



Laramie Energy, LLC

Mesa County, CO

Gunderson 20-03 Pad

Gunderson 20-05W

Wellbore #1

Design: Wellbore #1

QES Survey Report

26 June, 2017





Survey Report



| | | | |
|------------------|---------------------|-------------------------------------|------------------------------|
| Company: | Laramie Energy, LLC | Local Co-ordinate Reference: | Well Gunderson 20-05W |
| Project: | Mesa County, CO | TVD Reference: | well @ 7176.0usft (H&P #522) |
| Site: | Gunderson 20-03 Pad | MD Reference: | well @ 7176.0usft (H&P #522) |
| Well: | Gunderson 20-05W | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM5002 |

| | | | |
|--------------------|---------------------------|----------------------|----------------|
| 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 | | |

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|-----------------------|----------|---------------------|-------------------|-------------------|-------------|
| Site | | Gunderson 20-03 Pad | | | |
| Site Position: | | Northing: | 1,530,258.75 usft | Latitude: | 39.266756 |
| From: | Lat/Long | Easting: | 2,350,219.97 usft | Longitude: | -107.795317 |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -1.45 ° |

| Well | Gunderson 20-05W | | | | | |
|----------------------|------------------|----------|---------------------|-------------------|---------------|--------------|
| Well Position | +N/-S | 0.0 usft | Northing: | 1,530,318.09 usft | Latitude: | 39.266919 |
| | +E/-W | 0.0 usft | Easting: | 2,350,221.47 usft | Longitude: | -107.795317 |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | 0.0 usft | Ground Level: | 7,146.0 usft |

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|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Wellbore #1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2015 | 6/7/2017 | 9.58 | 65.44 | 51,425 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|-----|
| Design | Wellbore #1 | | | | |
| 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 | 255.23 | |

| | | | | | |
|-----------------------|------------------|---------------------------|------------------|--------------------|--|
| Survey Program | Date | 6/26/2017 | | | |
| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description | |
| 111.0 | 7,605.0 | MWD Surveys (Wellbore #1) | 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 @ 111.0' MD / TVD | | | | | | | | | | |
| 111.0 | 2.10 | 242.80 | 111.0 | -0.9 | -1.8 | 2.0 | 1.89 | 1.89 | 0.00 | |
| 202.0 | 2.70 | 241.10 | 201.9 | -2.7 | -5.2 | 5.7 | 0.66 | 0.66 | -1.87 | |
| 294.0 | 2.90 | 243.40 | 293.8 | -4.8 | -9.1 | 10.1 | 0.25 | 0.22 | 2.50 | |
| 384.0 | 5.20 | 250.90 | 383.6 | -7.2 | -15.0 | 16.4 | 2.62 | 2.56 | 8.33 | |
| 475.0 | 6.10 | 254.00 | 474.1 | -9.9 | -23.6 | 25.3 | 1.04 | 0.99 | 3.41 | |
| 567.0 | 6.30 | 256.60 | 565.6 | -12.4 | -33.2 | 35.2 | 0.37 | 0.22 | 2.83 | |
| 659.0 | 7.90 | 256.20 | 656.9 | -15.0 | -44.2 | 46.6 | 1.74 | 1.74 | -0.43 | |
| 751.0 | 8.50 | 257.00 | 747.9 | -18.1 | -57.0 | 59.7 | 0.66 | 0.65 | 0.87 | |
| 842.0 | 8.60 | 259.40 | 837.9 | -20.9 | -70.2 | 73.2 | 0.41 | 0.11 | 2.64 | |



Survey Report



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|------------------|---------------------|-------------------------------------|------------------------------|
| Company: | Laramie Energy, LLC | Local Co-ordinate Reference: | Well Gunderson 20-05W |
| Project: | Mesa County, CO | TVD Reference: | well @ 7176.0usft (H&P #522) |
| Site: | Gunderson 20-03 Pad | MD Reference: | well @ 7176.0usft (H&P #522) |
| Well: | Gunderson 20-05W | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM5002 |

| 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) |
| 932.0 | 8.90 | 259.10 | 926.9 | -23.4 | -83.7 | 86.9 | 0.34 | 0.33 | -0.33 |
| 1,024.0 | 8.70 | 254.50 | 1,017.8 | -26.6 | -97.4 | 101.0 | 0.79 | -0.22 | -5.00 |
| 1,118.0 | 8.60 | 256.60 | 1,110.7 | -30.1 | -111.1 | 115.1 | 0.35 | -0.11 | 2.23 |
| 1,212.0 | 8.50 | 255.90 | 1,203.7 | -33.5 | -124.7 | 129.1 | 0.15 | -0.11 | -0.74 |
| 1,306.0 | 8.90 | 255.90 | 1,296.6 | -36.9 | -138.4 | 143.3 | 0.43 | 0.43 | 0.00 |
| 1,400.0 | 9.10 | 254.30 | 1,389.4 | -40.7 | -152.7 | 158.0 | 0.34 | 0.21 | -1.70 |
| 1,495.0 | 9.30 | 257.10 | 1,483.2 | -44.5 | -167.4 | 173.2 | 0.52 | 0.21 | 2.95 |
| 1,588.0 | 10.10 | 256.10 | 1,574.9 | -48.1 | -182.6 | 188.8 | 0.88 | 0.86 | -1.08 |
| 1,682.0 | 9.50 | 254.40 | 1,667.5 | -52.2 | -198.1 | 204.8 | 0.71 | -0.64 | -1.81 |
| 1,777.0 | 8.90 | 252.90 | 1,761.3 | -56.4 | -212.7 | 220.0 | 0.68 | -0.63 | -1.58 |
| 1,871.0 | 8.40 | 252.00 | 1,854.2 | -60.7 | -226.1 | 234.1 | 0.55 | -0.53 | -0.96 |
| 1,965.0 | 8.10 | 255.20 | 1,947.2 | -64.5 | -239.1 | 247.6 | 0.58 | -0.32 | 3.40 |
| 2,061.0 | 7.87 | 251.10 | 2,042.3 | -68.4 | -251.8 | 260.9 | 0.64 | -0.24 | -4.27 |
| 2,155.0 | 7.40 | 252.00 | 2,135.5 | -72.3 | -263.7 | 273.4 | 0.52 | -0.50 | 0.96 |
| 2,249.0 | 7.30 | 253.40 | 2,228.7 | -75.9 | -275.2 | 285.4 | 0.22 | -0.11 | 1.49 |
| 2,343.0 | 6.70 | 250.40 | 2,322.0 | -79.4 | -286.0 | 296.8 | 0.75 | -0.64 | -3.19 |
| 2,438.0 | 6.50 | 251.00 | 2,416.4 | -83.0 | -296.3 | 307.7 | 0.22 | -0.21 | 0.63 |
| 2,532.0 | 6.10 | 248.60 | 2,509.8 | -86.6 | -306.0 | 318.0 | 0.51 | -0.43 | -2.55 |
| 2,623.0 | 7.20 | 255.10 | 2,600.2 | -89.8 | -316.0 | 328.5 | 1.46 | 1.21 | 7.14 |
| 2,717.0 | 7.20 | 260.90 | 2,693.5 | -92.3 | -327.5 | 340.2 | 0.77 | 0.00 | 6.17 |
| 2,815.0 | 8.40 | 260.50 | 2,790.5 | -94.4 | -340.7 | 353.5 | 1.23 | 1.22 | -0.41 |
| 2,909.0 | 7.70 | 258.80 | 2,883.6 | -96.8 | -353.6 | 366.6 | 0.79 | -0.74 | -1.81 |
| 3,003.0 | 7.60 | 258.60 | 2,976.8 | -99.2 | -365.9 | 379.1 | 0.11 | -0.11 | -0.21 |
| 3,097.0 | 7.60 | 259.90 | 3,070.0 | -101.6 | -378.1 | 391.5 | 0.18 | 0.00 | 1.38 |
| 3,192.0 | 7.50 | 259.00 | 3,164.1 | -103.8 | -390.4 | 404.0 | 0.16 | -0.11 | -0.95 |
| 3,286.0 | 6.90 | 260.90 | 3,257.4 | -105.9 | -402.0 | 415.7 | 0.69 | -0.64 | 2.02 |
| 3,380.0 | 6.50 | 256.20 | 3,350.8 | -108.1 | -412.7 | 426.6 | 0.72 | -0.43 | -5.00 |
| 3,474.0 | 6.20 | 260.10 | 3,444.2 | -110.2 | -422.9 | 437.0 | 0.56 | -0.32 | 4.15 |
| 3,568.0 | 7.60 | 255.00 | 3,537.5 | -112.7 | -433.9 | 448.3 | 1.62 | 1.49 | -5.43 |
| 3,662.0 | 8.60 | 260.00 | 3,630.6 | -115.5 | -446.8 | 461.5 | 1.30 | 1.06 | 5.32 |
| 3,757.0 | 8.50 | 258.80 | 3,724.5 | -118.1 | -460.7 | 475.6 | 0.22 | -0.11 | -1.26 |
| 3,851.0 | 8.40 | 260.90 | 3,817.5 | -120.5 | -474.3 | 489.4 | 0.35 | -0.11 | 2.23 |
| 3,945.0 | 8.20 | 261.30 | 3,910.5 | -122.6 | -487.7 | 502.9 | 0.22 | -0.21 | 0.43 |
| 4,039.0 | 7.80 | 259.00 | 4,003.6 | -124.9 | -500.6 | 515.9 | 0.54 | -0.43 | -2.45 |
| 4,134.0 | 8.30 | 259.30 | 4,097.6 | -127.4 | -513.7 | 529.2 | 0.53 | 0.53 | 0.32 |
| 4,228.0 | 7.90 | 259.20 | 4,190.7 | -129.9 | -526.7 | 542.4 | 0.43 | -0.43 | -0.11 |
| 4,322.0 | 7.60 | 257.80 | 4,283.8 | -132.4 | -539.1 | 555.0 | 0.38 | -0.32 | -1.49 |
| 4,417.0 | 7.80 | 253.40 | 4,378.0 | -135.5 | -551.4 | 567.7 | 0.66 | 0.21 | -4.63 |
| 4,511.0 | 7.80 | 253.20 | 4,471.1 | -139.2 | -563.6 | 580.5 | 0.03 | 0.00 | -0.21 |
| 4,605.0 | 7.60 | 252.80 | 4,564.3 | -142.9 | -575.7 | 593.1 | 0.22 | -0.21 | -0.43 |
| 4,699.0 | 7.40 | 252.30 | 4,657.5 | -146.6 | -587.4 | 605.3 | 0.22 | -0.21 | -0.53 |
| 4,794.0 | 7.60 | 254.90 | 4,751.7 | -150.1 | -599.3 | 617.7 | 0.41 | 0.21 | 2.74 |
| 4,888.0 | 7.20 | 255.70 | 4,844.9 | -153.1 | -611.0 | 629.8 | 0.44 | -0.43 | 0.85 |



Survey Report



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|------------------|---------------------|-------------------------------------|------------------------------|
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| Site: | Gunderson 20-03 Pad | MD Reference: | well @ 7176.0usft (H&P #522) |
| Well: | Gunderson 20-05W | North Reference: | True |
| Wellbore: | Wellbore #1 | Survey Calculation Method: | Minimum Curvature |
| Design: | Wellbore #1 | Database: | EDM5002 |

| 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) | |
| 4,982.0 | 6.90 | 257.20 | 4,938.2 | -155.9 | -622.2 | 641.4 | 0.37 | -0.32 | 1.60 | |
| 5,077.0 | 7.60 | 259.40 | 5,032.4 | -158.3 | -633.9 | 653.3 | 0.79 | 0.74 | 2.32 | |
| 5,171.0 | 6.40 | 267.50 | 5,125.7 | -159.6 | -645.3 | 664.7 | 1.65 | -1.28 | 8.62 | |
| 5,265.0 | 4.70 | 282.80 | 5,219.3 | -159.0 | -654.3 | 673.2 | 2.38 | -1.81 | 16.28 | |
| 5,359.0 | 4.00 | 299.20 | 5,313.0 | -156.6 | -660.9 | 679.0 | 1.51 | -0.74 | 17.45 | |
| 5,453.0 | 3.70 | 296.50 | 5,406.8 | -153.6 | -666.5 | 683.6 | 0.37 | -0.32 | -2.87 | |
| 5,548.0 | 3.20 | 294.10 | 5,501.6 | -151.2 | -671.6 | 688.0 | 0.55 | -0.53 | -2.53 | |
| 5,642.0 | 2.60 | 312.80 | 5,595.5 | -148.6 | -675.6 | 691.2 | 1.18 | -0.64 | 19.89 | |
| 5,736.0 | 2.60 | 302.00 | 5,689.4 | -146.1 | -679.0 | 693.8 | 0.52 | 0.00 | -11.49 | |
| 5,830.0 | 2.40 | 317.60 | 5,783.3 | -143.5 | -682.1 | 696.1 | 0.75 | -0.21 | 16.60 | |
| 5,924.0 | 2.40 | 327.30 | 5,877.2 | -140.4 | -684.5 | 697.7 | 0.43 | 0.00 | 10.32 | |
| 6,019.0 | 1.80 | 326.00 | 5,972.2 | -137.5 | -686.4 | 698.8 | 0.63 | -0.63 | -1.37 | |
| 6,113.0 | 1.60 | 301.20 | 6,066.1 | -135.6 | -688.3 | 700.2 | 0.80 | -0.21 | -26.38 | |
| 6,208.0 | 1.60 | 295.90 | 6,161.1 | -134.3 | -690.7 | 702.1 | 0.16 | 0.00 | -5.58 | |
| 6,302.0 | 1.30 | 304.80 | 6,255.1 | -133.1 | -692.7 | 703.8 | 0.40 | -0.32 | 9.47 | |
| 6,396.0 | 0.53 | 23.10 | 6,349.0 | -132.1 | -693.4 | 704.2 | 1.38 | -0.82 | 83.30 | |
| 6,490.0 | 0.10 | 0.44 | 6,443.0 | -131.6 | -693.3 | 703.9 | 0.47 | -0.46 | -24.11 | |
| 6,585.0 | 0.04 | 279.58 | 6,538.0 | -131.5 | -693.3 | 703.9 | 0.11 | -0.06 | -85.12 | |
| 6,679.0 | 0.44 | 144.14 | 6,632.0 | -131.8 | -693.1 | 703.8 | 0.50 | 0.43 | -144.09 | |
| 6,773.0 | 0.26 | 164.53 | 6,726.0 | -132.3 | -692.8 | 703.7 | 0.23 | -0.19 | 21.69 | |
| 6,867.0 | 1.10 | 189.50 | 6,820.0 | -133.4 | -692.9 | 704.0 | 0.93 | 0.89 | 26.56 | |
| 6,961.0 | 1.10 | 168.10 | 6,914.0 | -135.2 | -692.9 | 704.5 | 0.43 | 0.00 | -22.77 | |
| 7,055.0 | 0.90 | 155.60 | 7,008.0 | -136.7 | -692.4 | 704.4 | 0.31 | -0.21 | -13.30 | |
| 7,150.0 | 0.20 | 258.40 | 7,103.0 | -137.5 | -692.3 | 704.4 | 1.01 | -0.74 | 108.21 | |
| 7,244.0 | 0.60 | 271.10 | 7,197.0 | -137.5 | -692.9 | 705.1 | 0.43 | 0.43 | 13.51 | |
| 7,338.0 | 0.80 | 270.20 | 7,291.0 | -137.5 | -694.1 | 706.2 | 0.21 | 0.21 | -0.96 | |
| 7,433.0 | 0.90 | 266.00 | 7,386.0 | -137.5 | -695.5 | 707.5 | 0.12 | 0.11 | -4.42 | |
| 7,527.0 | 0.40 | 247.90 | 7,480.0 | -137.7 | -696.5 | 708.6 | 0.57 | -0.53 | -19.26 | |
| Projecton to Bit @ 7605.0' MD / 7558.0' TVD | | | | | | | | | | |
| 7,605.0 | 0.40 | 247.90 | 7,558.0 | -137.9 | -697.0 | 709.1 | 0.00 | 0.00 | 0.00 | |

| Design Annotations | | | | | |
|-----------------------|-----------------------|-------------------|--------------|--|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment | |
| | | +N/-S (usft) | +E/-W (usft) | | |
| 111.0 | 111.0 | -0.9 | -1.8 | First MWD Survey @ 111.0' MD / TVD | |
| 7,605.0 | 7,558.0 | -137.9 | -697.0 | Projection to Bit @ 7605.0' MD / 7558.0' TVD | |