



**Company:** BONANZA CREEK  
**Lease / Well:** SHABLE 1-R  
**County/Parish:** WELD 123  
**State:** COLORADO  
**Date:** 12/12/2018  
**Rig:** NA  
**Surveyor:** NATHAN PROFFITT  
**Job Number:** 6912-0512317452  
**Instrument Number:** 3087 **Type:** MEMORY  
**Proposed Direction:** 0 **GL Elev:** 4777  
**Magnetic Declination** 9.56 EAST TO TRUE NORTH  
**Calulation Method:** MINIMUM OF CURVATURE  
**Log Measured From:** GL

#### TIE-IN Coordinates

| Measured<br>Depth (ft.) | Inclination | Azimuth<br>Bearing | Vertical<br>Depth | Coordinates |         |
|-------------------------|-------------|--------------------|-------------------|-------------|---------|
|                         |             |                    |                   | (+N/-S)     | (+E/-W) |
| 0                       | 0.00        | 0.00               | 0.00              | 0.00        | 0.00    |

#### Directional Survey Report

| Measured<br>Depth (ft.) | Inclination | Azimuth<br>Bearing | Vertical<br>Depth | Vertical<br>Section | Coordinates<br>(+N/-S) | Coordinates<br>(+E/-W) | Dog-Leg<br>/ 100 ft. | Closure<br>Distance | Closure<br>Direction |
|-------------------------|-------------|--------------------|-------------------|---------------------|------------------------|------------------------|----------------------|---------------------|----------------------|
| 100                     | 0.22        | 151.98             | 100.00            | -0.17               | -0.17                  | 0.09                   | 0.22                 | 0.19                | 151.98°              |
| 200                     | 0.43        | 239.89             | 200.00            | -0.53               | -0.53                  | -0.14                  | 0.48                 | 0.55                | 195.30°              |
| 300                     | 0.27        | 292.58             | 300.00            | -0.62               | -0.62                  | -0.69                  | 0.34                 | 0.93                | 227.68°              |
| 400                     | 0.38        | 212.88             | 400.00            | -0.81               | -0.81                  | -1.08                  | 0.42                 | 1.35                | 233.13°              |
| 500                     | 0.32        | 108.75             | 499.99            | -1.18               | -1.18                  | -1.00                  | 0.55                 | 1.55                | 220.24°              |
| 600                     | 0.42        | 201.42             | 599.99            | -1.61               | -1.61                  | -0.87                  | 0.54                 | 1.83                | 208.32°              |
| 700                     | 0.39        | 130.29             | 699.99            | -2.17               | -2.17                  | -0.74                  | 0.47                 | 2.30                | 198.88°              |
| 800                     | 0.33        | 252.96             | 799.99            | -2.48               | -2.48                  | -0.76                  | 0.63                 | 2.59                | 197.03°              |
| 900                     | 0.13        | 79.71              | 899.99            | -2.54               | -2.54                  | -0.92                  | 0.46                 | 2.70                | 199.95°              |
| 1000                    | 0.34        | 234.40             | 999.99            | -2.69               | -2.69                  | -1.05                  | 0.46                 | 2.89                | 201.33°              |
| 1100                    | 0.50        | 166.41             | 1099.99           | -3.29               | -3.29                  | -1.19                  | 0.49                 | 3.50                | 199.89°              |
| 1200                    | 0.34        | 236.68             | 1199.99           | -3.88               | -3.88                  | -1.34                  | 0.50                 | 4.10                | 199.01°              |
| 1300                    | 0.27        | 137.49             | 1299.98           | -4.22               | -4.22                  | -1.43                  | 0.47                 | 4.45                | 198.68°              |
| 1400                    | 0.27        | 309.75             | 1399.98           | -4.24               | -4.24                  | -1.45                  | 0.54                 | 4.48                | 198.85°              |
| 1500                    | 0.32        | 202.49             | 1499.98           | -4.35               | -4.35                  | -1.74                  | 0.48                 | 4.68                | 201.77°              |
| 1600                    | 0.71        | 165.45             | 1599.98           | -5.20               | -5.20                  | -1.69                  | 0.49                 | 5.47                | 197.96°              |
| 1700                    | 0.61        | 168.45             | 1699.97           | -6.32               | -6.32                  | -1.42                  | 0.11                 | 6.48                | 192.69°              |
| 1800                    | 0.74        | 162.87             | 1799.97           | -7.46               | -7.46                  | -1.13                  | 0.15                 | 7.55                | 188.59°              |
| 1900                    | 0.44        | 112.56             | 1899.96           | -8.23               | -8.23                  | -0.58                  | 0.57                 | 8.25                | 184.05°              |
| 2000                    | 0.72        | 169.28             | 1999.96           | -8.99               | -8.99                  | -0.11                  | 0.60                 | 8.99                | 180.71°              |
| 2100                    | 0.81        | 149.61             | 2099.95           | -10.22              | -10.22                 | 0.36                   | 0.28                 | 10.23               | 177.96°              |
| 2200                    | 0.76        | 149.78             | 2199.94           | -11.40              | -11.40                 | 1.05                   | 0.05                 | 11.45               | 174.71°              |
| 2300                    | 0.34        | 153.79             | 2299.93           | -12.24              | -12.24                 | 1.52                   | 0.42                 | 12.34               | 172.92°              |
| 2400                    | 0.37        | 112.92             | 2399.93           | -12.63              | -12.63                 | 1.95                   | 0.25                 | 12.78               | 171.23°              |
| 2500                    | 0.65        | 125.77             | 2499.93           | -13.09              | -13.09                 | 2.71                   | 0.30                 | 13.37               | 168.32°              |
| 2600                    | 0.96        | 105.14             | 2599.92           | -13.64              | -13.64                 | 3.97                   | 0.42                 | 14.21               | 163.76°              |
| 2700                    | 0.82        | 122.69             | 2699.91           | -14.25              | -14.25                 | 5.39                   | 0.30                 | 15.23               | 159.29°              |
| 2800                    | 0.48        | 121.39             | 2799.90           | -14.85              | -14.85                 | 6.35                   | 0.34                 | 16.15               | 156.86°              |
| 2900                    | 0.50        | 85.57              | 2899.90           | -15.04              | -15.04                 | 7.14                   | 0.30                 | 16.64               | 154.60°              |
| 3000                    | 0.66        | 97.82              | 2999.89           | -15.08              | -15.08                 | 8.14                   | 0.20                 | 17.14               | 151.63°              |
| 3100                    | 0.33        | 61.01              | 3099.89           | -15.02              | -15.02                 | 8.97                   | 0.44                 | 17.49               | 149.16°              |
| 3200                    | 0.68        | 59.14              | 3199.88           | -14.57              | -14.57                 | 9.73                   | 0.35                 | 17.52               | 146.28°              |
| 3300                    | 0.36        | 104.50             | 3299.88           | -14.35              | -14.35                 | 10.54                  | 0.50                 | 17.80               | 143.70°              |
| 3400                    | 0.88        | 64.08              | 3399.87           | -14.09              | -14.09                 | 11.54                  | 0.65                 | 18.21               | 140.70°              |
| 3500                    | 0.86        | 56.05              | 3499.86           | -13.34              | -13.34                 | 12.85                  | 0.12                 | 18.52               | 136.07°              |
| 3600                    | 1.71        | 78.17              | 3599.84           | -12.61              | -12.61                 | 14.93                  | 0.97                 | 19.55               | 130.19°              |
| 3700                    | 1.72        | 97.75              | 3699.79           | -12.51              | -12.51                 | 17.88                  | 0.58                 | 21.82               | 124.98°              |
| 3800                    | 1.78        | 100.80             | 3799.75           | -13.00              | -13.00                 | 20.89                  | 0.11                 | 24.61               | 121.90°              |
| 3900                    | 1.76        | 94.43              | 3899.70           | -13.41              | -13.41                 | 23.95                  | 0.20                 | 27.45               | 119.25°              |
| 4000                    | 1.67        | 98.22              | 3999.65           | -13.74              | -13.74                 | 26.92                  | 0.14                 | 30.22               | 117.04°              |

| Directional Survey Report |             |                    |                   |                     |                        |         |                      |                     |                      |
|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
| Measured<br>Depth (ft.)   | Inclination | Azimuth<br>Bearing | Vertical<br>Depth | Vertical<br>Section | Coordinates<br>(+N/-S) | (+E/-W) | Dog-Leg<br>/ 100 ft. | Closure<br>Distance | Closure<br>Direction |

| Directional Survey Report |             |                    |                   |                     |                        |         |                      |                     |                      |
|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
| Measured<br>Depth (ft.)   | Inclination | Azimuth<br>Bearing | Vertical<br>Depth | Vertical<br>Section | Coordinates<br>(+N/-S) | (+E/-W) | Dog-Leg<br>/ 100 ft. | Closure<br>Distance | Closure<br>Direction |

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|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
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|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
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|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
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|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
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| Directional Survey Report |             |                    |                   |                     |                        |         |                      |                     |                      |
|---------------------------|-------------|--------------------|-------------------|---------------------|------------------------|---------|----------------------|---------------------|----------------------|
| Measured<br>Depth (ft.)   | Inclination | Azimuth<br>Bearing | Vertical<br>Depth | Vertical<br>Section | Coordinates<br>(+N/-S) | (+E/-W) | Dog-Leg<br>/ 100 ft. | Closure<br>Distance | Closure<br>Direction |