

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

| | |
|----------------------|------------------------|
| OPERATOR: | Noble Energy |
| WELL: | Brook LC28-75-1BHNC |
| FIELD: | Denver-Julesburg Basin |
| RIG: | H&P 273 |
| LEGALS: | Sec 28-T9N-R59W |
| COUNTY: | Weld |
| STATE: | CO |
| CAL. METHOD: | Minimum Curvature |
| MAG. DECL. APPLIED: | 8.09 Grid |
| VERTICAL SEC. DIR. : | 355.470 |

| | |
|---------------------------|------------------|
| SSDS Job Number : | CA-MJ-0901399781 |
| Start Date of Job : | 7/13/2014 |
| End Date of Job : | 7/19/2014 |
| Lead Directional Driller: | Micky Akinrodoye |
| Other SSDS DD's : | Jordan S. Timbs |
| | Marco Rolong |
| SSDS MWD Engineers : | Paul Kock |
| | Juan Centeno |
| | Micah Asato |

| | Main Hole =====> | 1st Side Track =====> | 2nd Side Track =====> | 3rd Side Track =====> | 4th Side Track =====> |
|-------------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Gyro Survey | 575.00 Tie On | | | | |
| First Survey Depth | 717.00 Sperry | | | | |
| Last Survey Depth | | | | | |
| | | | | | |
| | | | | | |
| KOP Depth/Sidetrack MD | 5519.00 KOP | KOP-ST1 | KOP-ST2 | KOP-ST3 | KOP-ST4 |
| | | | | | |
| First Survey Depth | 6555.00 MWD | MWD | MWD | MWD | MWD |
| Last Survey Depth | 10370.00 MWD | MWD | MWD | MWD | MWD |
| Bit Extrapolation to TD | 10435.00 T.D. | T.D. | T.D. | T.D. | T.D. |

The following Sperry Sun Drilling Services personnel listed below, do certify the above survey information to be accurate :

Print Name : Jordan S. Timbs

Print Name : Paul Kock

Print Name :

Sign Name :

Sign Name :

Sign Name :

Print Name :

Print Name :

Print Name :

Sign Name :

Sign Name :

Sign Name :

Examples of
Survey Types:

TieOn
MWD
ESS
Gyro
SS

Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro Survey's : Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
Single Shot (SS) Survey's : Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Noble Energy

Weld County, CO (NAD 83)

Sec. 28-T9N-R59W (LC28-15-A)

Brook LC28-75-1BHNC

Plan B

Design: Field Surveys

Sperry Drilling Services

Final Survey Report

03 September, 2014

Well Coordinates: 1,506,936.13 N, 3,421,295.22 E (40° 42' 54.07" N, 103° 58' 48.68" W)

Ground Level: 4,843.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Brook LC28-75-1BHNC

RKB=24ft @ 4867.00usft (H&P 273)

N

Grid

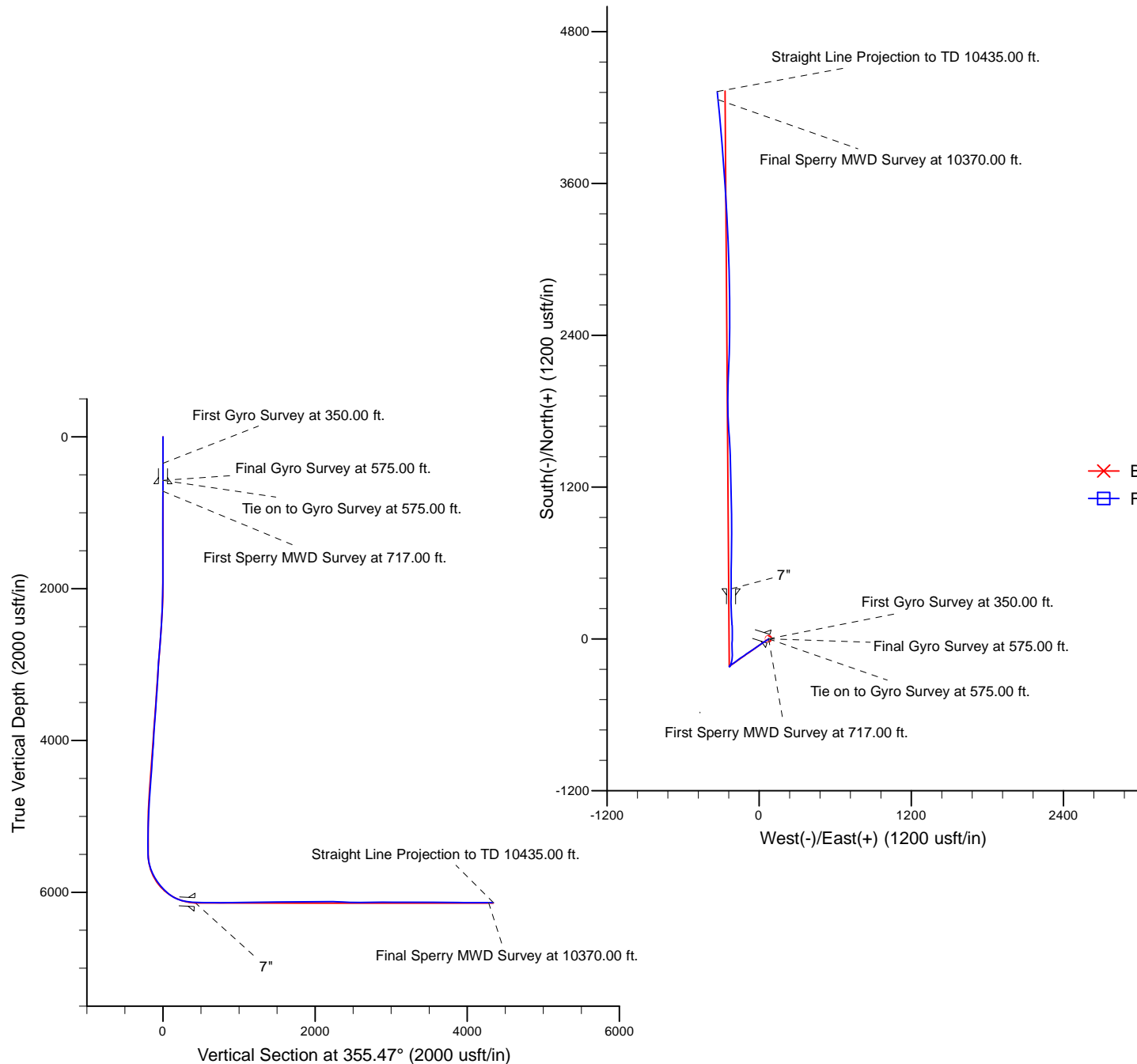
API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 28-T9N-R59W (LC28-15-A)
Well: Brook LC28-75-1BHNC
Wellbore: Plan B
Design: Field Surveys

Noble Energy

HALLIBURTON
Sperry Drilling



LEGEND

- ✕ Brook LC28-75-1BHNC, Plan B, Rev B0 - PROPOSAL V0
- Field Surveys

WELL DETAILS: Brook LC28-75-1BHNC

Ground Level: 4843.00
RKB=24ft @ 4867.00usft (H&P 273)

Created By: Tatiana Gomez
Created On: 17:07, August 27 2014

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|---|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Brook LC28-75-1BHNC_SHL - Brook LC28-75-1BHNC_600 - Brook LC28-75-1BHNC_SL | | | | | | | |
| 350.00 | 0.30 | 297.34 | 350.00 | 0.42 | -0.81 | 0.48 | 0.09 |
| First Gyro Survey at 350.00 ft. | | | | | | | |
| 575.00 | 0.30 | 110.14 | 575.00 | 0.49 | -0.78 | 0.55 | 0.27 |
| Final Gyro Survey at 575.00 ft. - Tie on to Gyro Survey at 575.00 ft. | | | | | | | |
| 619.00 | 0.35 | 107.74 | 619.00 | 0.41 | -0.55 | 0.45 | 0.11 |
| 9 5/8" | | | | | | | |
| 717.00 | 0.45 | 104.18 | 716.99 | 0.22 | 0.11 | 0.21 | 0.11 |
| First Sperry MWD Survey at 717.00 ft. | | | | | | | |
| 809.00 | 0.60 | 117.43 | 808.99 | -0.09 | 0.88 | -0.16 | 0.21 |
| 1,088.00 | 0.07 | 79.85 | 1,087.98 | -0.73 | 2.35 | -0.91 | 0.20 |
| 1,274.00 | 0.06 | 181.03 | 1,273.98 | -0.81 | 2.46 | -1.00 | 0.05 |
| 1,553.00 | 0.39 | 95.77 | 1,552.98 | -1.05 | 3.40 | -1.31 | 0.14 |
| 1,646.00 | 0.37 | 74.62 | 1,645.98 | -1.00 | 4.00 | -1.31 | 0.15 |
| 1,737.00 | 0.07 | 33.47 | 1,736.98 | -0.88 | 4.32 | -1.21 | 0.35 |
| 1,927.00 | 0.18 | 190.18 | 1,926.98 | -1.07 | 4.33 | -1.41 | 0.13 |
| 2,022.00 | 2.14 | 253.28 | 2,021.96 | -1.73 | 2.60 | -1.93 | 2.17 |
| 2,117.00 | 4.00 | 243.53 | 2,116.82 | -3.72 | -2.06 | -3.54 | 2.03 |
| 2,212.00 | 4.60 | 239.75 | 2,211.55 | -7.11 | -8.32 | -6.43 | 0.70 |
| 2,307.00 | 5.98 | 241.37 | 2,306.14 | -11.40 | -15.95 | -10.11 | 1.46 |
| 2,401.00 | 6.78 | 235.17 | 2,399.56 | -16.92 | -24.81 | -14.91 | 1.12 |
| 2,496.00 | 7.47 | 235.07 | 2,493.83 | -23.66 | -34.47 | -20.86 | 0.73 |
| 2,591.00 | 8.11 | 236.06 | 2,587.95 | -30.94 | -45.09 | -27.28 | 0.69 |
| 2,686.00 | 7.88 | 235.43 | 2,682.03 | -38.37 | -56.02 | -33.83 | 0.26 |
| 2,781.00 | 8.61 | 233.94 | 2,776.04 | -46.25 | -67.13 | -40.81 | 0.80 |
| 2,876.00 | 8.23 | 231.51 | 2,870.02 | -54.67 | -78.20 | -48.32 | 0.55 |
| 2,971.00 | 7.44 | 231.06 | 2,964.13 | -62.77 | -88.30 | -55.60 | 0.83 |
| 3,065.00 | 7.69 | 236.06 | 3,057.31 | -70.11 | -98.26 | -62.13 | 0.75 |
| 3,160.00 | 8.13 | 246.44 | 3,151.42 | -76.34 | -109.69 | -67.44 | 1.57 |
| 3,255.00 | 6.85 | 241.63 | 3,245.60 | -81.72 | -120.83 | -71.92 | 1.50 |
| 3,350.00 | 8.00 | 233.60 | 3,339.81 | -88.33 | -131.14 | -77.70 | 1.63 |
| 3,445.00 | 7.90 | 233.90 | 3,433.89 | -96.10 | -141.73 | -84.61 | 0.11 |
| 3,540.00 | 7.82 | 234.99 | 3,528.00 | -103.66 | -152.30 | -91.30 | 0.18 |
| 3,635.00 | 7.56 | 234.05 | 3,622.15 | -111.03 | -162.65 | -97.84 | 0.30 |
| 3,730.00 | 7.43 | 233.87 | 3,716.34 | -118.32 | -172.67 | -104.31 | 0.14 |
| 3,825.00 | 7.29 | 233.53 | 3,810.55 | -125.53 | -182.48 | -110.72 | 0.15 |
| 3,920.00 | 6.83 | 231.70 | 3,904.83 | -132.61 | -191.76 | -117.05 | 0.54 |
| 4,015.00 | 7.10 | 238.04 | 3,999.13 | -139.22 | -201.18 | -122.89 | 0.86 |
| 4,109.00 | 8.38 | 236.42 | 4,092.28 | -146.08 | -211.81 | -128.90 | 1.38 |
| 4,204.00 | 7.03 | 234.25 | 4,186.42 | -153.31 | -222.30 | -135.27 | 1.45 |
| 4,293.00 | 7.41 | 237.38 | 4,274.71 | -159.59 | -231.55 | -140.80 | 0.61 |
| 4,388.00 | 7.45 | 233.65 | 4,368.91 | -166.54 | -241.67 | -146.93 | 0.51 |
| 4,483.00 | 6.99 | 230.41 | 4,463.16 | -173.87 | -251.09 | -153.50 | 0.65 |
| 4,578.00 | 8.58 | 232.86 | 4,557.28 | -181.84 | -261.19 | -160.64 | 1.71 |
| 4,673.00 | 8.01 | 234.28 | 4,651.29 | -189.98 | -272.21 | -167.88 | 0.64 |
| 4,768.00 | 7.44 | 235.27 | 4,745.42 | -197.35 | -282.64 | -174.41 | 0.62 |
| 4,863.00 | 6.70 | 236.59 | 4,839.70 | -203.90 | -292.32 | -180.18 | 0.80 |
| 4,957.00 | 6.24 | 233.19 | 4,933.10 | -209.98 | -300.99 | -185.55 | 0.64 |
| 5,052.00 | 4.03 | 228.96 | 5,027.72 | -215.27 | -307.64 | -190.30 | 2.36 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 5,147.00 | 1.83 | 199.70 | 5,122.59 | -218.89 | -310.67 | -193.67 | 2.73 |
| 5,242.00 | 0.86 | 105.09 | 5,217.57 | -220.50 | -310.50 | -195.29 | 2.19 |
| 5,337.00 | 0.65 | 97.79 | 5,312.56 | -220.76 | -309.27 | -195.64 | 0.24 |
| 5,431.00 | 0.88 | 102.09 | 5,406.56 | -220.99 | -308.04 | -195.96 | 0.25 |
| 5,526.00 | 2.05 | 41.74 | 5,501.53 | -219.87 | -306.20 | -195.00 | 1.88 |
| 5,573.00 | 6.91 | 27.43 | 5,548.37 | -216.73 | -304.33 | -192.02 | 10.53 |
| 5,621.00 | 11.09 | 18.21 | 5,595.77 | -209.78 | -301.56 | -185.31 | 9.18 |
| 5,668.00 | 16.00 | 18.15 | 5,641.45 | -199.33 | -298.13 | -175.15 | 10.45 |
| 5,716.00 | 20.10 | 16.24 | 5,687.08 | -185.11 | -293.76 | -161.33 | 8.63 |
| 5,763.00 | 24.26 | 11.98 | 5,730.59 | -167.91 | -289.49 | -144.52 | 9.48 |
| 5,811.00 | 27.03 | 2.99 | 5,773.88 | -147.36 | -286.87 | -124.24 | 9.94 |
| 5,858.00 | 31.65 | 357.72 | 5,814.84 | -124.35 | -286.81 | -101.31 | 11.25 |
| 5,906.00 | 35.22 | 357.38 | 5,854.89 | -97.93 | -287.94 | -74.88 | 7.45 |
| 5,953.00 | 36.63 | 0.34 | 5,892.96 | -70.37 | -288.48 | -47.36 | 4.76 |
| 6,000.00 | 40.49 | 1.87 | 5,929.70 | -41.09 | -287.90 | -18.22 | 8.46 |
| 6,047.00 | 44.41 | 1.21 | 5,964.38 | -9.38 | -287.05 | 13.32 | 8.39 |
| 6,095.00 | 48.69 | 0.63 | 5,997.38 | 25.45 | -286.50 | 48.00 | 8.96 |
| 6,142.00 | 51.61 | 359.34 | 6,027.49 | 61.53 | -286.52 | 83.97 | 6.56 |
| 6,190.00 | 58.32 | 356.97 | 6,055.04 | 100.78 | -287.81 | 123.20 | 14.55 |
| 6,237.00 | 64.27 | 355.69 | 6,077.60 | 141.90 | -290.46 | 164.40 | 12.88 |
| 6,285.00 | 69.32 | 356.82 | 6,096.51 | 185.91 | -293.34 | 208.50 | 10.74 |
| 6,380.00 | 80.49 | 0.14 | 6,121.21 | 277.44 | -295.70 | 299.93 | 12.23 |
| 6,446.00 | 86.55 | 0.59 | 6,128.66 | 342.99 | -295.28 | 365.24 | 9.21 |
| 6,498.00 | 87.12 | 0.27 | 6,131.53 | 394.91 | -294.89 | 416.97 | 1.27 |
| 7" | | | | | | | |
| 6,555.00 | 87.75 | 359.91 | 6,134.08 | 451.85 | -294.80 | 473.72 | 1.27 |
| 6,650.00 | 88.89 | 359.97 | 6,136.86 | 546.81 | -294.90 | 568.39 | 1.20 |
| 6,745.00 | 89.91 | 1.15 | 6,137.86 | 641.79 | -293.97 | 663.01 | 1.64 |
| 6,840.00 | 89.35 | 0.57 | 6,138.47 | 736.78 | -292.55 | 757.59 | 0.85 |
| 6,934.00 | 90.80 | 0.20 | 6,138.35 | 830.78 | -291.92 | 851.24 | 1.59 |
| 7,029.00 | 91.14 | 359.99 | 6,136.74 | 925.76 | -291.76 | 945.91 | 0.42 |
| 7,124.00 | 90.40 | 358.51 | 6,135.46 | 1,020.74 | -293.00 | 1,040.70 | 1.74 |
| 7,219.00 | 91.08 | 358.84 | 6,134.24 | 1,115.71 | -295.20 | 1,135.54 | 0.80 |
| 7,314.00 | 91.20 | 359.16 | 6,132.35 | 1,210.67 | -296.86 | 1,230.34 | 0.36 |
| 7,409.00 | 91.29 | 359.01 | 6,130.28 | 1,305.64 | -298.37 | 1,325.13 | 0.18 |
| 7,503.00 | 91.17 | 358.38 | 6,128.27 | 1,399.59 | -300.51 | 1,418.96 | 0.68 |
| 7,598.00 | 90.62 | 357.26 | 6,126.78 | 1,494.51 | -304.13 | 1,513.86 | 1.31 |
| 7,693.00 | 90.06 | 356.76 | 6,126.22 | 1,589.38 | -309.08 | 1,608.83 | 0.79 |
| 7,788.00 | 89.35 | 355.18 | 6,126.71 | 1,684.14 | -315.76 | 1,703.82 | 1.82 |
| 7,883.00 | 90.28 | 358.37 | 6,127.01 | 1,778.98 | -321.10 | 1,798.78 | 3.50 |
| 7,978.00 | 90.77 | 0.97 | 6,126.14 | 1,873.96 | -321.65 | 1,893.51 | 2.78 |
| 8,073.00 | 90.49 | 1.07 | 6,125.10 | 1,968.94 | -319.96 | 1,988.06 | 0.31 |
| 8,168.00 | 91.94 | 1.82 | 6,123.08 | 2,063.89 | -317.56 | 2,082.52 | 1.72 |
| 8,263.00 | 89.48 | 2.17 | 6,121.91 | 2,158.81 | -314.26 | 2,176.89 | 2.62 |
| 8,357.00 | 87.47 | 1.91 | 6,124.41 | 2,252.72 | -310.91 | 2,270.24 | 2.16 |
| 8,452.00 | 87.32 | 0.65 | 6,128.73 | 2,347.59 | -308.79 | 2,364.65 | 1.33 |
| 8,546.00 | 87.29 | 0.58 | 6,133.15 | 2,441.48 | -307.78 | 2,458.17 | 0.08 |
| 8,641.00 | 90.96 | 0.11 | 6,134.60 | 2,536.45 | -307.21 | 2,552.79 | 3.89 |
| 8,736.00 | 90.86 | 0.19 | 6,133.09 | 2,631.44 | -306.96 | 2,647.47 | 0.13 |
| 8,831.00 | 90.52 | 359.20 | 6,131.94 | 2,726.43 | -307.47 | 2,742.20 | 1.10 |
| 8,925.00 | 89.85 | 357.93 | 6,131.64 | 2,820.40 | -309.82 | 2,836.06 | 1.53 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) |
|---|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|
| 9,020.00 | 90.71 | 358.10 | 6,131.18 | 2,915.34 | -313.11 | 2,930.96 | 0.92 |
| 9,115.00 | 89.85 | 358.88 | 6,130.71 | 3,010.30 | -315.62 | 3,025.83 | 1.22 |
| 9,210.00 | 89.88 | 358.23 | 6,130.94 | 3,105.27 | -318.01 | 3,120.69 | 0.68 |
| 9,305.00 | 89.85 | 358.04 | 6,131.16 | 3,200.22 | -321.10 | 3,215.59 | 0.20 |
| 9,399.00 | 90.03 | 357.07 | 6,131.26 | 3,294.14 | -325.11 | 3,309.52 | 1.05 |
| 9,494.00 | 90.15 | 356.54 | 6,131.11 | 3,388.99 | -330.41 | 3,404.50 | 0.57 |
| 9,589.00 | 89.66 | 356.30 | 6,131.27 | 3,483.80 | -336.34 | 3,499.48 | 0.57 |
| 9,683.00 | 89.26 | 355.76 | 6,132.15 | 3,577.57 | -342.85 | 3,593.47 | 0.71 |
| 9,778.00 | 89.38 | 355.74 | 6,133.28 | 3,672.30 | -349.89 | 3,688.47 | 0.13 |
| 9,873.00 | 88.89 | 355.73 | 6,134.71 | 3,767.03 | -356.95 | 3,783.45 | 0.52 |
| 9,968.00 | 89.60 | 355.55 | 6,135.97 | 3,861.75 | -364.17 | 3,878.45 | 0.77 |
| 10,062.00 | 89.88 | 354.94 | 6,136.39 | 3,955.42 | -371.97 | 3,972.44 | 0.71 |
| 10,157.00 | 89.78 | 355.48 | 6,136.67 | 4,050.09 | -379.90 | 4,067.44 | 0.58 |
| 10,252.00 | 90.06 | 355.12 | 6,136.81 | 4,144.77 | -387.68 | 4,162.44 | 0.48 |
| 10,370.00 | 90.15 | 354.02 | 6,136.59 | 4,262.24 | -398.85 | 4,280.42 | 0.94 |
| Final Sperry MWD Survey at 10370.00 ft. | | | | | | | |
| 10,431.89 | 90.15 | 354.02 | 6,136.43 | 4,323.79 | -405.30 | 4,342.29 | 0.00 |
| Brook LC28-75-1BHNC_BHL | | | | | | | |
| 10,435.00 | 90.15 | 354.02 | 6,136.42 | 4,326.88 | -405.62 | 4,345.40 | 0.00 |
| Straight Line Projection to TD 10435.00 ft. | | | | | | | |

Design Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------|-----------------------|-------------------|--------------|---|
| | | +N/-S (usft) | +E/-W (usft) | |
| 350.00 | 350.00 | 0.42 | -0.81 | First Gyro Survey at 350.00 ft. |
| 575.00 | 575.00 | 0.49 | -0.78 | Final Gyro Survey at 575.00 ft. |
| 575.00 | 575.00 | 0.49 | -0.78 | Tie on to Gyro Survey at 575.00 ft. |
| 717.00 | 716.99 | 0.22 | 0.11 | First Sperry MWD Survey at 717.00 ft. |
| 10,370.00 | 6,136.59 | 4,262.24 | -398.85 | Final Sperry MWD Survey at 10370.00 ft. |
| 10,435.00 | 6,136.42 | 4,326.88 | -405.62 | Straight Line Projection to TD 10435.00 ft. |

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin | | Start TVD (usft) |
|------------|-------------------------|-------------|-------------|--------------|--------------|------------------|
| | | | | +N/-S (usft) | +E/-W (usft) | |
| Target | Brook LC28-75-1BHNC_BHL | 355.47 | Slot | 0.00 | 0.00 | 0.00 |

Survey tool program

| From (usft) | To (usft) | Survey/Plan | Survey Tool |
|-------------|-----------|--------------------------|-------------|
| 350.00 | 575.00 | Surface Gyros | Flexi-Shot |
| 717.00 | 6,446.00 | MWD Surveys-Intermediate | MWD+SC |
| 6,555.00 | 10,435.00 | MWD Surveys_ Production | MWD+SC |

Casing Details

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|-----------------------|-----------------------|--------|---------------------|-------------------|
| 619.00 | 619.00 | 9 5/8" | 9-5/8 | 13-3/4 |
| 6,498.00 | 6,131.53 | 7" | 7 | 8-3/4 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

Wellbore Targets

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|--|---------------------|--------------------|---------------|-----------------|-----------------|--------------------|-------------------|------------------|-------------------|
| Brook LC28-75-1BHNC - actual wellpath hits target center - Point | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,506,936.13 | 3,421,295.22 | 40° 42' 54.072 N | 103° 58' 48.684 W |
| Brook LC28-75-1BHNC - actual wellpath hits target center - Polygon | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,506,936.13 | 3,421,295.22 | 40° 42' 54.072 N | 103° 58' 48.684 W |
| Point 1 | | | | 0.00 | 4,299.64 | -2,893.58 | 1,511,235.73 | 3,418,401.67 | |
| Point 2 | | | | 0.00 | 185.29 | -2,775.50 | 1,507,121.42 | 3,418,519.75 | |
| Point 3 | | | | 0.00 | 301.61 | 1,332.09 | 1,507,237.74 | 3,422,627.30 | |
| Point 4 | | | | 0.00 | 4,470.07 | 1,181.43 | 1,511,406.15 | 3,422,476.64 | |
| Point 5 | | | | 0.00 | 4,299.64 | -2,893.58 | 1,511,235.73 | 3,418,401.67 | |
| Brook LC28-75-1BHNC - actual wellpath hits target center - Polygon | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,506,936.13 | 3,421,295.22 | 40° 42' 54.072 N | 103° 58' 48.684 W |
| Point 1 | | | | 0.00 | 4,899.65 | -3,493.59 | 1,511,835.73 | 3,417,801.67 | |
| Point 2 | | | | 0.00 | -414.71 | -3,375.50 | 1,506,521.42 | 3,417,919.75 | |
| Point 3 | | | | 0.00 | -298.39 | 1,932.10 | 1,506,637.74 | 3,423,227.30 | |
| Point 4 | | | | 0.00 | 5,070.07 | 1,781.44 | 1,512,006.15 | 3,423,076.64 | |
| Point 5 | | | | 0.00 | 4,899.65 | -3,493.59 | 1,511,835.73 | 3,417,801.67 | |
| Brook LC28-75-1BHNC - actual wellpath misses target center by 62.86usft at 10431.89usft MD (6136.43 TVD, 4323.79 N, -405.30 E) - Point | 0.00 | 0.00 | 6,143.00 | 4,330.32 | -343.12 | 1,511,266.40 | 3,420,952.10 | 40° 43' 36.912 N | 103° 58' 52.176 W |

Directional Difficulty Index

| | | | |
|------------------------------------|----------------|-------------------------------|----------------------------------|
| Average Dogleg over Survey: | 1.65 °/100usft | Maximum Dogleg over Survey: | 14.55 °/100usft at 6,190.00 usft |
| Net Tortosity applicable to Plans: | 0.63 °/100usft | Directional Difficulty Index: | 6.162 |

Audit Info

North Reference Sheet for Sec. 28-T9N-R59W (LC28-15-A) - Brook
LC28-75-1BHNC - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24ft @ 4867.00usft (H&P 273). Northing and Easting are relative to Brook LC28-75-1BHNC

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998963

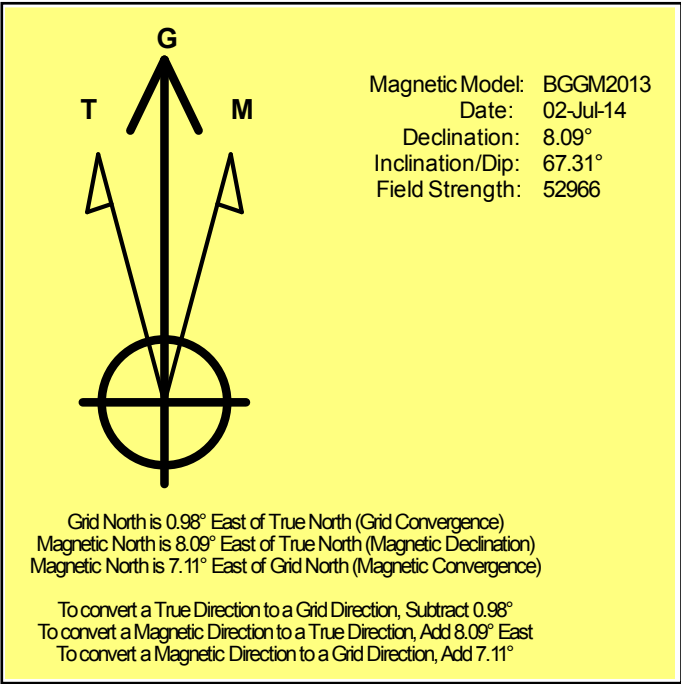
Grid Coordinates of Well: 1,506,936.13 usft N, 3,421,295.22 usft E

Geographical Coordinates of Well: 40° 42' 54.07" N, 103° 58' 48.68" W

Grid Convergence at Surface is: 0.98°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,435.00usft
the Bottom Hole Displacement is 4,345.85usft in the Direction of 354.64° (Grid).

Magnetic Convergence at surface is: -7.11° (2 July 2014, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 28-T9N-R59W (LC28-15-A)

Brook LC28-75-1BHNC

Plan B

Design: Field Surveys

Sperry Drilling Services

Geodetic Report

03 September, 2014

Well Coordinates: 1,506,936.13 N, 3,421,295.22 E (40° 42' 54.07" N, 103° 58' 48.68" W)

Ground Level: 4,843.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Brook LC28-75-1BHNC

RKB=24ft @ 4867.00usft (H&P 273)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured | | | Vertical | Local Coordinates | | Geographic Coordinates | | UTM Coordinates | |
|-----------------|--------------------|----------------|-----------------|-------------------|-----------------|------------------------|---------------------|--------------------|-------------------|
| Depth (usft) | Inclination (°) | Azimuth (°) | Depth (usft) | +N/-S (usft) | +E/-W (usft) | Latitude (usft) | Longitude (usft) | Northing (usft) | Easting (usft) |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40° 42' 54.072 N | 103° 58' 48.684 W | 1,506,936.13 | 3,421,295.22 |
| 350.00 | 0.30 | 297.34 | 350.00 | 0.42 | -0.81 | 40° 42' 54.076 N | 103° 58' 48.694 W | 1,506,936.55 | 3,421,294.41 |
| 575.00 | 0.30 | 110.14 | 575.00 | 0.49 | -0.78 | 40° 42' 54.077 N | 103° 58' 48.694 W | 1,506,936.62 | 3,421,294.44 |
| 619.00 | 0.35 | 107.74 | 619.00 | 0.41 | -0.55 | 40° 42' 54.076 N | 103° 58' 48.691 W | 1,506,936.54 | 3,421,294.67 |
| 717.00 | 0.45 | 104.18 | 716.99 | 0.22 | 0.11 | 40° 42' 54.074 N | 103° 58' 48.683 W | 1,506,936.35 | 3,421,295.32 |
| 809.00 | 0.60 | 117.43 | 808.99 | -0.09 | 0.88 | 40° 42' 54.071 N | 103° 58' 48.673 W | 1,506,936.04 | 3,421,296.10 |
| 1,088.00 | 0.07 | 79.85 | 1,087.98 | -0.73 | 2.35 | 40° 42' 54.064 N | 103° 58' 48.654 W | 1,506,935.40 | 3,421,297.57 |
| 1,274.00 | 0.06 | 181.03 | 1,273.98 | -0.81 | 2.46 | 40° 42' 54.063 N | 103° 58' 48.652 W | 1,506,935.32 | 3,421,297.68 |
| 1,553.00 | 0.39 | 95.77 | 1,552.98 | -1.05 | 3.40 | 40° 42' 54.061 N | 103° 58' 48.640 W | 1,506,935.08 | 3,421,298.62 |
| 1,646.00 | 0.37 | 74.62 | 1,645.98 | -1.00 | 4.00 | 40° 42' 54.061 N | 103° 58' 48.632 W | 1,506,935.13 | 3,421,299.22 |
| 1,737.00 | 0.07 | 33.47 | 1,736.98 | -0.88 | 4.32 | 40° 42' 54.062 N | 103° 58' 48.628 W | 1,506,935.25 | 3,421,299.54 |
| 1,927.00 | 0.18 | 190.18 | 1,926.98 | -1.07 | 4.33 | 40° 42' 54.061 N | 103° 58' 48.628 W | 1,506,935.06 | 3,421,299.55 |
| 2,022.00 | 2.14 | 253.28 | 2,021.96 | -1.73 | 2.60 | 40° 42' 54.054 N | 103° 58' 48.651 W | 1,506,934.40 | 3,421,297.82 |
| 2,117.00 | 4.00 | 243.53 | 2,116.82 | -3.72 | -2.06 | 40° 42' 54.035 N | 103° 58' 48.712 W | 1,506,932.41 | 3,421,293.16 |
| 2,212.00 | 4.60 | 239.75 | 2,211.55 | -7.11 | -8.32 | 40° 42' 54.003 N | 103° 58' 48.794 W | 1,506,929.02 | 3,421,286.90 |
| 2,307.00 | 5.98 | 241.37 | 2,306.14 | -11.40 | -15.95 | 40° 42' 53.962 N | 103° 58' 48.894 W | 1,506,924.73 | 3,421,279.27 |
| 2,401.00 | 6.78 | 235.17 | 2,399.56 | -16.92 | -24.81 | 40° 42' 53.909 N | 103° 58' 49.010 W | 1,506,919.21 | 3,421,270.41 |
| 2,496.00 | 7.47 | 235.07 | 2,493.83 | -23.66 | -34.47 | 40° 42' 53.844 N | 103° 58' 49.137 W | 1,506,912.47 | 3,421,260.75 |
| 2,591.00 | 8.11 | 236.06 | 2,587.95 | -30.94 | -45.09 | 40° 42' 53.774 N | 103° 58' 49.276 W | 1,506,905.20 | 3,421,250.13 |
| 2,686.00 | 7.88 | 235.43 | 2,682.03 | -38.37 | -56.02 | 40° 42' 53.702 N | 103° 58' 49.420 W | 1,506,897.76 | 3,421,239.20 |
| 2,781.00 | 8.61 | 233.94 | 2,776.04 | -46.25 | -67.13 | 40° 42' 53.626 N | 103° 58' 49.566 W | 1,506,889.88 | 3,421,228.09 |
| 2,876.00 | 8.23 | 231.51 | 2,870.02 | -54.67 | -78.20 | 40° 42' 53.545 N | 103° 58' 49.711 W | 1,506,881.46 | 3,421,217.02 |
| 2,971.00 | 7.44 | 231.06 | 2,964.13 | -62.77 | -88.30 | 40° 42' 53.467 N | 103° 58' 49.845 W | 1,506,873.36 | 3,421,206.92 |
| 3,065.00 | 7.69 | 236.06 | 3,057.31 | -70.11 | -98.26 | 40° 42' 53.396 N | 103° 58' 49.975 W | 1,506,866.03 | 3,421,196.97 |
| 3,160.00 | 8.13 | 246.44 | 3,151.42 | -76.34 | -109.69 | 40° 42' 53.336 N | 103° 58' 50.125 W | 1,506,859.79 | 3,421,185.53 |
| 3,255.00 | 6.85 | 241.63 | 3,245.60 | -81.72 | -120.83 | 40° 42' 53.285 N | 103° 58' 50.271 W | 1,506,854.41 | 3,421,174.39 |
| 3,350.00 | 8.00 | 233.60 | 3,339.81 | -88.33 | -131.14 | 40° 42' 53.221 N | 103° 58' 50.406 W | 1,506,847.80 | 3,421,164.09 |
| 3,445.00 | 7.90 | 233.90 | 3,433.89 | -96.10 | -141.73 | 40° 42' 53.146 N | 103° 58' 50.546 W | 1,506,840.03 | 3,421,153.49 |
| 3,540.00 | 7.82 | 234.99 | 3,528.00 | -103.66 | -152.30 | 40° 42' 53.074 N | 103° 58' 50.685 W | 1,506,832.48 | 3,421,142.92 |
| 3,635.00 | 7.56 | 234.05 | 3,622.15 | -111.03 | -162.65 | 40° 42' 53.002 N | 103° 58' 50.821 W | 1,506,825.10 | 3,421,132.57 |
| 3,730.00 | 7.43 | 233.87 | 3,716.34 | -118.32 | -172.67 | 40° 42' 52.932 N | 103° 58' 50.952 W | 1,506,817.81 | 3,421,122.55 |
| 3,825.00 | 7.29 | 233.53 | 3,810.55 | -125.53 | -182.48 | 40° 42' 52.863 N | 103° 58' 51.081 W | 1,506,810.60 | 3,421,112.74 |
| 3,920.00 | 6.83 | 231.70 | 3,904.83 | -132.61 | -191.76 | 40° 42' 52.794 N | 103° 58' 51.203 W | 1,506,803.52 | 3,421,103.46 |
| 4,015.00 | 7.10 | 238.04 | 3,999.13 | -139.22 | -201.18 | 40° 42' 52.730 N | 103° 58' 51.327 W | 1,506,796.91 | 3,421,094.05 |
| 4,109.00 | 8.38 | 236.42 | 4,092.28 | -146.08 | -211.81 | 40° 42' 52.664 N | 103° 58' 51.467 W | 1,506,790.05 | 3,421,083.41 |
| 4,204.00 | 7.03 | 234.25 | 4,186.42 | -153.31 | -222.30 | 40° 42' 52.595 N | 103° 58' 51.604 W | 1,506,782.82 | 3,421,072.92 |
| 4,293.00 | 7.41 | 237.38 | 4,274.71 | -159.59 | -231.55 | 40° 42' 52.534 N | 103° 58' 51.726 W | 1,506,776.55 | 3,421,063.67 |
| 4,388.00 | 7.45 | 233.65 | 4,368.91 | -166.54 | -241.67 | 40° 42' 52.467 N | 103° 58' 51.859 W | 1,506,769.59 | 3,421,053.55 |
| 4,483.00 | 6.99 | 230.41 | 4,463.16 | -173.87 | -251.09 | 40° 42' 52.397 N | 103° 58' 51.983 W | 1,506,762.26 | 3,421,044.14 |
| 4,578.00 | 8.58 | 232.86 | 4,557.28 | -181.84 | -261.19 | 40° 42' 52.320 N | 103° 58' 52.116 W | 1,506,754.30 | 3,421,034.03 |
| 4,673.00 | 8.01 | 234.28 | 4,651.29 | -189.98 | -272.21 | 40° 42' 52.241 N | 103° 58' 52.261 W | 1,506,746.15 | 3,421,023.01 |
| 4,768.00 | 7.44 | 235.27 | 4,745.42 | -197.35 | -282.64 | 40° 42' 52.170 N | 103° 58' 52.398 W | 1,506,738.79 | 3,421,012.58 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Local Coordinates | | Geographic Coordinates | | UTM Coordinates | |
|-----------------------------|--------------------|----------------|-----------------------------|-------------------|-----------------|------------------------|---------------------|--------------------|-------------------|
| | | | | +N/-S (usft) | +E/-W (usft) | Latitude (usft) | Longitude (usft) | Northing (usft) | Easting (usft) |
| 4,863.00 | 6.70 | 236.59 | 4,839.70 | -203.90 | -292.32 | 40° 42' 52.107 N | 103° 58' 52.525 W | 1,506,732.23 | 3,421,002.90 |
| 4,957.00 | 6.24 | 233.19 | 4,933.10 | -209.98 | -300.99 | 40° 42' 52.048 N | 103° 58' 52.639 W | 1,506,726.15 | 3,420,994.23 |
| 5,052.00 | 4.03 | 228.96 | 5,027.72 | -215.27 | -307.64 | 40° 42' 51.997 N | 103° 58' 52.726 W | 1,506,720.86 | 3,420,987.58 |
| 5,147.00 | 1.83 | 199.70 | 5,122.59 | -218.89 | -310.67 | 40° 42' 51.962 N | 103° 58' 52.767 W | 1,506,717.24 | 3,420,984.55 |
| 5,242.00 | 0.86 | 105.09 | 5,217.57 | -220.50 | -310.50 | 40° 42' 51.946 N | 103° 58' 52.765 W | 1,506,715.63 | 3,420,984.73 |
| 5,337.00 | 0.65 | 97.79 | 5,312.56 | -220.76 | -309.27 | 40° 42' 51.943 N | 103° 58' 52.749 W | 1,506,715.37 | 3,420,985.95 |
| 5,431.00 | 0.88 | 102.09 | 5,406.56 | -220.99 | -308.04 | 40° 42' 51.941 N | 103° 58' 52.733 W | 1,506,715.15 | 3,420,987.18 |
| 5,526.00 | 2.05 | 41.74 | 5,501.53 | -219.87 | -306.20 | 40° 42' 51.951 N | 103° 58' 52.709 W | 1,506,716.26 | 3,420,989.03 |
| 5,573.00 | 6.91 | 27.43 | 5,548.37 | -216.73 | -304.33 | 40° 42' 51.982 N | 103° 58' 52.684 W | 1,506,719.40 | 3,420,990.89 |
| 5,621.00 | 11.09 | 18.21 | 5,595.77 | -209.78 | -301.56 | 40° 42' 52.050 N | 103° 58' 52.646 W | 1,506,726.35 | 3,420,993.66 |
| 5,668.00 | 16.00 | 18.15 | 5,641.45 | -199.33 | -298.13 | 40° 42' 52.153 N | 103° 58' 52.599 W | 1,506,736.81 | 3,420,997.10 |
| 5,716.00 | 20.10 | 16.24 | 5,687.08 | -185.11 | -293.76 | 40° 42' 52.293 N | 103° 58' 52.539 W | 1,506,751.02 | 3,421,001.47 |
| 5,763.00 | 24.26 | 11.98 | 5,730.59 | -167.91 | -289.49 | 40° 42' 52.462 N | 103° 58' 52.480 W | 1,506,768.23 | 3,421,005.73 |
| 5,811.00 | 27.03 | 2.99 | 5,773.88 | -147.36 | -286.87 | 40° 42' 52.665 N | 103° 58' 52.442 W | 1,506,788.78 | 3,421,008.35 |
| 5,858.00 | 31.65 | 357.72 | 5,814.84 | -124.35 | -286.81 | 40° 42' 52.892 N | 103° 58' 52.436 W | 1,506,811.78 | 3,421,008.41 |
| 5,906.00 | 35.22 | 357.38 | 5,854.89 | -97.93 | -287.94 | 40° 42' 53.153 N | 103° 58' 52.444 W | 1,506,838.20 | 3,421,007.28 |
| 5,953.00 | 36.63 | 0.34 | 5,892.96 | -70.37 | -288.48 | 40° 42' 53.425 N | 103° 58' 52.445 W | 1,506,865.76 | 3,421,006.74 |
| 6,000.00 | 40.49 | 1.87 | 5,929.70 | -41.09 | -287.90 | 40° 42' 53.715 N | 103° 58' 52.431 W | 1,506,895.04 | 3,421,007.33 |
| 6,047.00 | 44.41 | 1.21 | 5,964.38 | -9.38 | -287.05 | 40° 42' 54.028 N | 103° 58' 52.413 W | 1,506,926.75 | 3,421,008.17 |
| 6,095.00 | 48.69 | 0.63 | 5,997.38 | 25.45 | -286.50 | 40° 42' 54.372 N | 103° 58' 52.398 W | 1,506,961.58 | 3,421,008.72 |
| 6,142.00 | 51.61 | 359.34 | 6,027.49 | 61.53 | -286.52 | 40° 42' 54.728 N | 103° 58' 52.391 W | 1,506,997.66 | 3,421,008.71 |
| 6,190.00 | 58.32 | 356.97 | 6,055.04 | 100.78 | -287.81 | 40° 42' 55.116 N | 103° 58' 52.399 W | 1,507,036.91 | 3,421,007.41 |
| 6,237.00 | 64.27 | 355.69 | 6,077.60 | 141.90 | -290.46 | 40° 42' 55.523 N | 103° 58' 52.424 W | 1,507,078.03 | 3,421,004.76 |
| 6,285.00 | 69.32 | 356.82 | 6,096.51 | 185.91 | -293.34 | 40° 42' 55.958 N | 103° 58' 52.451 W | 1,507,122.04 | 3,421,001.89 |
| 6,380.00 | 80.49 | 0.14 | 6,121.21 | 277.44 | -295.70 | 40° 42' 56.863 N | 103° 58' 52.462 W | 1,507,213.57 | 3,420,999.53 |
| 6,446.00 | 86.55 | 0.59 | 6,128.66 | 342.99 | -295.28 | 40° 42' 57.510 N | 103° 58' 52.442 W | 1,507,279.11 | 3,420,999.95 |
| 6,498.00 | 87.12 | 0.27 | 6,131.53 | 394.91 | -294.89 | 40° 42' 58.023 N | 103° 58' 52.425 W | 1,507,331.03 | 3,421,000.33 |
| 6,555.00 | 87.75 | 359.91 | 6,134.08 | 451.85 | -294.80 | 40° 42' 58.586 N | 103° 58' 52.411 W | 1,507,387.97 | 3,421,000.42 |
| 6,650.00 | 88.89 | 359.97 | 6,136.86 | 546.81 | -294.90 | 40° 42' 59.524 N | 103° 58' 52.391 W | 1,507,482.93 | 3,421,000.32 |
| 6,745.00 | 89.91 | 1.15 | 6,137.86 | 641.79 | -293.97 | 40° 43' 0.462 N | 103° 58' 52.358 W | 1,507,577.92 | 3,421,001.25 |
| 6,840.00 | 89.35 | 0.57 | 6,138.47 | 736.78 | -292.55 | 40° 43' 1.401 N | 103° 58' 52.319 W | 1,507,672.90 | 3,421,002.68 |
| 6,934.00 | 90.80 | 0.20 | 6,138.35 | 830.78 | -291.92 | 40° 43' 2.329 N | 103° 58' 52.290 W | 1,507,766.90 | 3,421,003.31 |
| 7,029.00 | 91.14 | 359.99 | 6,136.74 | 925.76 | -291.76 | 40° 43' 3.267 N | 103° 58' 52.266 W | 1,507,861.88 | 3,421,003.46 |
| 7,124.00 | 90.40 | 358.51 | 6,135.46 | 1,020.74 | -293.00 | 40° 43' 4.206 N | 103° 58' 52.261 W | 1,507,956.86 | 3,421,002.22 |
| 7,219.00 | 91.08 | 358.84 | 6,134.24 | 1,115.71 | -295.20 | 40° 43' 5.145 N | 103° 58' 52.269 W | 1,508,051.83 | 3,421,000.02 |
| 7,314.00 | 91.20 | 359.16 | 6,132.35 | 1,210.67 | -296.86 | 40° 43' 6.083 N | 103° 58' 52.269 W | 1,508,146.79 | 3,420,998.37 |
| 7,409.00 | 91.29 | 359.01 | 6,130.28 | 1,305.64 | -298.37 | 40° 43' 7.022 N | 103° 58' 52.268 W | 1,508,241.76 | 3,420,996.85 |
| 7,503.00 | 91.17 | 358.38 | 6,128.27 | 1,399.59 | -300.51 | 40° 43' 7.950 N | 103° 58' 52.275 W | 1,508,335.71 | 3,420,994.71 |
| 7,598.00 | 90.62 | 357.26 | 6,126.78 | 1,494.51 | -304.13 | 40° 43' 8.889 N | 103° 58' 52.300 W | 1,508,430.63 | 3,420,991.10 |
| 7,693.00 | 90.06 | 356.76 | 6,126.22 | 1,589.38 | -309.08 | 40° 43' 9.827 N | 103° 58' 52.344 W | 1,508,525.49 | 3,420,986.14 |
| 7,788.00 | 89.35 | 355.18 | 6,126.71 | 1,684.14 | -315.76 | 40° 43' 10.764 N | 103° 58' 52.409 W | 1,508,620.25 | 3,420,979.47 |
| 7,883.00 | 90.28 | 358.37 | 6,127.01 | 1,778.98 | -321.10 | 40° 43' 11.702 N | 103° 58' 52.458 W | 1,508,715.09 | 3,420,974.12 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Local Coordinates | | Geographic Coordinates | | UTM Coordinates | |
|--------------------------|--------------------|----------------|--------------------------|-------------------|-----------------|------------------------|---------------------|--------------------|-------------------|
| | | | | +N/-S (usft) | +E/-W (usft) | Latitude (usft) | Longitude (usft) | Northing (usft) | Easting (usft) |
| 7,978.00 | 90.77 | 0.97 | 6,126.14 | 1,873.96 | -321.65 | 40° 43' 12.640 N | 103° 58' 52.444 W | 1,508,810.07 | 3,420,973.57 |
| 8,073.00 | 90.49 | 1.07 | 6,125.10 | 1,968.94 | -319.96 | 40° 43' 13.579 N | 103° 58' 52.400 W | 1,508,905.05 | 3,420,975.27 |
| 8,168.00 | 91.94 | 1.82 | 6,123.08 | 2,063.89 | -317.56 | 40° 43' 14.516 N | 103° 58' 52.348 W | 1,508,999.99 | 3,420,977.66 |
| 8,263.00 | 89.48 | 2.17 | 6,121.91 | 2,158.81 | -314.26 | 40° 43' 15.453 N | 103° 58' 52.284 W | 1,509,094.92 | 3,420,980.97 |
| 8,357.00 | 87.47 | 1.91 | 6,124.41 | 2,252.72 | -310.91 | 40° 43' 16.381 N | 103° 58' 52.220 W | 1,509,188.82 | 3,420,984.31 |
| 8,452.00 | 87.32 | 0.65 | 6,128.73 | 2,347.59 | -308.79 | 40° 43' 17.318 N | 103° 58' 52.171 W | 1,509,283.70 | 3,420,986.43 |
| 8,546.00 | 87.29 | 0.58 | 6,133.15 | 2,441.48 | -307.78 | 40° 43' 18.245 N | 103° 58' 52.137 W | 1,509,377.59 | 3,420,987.44 |
| 8,641.00 | 90.96 | 0.11 | 6,134.60 | 2,536.45 | -307.21 | 40° 43' 19.183 N | 103° 58' 52.109 W | 1,509,472.56 | 3,420,988.01 |
| 8,736.00 | 90.86 | 0.19 | 6,133.09 | 2,631.44 | -306.96 | 40° 43' 20.122 N | 103° 58' 52.084 W | 1,509,567.54 | 3,420,988.26 |
| 8,831.00 | 90.52 | 359.20 | 6,131.94 | 2,726.43 | -307.47 | 40° 43' 21.060 N | 103° 58' 52.070 W | 1,509,662.53 | 3,420,987.75 |
| 8,925.00 | 89.85 | 357.93 | 6,131.64 | 2,820.40 | -309.82 | 40° 43' 21.989 N | 103° 58' 52.079 W | 1,509,756.50 | 3,420,985.40 |
| 9,020.00 | 90.71 | 358.10 | 6,131.18 | 2,915.34 | -313.11 | 40° 43' 22.927 N | 103° 58' 52.101 W | 1,509,851.44 | 3,420,982.11 |
| 9,115.00 | 89.85 | 358.88 | 6,130.71 | 3,010.30 | -315.62 | 40° 43' 23.866 N | 103° 58' 52.112 W | 1,509,946.40 | 3,420,979.61 |
| 9,210.00 | 89.88 | 358.23 | 6,130.94 | 3,105.27 | -318.01 | 40° 43' 24.805 N | 103° 58' 52.122 W | 1,510,041.37 | 3,420,977.21 |
| 9,305.00 | 89.85 | 358.04 | 6,131.16 | 3,200.22 | -321.10 | 40° 43' 25.743 N | 103° 58' 52.141 W | 1,510,136.32 | 3,420,974.12 |
| 9,399.00 | 90.03 | 357.07 | 6,131.26 | 3,294.14 | -325.11 | 40° 43' 26.672 N | 103° 58' 52.173 W | 1,510,230.23 | 3,420,970.11 |
| 9,494.00 | 90.15 | 356.54 | 6,131.11 | 3,388.99 | -330.41 | 40° 43' 27.610 N | 103° 58' 52.220 W | 1,510,325.08 | 3,420,964.82 |
| 9,589.00 | 89.66 | 356.30 | 6,131.27 | 3,483.80 | -336.34 | 40° 43' 28.548 N | 103° 58' 52.276 W | 1,510,419.90 | 3,420,958.88 |
| 9,683.00 | 89.26 | 355.76 | 6,132.15 | 3,577.57 | -342.85 | 40° 43' 29.475 N | 103° 58' 52.340 W | 1,510,513.66 | 3,420,952.38 |
| 9,778.00 | 89.38 | 355.74 | 6,133.28 | 3,672.30 | -349.89 | 40° 43' 30.412 N | 103° 58' 52.410 W | 1,510,608.40 | 3,420,945.34 |
| 9,873.00 | 88.89 | 355.73 | 6,134.71 | 3,767.03 | -356.95 | 40° 43' 31.349 N | 103° 58' 52.481 W | 1,510,703.12 | 3,420,938.27 |
| 9,968.00 | 89.60 | 355.55 | 6,135.97 | 3,861.75 | -364.17 | 40° 43' 32.286 N | 103° 58' 52.554 W | 1,510,797.84 | 3,420,931.05 |
| 10,062.00 | 89.88 | 354.94 | 6,136.39 | 3,955.42 | -371.97 | 40° 43' 33.213 N | 103° 58' 52.634 W | 1,510,891.51 | 3,420,923.26 |
| 10,157.00 | 89.78 | 355.48 | 6,136.67 | 4,050.09 | -379.90 | 40° 43' 34.150 N | 103° 58' 52.716 W | 1,510,986.18 | 3,420,915.33 |
| 10,252.00 | 90.06 | 355.12 | 6,136.81 | 4,144.77 | -387.68 | 40° 43' 35.086 N | 103° 58' 52.796 W | 1,511,080.86 | 3,420,907.54 |
| 10,370.00 | 90.15 | 354.02 | 6,136.59 | 4,262.24 | -398.85 | 40° 43' 36.249 N | 103° 58' 52.915 W | 1,511,198.32 | 3,420,896.38 |
| 10,431.89 | 90.15 | 354.02 | 6,136.43 | 4,323.79 | -405.30 | 40° 43' 36.858 N | 103° 58' 52.985 W | 1,511,259.87 | 3,420,889.93 |
| 10,435.00 | 90.15 | 354.02 | 6,136.42 | 4,326.88 | -405.62 | 40° 43' 36.889 N | 103° 58' 52.988 W | 1,511,262.97 | 3,420,889.60 |

Design Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|--------------------------|--------------------------|-------------------|-----------------|---|
| | | +N/-S (usft) | +E/-W (usft) | |
| 350.00 | 350.00 | 0.42 | -0.81 | First Gyro Survey at 350.00 ft. |
| 575.00 | 575.00 | 0.49 | -0.78 | Final Gyro Survey at 575.00 ft. |
| 575.00 | 575.00 | 0.49 | -0.78 | Tie on to Gyro Survey at 575.00 ft. |
| 717.00 | 716.99 | 0.22 | 0.11 | First Sperry MWD Survey at 717.00 ft. |
| 10,370.00 | 6,136.59 | 4,262.24 | -398.85 | Final Sperry MWD Survey at 10370.00 ft. |
| 10,435.00 | 6,136.42 | 4,326.88 | -405.62 | Straight Line Projection to TD 10435.00 ft. |

Design Report for Brook LC28-75-1BHNC - Field Surveys

Vertical Section Information

| Angle Type | Target | Azimuth (°) | Origin Type | Origin +N/_S (usft) | Origin +E/-W (usft) | Start TVD (usft) |
|---------------|-------------------------|----------------|----------------|---------------------------|---------------------------|------------------------|
| Target | Brook LC28-75-1BHNC_BHL | 355.47 | Slot | 0.00 | 0.00 | 0.00 |

Survey tool program

| From (usft) | To (usft) | Survey/Plan | Survey Tool |
|----------------|--------------|--------------------------|-------------|
| 350.00 | 575.00 | Surface Gyros | Flexi-Shot |
| 717.00 | 6,446.00 | MWD Surveys-Intermediate | MWD+SC |
| 6,555.00 | 10,435.00 | MWD Surveys_ Production | MWD+SC |

Casing Details

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|-----------------------------|-----------------------------|--------|---------------------------|-------------------------|
| 619.00 | 619.00 | 9 5/8" | 9-5/8 | 13-3/4 |
| 6,498.00 | 6,131.53 | 7" | 7 | 8-3/4 |

Design Targets

| Shape | Target Name | TVD () | Northing () | Easting () | +N/-S | +E/-W | Created | Updated |
|-------|-------------|------------|-----------------|----------------|-------|-------|---------|---------|
|-------|-------------|------------|-----------------|----------------|-------|-------|---------|---------|

Directional Difficulty Index

| | | | |
|-------------------------------------|----------------|-------------------------------|----------------------------------|
| Average Dogleg over Survey: | 1.65 °/100usft | Maximum Dogleg over Survey: | 14.55 °/100usft at 6,190.00 usft |
| Net Tortousity applicable to Plans: | 0.63 °/100usft | Directional Difficulty Index: | 6.162 |

Design Report for Brook LC28-75-1BHNC - Field Surveys

Audit Info

North Reference Sheet for Sec. 28-T9N-R59W (LC28-15-A) - Brook LC28-75-1BHNC - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24ft @ 4867.00usft (H&P 273). Northing and Easting are relative to Brook LC28-75-1BHNC

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998963

Grid Coordinates of Well: 1,506,936.13 usft N, 3,421,295.22 usft E

Geographical Coordinates of Well: 40° 42' 54.07" N, 103° 58' 48.68" W

Grid Convergence at Surface is: 0.98°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,435.00usft

the Bottom Hole Displacement is 4,345.85usft in the Direction of 354.64° (Grid).

Magnetic Convergence at surface is: -7.11° (2 July 2014, , BGGM2013)

