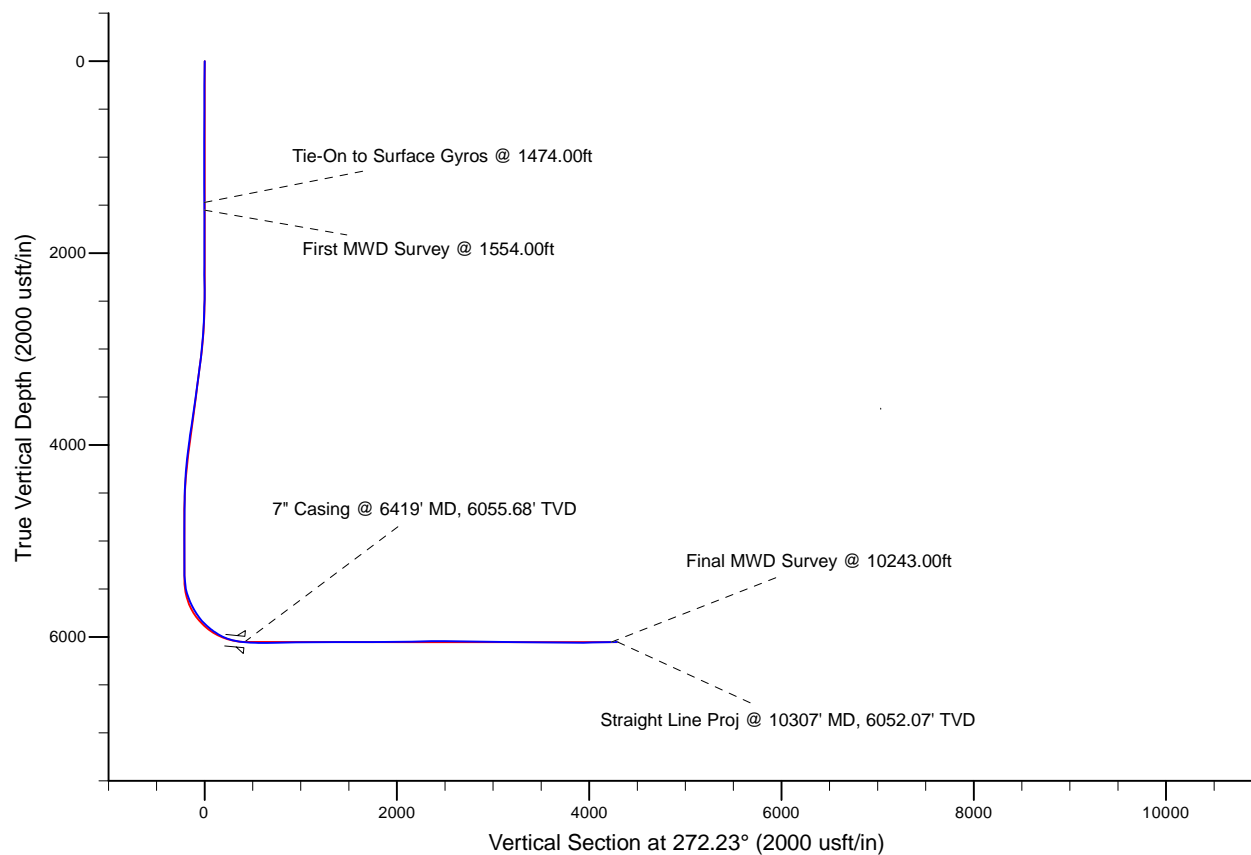
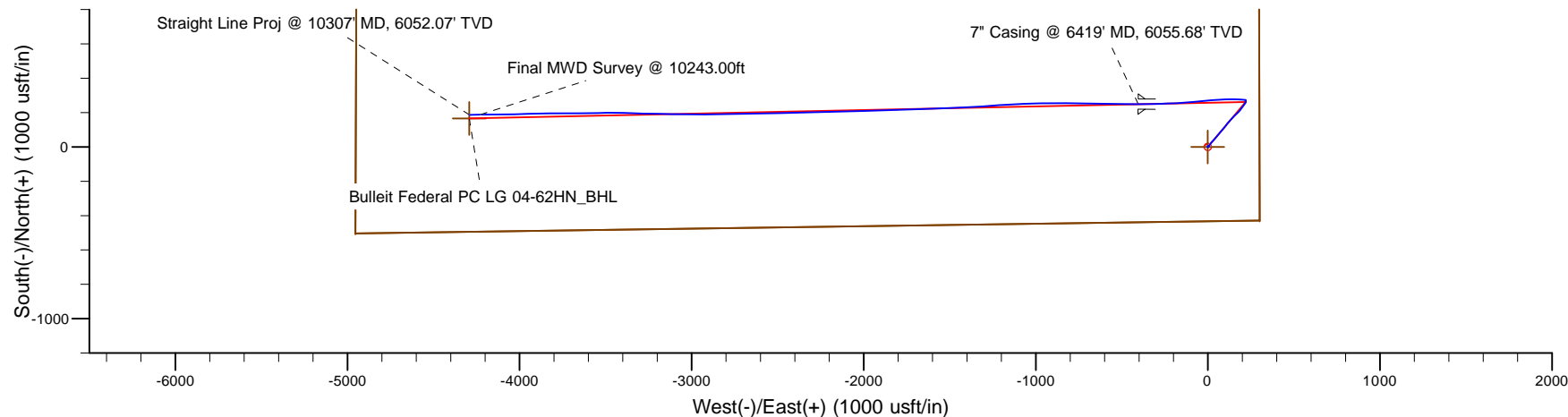


Project: Weld County, CO (NAD 83)
Site: Sec. 4-T8N-R59W (Bulleit Fed)
Well: Bulleit Federal PC LG 04-62HN
Wellbore: Plan A
Design: Final Surveys

Noble Energy

HALLIBURTON
Sperry Drilling



LEGEND

- Bulleit Federal PC LG 04-62HN, Plan A, Rev A0 - PROPOSAL V0
- Final Surveys

Platted SHL: 430' FSL, 300' FEL
Platted Lat/Long: 40.68528 N, 103.97292 W
Location: Sec. 4-T8N-R59W

7" Casing: ~688.43' FSL, ~704.88' FEL
Lat/Long: 40.685985 N, 103.974364 W
State Planes - CO Northern: 1,496,387.27' N, 3,423,092.15' E
Location: Sec. 4-T8N-R59W

BHL: ~682' FSL, ~661.26' FWL
Lat/Long: 40.685997 N, 103.988376 W
State Planes - CO Northern: 1,496,325.06' N, 3,419,206.51' E
Location: Sec. 4-T8N-R59W

WELL DETAILS: Bulleit Federal PC LG 04-62HN

Ground Level: 4814.00
RKB=24 @ 4838.00usft (H&P 315)

Created By: Fred Hartmann
Created On: 02/27/2014

Noble Energy

Weld County, CO (NAD 83)
Sec. 4-T8N-R59W (Bulleit Fed)
Bulleit Federal PC LG 04-62HN

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

27 February, 2014

Well Coordinates: 1,496,137.31 N, 3,423,496.87 E (40° 41' 07.01" N, 103° 58' 22.51" W)
Ground Level: 4,814.00 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 Bulleit Federal PC LG 04-62HN

RKB=24 @ 4838.00usft (H&P 315)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Bulleit Federal PC LG 04-62HN - Final 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
252.00	1.00	2.24	251.99	2.20	0.09	0.00	0.40
515.00	0.50	129.14	514.97	3.77	1.07	-0.92	0.52
832.00	0.20	29.64	831.97	3.37	2.41	-2.28	0.18
1,046.00	0.30	54.14	1,045.97	4.03	3.05	-2.89	0.07
1,292.00	0.60	311.24	1,291.96	5.25	2.60	-2.40	0.30
1,474.00	0.40	166.54	1,473.96	5.26	2.04	-1.83	0.52
Tie-On to Surface Gyros @ 1474.00ft							
1,554.00	0.31	195.29	1,553.96	4.78	2.04	-1.86	0.25
First MWD Survey @ 1554.00ft							
1,649.00	0.46	199.38	1,648.96	4.18	1.85	-1.69	0.16
1,743.00	0.44	184.43	1,742.95	3.46	1.70	-1.56	0.13
1,838.00	0.47	192.51	1,837.95	2.72	1.58	-1.48	0.07
1,933.00	0.50	190.35	1,932.95	1.93	1.42	-1.35	0.04
2,028.00	0.47	219.26	2,027.94	1.22	1.10	-1.06	0.26
2,123.00	0.52	216.06	2,122.94	0.57	0.60	-0.58	0.06
2,218.00	0.60	191.85	2,217.94	-0.27	0.25	-0.26	0.26
2,313.00	0.50	203.04	2,312.93	-1.14	-0.02	-0.03	0.15
2,407.00	0.50	202.17	2,406.93	-1.89	-0.33	0.26	0.01
2,502.00	1.55	74.08	2,501.92	-1.92	0.75	-0.82	2.00
2,597.00	3.38	38.54	2,596.83	0.62	3.73	-3.70	2.42
2,692.00	4.60	26.76	2,691.60	6.21	7.19	-6.94	1.54
2,787.00	6.38	34.72	2,786.16	13.95	11.91	-11.36	2.03
2,882.00	7.38	38.90	2,880.48	23.04	18.75	-17.84	1.18
2,977.00	8.85	39.13	2,974.52	33.46	27.19	-25.87	1.55
3,072.00	9.56	43.61	3,068.30	44.84	37.25	-35.47	1.06
3,167.00	11.16	40.54	3,161.75	57.54	48.66	-46.39	1.78
3,261.00	12.49	40.91	3,253.75	72.13	61.23	-58.38	1.42
3,356.00	12.73	39.94	3,346.46	87.92	74.68	-71.20	0.34
3,451.00	12.64	39.14	3,439.14	104.01	87.96	-83.85	0.21
3,546.00	13.01	38.26	3,531.77	120.47	101.14	-96.38	0.44
3,640.00	13.22	37.76	3,623.32	137.27	114.28	-108.85	0.25
3,735.00	13.03	43.79	3,715.84	153.59	128.34	-122.27	1.45
3,830.00	12.96	43.35	3,808.41	169.07	143.06	-136.38	0.13
3,925.00	12.30	45.40	3,901.11	183.92	157.58	-150.31	0.84
4,020.00	10.99	47.03	3,994.15	197.20	171.41	-163.62	1.42
4,115.00	10.94	42.09	4,087.42	210.06	184.08	-175.78	0.99
4,210.00	9.52	35.78	4,180.91	223.13	194.72	-185.90	1.90
4,305.00	7.49	35.62	4,274.86	234.53	202.92	-193.65	2.14
4,400.00	5.72	36.28	4,369.23	243.38	209.33	-199.71	1.86
4,495.00	4.92	38.38	4,463.82	250.39	214.66	-204.76	0.87
4,589.00	3.15	27.05	4,557.58	255.85	218.34	-208.22	2.06
4,684.00	2.35	12.95	4,652.47	260.08	219.96	-209.68	1.10
4,779.00	1.51	357.99	4,747.42	263.23	220.35	-209.95	1.02
4,874.00	1.21	357.10	4,842.39	265.48	220.26	-209.77	0.32
4,969.00	1.09	346.65	4,937.37	267.36	220.00	-209.44	0.25
5,064.00	0.98	1.75	5,032.36	269.05	219.81	-209.19	0.31
5,158.00	0.95	14.59	5,126.35	270.61	220.03	-209.35	0.23
5,253.00	0.70	9.84	5,221.34	271.94	220.33	-209.59	0.27
5,347.00	0.49	15.41	5,315.33	272.90	220.54	-209.76	0.23

Design Report for Bulleit Federal PC LG 04-62HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,393.00	0.67	5.24	5,361.33	273.35	220.61	-209.82	0.45
5,534.00	12.05	275.88	5,501.29	275.69	205.99	-195.12	8.55
5,582.00	17.21	275.06	5,547.71	276.83	193.93	-183.02	10.76
5,629.00	20.59	271.95	5,592.18	277.73	178.74	-167.81	7.50
5,677.00	23.92	271.16	5,636.59	278.21	160.57	-149.63	6.97
5,724.00	27.09	271.29	5,679.01	278.64	140.34	-129.40	6.75
5,772.00	29.75	268.50	5,721.22	278.58	117.50	-106.58	6.19
5,819.00	33.73	267.13	5,761.18	277.62	92.80	-81.94	8.61
5,867.00	37.95	265.53	5,800.09	275.80	64.76	-53.99	9.01
5,914.00	41.77	264.44	5,836.16	273.16	34.76	-24.12	8.26
5,962.00	46.17	264.19	5,870.70	269.85	1.61	8.88	9.17
6,008.00	50.07	264.94	5,901.40	266.62	-32.48	42.82	8.56
6,056.00	52.87	265.47	5,931.30	263.48	-69.89	80.08	5.90
6,103.00	56.30	266.26	5,958.53	260.73	-108.09	118.15	7.43
6,151.00	60.81	266.22	5,983.56	258.04	-148.94	158.86	9.40
6,198.00	66.22	266.99	6,004.52	255.56	-190.92	200.71	11.60
6,246.00	71.05	267.99	6,022.00	253.61	-235.57	245.25	10.25
6,293.00	75.42	267.58	6,035.55	251.87	-280.52	290.10	9.34
6,336.00	79.37	268.60	6,044.93	250.47	-322.45	331.95	9.47
6,371.00	82.65	269.74	6,050.40	249.97	-357.02	366.46	9.91
6,419.00	84.73	270.25	6,055.68	249.97	-404.72	414.13	4.45
7" Casing @ 6419' MD, 6055.68' TVD							
6,471.00	86.98	270.79	6,059.44	250.44	-456.58	465.97	4.45
6,566.00	89.41	270.63	6,062.43	251.61	-551.52	560.88	2.56
6,661.00	90.68	269.88	6,062.36	252.03	-646.52	655.83	1.55
6,756.00	90.25	271.29	6,061.58	253.00	-741.50	750.78	1.55
6,851.00	90.99	271.84	6,060.56	255.60	-836.46	845.77	0.97
6,946.00	91.82	268.61	6,058.23	255.97	-931.42	940.67	3.51
7,041.00	91.26	267.92	6,055.67	253.10	-1,026.34	1,035.41	0.94
7,135.00	90.18	267.02	6,054.49	248.95	-1,120.24	1,129.07	1.50
7,230.00	89.97	266.50	6,054.37	243.58	-1,215.09	1,223.64	0.59
7,325.00	89.41	265.35	6,054.88	236.83	-1,309.84	1,318.06	1.35
7,420.00	90.31	267.74	6,055.11	231.10	-1,404.66	1,412.59	2.69
7,515.00	89.97	267.51	6,054.88	227.17	-1,499.58	1,507.28	0.43
7,609.00	90.12	267.81	6,054.81	223.33	-1,593.50	1,600.98	0.36
7,704.00	90.12	267.83	6,054.61	219.71	-1,688.43	1,695.70	0.02
7,799.00	90.31	267.98	6,054.25	216.24	-1,783.37	1,790.43	0.25
7,894.00	90.59	268.54	6,053.51	213.36	-1,878.32	1,885.20	0.66
7,989.00	90.65	268.51	6,052.48	210.91	-1,973.28	1,979.99	0.07
8,083.00	90.89	268.64	6,051.22	208.57	-2,067.25	2,073.79	0.29
8,178.00	91.39	268.73	6,049.33	206.40	-2,162.20	2,168.59	0.53
8,273.00	91.66	268.20	6,046.80	203.85	-2,257.13	2,263.35	0.63
8,368.00	90.80	267.70	6,044.76	200.45	-2,352.05	2,358.07	1.05
8,462.00	89.97	268.82	6,044.13	197.60	-2,446.00	2,451.84	1.48
8,557.00	88.89	269.31	6,045.07	196.05	-2,540.98	2,546.69	1.25
8,652.00	88.98	269.07	6,046.84	194.71	-2,635.96	2,641.54	0.27
8,747.00	89.29	269.18	6,048.27	193.26	-2,730.94	2,736.39	0.35
8,842.00	89.04	268.70	6,049.66	191.50	-2,825.91	2,831.22	0.57
8,937.00	89.91	269.41	6,050.53	189.93	-2,920.89	2,926.07	1.18
9,032.00	88.64	270.73	6,051.73	190.05	-3,015.88	3,020.99	1.93
9,127.00	88.67	270.90	6,053.96	191.40	-3,110.84	3,115.93	0.18

Design Report for Bulleit Federal PC LG 04-62HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,221.00	89.01	271.14	6,055.86	193.07	-3,204.81	3,209.89	0.44
9,316.00	90.62	272.35	6,056.17	195.96	-3,299.76	3,304.88	2.12
9,411.00	89.91	271.28	6,055.73	198.97	-3,394.71	3,399.88	1.35
9,506.00	89.01	269.25	6,056.62	199.41	-3,489.70	3,494.81	2.34
9,601.00	88.67	268.91	6,058.55	197.89	-3,584.67	3,589.65	0.51
9,696.00	89.51	269.69	6,060.06	196.73	-3,679.65	3,684.51	1.21
9,791.00	89.51	269.78	6,060.87	196.29	-3,774.64	3,779.42	0.09
9,858.00	89.45	268.69	6,061.48	195.39	-3,841.63	3,846.32	1.63
9,953.00	90.68	268.51	6,061.37	193.07	-3,936.60	3,941.13	1.31
10,048.00	91.20	268.89	6,059.81	190.92	-4,031.56	4,035.94	0.68
10,143.00	91.66	269.09	6,057.44	189.24	-4,126.52	4,130.76	0.53
10,243.00	91.97	269.65	6,054.27	188.14	-4,226.46	4,230.58	0.64
Final MWD Survey @ 10243.00ft							
10,307.00	91.97	269.65	6,052.07	187.75	-4,290.42	4,294.48	0.00
Straight Line Proj @ 10307' MD, 6052.07' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,474.00	1,473.96	5.26	2.04	Tie-On to Surface Gyros @ 1474.00ft
1,554.00	1,553.96	4.78	2.04	First MWD Survey @ 1554.00ft
10,243.00	6,054.27	188.14	-4,226.46	Final MWD Survey @ 10243.00ft
10,307.00	6,052.07	187.75	-4,290.42	Straight Line Proj @ 10307' MD, 6052.07' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Bulleit Federal PC LG 04-62HN_BHL	272.23	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
252.00	1,474.00	Surface Gyros	Flexi-Shot
1,554.00	6,371.00	MWD Surveys - Intermediate	MWD
6,471.00	10,243.00	MWD Surveys - Production	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,419.00	6,055.68	7" Casing @ 6419' MD, 6055.68' TVD	7	8-3/4

Design Report for Bulleit Federal PC LG 04-62HN - Final 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
Bulleit Federal PC LG	0.00	0.00	0.00	0.01	0.00	1,496,137.32	3,423,496.87	40.685280	-103.972920
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	5,024.12	-4,936.96	1,501,161.36	3,418,559.98	
Point 2				0.00	-503.85	-4,953.80	1,495,633.47	3,418,543.14	
Point 3				0.00	-428.42	301.41	1,495,708.90	3,423,798.27	
Point 4				0.00	5,150.13	291.24	1,501,287.37	3,423,788.10	
Point 5				0.00	5,024.12	-4,936.96	1,501,161.36	3,418,559.98	
Bulleit Federal PC LG	0.00	0.00	0.00	0.01	0.00	1,496,137.32	3,423,496.87	40.685280	-103.972920
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	4,424.11	-4,336.95	1,500,561.36	3,419,159.98	
Point 2				0.00	96.15	-4,353.79	1,496,233.47	3,419,143.14	
Point 3				0.00	171.59	-298.60	1,496,308.90	3,423,198.27	
Point 4				0.00	4,550.12	-308.77	1,500,687.37	3,423,188.10	
Point 5				0.00	4,424.11	-4,336.95	1,500,561.36	3,419,159.98	
Bulleit Federal PC LG	0.00	0.00	0.00	0.01	0.00	1,496,137.32	3,423,496.87	40.685280	-103.972920
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
Bulleit Federal PC LG	0.00	0.00	5,416.15	262.27	220.07	1,496,399.58	3,423,716.93	40.685989	-103.972110
- actual wellpath misses target center by 11.94usft at 5447.49usft MD (5415.76 TVD, 274.09 N, 218.46 E)									
- Circle (radius 35.00)									
Bulleit Federal PC LG	0.00	0.00	6,055.00	166.97	-4,291.18	1,496,304.28	3,419,205.75	40.685940	-103.988380
- actual wellpath misses target center by 21.00usft at 10307.00usft MD (6052.07 TVD, 187.75 N, -4290.42 E)									
- Point									
Bulleit Federal PC LG	0.00	0.00	6,055.00	0.01	0.00	1,496,137.32	3,423,496.87	40.685280	-103.972920
- actual wellpath misses target center by 297.61usft at 6086.33usft MD (5949.13 TVD, 261.66 N, -94.35 E)									
- Polygon									
Point 1				6,055.00	284.30	-394.19	1,496,421.61	3,423,102.68	
Point 2				6,055.00	214.30	-394.19	1,496,351.61	3,423,102.68	
Point 3				6,055.00	131.96	-4,291.18	1,496,269.28	3,419,205.75	
Point 4				6,055.00	201.97	-4,291.18	1,496,339.28	3,419,205.75	
Point 5				6,055.00	284.30	-394.19	1,496,421.61	3,423,102.68	

Directional Difficulty Index

Average Dogleg over Survey:	1.61 °/100usft	Maximum Dogleg over Survey:	11.60 °/100usft at 6,198.00 usft
Net Tortosity applicable to Plans:	0.50 °/100usft	Directional Difficulty Index:	6.139

Audit Info

North Reference Sheet for Sec. 4-T8N-R59W (Bulleit Fed) - Bulleit Federal PC LG
04-62HN

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

Vertical Depths are relative to RKB=24 @ 4838.00usft (H&P 315). Northing and Easting are relative to Bulleit Federal PC LG 04-62HN

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998556

Grid Coordinates of Well: 1,496,137.31 usft N, 3,423,496.87 usft E

Geographical Coordinates of Well: 40° 41' 07.01" N, 103° 58' 22.51" W

Grid Convergence at Surface is: 0.99°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,307.00usft
the Bottom Hole Displacement is 4,294.53usft in the Direction of 272.51° (Grid).

Magnetic Convergence at surface is: -7.15° (22 January 2014, , BGGM2013)

