



EQT Production - Marcellus

Wetzel County, WV

Wetzel County 514562

Well #514562

API # 47-10302980

ST01 Wellbore

Design: 514562 ST01 As Drilled

Standard Survey Report

17 August, 2015



Where energy meets innovation.

WV Department of
Environmental Protection
10/28/2016



Phoenix Technology Services

Survey Report



| | | |
|---|--|---|
| Database: ST01 Company: EQT Production Services Project: ST01 Site: West Virginia #1440 Well: 44-811802 Wellbore: ST01 Wellbore Design: 144-811802-001 | Local Co-ordinate Reference: NAD 1927 TVD Reference: Mean Sea Level MD Reference: Mean Sea Level North Reference: NAD 1927 Survey Calculation Method: Minimum Curvature | Wellhead Elevation: 1443.0 usft Wellhead Depth: 1443.0 usft Wellhead Orientation: 0.00 |
|---|--|---|

| | | | |
|----------------------|--------------------------------------|----------------------|-----------------------------|
| Project: ST01 | | | |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD 1927 (NADCON CONUS) | | |
| Map Zone: | West Virginia North 4701 | | Using geodetic scale factor |

| | | | | | |
|------------------------------|----------|---------------------|-------------------|--------------------------|---------|
| Site | | | | | |
| Site Position: | | Northing: | 386,677.15 usft | Latitude: | 39.56 |
| From: | Map | Easting: | 1,695,439.73 usft | Longitude: | -80.58 |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -0.69 ° |

| | | | | | | |
|-----------------------------|--------------|----------|----------------------------|-------------------|----------------------|------------------|
| Well | | | | | | |
| Well Position | +N/-S | 0.0 usft | Northing: | 386,677.15 usft | Latitude: | 39° 33' 23.860 N |
| | +E/-W | 0.0 usft | Easting: | 1,695,439.73 usft | Longitude: | 80° 34' 48.685 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | usft | Ground Level: | 1,443.0 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | | | | | |
| Magnetics | Model Name | Sample Date | Declination (") | Dip Angle (") | Field Strength (nT) |
| | HDGM | 7/30/2015 | -8.35 | 67.07 | 52,510 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|---------|
| Design | | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 4,118.0 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (") | |
| | 0.0 | 0.0 | 0.0 | 132.20 | |

| | | | | | |
|-----------------------|------------------|--------------------------------------|------------------|-----------------------------------|--|
| Survey Program | | | | | |
| | | Date: 8/17/2015 | | | |
| From (') | To (usft) | Survey (Wellbore) | Tool Name | Description | |
| 0.00 | 4,118.0 | 514562 Gyrodata Gyro (Main Wellbore) | GYD_DP_MS | Gyrodata gyro-compassing and drop | |
| 0.00 | 12,009.0 | 514562 ST01 PHX MWD (ST01 Wellbore) | PHX+MWD+HDGM | PHX+OWSG MWD + HDGM | |

| Survey | | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft) | Inclination (") | Azimuth (") | Vertical Depth (usft) | Subsea 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 | -1,459.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | |
| 103.0 | 0.14 | 356.63 | 103.0 | -1,356.0 | 0.1 | 0.0 | -0.1 | 0.14 | 0.14 | 0.00 | |
| 203.0 | 0.08 | 320.07 | 203.0 | -1,256.0 | 0.3 | -0.1 | -0.2 | 0.09 | -0.06 | -38.56 | |
| 303.0 | 0.12 | 103.65 | 303.0 | -1,156.0 | 0.3 | 0.0 | -0.2 | 0.19 | 0.04 | 143.58 | |
| 403.0 | 0.18 | 137.98 | 403.0 | -1,056.0 | 0.2 | 0.2 | 0.0 | 0.11 | 0.06 | 34.33 | |
| 503.0 | 0.21 | 188.06 | 503.0 | -956.0 | -0.1 | 0.3 | 0.3 | 0.17 | 0.03 | 50.08 | |
| 603.0 | 0.16 | 195.13 | 603.0 | -856.0 | -0.4 | 0.2 | 0.5 | 0.05 | -0.05 | 7.07 | |
| 703.0 | 0.10 | 202.15 | 703.0 | -756.0 | -0.6 | 0.2 | 0.5 | 0.06 | -0.06 | 7.02 | |

| | | | |
|-----------|-------------------------|------------------------------|-------------------|
| Database: | Q1 Production - Phoenix | Local Co-ordinate Reference: | Q1 - 1980 (usft) |
| Company: | Q1 Production - Phoenix | TVD Reference: | Q1 - 1980 (usft) |
| Project: | Q1 Production - Phoenix | MD Reference: | Q1 - 1980 (usft) |
| Site: | Q1 Production - Phoenix | North Reference: | Q1 - 1980 (usft) |
| Well: | Q1 Production - Phoenix | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Q1 Production - Phoenix | | |
| Design: | Q1 Production - Phoenix | | |

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 803.0 | 0.09 | 201.10 | 803.0 | -656.0 | -0.8 | 0.1 | 0.6 | 0.01 | -0.01 | -1.05 |
| 903.0 | 0.08 | 199.78 | 903.0 | -556.0 | -0.9 | 0.0 | 0.7 | 0.01 | -0.01 | -1.32 |
| 1,003.0 | 0.21 | 158.99 | 1,003.0 | -456.0 | -1.2 | 0.1 | 0.8 | 0.16 | 0.13 | -40.79 |
| 1,103.0 | 0.15 | 135.68 | 1,103.0 | -356.0 | -1.4 | 0.2 | 1.1 | 0.09 | -0.06 | -23.31 |
| 1,203.0 | 0.21 | 101.13 | 1,203.0 | -256.0 | -1.6 | 0.5 | 1.4 | 0.12 | 0.06 | -34.55 |
| 1,303.0 | 0.22 | 108.76 | 1,303.0 | -156.0 | -1.7 | 0.9 | 1.8 | 0.03 | 0.01 | 7.63 |
| 1,403.0 | 0.18 | 141.67 | 1,403.0 | -56.0 | -1.8 | 1.2 | 2.1 | 0.12 | -0.04 | 32.91 |
| 1,503.0 | 0.20 | 120.90 | 1,503.0 | 44.0 | -2.1 | 1.4 | 2.4 | 0.07 | 0.02 | -20.77 |
| 1,603.0 | 0.19 | 123.06 | 1,603.0 | 144.0 | -2.2 | 1.7 | 2.8 | 0.01 | -0.01 | 2.16 |
| 1,703.0 | 0.11 | 69.94 | 1,703.0 | 244.0 | -2.3 | 1.9 | 3.0 | 0.15 | -0.08 | -53.12 |
| 1,803.0 | 0.16 | 36.67 | 1,803.0 | 344.0 | -2.2 | 2.1 | 3.0 | 0.09 | 0.05 | -33.27 |
| 1,903.0 | 0.24 | 30.27 | 1,903.0 | 444.0 | -1.9 | 2.3 | 2.9 | 0.08 | 0.08 | -6.40 |
| 2,003.0 | 0.42 | 25.01 | 2,003.0 | 544.0 | -1.3 | 2.5 | 2.8 | 0.18 | 0.18 | -5.26 |
| 2,103.0 | 0.37 | 8.06 | 2,103.0 | 644.0 | -0.7 | 2.7 | 2.5 | 0.13 | -0.05 | -16.95 |
| 2,203.0 | 0.54 | 1.87 | 2,203.0 | 744.0 | 0.1 | 2.8 | 2.0 | 0.18 | 0.17 | -6.19 |
| 2,303.0 | 1.17 | 359.55 | 2,303.0 | 844.0 | 1.6 | 2.8 | 1.0 | 0.63 | 0.63 | -2.32 |
| 2,403.0 | 1.38 | 359.62 | 2,402.9 | 943.9 | 3.8 | 2.8 | -0.5 | 0.21 | 0.21 | 0.07 |
| 2,503.0 | 1.50 | 358.22 | 2,502.9 | 1,043.9 | 6.3 | 2.7 | -2.2 | 0.13 | 0.12 | -1.40 |
| 2,603.0 | 1.37 | 357.03 | 2,602.9 | 1,143.9 | 8.8 | 2.6 | -4.0 | 0.13 | -0.13 | -1.19 |
| 2,703.0 | 1.73 | 356.22 | 2,702.8 | 1,243.8 | 11.5 | 2.5 | -5.9 | 0.36 | 0.36 | -0.81 |
| 2,803.0 | 1.69 | 351.60 | 2,802.8 | 1,343.8 | 14.5 | 2.2 | -8.1 | 0.14 | -0.04 | -4.62 |
| 2,817.0 | 1.54 | 349.50 | 2,816.8 | 1,357.8 | 14.9 | 2.1 | -8.4 | 1.15 | -1.07 | -15.00 |
| 2,918.0 | 1.25 | 337.11 | 2,917.8 | 1,458.8 | 17.2 | 1.4 | -10.5 | 0.41 | -0.29 | -12.27 |
| 3,018.0 | 1.10 | 330.13 | 3,017.7 | 1,558.7 | 19.1 | 0.5 | -12.4 | 0.21 | -0.15 | -6.98 |
| 3,118.0 | 0.86 | 330.82 | 3,117.7 | 1,658.7 | 20.6 | -0.3 | -14.0 | 0.24 | -0.24 | 0.69 |
| 3,218.0 | 0.82 | 324.62 | 3,217.7 | 1,758.7 | 21.8 | -1.1 | -15.5 | 0.10 | -0.04 | -6.20 |
| 3,318.0 | 0.92 | 325.37 | 3,317.7 | 1,858.7 | 23.0 | -2.0 | -16.9 | 0.10 | 0.10 | 0.75 |
| 3,418.0 | 0.67 | 333.97 | 3,417.7 | 1,958.7 | 24.2 | -2.7 | -18.3 | 0.28 | -0.25 | 8.60 |
| 3,518.0 | 0.66 | 335.54 | 3,517.7 | 2,058.7 | 25.3 | -3.2 | -19.3 | 0.02 | -0.01 | 1.57 |
| 3,618.0 | 0.87 | 335.96 | 3,617.7 | 2,158.7 | 26.5 | -3.7 | -20.6 | 0.21 | 0.21 | 0.42 |
| 3,718.0 | 1.12 | 336.38 | 3,717.7 | 2,258.7 | 28.1 | -4.4 | -22.1 | 0.25 | 0.25 | 0.42 |
| 3,818.0 | 0.54 | 347.14 | 3,817.7 | 2,358.7 | 29.4 | -4.9 | -23.4 | 0.60 | -0.58 | 10.76 |
| 3,918.0 | 0.62 | 345.64 | 3,917.7 | 2,458.7 | 30.4 | -5.2 | -24.3 | 0.08 | 0.08 | -1.50 |
| 4,018.0 | 0.56 | 349.40 | 4,017.6 | 2,558.6 | 31.4 | -5.4 | -25.1 | 0.07 | -0.06 | 3.76 |
| 4,118.0 | 0.69 | 348.80 | 4,117.6 | 2,658.6 | 32.5 | -5.6 | -26.0 | 0.13 | 0.13 | -0.60 |
| 4,137.0 | 0.80 | 346.80 | 4,136.6 | 2,677.6 | 32.7 | -5.6 | -26.2 | 0.59 | 0.58 | -10.53 |
| 4,190.0 | 1.10 | 334.90 | 4,189.6 | 2,730.6 | 33.6 | -5.9 | -26.9 | 0.67 | 0.57 | -22.45 |
| 4,221.0 | 4.50 | 344.70 | 4,220.6 | 2,761.6 | 35.0 | -6.4 | -28.2 | 11.04 | 10.97 | 31.81 |
| 4,253.0 | 9.50 | 351.20 | 4,252.3 | 2,793.3 | 38.8 | -7.1 | -31.4 | 15.80 | 15.63 | 20.31 |
| 4,284.0 | 12.80 | 355.90 | 4,282.8 | 2,823.8 | 44.8 | -7.8 | -35.8 | 11.03 | 10.65 | 15.16 |
| 4,316.0 | 13.00 | 356.80 | 4,313.9 | 2,854.9 | 51.9 | -8.2 | -41.0 | 0.89 | 0.63 | 2.81 |
| 4,347.0 | 12.70 | 357.00 | 4,344.2 | 2,885.2 | 58.8 | -8.6 | -45.9 | 0.98 | -0.97 | 0.65 |



Phoenix Technology Services

Survey Report



| | | | |
|-----------|----------------------------|------------------------------|-------------------|
| Database: | 11951001 - 11951001 | Local Co-ordinate Reference: | 11951001 |
| Company: | EQT Production - Westfield | TVD Reference: | 11951001 |
| Project: | Westfield - WV | MD Reference: | 11951001 |
| Site: | Westfield - 11951001 | North Reference: | 11951001 |
| Well: | 11951001 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | 11951001 | | |
| Design: | 11951001 | | |

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|---------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 10,558.0 | 88.70 | 162.50 | 7,622.3 | 6,163.3 | -1,821.7 | 3,101.6 | 3,521.4 | 1.12 | -0.16 | -1.11 |
| 10,621.0 | 88.00 | 161.00 | 7,624.1 | 6,165.1 | -1,881.5 | 3,121.3 | 3,576.2 | 2.63 | -1.11 | -2.38 |
| 10,684.0 | 89.00 | 162.90 | 7,625.8 | 6,166.8 | -1,941.4 | 3,140.9 | 3,630.8 | 3.41 | 1.59 | 3.02 |
| 10,747.0 | 90.10 | 166.40 | 7,626.3 | 6,167.3 | -2,002.1 | 3,157.5 | 3,684.0 | 5.82 | 1.75 | 5.56 |
| 10,810.0 | 88.80 | 162.10 | 7,626.9 | 6,167.9 | -2,062.7 | 3,174.6 | 3,737.4 | 7.13 | -2.06 | -6.83 |
| 10,873.0 | 88.70 | 162.80 | 7,628.2 | 6,169.2 | -2,122.8 | 3,193.6 | 3,791.8 | 1.12 | -0.16 | 1.11 |
| 10,936.0 | 89.50 | 164.20 | 7,629.2 | 6,170.2 | -2,183.2 | 3,211.5 | 3,845.6 | 2.56 | 1.27 | 2.22 |
| 10,999.0 | 90.10 | 165.20 | 7,629.5 | 6,170.5 | -2,244.0 | 3,228.1 | 3,898.7 | 1.85 | 0.95 | 1.59 |
| 11,062.0 | 89.80 | 165.00 | 7,629.5 | 6,170.5 | -2,304.8 | 3,244.3 | 3,951.6 | 0.57 | -0.48 | -0.32 |
| 11,125.0 | 89.30 | 162.80 | 7,630.0 | 6,171.0 | -2,365.4 | 3,261.8 | 4,005.2 | 3.58 | -0.79 | -3.49 |
| 11,188.0 | 90.10 | 163.20 | 7,630.3 | 6,171.3 | -2,425.6 | 3,280.2 | 4,059.3 | 1.42 | 1.27 | 0.63 |
| 11,251.0 | 89.80 | 164.60 | 7,630.4 | 6,171.4 | -2,486.1 | 3,297.7 | 4,112.9 | 2.27 | -0.48 | 2.22 |
| 11,314.0 | 89.10 | 162.80 | 7,631.0 | 6,172.0 | -2,546.6 | 3,315.4 | 4,166.7 | 3.07 | -1.11 | -2.86 |
| 11,377.0 | 89.10 | 161.60 | 7,632.0 | 6,173.0 | -2,608.6 | 3,334.6 | 4,221.2 | 1.90 | 0.00 | -1.90 |
| 11,440.0 | 88.90 | 161.70 | 7,633.1 | 6,174.1 | -2,666.4 | 3,354.5 | 4,276.1 | 0.35 | -0.32 | 0.16 |
| 11,503.0 | 89.40 | 163.60 | 7,634.0 | 6,175.0 | -2,726.5 | 3,373.2 | 4,330.4 | 3.12 | 0.79 | 3.02 |
| 11,566.0 | 90.00 | 164.50 | 7,634.3 | 6,175.3 | -2,787.1 | 3,390.6 | 4,383.9 | 1.72 | 0.95 | 1.43 |
| 11,629.0 | 90.10 | 164.60 | 7,634.3 | 6,175.3 | -2,847.8 | 3,407.3 | 4,437.1 | 0.22 | 0.16 | 0.16 |
| 11,692.0 | 89.80 | 164.90 | 7,634.3 | 6,175.3 | -2,908.6 | 3,423.9 | 4,490.2 | 0.67 | -0.48 | 0.48 |
| 11,756.0 | 89.30 | 165.30 | 7,634.9 | 6,175.9 | -2,970.4 | 3,440.4 | 4,543.9 | 1.00 | -0.78 | 0.63 |
| 11,818.0 | 88.30 | 163.40 | 7,636.2 | 6,177.2 | -3,030.1 | 3,457.1 | 4,596.4 | 3.46 | -1.61 | -3.06 |
| 11,882.0 | 89.00 | 162.30 | 7,637.7 | 6,178.7 | -3,091.2 | 3,475.9 | 4,651.4 | 2.04 | 1.09 | -1.72 |
| 11,945.0 | 89.80 | 165.00 | 7,638.3 | 6,179.3 | -3,151.7 | 3,493.7 | 4,705.2 | 4.47 | 1.27 | 4.29 |
| 11,951.0 | 89.70 | 165.00 | 7,638.3 | 6,179.3 | -3,157.5 | 3,495.2 | 4,710.2 | 1.67 | -1.67 | 0.00 |
| 12,001.0 | 89.70 | 165.00 | 7,638.6 | 6,179.6 | -3,205.8 | 3,508.2 | 4,752.3 | 0.00 | 0.00 | 0.00 |
| 12,001.5 | 89.70 | 165.00 | 7,638.6 | 6,179.6 | -3,206.3 | 3,508.3 | 4,752.7 | 0.00 | 0.00 | 0.00 |
| 12,009.0 | 89.70 | 165.00 | 7,638.6 | 6,179.6 | -3,213.5 | 3,510.2 | 4,759.0 | 0.00 | 0.00 | 0.00 |

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------|-----------------------|-------------------|--------------|---|
| | | +N/-S (usft) | +E/-W (usft) | |
| 4,118.0 | 4,117.6 | 32.5 | -5.6 | Gyro Tie On=4118' MD |
| 8,759.0 | 7,613.0 | -119.7 | 2,523.8 | LP=8759' MD/7613' TVD |
| 11,951.0 | 7,638.3 | -3,157.5 | 3,495.2 | Final Survey=11951' MD/7638' TVD |
| 12,009.0 | 7,638.6 | -3,213.5 | 3,510.2 | PROJ to Bit/Deepest Point=12009' MD/7639' TVD |

RECEIVED
Office of Oil and Gas

JUL 28 2016

Checked By: _____ Approved By: _____ Date: _____

