



Whiting Petroleum Corp.

**Weld County, CO
Sec 8-T10N-R58W
Razor #08E-1704**

Hz

Plan: APD Pilot Hole

Standard Planning Report

27 April, 2015



WOG

Planning Report

| | | | |
|------------------|-------------------------|-------------------------------------|--|
| Database: | LandmarkEDM | Local Co-ordinate Reference: | Well Razor #08E-1704 |
| Company: | Whiting Petroleum Corp. | TVD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Project: | Weld County, CO | MD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Site: | Sec 8-T10N-R58W | North Reference: | True |
| Well: | Razor #08E-1704 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Hz | | |
| Design: | APD Pilot Hole | | |

| | | | |
|--------------------|---------------------------|----------------------|----------------|
| Project | Weld County, CO | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Northern Zone | | |

| | | | | |
|------------------------------|-----------------|---------------------|-------------------|-------------------------------------|
| Site | Sec 8-T10N-R58W | | | |
| Site Position: | | Northing: | 1,560,182.07 usft | Latitude: 40° 51' 36.400 N |
| From: | Lat/Long | Easting: | 3,442,656.21 usft | Longitude: 103° 53' 58.852 W |
| Position Uncertainty: | 0.00 usft | Slot Radius: | 13.200 in | Grid Convergence: 1.03 ° |

| | | | | |
|-----------------------------|-----------------|----------------------------|------------------|------------------------------------|
| Well | Razor #08E-1704 | | | |
| Well Position | +N/-S | -2,224.49 usft | Northing: | 1,557,972.29 usft |
| | +E/-W | 794.71 usft | Easting: | 3,443,490.93 usft |
| Position Uncertainty | 0.00 usft | Wellhead Elevation: | | Ground Level: 4,962.00 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Hz | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 3/4/2015 | 7.92 | 67.42 | 53,061 |

| | | | | |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|
| Design | APD Pilot Hole | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PROTOTYPE | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
| | 0.00 | 0.00 | 0.00 | 82.00 |

| | | | | | | | | | | |
|------------------------------|------------------------|--------------------|------------------------------|---------------------|---------------------|------------------------------|-----------------------------|----------------------------|----------------|---------------|
| Plan Sections | | | | | | | | | | |
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 612.50 | 6.25 | 82.00 | 611.88 | 2.37 | 16.86 | 2.00 | 2.00 | 0.00 | 82.00 | |
| 4,787.50 | 6.25 | 82.00 | 4,762.07 | 65.63 | 466.96 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,100.00 | 0.00 | 0.00 | 5,073.95 | 68.00 | 483.82 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,180.00 | 0.00 | 0.00 | 6,153.95 | 68.00 | 483.82 | 0.00 | 0.00 | 0.00 | 0.00 | |



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| Project: | Weld County, CO | MD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Site: | Sec 8-T10N-R58W | North Reference: | True |
| Well: | Razor #08E-1704 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Hz | | |
| Design: | APD Pilot Hole | | |

| Planned Survey | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-----------------------|----------------------|---------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Build 2°/100' | | | | | | | | | |
| 400.00 | 2.00 | 82.00 | 399.98 | 0.24 | 1.73 | 1.75 | 2.00 | 2.00 | 0.00 |
| 500.00 | 4.00 | 82.00 | 499.84 | 0.97 | 6.91 | 6.98 | 2.00 | 2.00 | 0.00 |
| 600.00 | 6.00 | 82.00 | 599.45 | 2.18 | 15.54 | 15.69 | 2.00 | 2.00 | 0.00 |
| 612.50 | 6.25 | 82.00 | 611.88 | 2.37 | 16.86 | 17.03 | 2.00 | 2.00 | 0.00 |
| Hold 6.25° Inc | | | | | | | | | |
| 700.00 | 6.25 | 82.00 | 698.86 | 3.70 | 26.29 | 26.55 | 0.00 | 0.00 | 0.00 |
| 800.00 | 6.25 | 82.00 | 798.27 | 5.21 | 37.08 | 37.44 | 0.00 | 0.00 | 0.00 |
| 900.00 | 6.25 | 82.00 | 897.67 | 6.73 | 47.86 | 48.33 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 6.25 | 82.00 | 997.08 | 8.24 | 58.64 | 59.21 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 6.25 | 82.00 | 1,096.48 | 9.76 | 69.42 | 70.10 | 0.00 | 0.00 | 0.00 |
| 1,200.00 | 6.25 | 82.00 | 1,195.89 | 11.27 | 80.20 | 80.99 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 6.25 | 82.00 | 1,295.29 | 12.79 | 90.98 | 91.87 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 6.25 | 82.00 | 1,394.70 | 14.30 | 101.76 | 102.76 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 6.25 | 82.00 | 1,494.11 | 15.82 | 112.54 | 113.65 | 0.00 | 0.00 | 0.00 |
| 1,556.23 | 6.25 | 82.00 | 1,550.00 | 16.67 | 118.60 | 119.77 | 0.00 | 0.00 | 0.00 |
| Upper Pierre | | | | | | | | | |
| 1,600.00 | 6.25 | 82.00 | 1,593.51 | 17.33 | 123.32 | 124.53 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 6.25 | 82.00 | 1,692.92 | 18.85 | 134.10 | 135.42 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 6.25 | 82.00 | 1,792.32 | 20.36 | 144.88 | 146.31 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 6.25 | 82.00 | 1,891.73 | 21.88 | 155.66 | 157.19 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 6.25 | 82.00 | 1,991.13 | 23.39 | 166.44 | 168.08 | 0.00 | 0.00 | 0.00 |
| 2,100.00 | 6.25 | 82.00 | 2,090.54 | 24.91 | 177.23 | 178.97 | 0.00 | 0.00 | 0.00 |
| 2,200.00 | 6.25 | 82.00 | 2,189.95 | 26.42 | 188.01 | 189.85 | 0.00 | 0.00 | 0.00 |
| 2,300.00 | 6.25 | 82.00 | 2,289.35 | 27.94 | 198.79 | 200.74 | 0.00 | 0.00 | 0.00 |
| 2,400.00 | 6.25 | 82.00 | 2,388.76 | 29.45 | 209.57 | 211.63 | 0.00 | 0.00 | 0.00 |
| 2,500.00 | 6.25 | 82.00 | 2,488.16 | 30.97 | 220.35 | 222.51 | 0.00 | 0.00 | 0.00 |
| 2,600.00 | 6.25 | 82.00 | 2,587.57 | 32.48 | 231.13 | 233.40 | 0.00 | 0.00 | 0.00 |
| 2,700.00 | 6.25 | 82.00 | 2,686.97 | 34.00 | 241.91 | 244.29 | 0.00 | 0.00 | 0.00 |
| 2,800.00 | 6.25 | 82.00 | 2,786.38 | 35.51 | 252.69 | 255.17 | 0.00 | 0.00 | 0.00 |
| 2,900.00 | 6.25 | 82.00 | 2,885.78 | 37.03 | 263.47 | 266.06 | 0.00 | 0.00 | 0.00 |
| 3,000.00 | 6.25 | 82.00 | 2,985.19 | 38.54 | 274.25 | 276.95 | 0.00 | 0.00 | 0.00 |
| 3,100.00 | 6.25 | 82.00 | 3,084.60 | 40.06 | 285.03 | 287.83 | 0.00 | 0.00 | 0.00 |
| 3,200.00 | 6.25 | 82.00 | 3,184.00 | 41.57 | 295.81 | 298.72 | 0.00 | 0.00 | 0.00 |
| 3,300.00 | 6.25 | 82.00 | 3,283.41 | 43.09 | 306.59 | 309.61 | 0.00 | 0.00 | 0.00 |
| 3,400.00 | 6.25 | 82.00 | 3,382.81 | 44.60 | 317.37 | 320.49 | 0.00 | 0.00 | 0.00 |
| 3,500.00 | 6.25 | 82.00 | 3,482.22 | 46.12 | 328.16 | 331.38 | 0.00 | 0.00 | 0.00 |
| 3,517.89 | 6.25 | 82.00 | 3,500.00 | 46.39 | 330.08 | 333.33 | 0.00 | 0.00 | 0.00 |
| Hygiene | | | | | | | | | |
| 3,600.00 | 6.25 | 82.00 | 3,581.62 | 47.63 | 338.94 | 342.27 | 0.00 | 0.00 | 0.00 |
| 3,668.78 | 6.25 | 82.00 | 3,650.00 | 48.68 | 346.35 | 349.76 | 0.00 | 0.00 | 0.00 |
| Lower Pierre | | | | | | | | | |
| 3,700.00 | 6.25 | 82.00 | 3,681.03 | 49.15 | 349.72 | 353.15 | 0.00 | 0.00 | 0.00 |
| 3,800.00 | 6.25 | 82.00 | 3,780.44 | 50.66 | 360.50 | 364.04 | 0.00 | 0.00 | 0.00 |
| 3,900.00 | 6.25 | 82.00 | 3,879.84 | 52.18 | 371.28 | 374.93 | 0.00 | 0.00 | 0.00 |
| 4,000.00 | 6.25 | 82.00 | 3,979.25 | 53.69 | 382.06 | 385.81 | 0.00 | 0.00 | 0.00 |
| 4,100.00 | 6.25 | 82.00 | 4,078.65 | 55.21 | 392.84 | 396.70 | 0.00 | 0.00 | 0.00 |
| 4,200.00 | 6.25 | 82.00 | 4,178.06 | 56.73 | 403.62 | 407.59 | 0.00 | 0.00 | 0.00 |
| 4,300.00 | 6.25 | 82.00 | 4,277.46 | 58.24 | 414.40 | 418.47 | 0.00 | 0.00 | 0.00 |
| 4,400.00 | 6.25 | 82.00 | 4,376.87 | 59.76 | 425.18 | 429.36 | 0.00 | 0.00 | 0.00 |



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| Project: | Weld County, CO | MD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Site: | Sec 8-T10N-R58W | North Reference: | True |
| Well: | Razor #08E-1704 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Hz | | |
| Design: | APD Pilot Hole | | |

| Planned Survey | | | | | | | | | |
|----------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-----------------------|----------------------|---------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 4,500.00 | 6.25 | 82.00 | 4,476.27 | 61.27 | 435.96 | 440.25 | 0.00 | 0.00 | 0.00 |
| 4,600.00 | 6.25 | 82.00 | 4,575.68 | 62.79 | 446.74 | 451.13 | 0.00 | 0.00 | 0.00 |
| 4,700.00 | 6.25 | 82.00 | 4,675.09 | 64.30 | 457.52 | 462.02 | 0.00 | 0.00 | 0.00 |
| 4,787.50 | 6.25 | 82.00 | 4,762.07 | 65.63 | 466.96 | 471.55 | 0.00 | 0.00 | 0.00 |
| Drop 2°/100' | | | | | | | | | |
| 4,800.00 | 6.00 | 82.00 | 4,774.49 | 65.81 | 468.28 | 472.88 | 2.00 | -2.00 | 0.00 |
| 4,900.00 | 4.00 | 82.00 | 4,874.11 | 67.03 | 476.91 | 481.60 | 2.00 | -2.00 | 0.00 |
| 5,000.00 | 2.00 | 82.00 | 4,973.97 | 67.75 | 482.09 | 486.83 | 2.00 | -2.00 | 0.00 |
| 5,100.00 | 0.00 | 0.00 | 5,073.95 | 68.00 | 483.82 | 488.57 | 2.00 | -2.00 | 0.00 |
| Hold Vertical | | | | | | | | | |
| 5,200.00 | 0.00 | 0.00 | 5,173.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,300.00 | 0.00 | 0.00 | 5,273.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,400.00 | 0.00 | 0.00 | 5,373.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,482.05 | 0.00 | 0.00 | 5,456.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| P200 Marker | | | | | | | | | |
| 5,500.00 | 0.00 | 0.00 | 5,473.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,503.05 | 0.00 | 0.00 | 5,477.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| P300 Marker | | | | | | | | | |
| 5,524.05 | 0.00 | 0.00 | 5,498.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| P350 Marker | | | | | | | | | |
| 5,531.05 | 0.00 | 0.00 | 5,505.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Sharon Springs | | | | | | | | | |
| 5,600.00 | 0.00 | 0.00 | 5,573.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,700.00 | 0.00 | 0.00 | 5,673.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,800.00 | 0.00 | 0.00 | 5,773.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,816.05 | 0.00 | 0.00 | 5,790.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Niobrara | | | | | | | | | |
| 5,843.05 | 0.00 | 0.00 | 5,817.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Top A Chalk (N100) | | | | | | | | | |
| 5,876.05 | 0.00 | 0.00 | 5,850.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Top A Marl (N200) | | | | | | | | | |
| 5,900.00 | 0.00 | 0.00 | 5,873.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 5,910.05 | 0.00 | 0.00 | 5,884.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| A Marl (N250) | | | | | | | | | |
| 5,924.05 | 0.00 | 0.00 | 5,898.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Top Upper B (N400) | | | | | | | | | |
| 5,952.05 | 0.00 | 0.00 | 5,926.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Base Upper B (N430) | | | | | | | | | |
| 5,969.05 | 0.00 | 0.00 | 5,943.00 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| Top Lower B (N460) | | | | | | | | | |
| 6,000.00 | 0.00 | 0.00 | 5,973.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 6,100.00 | 0.00 | 0.00 | 6,073.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| 6,180.00 | 0.00 | 0.00 | 6,153.95 | 68.00 | 483.82 | 488.57 | 0.00 | 0.00 | 0.00 |
| TD at 6180.00' MD | | | | | | | | | |

| Casing Points | | | | |
|-----------------------|-----------------------|------|----------------------|--------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (in) | Hole Diameter (in) |
| 6,266.37 | 7" | | 7.000 | 8.750 |



WOG

Planning Report

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| Database: | LandmarkEDM | Local Co-ordinate Reference: | Well Razor #08E-1704 |
| Company: | Whiting Petroleum Corp. | TVD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Project: | Weld County, CO | MD Reference: | KBE @ 4980.00usft (Original Well Elev) |
| Site: | Sec 8-T10N-R58W | North Reference: | True |
| Well: | Razor #08E-1704 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Hz | | |
| Design: | APD Pilot Hole | | |

| Formations | | | | | | |
|-----------------------|-----------------------|---------------------|-----------|---------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) | |
| 1,556.23 | 1,550.00 | Upper Pierre | | 0.00 | | |
| 3,517.89 | 3,500.00 | Hygiene | | 0.00 | | |
| 3,668.78 | 3,650.00 | Lower Pierre | | 0.00 | | |
| 5,482.05 | 5,456.00 | P200 Marker | | 0.00 | | |
| 5,503.05 | 5,477.00 | P300 Marker | | 0.00 | | |
| 5,524.05 | 5,498.00 | P350 Marker | | 0.00 | | |
| 5,531.05 | 5,505.00 | Sharon Springs | | 0.00 | | |
| 5,816.05 | 5,790.00 | Niobrara | | 0.00 | | |
| 5,843.05 | 5,817.00 | Top A Chalk (N100) | | 0.00 | | |
| 5,876.05 | 5,850.00 | Top A Marl (N200) | | 0.00 | | |
| 5,910.05 | 5,884.00 | A Marl (N250) | | 0.00 | | |
| 5,924.05 | 5,898.00 | Top Upper B (N400) | | 0.00 | | |
| 5,952.05 | 5,926.00 | Base Upper B (N430) | | 0.00 | | |
| 5,969.05 | 5,943.00 | Top Lower B (N460) | | 0.00 | | |

| Plan Annotations | | | | | |
|-----------------------|-----------------------|-------------------|--------------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | | |
| | | +N/-S (usft) | +E/-W (usft) | Comment | |
| 300.00 | 300.00 | 0.00 | 0.00 | Build 2°/100' | |
| 612.50 | 611.88 | 2.37 | 16.86 | Hold 6.25° Inc | |
| 4,787.50 | 4,762.07 | 65.63 | 466.96 | Drop 2°/100' | |
| 5,100.00 | 5,073.95 | 68.00 | 483.82 | Hold Vertical | |
| 6,180.00 | 6,153.95 | 68.00 | 483.82 | TD at 6180.00' MD | |