



Laramie Energy, LLC

Mesa County, CO

Nichols 24-06A

Nichols 0994-24-06W

B-9

Design: B-9

QES Survey Report

12 December, 2017





Survey Report



| | | | |
|------------------|---------------------|-------------------------------------|------------------------------|
| Company: | Laramie Energy, LLC | Local Co-ordinate Reference: | Well Nichols 0994-24-06W |
| Project: | Mesa County, CO | TVD Reference: | well @ 7161.0usft (H&P #290) |
| Site: | Nichols 24-06A | MD Reference: | well @ 7161.0usft (H&P #290) |
| Well: | Nichols 0994-24-06W | North Reference: | True |
| Wellbore: | B-9 | Survey Calculation Method: | Minimum Curvature |
| Design: | B-9 | Database: | EDM 5000.1 Single User Db |

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

| | | | | | |
|------------------------------|----------------|---------------------|-------------------|--------------------------|-------------|
| Site | Nichols 24-06A | | | | |
| Site Position: | | Northing: | 1,529,702.08 usft | Latitude: | 39.264528 |
| From: | Lat/Long | Easting: | 2,340,203.74 usft | Longitude: | -107.830633 |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -1.47 ° |

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|-----------------------------|---------------------|----------|----------------------------|-------------------|----------------------|--------------|
| Well | Nichols 0994-24-06W | | | | | |
| Well Position | +N/-S | 0.0 usft | Northing: | 1,529,726.11 usft | Latitude: | 39.264594 |
| | +E/-W | 0.0 usft | Easting: | 2,340,203.51 usft | Longitude: | -107.830636 |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | 0.0 usft | Ground Level: | 7,137.0 usft |

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|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | B-9 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2015 | 12/4/2017 | 9.55 | 65.42 | 51,364.22385348 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|-----|
| Design | B-9 | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.0 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) | |
| | 0.0 | 0.0 | 0.0 | 288.81 | |

| | | | | | |
|-----------------------|------------------|--------------------------|------------------|--------------------|--|
| Survey Program | Date | 12/12/2017 | | | |
| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description | |
| 202.0 | 7,558.0 | QES MWD Surveys (B-9) | MWD default | MWD - Standard | |

| | | | | | | | | | | |
|--|------------------------|--------------------|------------------------------|---------------------|---------------------|--------------------------------|--------------------------------|-------------------------------|------------------------------|--|
| Survey | | | | | | | | | | |
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | |
| First MWD Survey @ 202.0' MD / 201.9' TVD | | | | | | | | | | |
| 202.0 | 2.90 | 297.50 | 201.9 | 2.4 | -4.5 | 5.1 | 1.44 | 1.44 | 0.00 | |
| 293.0 | 3.50 | 300.50 | 292.8 | 4.8 | -9.0 | 10.0 | 0.68 | 0.66 | 3.30 | |
| 384.0 | 3.70 | 289.40 | 383.6 | 7.2 | -14.1 | 15.7 | 0.80 | 0.22 | -12.20 | |
| 474.0 | 3.90 | 285.30 | 473.4 | 9.0 | -19.8 | 21.7 | 0.37 | 0.22 | -4.56 | |
| 565.0 | 5.00 | 289.70 | 564.1 | 11.1 | -26.5 | 28.7 | 1.26 | 1.21 | 4.84 | |
| 655.0 | 6.60 | 295.00 | 653.7 | 14.7 | -34.9 | 37.8 | 1.87 | 1.78 | 5.89 | |
| 745.0 | 8.30 | 293.90 | 742.9 | 19.5 | -45.5 | 49.4 | 1.90 | 1.89 | -1.22 | |
| 837.0 | 9.80 | 289.00 | 833.7 | 24.7 | -59.0 | 63.8 | 1.83 | 1.63 | -5.33 | |
| 928.0 | 10.50 | 286.50 | 923.3 | 29.6 | -74.3 | 79.9 | 0.91 | 0.77 | -2.75 | |



Survey Report



| | | | |
|------------------|---------------------|-------------------------------------|------------------------------|
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| Project: | Mesa County, CO | TVD Reference: | well @ 7161.0usft (H&P #290) |
| Site: | Nichols 24-06A | MD Reference: | well @ 7161.0usft (H&P #290) |
| Well: | Nichols 0994-24-06W | North Reference: | True |
| Wellbore: | B-9 | Survey Calculation Method: | Minimum Curvature |
| Design: | B-9 | Database: | EDM 5000.1 Single User Db |

| Survey | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 1,022.0 | 12.30 | 282.90 | 1,015.5 | 34.3 | -92.3 | 98.4 | 2.06 | 1.91 | -3.83 |
| 1,117.0 | 13.80 | 286.50 | 1,108.0 | 39.7 | -113.0 | 119.8 | 1.80 | 1.58 | 3.79 |
| 1,211.0 | 14.20 | 284.40 | 1,199.2 | 45.8 | -134.9 | 142.5 | 0.69 | 0.43 | -2.23 |
| 1,306.0 | 15.60 | 288.90 | 1,291.0 | 52.8 | -158.3 | 166.9 | 1.91 | 1.47 | 4.74 |
| 1,400.0 | 16.90 | 289.50 | 1,381.3 | 61.5 | -183.1 | 193.2 | 1.39 | 1.38 | 0.64 |
| 1,495.0 | 17.30 | 290.00 | 1,472.1 | 70.9 | -209.4 | 221.1 | 0.45 | 0.42 | 0.53 |
| 1,587.0 | 17.00 | 289.70 | 1,560.0 | 80.1 | -234.9 | 248.2 | 0.34 | -0.33 | -0.33 |
| 1,681.0 | 16.90 | 289.00 | 1,649.9 | 89.2 | -260.8 | 275.6 | 0.24 | -0.11 | -0.74 |
| 1,775.0 | 16.70 | 288.60 | 1,739.9 | 98.0 | -286.5 | 302.8 | 0.25 | -0.21 | -0.43 |
| 1,870.0 | 17.90 | 289.70 | 1,830.6 | 107.2 | -313.2 | 331.0 | 1.31 | 1.26 | 1.16 |
| 1,964.0 | 17.80 | 289.10 | 1,920.1 | 116.8 | -340.4 | 359.9 | 0.22 | -0.11 | -0.64 |
| 2,059.0 | 17.60 | 288.80 | 2,010.6 | 126.2 | -367.7 | 388.7 | 0.23 | -0.21 | -0.32 |
| 2,153.0 | 17.10 | 289.10 | 2,100.3 | 135.3 | -394.2 | 416.8 | 0.54 | -0.53 | 0.32 |
| 2,248.0 | 18.40 | 290.40 | 2,190.8 | 145.1 | -421.5 | 445.7 | 1.43 | 1.37 | 1.37 |
| 2,342.0 | 17.80 | 290.20 | 2,280.1 | 155.2 | -448.8 | 474.9 | 0.64 | -0.64 | -0.21 |
| 2,437.0 | 17.60 | 289.40 | 2,370.6 | 165.0 | -476.0 | 503.8 | 0.33 | -0.21 | -0.84 |
| 2,531.0 | 17.20 | 289.40 | 2,460.3 | 174.3 | -502.5 | 531.9 | 0.43 | -0.43 | 0.00 |
| 2,626.0 | 16.90 | 289.70 | 2,551.1 | 183.7 | -528.8 | 559.8 | 0.33 | -0.32 | 0.32 |
| 2,721.0 | 17.10 | 289.50 | 2,642.0 | 193.0 | -554.9 | 587.5 | 0.22 | 0.21 | -0.21 |
| 2,815.0 | 18.90 | 288.50 | 2,731.4 | 202.4 | -582.4 | 616.6 | 1.94 | 1.91 | -1.06 |
| 2,910.0 | 18.40 | 288.00 | 2,821.4 | 211.9 | -611.3 | 647.0 | 0.55 | -0.53 | -0.53 |
| 3,005.0 | 18.00 | 288.00 | 2,911.6 | 221.1 | -639.5 | 676.6 | 0.42 | -0.42 | 0.00 |
| 3,099.0 | 17.50 | 288.10 | 3,001.2 | 230.0 | -666.7 | 705.3 | 0.53 | -0.53 | 0.11 |
| 3,194.0 | 17.30 | 287.70 | 3,091.8 | 238.7 | -693.8 | 733.7 | 0.25 | -0.21 | -0.42 |
| 3,289.0 | 17.00 | 287.00 | 3,182.6 | 247.1 | -720.5 | 761.7 | 0.38 | -0.32 | -0.74 |
| 3,383.0 | 16.70 | 287.10 | 3,272.6 | 255.1 | -746.5 | 788.9 | 0.32 | -0.32 | 0.11 |
| 3,478.0 | 17.60 | 288.10 | 3,363.3 | 263.5 | -773.2 | 816.9 | 1.00 | 0.95 | 1.05 |
| 3,573.0 | 17.30 | 288.50 | 3,454.0 | 272.5 | -800.3 | 845.4 | 0.34 | -0.32 | 0.42 |
| 3,667.0 | 16.90 | 288.40 | 3,543.8 | 281.2 | -826.5 | 873.1 | 0.43 | -0.43 | -0.11 |
| 3,762.0 | 18.00 | 288.00 | 3,634.4 | 290.1 | -853.6 | 901.5 | 1.16 | 1.16 | -0.42 |
| 3,857.0 | 17.60 | 287.20 | 3,724.9 | 298.9 | -881.3 | 930.6 | 0.49 | -0.42 | -0.84 |
| 3,951.0 | 17.20 | 286.90 | 3,814.6 | 307.2 | -908.1 | 958.7 | 0.44 | -0.43 | -0.32 |
| 4,046.0 | 18.00 | 291.70 | 3,905.1 | 316.7 | -935.2 | 987.4 | 1.74 | 0.84 | 5.05 |
| 4,140.0 | 17.70 | 289.70 | 3,994.6 | 326.9 | -962.2 | 1,016.2 | 0.73 | -0.32 | -2.13 |
| 4,235.0 | 17.80 | 295.70 | 4,085.1 | 338.0 | -988.8 | 1,045.0 | 1.93 | 0.11 | 6.32 |
| 4,329.0 | 16.90 | 294.10 | 4,174.8 | 349.8 | -1,014.3 | 1,072.9 | 1.08 | -0.96 | -1.70 |
| 4,424.0 | 17.90 | 294.10 | 4,265.5 | 361.4 | -1,040.2 | 1,101.2 | 1.05 | 1.05 | 0.00 |
| 4,519.0 | 16.90 | 293.40 | 4,356.1 | 372.9 | -1,066.2 | 1,129.5 | 1.08 | -1.05 | -0.74 |
| 4,613.0 | 16.30 | 292.80 | 4,446.2 | 383.4 | -1,090.9 | 1,156.3 | 0.66 | -0.64 | -0.64 |
| 4,708.0 | 14.70 | 290.80 | 4,537.7 | 392.9 | -1,114.5 | 1,181.6 | 1.78 | -1.68 | -2.11 |
| 4,802.0 | 13.60 | 289.10 | 4,628.9 | 400.7 | -1,136.0 | 1,204.6 | 1.25 | -1.17 | -1.81 |
| 4,897.0 | 13.40 | 293.70 | 4,721.3 | 408.8 | -1,156.7 | 1,226.7 | 1.15 | -0.21 | 4.84 |
| 4,991.0 | 12.60 | 291.50 | 4,812.9 | 416.9 | -1,176.2 | 1,247.8 | 1.00 | -0.85 | -2.34 |



Survey Report



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| Site: | Nichols 24-06A | MD Reference: | well @ 7161.0usft (H&P #290) |
| Well: | Nichols 0994-24-06W | North Reference: | True |
| Wellbore: | B-9 | Survey Calculation Method: | Minimum Curvature |
| Design: | B-9 | Database: | EDM 5000.1 Single User Db |

| Survey | | | | | | | | | | |
|--|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | |
| 5,086.0 | 11.90 | 289.80 | 4,905.7 | 424.0 | -1,195.1 | 1,268.0 | 0.83 | -0.74 | -1.79 | |
| 5,180.0 | 11.40 | 299.30 | 4,997.8 | 431.9 | -1,212.3 | 1,286.8 | 2.11 | -0.53 | 10.11 | |
| 5,275.0 | 9.40 | 297.50 | 5,091.2 | 440.0 | -1,227.3 | 1,303.7 | 2.13 | -2.11 | -1.89 | |
| 5,369.0 | 8.40 | 298.00 | 5,184.1 | 446.8 | -1,240.2 | 1,318.0 | 1.07 | -1.06 | 0.53 | |
| 5,464.0 | 8.10 | 293.50 | 5,278.1 | 452.7 | -1,252.5 | 1,331.6 | 0.75 | -0.32 | -4.74 | |
| 5,558.0 | 6.50 | 287.50 | 5,371.3 | 457.0 | -1,263.6 | 1,343.5 | 1.88 | -1.70 | -6.38 | |
| 5,653.0 | 3.90 | 291.40 | 5,465.9 | 459.8 | -1,271.8 | 1,352.1 | 2.76 | -2.74 | 4.11 | |
| 5,747.0 | 3.00 | 301.20 | 5,559.8 | 462.2 | -1,276.8 | 1,357.7 | 1.14 | -0.96 | 10.43 | |
| 5,842.0 | 1.10 | 337.50 | 5,654.7 | 464.4 | -1,279.3 | 1,360.7 | 2.33 | -2.00 | 38.21 | |
| 5,936.0 | 0.50 | 65.50 | 5,748.7 | 465.4 | -1,279.3 | 1,361.0 | 1.27 | -0.64 | 93.62 | |
| 6,031.0 | 0.00 | 62.50 | 5,843.7 | 465.5 | -1,278.9 | 1,360.7 | 0.53 | -0.53 | 0.00 | |
| 6,125.0 | 0.50 | 258.00 | 5,937.7 | 465.4 | -1,279.3 | 1,361.1 | 0.53 | 0.53 | 0.00 | |
| 6,220.0 | 0.10 | 21.90 | 6,032.7 | 465.4 | -1,279.7 | 1,361.4 | 0.59 | -0.42 | 130.42 | |
| 6,314.0 | 0.10 | 34.50 | 6,126.7 | 465.6 | -1,279.6 | 1,361.4 | 0.02 | 0.00 | 13.40 | |
| 6,409.0 | 0.60 | 264.10 | 6,221.7 | 465.6 | -1,280.1 | 1,361.8 | 0.70 | 0.53 | -137.26 | |
| 6,504.0 | 0.30 | 168.00 | 6,316.7 | 465.3 | -1,280.5 | 1,362.1 | 0.74 | -0.32 | -101.16 | |
| 6,599.0 | 0.70 | 213.80 | 6,411.7 | 464.6 | -1,280.8 | 1,362.2 | 0.56 | 0.42 | 48.21 | |
| 6,693.0 | 0.90 | 218.70 | 6,505.7 | 463.5 | -1,281.6 | 1,362.6 | 0.22 | 0.21 | 5.21 | |
| 6,787.0 | 1.30 | 223.00 | 6,599.7 | 462.2 | -1,282.7 | 1,363.3 | 0.43 | 0.43 | 4.57 | |
| 6,882.0 | 1.70 | 236.60 | 6,694.6 | 460.6 | -1,284.7 | 1,364.6 | 0.56 | 0.42 | 14.32 | |
| 6,976.0 | 1.60 | 233.60 | 6,788.6 | 459.1 | -1,286.9 | 1,366.2 | 0.14 | -0.11 | -3.19 | |
| 7,071.0 | 1.90 | 234.00 | 6,883.5 | 457.3 | -1,289.2 | 1,367.8 | 0.32 | 0.32 | 0.42 | |
| 7,166.0 | 1.90 | 244.20 | 6,978.5 | 455.7 | -1,291.9 | 1,369.9 | 0.36 | 0.00 | 10.74 | |
| 7,260.0 | 2.20 | 246.20 | 7,072.4 | 454.3 | -1,295.0 | 1,372.3 | 0.33 | 0.32 | 2.13 | |
| 7,355.0 | 2.40 | 245.40 | 7,167.3 | 452.8 | -1,298.4 | 1,375.1 | 0.21 | 0.21 | -0.84 | |
| 7,450.0 | 2.50 | 242.70 | 7,262.3 | 451.0 | -1,302.1 | 1,378.0 | 0.16 | 0.11 | -2.84 | |
| 7,504.0 | 2.20 | 238.70 | 7,316.2 | 449.9 | -1,304.0 | 1,379.4 | 0.63 | -0.56 | -7.41 | |
| Projection to TD @ 7558.0' MD / 7370.2' TVD | | | | | | | | | | |
| 7,558.0 | 2.20 | 238.70 | 7,370.2 | 448.8 | -1,305.8 | 1,380.8 | 0.00 | 0.00 | 0.00 | |

| Design Annotations | | | | | |
|-----------------------|-----------------------|-------------------|--------------|---|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment | |
| | | +N/-S (usft) | +E/-W (usft) | | |
| 202.0 | 201.9 | 2.4 | -4.5 | First MWD Survey @ 202.0' MD / 201.9' TVD | |
| 7,558.0 | 7,370.2 | 448.8 | -1,305.8 | Projection to TD @ 7558.0' MD / 7370.2' TVD | |

Checked By: _____ Approved By: _____ Date: _____