12 | 6,765.11 | 6,557.12 | 31.98 | 29.30 | 49.17 | 1,245.90 | -649.42 | 891.46 | 832.47 | 59.00 | 15.110 | |
| 6,900.00 | 6,657.12 | 6,865.11 | 6,657.12 | 32.08 | 29.41 | 49.17 | 1,245.90 | -649.42 | 891.46 | 832.26 | 59.21 | 15.056 | |
| 7,000.00 | 6,757.12 | 6,965.11 | 6,757.12 | 32.18 | 29.51 | 49.17 | 1,245.90 | -649.42 | 891.46 | 832.04 | 59.42 | 15.002 | |
| 7,100.00 | 6,857.12 | 7,065.11 | 6,857.12 | 32.28 | 29.62 | 49.17 | 1,245.90 | -649.42 | 891.46 | 831.83 | 59.64 | 14.948 | |
| 7,200.00 | 6,957.12 | 7,165.11 | 6,957.12 | 32.38 | 29.73 | 49.17 | 1,245.90 | -649.42 | 891.46 | 831.61 | 59.86 | 14.893 | |
| 7,300.00 | 7,057.12 | 7,265.11 | 7,057.12 | 32.49 | 29.84 | 49.17 | 1,245.90 | -649.42 | 891.46 | 831.39 | 60.08 | 14.838 | |
| 7,400.00 | 7,157.12 | 7,365.11 | 7,157.12 | 32.59 | 29.95 | 49.17 | 1,245.90 | -649.42 | 891.46 | 831.16 | 60.30 | 14.783 | |
| 7,500.00 | 7,257.12 | 7,465.11 | 7,257.12 | 32.70 | 30.07 | 49.17 | 1,245.90 | -649.42 | 891.46 | 830.93 | 60.53 | 14.728 | |
| 7,600.00 | 7,357.12 | 7,565.11 | 7,357.12 | 32.81 | 30.18 | 49.17 | 1,245.90 | -649.42 | 891.46 | 830.71 | 60.76 | 14.672 | |
| 7,700.00 | 7,457.12 | 7,665.11 | 7,457.12 | 32.92 | 30.30 | 49.17 | 1,245.90 | -649.42 | 891.46 | 830.47 | 60.99 | 14.617 | |
| 7,800.00 | 7,557.12 | 7,765.11 | 7,557.12 | 33.03 | 30.41 | 49.17 | 1,245.90 | -649.42 | 891.46 | 830.24 | 61.22 | 14.561 | |
| 7,900.00 | 7,657.12 | 7,865.11 | 7,657.12 | 33.14 | 30.53 | 49.17 | 1,245.90 | -649.42 | 891.46 | 830.00 | 61.46 | 14.505 | |
| 8,000.00 | 7,757.12 | 7,965.11 | 7,757.12 | 33.25 | 30.65 | 49.17 | 1,245.90 | -649.42 | 891.46 | 829.77 | 61.70 | 14.449 | |
| 8,100.00 | 7,857.12 | 8,065.11 | 7,857.12 | 33.37 | 30.77 | 49.17 | 1,245.90 | -649.42 | 891.46 | 829.53 | 61.94 | 14.393 | |
| 8,135.42 | 7,892.54 | 8,100.53 | 7,892.54 | 33.41 | 30.81 | 49.17 | 1,245.90 | -649.42 | 891.46 | 829.44 | 62.02 | 14.373 | |
| 8,155.88 | 7,913.00 | 8,115.99 | 7,908.00 | 33.43 | 30.83 | 49.17 | 1,245.90 | -649.42 | 891.48 | 829.41 | 62.07 | 14.363 | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -180.00 | -14.57 | 0.00 | 14.57 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | -180.00 | -14.57 | 0.00 | 14.57 | 14.38 | 0.19 | 76.271 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | -180.00 | -14.57 | 0.00 | 14.57 | 13.93 | 0.64 | 22.748 CC | |
| 223.22 | 223.22 | 223.22 | 223.22 | 0.37 | 0.37 | -179.63 | -14.57 | -0.09 | 14.57 | 13.83 | 0.74 | 19.633 | |
| 300.00 | 300.00 | 299.96 | 299.94 | 0.55 | 0.53 | -173.18 | -14.58 | -1.74 | 14.69 | 13.61 | 1.08 | 13.623 ES | |
| 400.00 | 400.00 | 399.67 | 399.51 | 0.77 | 0.76 | -154.56 | -14.62 | -6.96 | 16.20 | 14.69 | 1.51 | 10.698 SF | |
| 500.00 | 500.00 | 498.90 | 498.36 | 0.99 | 1.01 | -133.32 | -14.69 | -15.58 | 21.47 | 19.51 | 1.97 | 10.921 | |
| 600.00 | 600.00 | 597.42 | 596.14 | 1.22 | 1.29 | -118.24 | -14.78 | -27.52 | 31.48 | 29.02 | 2.46 | 12.819 | |
| 700.00 | 700.00 | 695.00 | 692.54 | 1.44 | 1.62 | -109.25 | -14.89 | -42.66 | 45.79 | 42.81 | 2.99 | 15.317 | |
| 800.00 | 800.00 | 791.43 | 787.24 | 1.67 | 1.99 | -103.88 | -15.03 | -60.83 | 63.95 | 60.38 | 3.57 | 17.904 | |
| 900.00 | 900.00 | 886.52 | 879.97 | 1.89 | 2.41 | -100.51 | -15.19 | -81.86 | 85.64 | 81.43 | 4.20 | 20.374 | |
| 950.00 | 950.00 | 933.51 | 925.52 | 2.01 | 2.65 | -99.29 | -15.28 | -93.39 | 97.75 | 93.21 | 4.54 | 21.530 | |
| 1,000.00 | 1,000.00 | 980.20 | 970.59 | 2.11 | 2.88 | -34.87 | -15.37 | -105.58 | 110.33 | 106.07 | 4.26 | 25.909 | |
| 1,100.00 | 1,099.93 | 1,072.94 | 1,059.49 | 2.33 | 3.41 | -33.80 | -15.57 | -131.97 | 135.78 | 131.06 | 4.72 | 28.739 | |
| 1,200.00 | 1,199.68 | 1,164.83 | 1,146.69 | 2.55 | 3.98 | -33.53 | -15.79 | -160.94 | 161.54 | 156.33 | 5.20 | 31.036 | |
| 1,300.00 | 1,299.13 | 1,255.87 | 1,232.13 | 2.79 | 4.61 | -33.71 | -16.03 | -192.38 | 187.55 | 181.84 | 5.70 | 32.894 | |
| 1,400.00 | 1,398.15 | 1,347.81 | 1,317.39 | 3.05 | 5.29 | -34.20 | -16.29 | -226.77 | 213.70 | 207.48 | 6.22 | 34.331 | |
| 1,500.00 | 1,496.63 | 1,444.73 | 1,406.96 | 3.35 | 6.04 | -35.02 | -16.57 | -263.78 | 237.95 | 231.15 | 6.80 | 35.010 | |
| 1,600.00 | 1,594.44 | 1,542.19 | 1,497.04 | 3.69 | 6.80 | -36.13 | -16.85 | -301.00 | 259.51 | 252.10 | 7.41 | 35.023 | |
| 1,700.00 | 1,691.46 | 1,640.09 | 1,587.52 | 4.08 | 7.57 | -37.50 | -17.14 | -338.38 | 278.49 | 270.41 | 8.08 | 34.473 | |
| 1,800.00 | 1,787.58 | 1,738.31 | 1,678.29 | 4.54 | 8.35 | -39.11 | -17.42 | -375.89 | 294.99 | 286.17 | 8.82 | 33.443 | |
| 1,900.00 | 1,882.68 | 1,836.71 | 1,769.24 | 5.06 | 9.14 | -40.97 | -17.70 | -413.46 | 309.14 | 299.49 | 9.66 | 32.012 | |
| 1,961.54 | 1,940.65 | 1,897.31 | 1,825.24 | 5.41 | 9.62 | -42.25 | -17.88 | -436.60 | 316.76 | 306.53 | 10.23 | 30.967 | |
| 2,000.00 | 1,976.74 | 1,935.19 | 1,860.25 | 5.64 | 9.92 | -43.12 | -17.99 | -451.07 | 321.31 | 310.70 | 10.61 | 30.273 | |
| 2,100.00 | 2,070.57 | 2,033.67 | 1,951.27 | 6.26 | 10.71 | -45.29 | -18.27 | -488.67 | 333.48 | 321.82 | 11.66 | 28.594 | |
| 2,200.00 | 2,164.40 | 2,132.15 | 2,042.29 | 6.90 | 11.50 | -47.30 | -18.56 | -526.28 | 346.09 | 333.32 | 12.78 | 27.091 | |
| 2,300.00 | 2,258.23 | 2,230.63 | 2,133.31 | 7.56 | 12.29 | -49.17 | -18.84 | -563.89 | 359.10 | 345.16 | 13.94 | 25.756 | |
| 2,400.00 | 2,352.06 | 2,329.12 | 2,224.33 | 8.23 | 13.08 | -50.91 | -19.13 | -601.49 | 372.46 | 357.31 | 15.16 | 24.575 | |
| 2,500.00 | 2,445.89 | 2,427.60 | 2,315.35 | 8.90 | 13.87 | -52.53 | -19.41 | -639.10 | 386.14 | 369.74 | 16.41 | 23.534 | |
| 2,600.00 | 2,539.72 | 2,526.08 | 2,406.36 | 9.58 | 14.66 | -54.04 | -19.70 | -676.71 | 400.11 | 382.42 | 17.69 | 22.614 | |
| 2,700.00 | 2,633.55 | 2,624.56 | 2,497.38 | 10.27 | 15.46 | -55.45 | -19.98 | -714.31 | 414.33 | 395.33 | 19.01 | 21.800 | |
| 2,800.00 | 2,727.39 | 2,723.04 | 2,588.40 | 10.96 | 16.25 | -56.77 | -20.27 | -751.92 | 428.79 | 408.44 | 20.34 | 21.079 | |
| 2,900.00 | 2,821.22 | 2,821.53 | 2,679.42 | 11.66 | 17.04 | -57.99 | -20.55 | -789.52 | 443.45 | 421.75 | 21.70 | 20.438 | |
| 3,000.00 | 2,915.05 | 2,920.01 | 2,770.44 | 12.36 | 17.84 | -59.14 | -20.84 | -827.13 | 458.30 | 435.23 | 23.07 | 19.867 | |
| 3,100.00 | 3,008.88 | 3,018.49 | 2,861.46 | 13.06 | 18.63 | -60.22 | -21.12 | -864.74 | 473.32 | 448.87 | 24.45 | 19.356 | |
| 3,200.00 | 3,102.71 | 3,116.97 | 2,952.48 | 13.76 | 19.43 | -61.24 | -21.41 | -902.34 | 488.50 | 462.65 | 25.85 | 18.897 | |
| 3,300.00 | 3,196.54 | 3,215.45 | 3,043.49 | 14.47 | 20.22 | -62.19 | -21.69 | -939.95 | 503.81 | 476.56 | 27.26 | 18.484 | |
| 3,400.00 | 3,290.37 | 3,313.93 | 3,134.51 | 15.18 | 21.02 | -63.08 | -21.98 | -977.56 | 519.26 | 490.59 | 28.67 | 18.111 | |
| 3,500.00 | 3,384.20 | 3,412.42 | 3,225.53 | 15.88 | 21.81 | -63.93 | -22.26 | -1,015.16 | 534.82 | 504.73 | 30.09 | 17.773 | |
| 3,600.00 | 3,478.03 | 3,510.90 | 3,316.55 | 16.59 | 22.61 | -64.72 | -22.55 | -1,052.77 | 550.49 | 518.97 | 31.52 | 17.465 | |
| 3,700.00 | 3,571.86 | 3,609.38 | 3,407.57 | 17.30 | 23.40 | -65.47 | -22.83 | -1,090.37 | 566.26 | 533.31 | 32.95 | 17.184 | |
| 3,800.00 | 3,665.69 | 3,707.86 | 3,498.59 | 18.02 | 24.20 | -66.18 | -23.12 | -1,127.98 | 582.12 | 547.73 | 34.39 | 16.928 | |
| 3,900.00 | 3,759.52 | 3,806.34 | 3,589.61 | 18.73 | 25.00 | -66.86 | -23.40 | -1,165.59 | 598.06 | 562.23 | 35.83 | 16.692 | |
| 4,000.00 | 3,853.35 | 3,904.83 | 3,680.62 | 19.44 | 25.79 | -67.50 | -23.69 | -1,203.19 | 614.08 | 576.81 | 37.27 | 16.476 | |
| 4,100.00 | 3,947.19 | 4,003.31 | 3,771.64 | 20.16 | 26.59 | -68.10 | -23.97 | -1,240.80 | 630.17 | 591.46 | 38.72 | 16.277 | |
| 4,200.00 | 4,041.02 | 4,101.79 | 3,862.66 | 20.87 | 27.38 | -68.68 | -24.26 | -1,278.41 | 646.33 | 606.16 | 40.16 | 16.092 | |
| 4,300.00 | 4,134.85 | 4,200.27 | 3,953.68 | 21.58 | 28.18 | -69.23 | -24.54 | -1,316.01 | 662.54 | 620.93 | 41.61 | 15.921 | |
| 4,400.00 | 4,228.68 | 4,298.75 | 4,044.70 | 22.30 | 28.98 | -69.75 | -24.83 | -1,353.62 | 678.82 | 635.75 | 43.06 | 15.763 | |
| 4,500.00 | 4,322.51 | 4,397.24 | 4,135.72 | 23.02 | 29.77 | -70.25 | -25.11 | -1,391.23 | 695.14 | 650.63 | 44.52 | 15.616 | |
| 4,600.00 | 4,416.34 | 4,495.72 | 4,226.74 | 23.73 | 30.57 | -70.72 | -25.40 | -1,428.83 | 711.52 | 665.55 | 45.97 | 15.478 | |
| 4,700.00 | 4,510.17 | 4,594.20 | 4,317.75 | 24.45 | 31.37 | -71.18 | -25.68 | -1,466.44 | 727.94 | 680.52 | 47.42 | 15.350 | |
| 4,800.00 | 4,604.00 | 4,692.68 | 4,408.77 | 25.17 | 32.16 | -71.61 | -25.97 | -1,504.04 | 744.40 | 695.52 | 48.88 | 15.230 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design | | WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 11-04 | | | | | | | | | | Offset Site Error: | | 0.00 ft | | | |
|-----------------------|---------------------|---|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|--|--------------------|--|---------|--|
| Survey Program: 0-MWD | | | | | | | | | | | | | | Offset Well Error: | | 0.00 ft | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | Warning | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | | | | |
| 4,900.00 | 4,697.83 | 4,791.16 | 4,499.79 | 25.88 | 32.96 | -72.03 | -26.25 | -1,541.65 | 760.90 | 710.57 | 50.33 | 15.117 | | | | | |
| 5,000.00 | 4,791.66 | 4,889.65 | 4,590.81 | 26.60 | 33.76 | -72.42 | -26.54 | -1,579.26 | 777.44 | 725.65 | 51.79 | 15.012 | | | | | |
| 5,100.00 | 4,885.49 | 4,988.13 | 4,681.83 | 27.32 | 34.55 | -72.80 | -26.82 | -1,616.86 | 794.02 | 740.77 | 53.25 | 14.912 | | | | | |
| 5,200.00 | 4,979.32 | 5,086.61 | 4,772.85 | 28.04 | 35.35 | -73.17 | -27.11 | -1,654.47 | 810.63 | 755.92 | 54.70 | 14.819 | | | | | |
| 5,221.35 | 4,999.35 | 5,107.63 | 4,792.27 | 28.19 | 35.52 | -73.24 | -27.17 | -1,662.50 | 814.17 | 759.16 | 55.01 | 14.800 | | | | | |
| 5,300.00 | 5,073.52 | 5,185.08 | 4,863.86 | 28.68 | 36.15 | -73.71 | -27.39 | -1,692.07 | 827.56 | 771.44 | 56.13 | 14.745 | | | | | |
| 5,400.00 | 5,168.80 | 5,305.45 | 4,975.92 | 29.18 | 36.90 | -74.20 | -27.72 | -1,735.98 | 844.28 | 786.89 | 57.39 | 14.712 | | | | | |
| 5,500.00 | 5,265.09 | 5,428.51 | 5,092.29 | 29.63 | 37.56 | -74.63 | -28.03 | -1,775.97 | 859.14 | 800.62 | 58.52 | 14.681 | | | | | |
| 5,600.00 | 5,362.25 | 5,552.33 | 5,211.00 | 30.03 | 38.15 | -75.00 | -28.29 | -1,811.13 | 872.11 | 812.58 | 59.53 | 14.650 | | | | | |
| 5,700.00 | 5,460.19 | 5,676.82 | 5,331.78 | 30.38 | 38.66 | -75.33 | -28.52 | -1,841.28 | 883.14 | 822.72 | 60.42 | 14.617 | | | | | |
| 5,800.00 | 5,558.76 | 5,801.88 | 5,454.31 | 30.68 | 39.09 | -75.60 | -28.71 | -1,866.25 | 892.20 | 831.03 | 61.18 | 14.584 | | | | | |
| 5,900.00 | 5,657.87 | 5,927.38 | 5,578.25 | 30.94 | 39.44 | -75.83 | -28.86 | -1,885.91 | 899.27 | 837.47 | 61.81 | 14.550 | | | | | |
| 6,000.00 | 5,757.38 | 6,053.21 | 5,703.26 | 31.14 | 39.70 | -76.01 | -28.97 | -1,900.15 | 904.32 | 842.01 | 62.31 | 14.514 | | | | | |
| 6,100.00 | 5,857.17 | 6,179.25 | 5,828.98 | 31.30 | 39.90 | -76.14 | -29.03 | -1,908.90 | 907.34 | 844.65 | 62.69 | 14.474 | | | | | |
| 6,200.00 | 5,957.12 | 6,305.37 | 5,955.06 | 31.42 | 40.02 | -76.23 | -29.06 | -1,912.11 | 908.32 | 845.37 | 62.95 | 14.429 | | | | | |
| 6,232.88 | 5,990.00 | 6,340.31 | 5,990.00 | 31.44 | 40.04 | -139.64 | -29.06 | -1,912.13 | 908.28 | 845.28 | 63.00 | 14.416 | | | | | |
| 6,300.00 | 6,057.12 | 6,407.43 | 6,057.12 | 31.50 | 40.08 | -139.64 | -29.06 | -1,912.13 | 908.28 | 845.17 | 63.11 | 14.391 | | | | | |
| 6,400.00 | 6,157.12 | 6,507.43 | 6,157.12 | 31.59 | 40.15 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.99 | 63.29 | 14.350 | | | | | |
| 6,500.00 | 6,257.12 | 6,607.43 | 6,257.12 | 31.69 | 40.23 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.81 | 63.48 | 14.309 | | | | | |
| 6,600.00 | 6,357.12 | 6,707.43 | 6,357.12 | 31.78 | 40.30 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.62 | 63.66 | 14.268 | | | | | |
| 6,700.00 | 6,457.12 | 6,807.43 | 6,457.12 | 31.88 | 40.38 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.43 | 63.85 | 14.226 | | | | | |
| 6,800.00 | 6,557.12 | 6,907.43 | 6,557.12 | 31.98 | 40.45 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.24 | 64.04 | 14.184 | | | | | |
| 6,900.00 | 6,657.12 | 7,007.43 | 6,657.12 | 32.08 | 40.53 | -139.64 | -29.06 | -1,912.13 | 908.28 | 844.05 | 64.23 | 14.141 | | | | | |
| 7,000.00 | 6,757.12 | 7,107.43 | 6,757.12 | 32.18 | 40.61 | -139.64 | -29.06 | -1,912.13 | 908.28 | 843.86 | 64.42 | 14.099 | | | | | |
| 7,100.00 | 6,857.12 | 7,207.43 | 6,857.12 | 32.28 | 40.69 | -139.64 | -29.06 | -1,912.13 | 908.28 | 843.66 | 64.62 | 14.056 | | | | | |
| 7,200.00 | 6,957.12 | 7,307.43 | 6,957.12 | 32.38 | 40.77 | -139.64 | -29.06 | -1,912.13 | 908.28 | 843.46 | 64.82 | 14.012 | | | | | |
| 7,300.00 | 7,057.12 | 7,407.43 | 7,057.12 | 32.49 | 40.85 | -139.64 | -29.06 | -1,912.13 | 908.28 | 843.26 | 65.02 | 13.969 | | | | | |
| 7,400.00 | 7,157.12 | 7,507.43 | 7,157.12 | 32.59 | 40.93 | -139.64 | -29.06 | -1,912.13 | 908.28 | 843.05 | 65.23 | 13.925 | | | | | |
| 7,500.00 | 7,257.12 | 7,607.43 | 7,257.12 | 32.70 | 41.02 | -139.64 | -29.06 | -1,912.13 | 908.28 | 842.85 | 65.43 | 13.881 | | | | | |
| 7,600.00 | 7,357.12 | 7,707.43 | 7,357.12 | 32.81 | 41.10 | -139.64 | -29.06 | -1,912.13 | 908.28 | 842.64 | 65.64 | 13.836 | | | | | |
| 7,700.00 | 7,457.12 | 7,807.43 | 7,457.12 | 32.92 | 41.19 | -139.64 | -29.06 | -1,912.13 | 908.28 | 842.42 | 65.86 | 13.792 | | | | | |
| 7,800.00 | 7,557.12 | 7,907.43 | 7,557.12 | 33.03 | 41.27 | -139.64 | -29.06 | -1,912.13 | 908.28 | 842.21 | 66.07 | 13.747 | | | | | |
| 7,900.00 | 7,657.12 | 8,007.43 | 7,657.12 | 33.14 | 41.36 | -139.64 | -29.06 | -1,912.13 | 908.28 | 841.99 | 66.29 | 13.702 | | | | | |
| 8,000.00 | 7,757.12 | 8,107.43 | 7,757.12 | 33.25 | 41.45 | -139.64 | -29.06 | -1,912.13 | 908.28 | 841.77 | 66.51 | 13.657 | | | | | |
| 8,100.00 | 7,857.12 | 8,207.43 | 7,857.12 | 33.37 | 41.54 | -139.64 | -29.06 | -1,912.13 | 908.28 | 841.55 | 66.73 | 13.612 | | | | | |
| 8,122.17 | 7,879.29 | 8,229.61 | 7,879.29 | 33.39 | 41.56 | -139.64 | -29.06 | -1,912.13 | 908.28 | 841.50 | 66.78 | 13.602 | | | | | |
| 8,155.88 | 7,913.00 | 8,238.31 | 7,888.00 | 33.43 | 41.57 | -139.64 | -29.06 | -1,912.13 | 908.62 | 841.80 | 66.83 | 13.597 | | | | | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 18.21 | 0.00 | 18.21 | | | | |
| 100.00 | 100.00 | 100.00 | 100.00 | 0.10 | 0.10 | 0.00 | 18.21 | 0.00 | 18.21 | 18.02 | 0.19 | 95.339 | |
| 200.00 | 200.00 | 200.00 | 200.00 | 0.32 | 0.32 | 0.00 | 18.21 | 0.00 | 18.21 | 17.57 | 0.64 | 28.435 CC, ES | |
| 300.00 | 300.00 | 299.50 | 299.48 | 0.55 | 0.54 | 3.53 | 19.46 | 1.20 | 19.50 | 18.42 | 1.09 | 17.967 | |
| 400.00 | 400.00 | 398.77 | 398.61 | 0.77 | 0.77 | 11.67 | 23.17 | 4.79 | 23.70 | 22.17 | 1.53 | 15.481 SF | |
| 500.00 | 500.00 | 497.56 | 497.02 | 0.99 | 1.02 | 20.09 | 29.32 | 10.72 | 31.36 | 29.38 | 1.99 | 15.775 | |
| 600.00 | 600.00 | 595.64 | 594.39 | 1.22 | 1.29 | 26.59 | 37.84 | 18.94 | 42.69 | 40.22 | 2.47 | 17.300 | |
| 700.00 | 700.00 | 692.80 | 690.38 | 1.44 | 1.61 | 31.12 | 48.64 | 29.36 | 57.62 | 54.64 | 2.98 | 19.346 | |
| 800.00 | 800.00 | 788.83 | 784.70 | 1.67 | 1.97 | 34.21 | 61.60 | 41.88 | 76.05 | 72.52 | 3.53 | 21.562 | |
| 900.00 | 900.00 | 883.54 | 877.07 | 1.89 | 2.37 | 36.34 | 76.61 | 56.37 | 97.84 | 93.72 | 4.11 | 23.776 | |
| 950.00 | 950.00 | 930.34 | 922.45 | 2.01 | 2.59 | 37.16 | 84.83 | 64.31 | 109.96 | 105.53 | 4.43 | 24.848 | |
| 1,000.00 | 1,000.00 | 976.71 | 967.23 | 2.11 | 2.82 | 101.19 | 93.51 | 72.68 | 122.96 | 118.68 | 4.28 | 28.715 | |
| 1,100.00 | 1,099.93 | 1,067.90 | 1,054.69 | 2.33 | 3.31 | 102.93 | 112.08 | 90.61 | 151.91 | 147.18 | 4.73 | 32.095 | |
| 1,200.00 | 1,199.68 | 1,156.77 | 1,139.08 | 2.55 | 3.84 | 104.91 | 132.10 | 109.93 | 184.88 | 179.69 | 5.19 | 35.633 | |
| 1,300.00 | 1,299.13 | 1,243.03 | 1,220.14 | 2.79 | 4.39 | 106.84 | 153.33 | 130.42 | 221.95 | 216.30 | 5.65 | 39.257 | |
| 1,400.00 | 1,398.15 | 1,326.46 | 1,297.66 | 3.05 | 4.97 | 108.57 | 175.52 | 151.84 | 263.13 | 256.99 | 6.13 | 42.893 | |
| 1,500.00 | 1,496.63 | 1,413.54 | 1,377.90 | 3.35 | 5.62 | 110.28 | 199.84 | 175.32 | 307.61 | 300.95 | 6.66 | 46.187 | |
| 1,600.00 | 1,594.44 | 1,501.23 | 1,458.70 | 3.69 | 6.27 | 111.90 | 224.38 | 199.00 | 353.75 | 346.53 | 7.22 | 48.968 | |
| 1,700.00 | 1,691.46 | 1,587.81 | 1,538.46 | 4.08 | 6.93 | 113.39 | 248.60 | 222.39 | 401.60 | 393.77 | 7.83 | 51.299 | |
| 1,800.00 | 1,787.58 | 1,673.16 | 1,617.09 | 4.54 | 7.57 | 114.76 | 272.49 | 245.44 | 451.24 | 442.76 | 8.48 | 53.237 | |
| 1,900.00 | 1,882.68 | 1,757.19 | 1,694.50 | 5.06 | 8.22 | 116.00 | 296.00 | 268.13 | 502.73 | 493.57 | 9.17 | 54.836 | |
| 1,961.54 | 1,940.65 | 1,808.19 | 1,741.49 | 5.41 | 8.60 | 116.71 | 310.27 | 281.90 | 535.37 | 525.75 | 9.62 | 55.675 | |
| 2,000.00 | 1,976.74 | 1,839.90 | 1,770.70 | 5.64 | 8.85 | 117.54 | 319.14 | 290.47 | 556.04 | 546.12 | 9.92 | 56.059 | |
| 2,100.00 | 2,070.57 | 1,922.32 | 1,846.64 | 6.26 | 9.48 | 119.46 | 342.20 | 312.73 | 610.14 | 599.42 | 10.72 | 56.893 | |
| 2,200.00 | 2,164.40 | 2,004.75 | 1,922.58 | 6.90 | 10.11 | 121.07 | 365.26 | 334.99 | 664.66 | 653.11 | 11.55 | 57.543 | |
| 2,300.00 | 2,258.23 | 2,087.18 | 1,998.52 | 7.56 | 10.75 | 122.44 | 388.33 | 357.25 | 719.51 | 707.12 | 12.39 | 58.060 | |
| 2,400.00 | 2,352.06 | 2,169.61 | 2,074.46 | 8.23 | 11.38 | 123.63 | 411.39 | 379.51 | 774.61 | 761.36 | 13.25 | 58.483 | |
| 2,500.00 | 2,445.89 | 2,252.03 | 2,150.40 | 8.90 | 12.02 | 124.65 | 434.45 | 401.77 | 829.91 | 815.81 | 14.11 | 58.836 | |
| 2,600.00 | 2,539.72 | 2,334.46 | 2,226.34 | 9.58 | 12.66 | 125.56 | 457.51 | 424.04 | 885.39 | 870.41 | 14.97 | 59.135 | |
| 2,700.00 | 2,633.55 | 2,416.89 | 2,302.28 | 10.27 | 13.29 | 126.36 | 480.58 | 446.30 | 940.99 | 925.15 | 15.84 | 59.392 | |
| 2,800.00 | 2,727.39 | 2,499.31 | 2,378.22 | 10.96 | 13.93 | 127.07 | 503.64 | 468.56 | 996.72 | 980.00 | 16.72 | 59.616 | |
| 2,900.00 | 2,821.22 | 2,581.74 | 2,454.16 | 11.66 | 14.57 | 127.70 | 526.70 | 490.82 | 1,052.53 | 1,034.94 | 17.60 | 59.813 | |
| 3,000.00 | 2,915.05 | 2,664.17 | 2,530.10 | 12.36 | 15.21 | 128.27 | 549.76 | 513.08 | 1,108.43 | 1,089.95 | 18.48 | 59.988 | |
| 3,100.00 | 3,008.88 | 2,746.60 | 2,606.03 | 13.06 | 15.85 | 128.79 | 572.83 | 535.34 | 1,164.40 | 1,145.04 | 19.36 | 60.145 | |
| 3,200.00 | 3,102.71 | 2,829.02 | 2,681.97 | 13.76 | 16.49 | 129.26 | 595.89 | 557.61 | 1,220.43 | 1,200.19 | 20.24 | 60.287 | |
| 3,300.00 | 3,196.54 | 2,911.45 | 2,757.91 | 14.47 | 17.12 | 129.69 | 618.95 | 579.87 | 1,276.51 | 1,255.38 | 21.13 | 60.416 | |
| 3,400.00 | 3,290.37 | 2,993.88 | 2,833.85 | 15.18 | 17.76 | 130.09 | 642.02 | 602.13 | 1,332.64 | 1,310.62 | 22.01 | 60.533 | |
| 3,500.00 | 3,384.20 | 3,076.31 | 2,909.79 | 15.88 | 18.40 | 130.45 | 665.08 | 624.39 | 1,388.80 | 1,365.90 | 22.90 | 60.641 | |
| 3,600.00 | 3,478.03 | 3,158.73 | 2,985.73 | 16.59 | 19.04 | 130.78 | 688.14 | 646.65 | 1,445.00 | 1,421.21 | 23.79 | 60.741 | |
| 3,700.00 | 3,571.86 | 3,241.16 | 3,061.67 | 17.30 | 19.68 | 131.09 | 711.20 | 668.91 | 1,501.24 | 1,476.56 | 24.68 | 60.833 | |
| 3,800.00 | 3,665.69 | 3,323.59 | 3,137.61 | 18.02 | 20.32 | 131.38 | 734.27 | 691.17 | 1,557.50 | 1,531.93 | 25.57 | 60.918 | |
| 3,900.00 | 3,759.52 | 3,406.02 | 3,213.55 | 18.73 | 20.96 | 131.65 | 757.33 | 713.44 | 1,613.78 | 1,587.33 | 26.46 | 60.998 | |
| 4,000.00 | 3,853.35 | 3,488.44 | 3,289.49 | 19.44 | 21.60 | 131.90 | 780.39 | 735.70 | 1,670.09 | 1,642.75 | 27.35 | 61.072 | |
| 4,100.00 | 3,947.19 | 3,570.87 | 3,365.43 | 20.16 | 22.25 | 132.13 | 803.46 | 757.96 | 1,726.42 | 1,698.19 | 28.24 | 61.142 | |
| 4,200.00 | 4,041.02 | 3,653.30 | 3,441.37 | 20.87 | 22.89 | 132.35 | 826.52 | 780.22 | 1,782.77 | 1,753.64 | 29.13 | 61.207 | |
| 4,300.00 | 4,134.85 | 3,735.73 | 3,517.31 | 21.58 | 23.53 | 132.55 | 849.58 | 802.48 | 1,839.13 | 1,809.12 | 30.02 | 61.269 | |
| 4,400.00 | 4,228.68 | 3,818.15 | 3,593.25 | 22.30 | 24.17 | 132.75 | 872.64 | 824.74 | 1,895.51 | 1,864.60 | 30.91 | 61.327 | |
| 4,500.00 | 4,322.51 | 3,900.58 | 3,669.19 | 23.02 | 24.81 | 132.93 | 895.71 | 847.01 | 1,951.90 | 1,920.11 | 31.80 | 61.382 | |
| 4,600.00 | 4,416.34 | 3,983.01 | 3,745.13 | 23.73 | 25.45 | 133.10 | 918.77 | 869.27 | 2,008.31 | 1,975.62 | 32.69 | 61.434 | |
| 4,700.00 | 4,510.17 | 4,065.44 | 3,821.07 | 24.45 | 26.09 | 133.26 | 941.83 | 891.53 | 2,064.73 | 2,031.15 | 33.58 | 61.483 | |
| 4,800.00 | 4,604.00 | 4,147.86 | 3,897.01 | 25.17 | 26.73 | 133.42 | 964.90 | 913.79 | 2,121.16 | 2,086.68 | 34.47 | 61.529 | |
| 4,900.00 | 4,697.83 | 4,230.29 | 3,972.95 | 25.88 | 27.37 | 133.56 | 987.96 | 936.05 | 2,177.59 | 2,142.23 | 35.37 | 61.574 | |

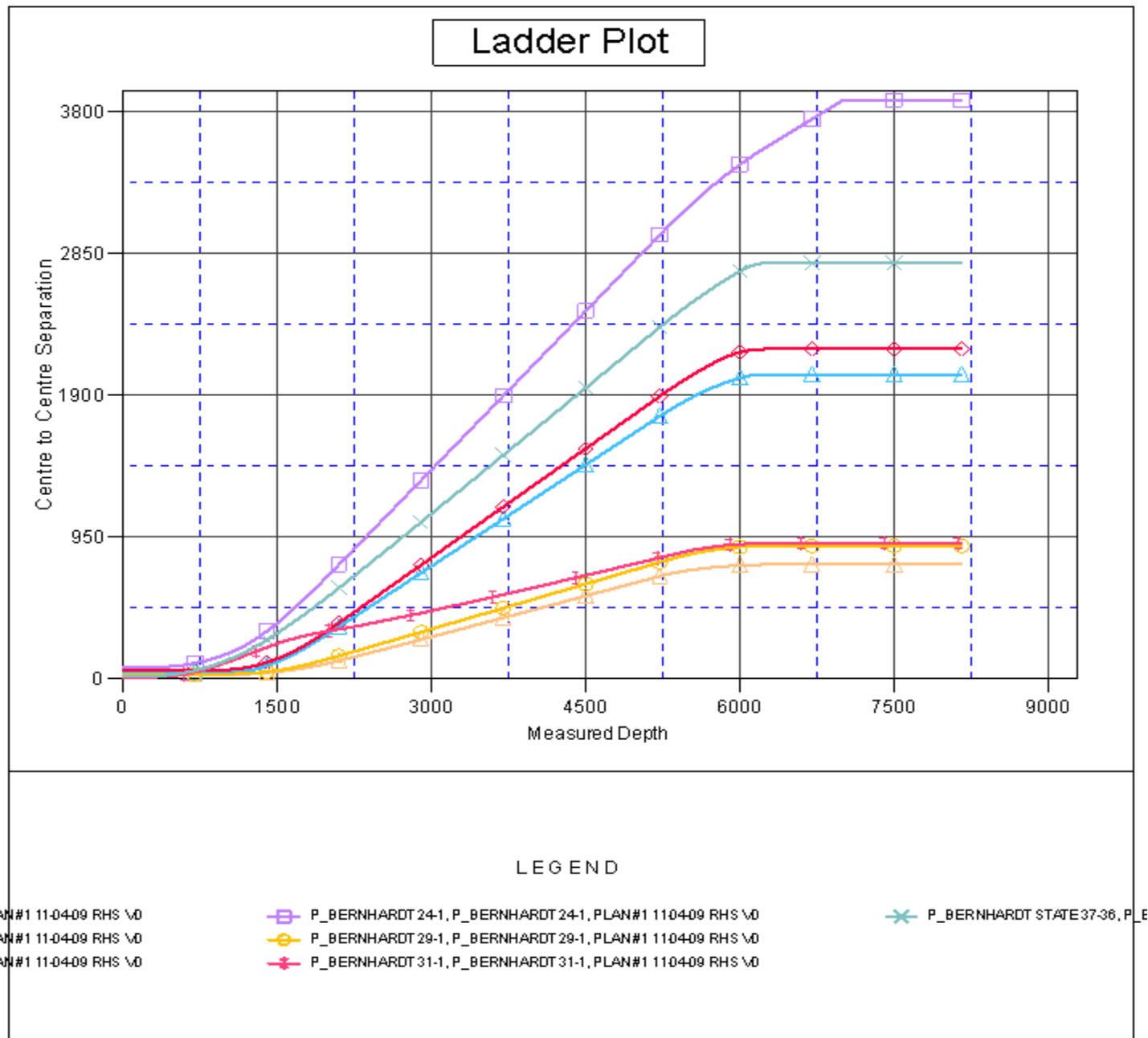
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

| Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT STATE 37-36 - P_BERNHARDT STATE 37-36 | | | | | | | | | | | | Offset Site Error: | 0.00 ft |
|--|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.00 ft |
| Reference | Offset | Semi Major Axis | | Distance | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 5,000.00 | 4,791.66 | 4,312.72 | 4,048.89 | 26.60 | 28.01 | 133.70 | 1,011.02 | 958.31 | 2,234.04 | 2,197.78 | 36.26 | 61.616 | |
| 5,100.00 | 4,885.49 | 4,395.15 | 4,124.83 | 27.32 | 28.65 | 133.83 | 1,034.08 | 980.57 | 2,290.50 | 2,253.35 | 37.15 | 61.656 | |
| 5,200.00 | 4,979.32 | 4,477.57 | 4,200.76 | 28.04 | 29.30 | 133.96 | 1,057.15 | 1,002.84 | 2,346.96 | 2,308.92 | 38.04 | 61.695 | |
| 5,221.35 | 4,999.35 | 4,495.17 | 4,216.97 | 28.19 | 29.43 | 133.99 | 1,062.07 | 1,007.59 | 2,359.01 | 2,320.78 | 38.23 | 61.703 | |
| 5,300.00 | 5,073.52 | 4,560.45 | 4,277.12 | 28.68 | 29.94 | 134.81 | 1,080.34 | 1,025.22 | 2,402.81 | 2,363.69 | 39.12 | 61.427 | |
| 5,400.00 | 5,168.80 | 4,644.71 | 4,354.75 | 29.18 | 30.60 | 135.73 | 1,103.91 | 1,047.98 | 2,456.64 | 2,416.47 | 40.17 | 61.158 | |
| 5,500.00 | 5,265.09 | 4,730.28 | 4,433.58 | 29.63 | 31.26 | 136.53 | 1,127.85 | 1,071.09 | 2,508.36 | 2,467.17 | 41.19 | 60.903 | |
| 5,600.00 | 5,362.25 | 4,817.06 | 4,513.53 | 30.03 | 31.94 | 137.21 | 1,152.13 | 1,094.52 | 2,557.89 | 2,515.73 | 42.16 | 60.667 | |
| 5,700.00 | 5,460.19 | 4,904.94 | 4,594.49 | 30.38 | 32.62 | 137.78 | 1,176.72 | 1,118.26 | 2,605.20 | 2,562.10 | 43.09 | 60.454 | |
| 5,800.00 | 5,558.76 | 4,993.81 | 4,676.36 | 30.68 | 33.31 | 138.24 | 1,201.59 | 1,142.26 | 2,650.23 | 2,606.25 | 43.97 | 60.267 | |
| 5,900.00 | 5,657.87 | 5,083.56 | 4,759.05 | 30.94 | 34.01 | 138.62 | 1,226.70 | 1,166.50 | 2,692.96 | 2,648.16 | 44.80 | 60.108 | |
| 6,000.00 | 5,757.38 | 5,174.09 | 4,842.46 | 31.14 | 34.72 | 138.90 | 1,252.03 | 1,190.95 | 2,733.36 | 2,687.79 | 45.57 | 59.978 | |
| 6,100.00 | 5,857.17 | 5,262.17 | 4,928.34 | 31.30 | 35.43 | 139.16 | 1,277.36 | 1,217.28 | 2,768.67 | 2,721.48 | 46.34 | 59.851 | |
| 6,200.00 | 5,957.12 | 5,352.45 | 5,013.45 | 31.42 | 36.12 | 139.39 | 1,299.44 | 1,240.36 | 2,796.16 | 2,747.39 | 47.07 | 59.729 | |
| 6,232.88 | 5,990.00 | 5,384.67 | 5,046.00 | 31.44 | 36.96 | 139.45 | 1,312.44 | 1,253.37 | 2,812.33 | 2,763.25 | 47.76 | 59.604 | |
| 6,300.00 | 6,057.12 | 5,451.79 | 5,113.12 | 31.50 | 37.64 | 139.55 | 1,324.44 | 1,265.37 | 2,824.33 | 2,775.11 | 48.40 | 59.484 | |
| 6,400.00 | 6,157.12 | 5,551.79 | 5,213.12 | 31.59 | 38.38 | 139.65 | 1,336.44 | 1,277.37 | 2,836.33 | 2,787.90 | 49.04 | 59.364 | |
| 6,500.00 | 6,257.12 | 5,651.79 | 5,313.12 | 31.69 | 39.12 | 139.75 | 1,348.44 | 1,290.37 | 2,848.33 | 2,799.67 | 49.68 | 59.244 | |
| 6,600.00 | 6,357.12 | 5,751.79 | 5,413.12 | 31.78 | 39.86 | 139.85 | 1,360.44 | 1,303.37 | 2,860.33 | 2,811.45 | 50.32 | 59.124 | |
| 6,700.00 | 6,457.12 | 5,851.79 | 5,513.12 | 31.88 | 40.60 | 139.95 | 1,372.44 | 1,316.37 | 2,872.33 | 2,823.22 | 50.96 | 59.004 | |
| 6,800.00 | 6,557.12 | 5,951.79 | 5,613.12 | 31.98 | 41.34 | 140.05 | 1,384.44 | 1,329.37 | 2,884.33 | 2,835.99 | 51.60 | 58.884 | |
| 6,900.00 | 6,657.12 | 6,051.79 | 5,713.12 | 32.08 | 42.08 | 140.15 | 1,396.44 | 1,342.37 | 2,896.33 | 2,847.76 | 52.24 | 58.764 | |
| 7,000.00 | 6,757.12 | 6,151.79 | 5,813.12 | 32.18 | 42.82 | 140.25 | 1,408.44 | 1,355.37 | 2,908.33 | 2,859.53 | 52.88 | 58.644 | |
| 7,100.00 | 6,857.12 | 6,251.79 | 5,913.12 | 32.28 | 43.56 | 140.35 | 1,420.44 | 1,368.37 | 2,920.33 | 2,871.29 | 53.52 | 58.524 | |
| 7,200.00 | 6,957.12 | 6,351.79 | 6,013.12 | 32.38 | 44.30 | 140.45 | 1,432.44 | 1,381.37 | 2,932.33 | 2,883.05 | 54.16 | 58.404 | |
| 7,300.00 | 7,057.12 | 6,451.79 | 6,113.12 | 32.44 | 45.04 | 140.55 | 1,444.44 | 1,394.37 | 2,944.33 | 2,894.80 | 54.80 | 58.284 | |
| 7,400.00 | 7,157.12 | 6,551.79 | 6,213.12 | 32.59 | 45.78 | 140.65 | 1,456.44 | 1,407.37 | 2,956.33 | 2,906.55 | 55.44 | 58.164 | |
| 7,500.00 | 7,257.12 | 6,651.79 | 6,313.12 | 32.70 | 46.52 | 140.75 | 1,468.44 | 1,420.37 | 2,968.33 | 2,918.30 | 56.08 | 58.044 | |
| 7,600.00 | 7,357.12 | 6,751.79 | 6,413.12 | 32.81 | 47.26 | 140.85 | 1,480.44 | 1,433.37 | 2,980.33 | 2,930.05 | 56.72 | 57.924 | |
| 7,700.00 | 7,457.12 | 6,851.79 | 6,513.12 | 32.92 | 48.00 | 140.95 | 1,492.44 | 1,446.37 | 2,992.33 | 2,941.80 | 57.36 | 57.804 | |
| 7,800.00 | 7,557.12 | 6,951.79 | 6,613.12 | 33.03 | 48.74 | 141.05 | 1,504.44 | 1,459.37 | 3,004.33 | 2,953.54 | 58.00 | 57.684 | |
| 7,900.00 | 7,657.12 | 7,051.79 | 6,713.12 | 33.14 | 49.48 | 141.15 | 1,516.44 | 1,472.37 | 3,016.33 | 2,965.28 | 58.64 | 57.564 | |
| 8,000.00 | 7,757.12 | 7,151.79 | 6,813.12 | 33.25 | 50.22 | 141.25 | 1,528.44 | 1,485.37 | 3,028.33 | 2,977.02 | 59.28 | 57.444 | |
| 8,100.00 | 7,857.12 | 7,251.79 | 6,913.12 | 33.37 | 50.96 | 141.35 | 1,540.44 | 1,498.37 | 3,040.33 | 2,988.75 | 59.92 | 57.324 | |
| 8,155.88 | 7,913.00 | 7,277.67 | 6,969.00 | 33.43 | 51.70 | 141.45 | 1,552.44 | 1,511.37 | 3,052.33 | 2,999.60 | 60.56 | 57.204 | |

| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NOTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 4-1
Offset Depths are relative to Offset Datum
Central Meridian is 105° 30' 0.000 W °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.43°



| | | | |
|---------------------------|-----------------------------|-------------------------------------|---------------------------------------|
| Company: | US ROCKIES REGION PLANNING | Local Co-ordinate Reference: | Well P_BERNHARDT 4-1 |
| Project: | COLORADO NORTHERN ZONE - 83 | TVD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Reference Site: | WELD_BERNHARDT 8 PAD 4N67W1 | MD Reference: | WELL @ 4840.00ft (Original Well Elev) |
| Site Error: | 0.00ft | North Reference: | True |
| Reference Well: | P_BERNHARDT 4-1 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.00ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | P_BERNHARDT 4-1 | Database: | EDM 2003.21 Single User Db |
| Reference Design: | PLAN #1 11-04-09 RHS | Offset TVD Reference: | Offset Datum |

Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 4-1
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.43°

