

Noble Energy

Weld County, CO (NAD 83)

Sec. 17-T6N-R63W

Colt A13-662

05-123-40925

Original Wellbore

Design: Actual Surveys

05-123-40925

Sperry Drilling Services

Standard Report

06 May, 2015

Surface UWI : 05-123-40925

Well Coordinates: 1,422,257.40 N, 3,286,818.16 E (40° 29' 16.51" N, 104° 28' 07.72" W)

Ground Level: 4,661.00 usft

Local Coordinate Origin:

Centered on Well Colt A13-662

Viewing Datum:

KB @ 4685.00usft (HP 343)

TVDs to System:

N

North Reference:

Grid

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

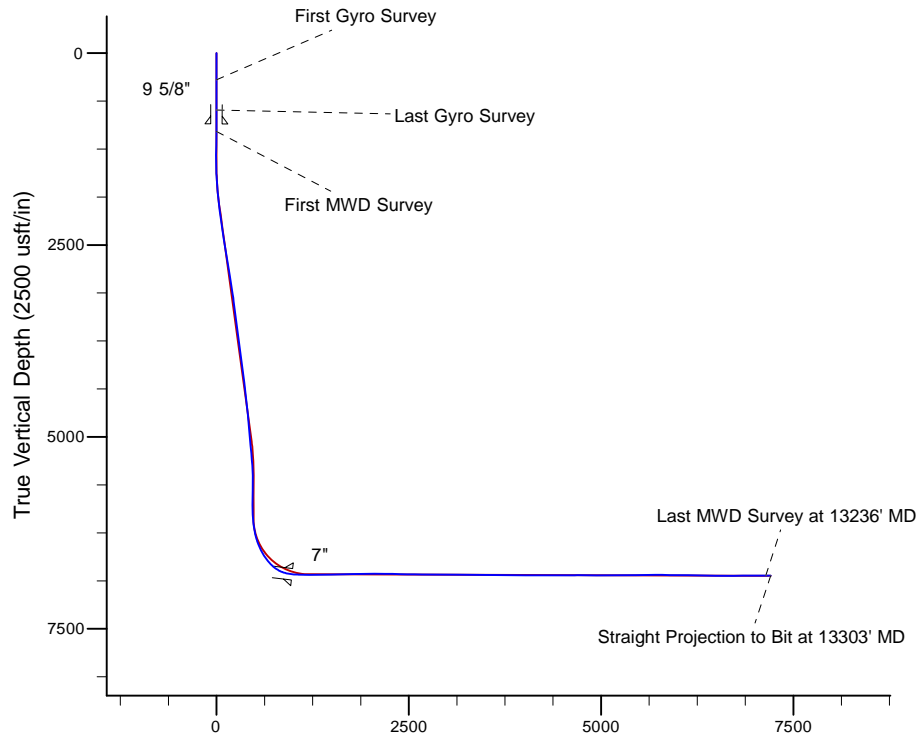
Version: 5000.1 Build: 73

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 17-T6N-R63W
Well: Colt A13-662
Wellbore: Original Wellbore
Design: Actual Surveys

Noble Energy

HALLIBURTON
Sperry Drilling



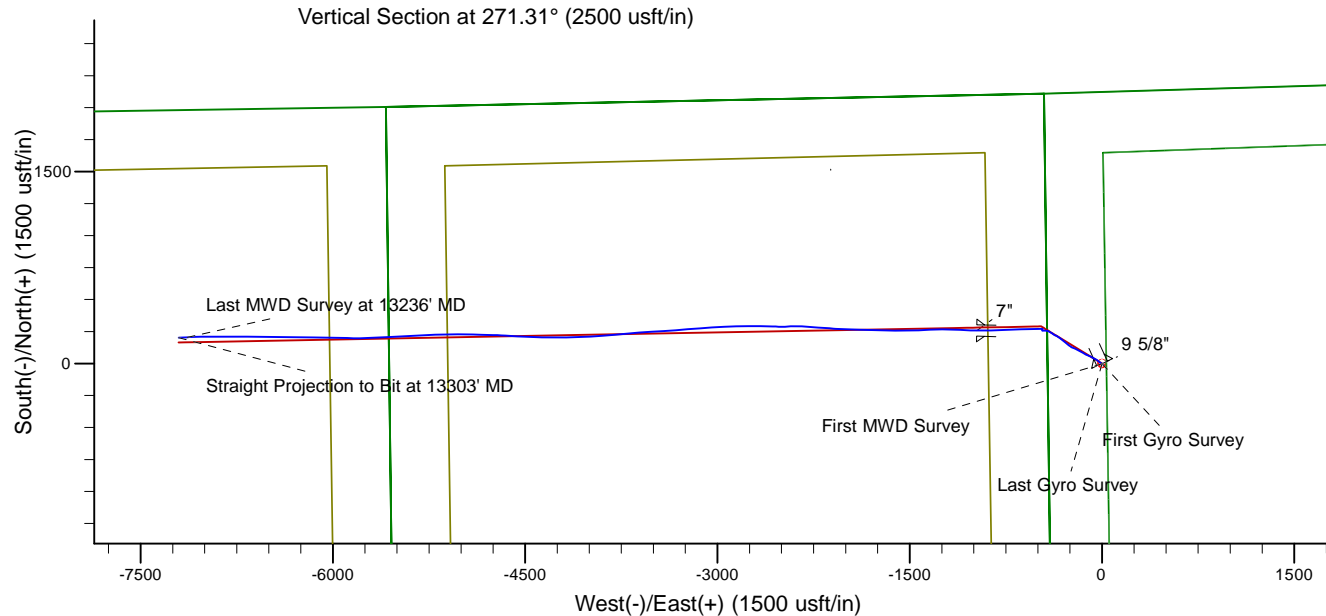
Platted SHL: 2120 FNL, 424 FWL
Platted Lat/Long: 40.487920 N, 104.468810 W
Location: Sec. 17-T6N-R63W

~7" Casing: 1814' FNL, 622' FEL
Lat/Long: 40.488659 N, 104.472311 W
State Planes - CO Northern: 1422515.35 N, 3285841.28 E
Location: Sec. 17-T6N-R63W

Platted BHL: 1815 FNL, 1640 FEL
Lat/Long: 40.4886 N, 104.4947 W
State Planes - CO Northern: 1422422.42 N, 3279614.55 E
Location: Sec. Sec. 13-T6N-R64W

LEGEND

- Colt A13-662, Original Wellbore, Rev B0 V0
- Actual Surveys



WELL DETAILS: Colt A13-662

Ground Level: 4661.00
KB @ 4685.00usft (HP 343)

Created By: Amanda Marchand
Created On: 5/6/2015

Design Report for Colt A13-662 - Actual 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
347.00	0.00	0.00	347.00	0.00	0.00	0.00	0.00
First Gyro Survey							
741.00	0.20	141.33	741.00	-0.54	0.43	-0.44	0.05
Last Gyro Survey							
1,020.00	0.43	158.78	1,019.99	-1.89	1.11	-1.16	0.09
First MWD Survey							
1,208.00	0.66	161.59	1,207.99	-3.58	1.71	-1.79	0.12
1,300.00	0.75	158.14	1,299.98	-4.64	2.10	-2.21	0.11
1,486.00	0.65	193.42	1,485.97	-6.80	2.31	-2.47	0.23
1,579.00	2.60	307.41	1,578.94	-6.03	0.51	-0.65	3.15
1,764.00	5.08	311.05	1,763.51	1.90	-9.00	9.04	1.35
1,857.00	7.57	312.34	1,855.93	8.73	-16.63	16.83	2.68
1,949.00	9.58	306.21	1,946.90	17.34	-27.29	27.68	2.40
2,042.00	9.22	302.94	2,038.65	25.96	-39.79	40.37	0.69
2,136.00	8.81	299.86	2,131.49	33.64	-52.35	53.11	0.67
2,227.00	8.52	295.99	2,221.45	40.06	-64.45	65.35	0.72
2,320.00	10.25	298.84	2,313.21	47.07	-77.90	78.95	1.93
2,412.00	9.55	296.49	2,403.84	54.43	-91.90	93.12	0.88
2,504.00	9.26	294.08	2,494.60	60.85	-105.49	106.85	0.53
2,596.00	8.85	291.14	2,585.45	66.42	-118.84	120.33	0.67
2,689.00	10.58	301.59	2,677.12	73.48	-132.79	134.44	2.65
2,782.00	10.28	300.39	2,768.59	82.15	-147.22	149.07	0.40
2,875.00	10.65	299.82	2,860.04	90.62	-161.84	163.87	0.41
3,065.00	10.01	297.77	3,046.96	107.04	-191.68	194.08	0.39
3,160.00	9.89	293.63	3,140.53	114.16	-206.46	209.02	0.76
3,255.00	8.54	291.60	3,234.30	120.03	-220.49	223.18	1.46
3,350.00	6.90	292.68	3,328.44	124.83	-232.32	235.12	1.73
3,446.00	8.65	304.84	3,423.56	131.17	-243.57	246.51	2.49
3,541.00	7.27	305.24	3,517.64	138.72	-254.34	257.45	1.45
3,636.00	9.40	308.60	3,611.63	147.03	-265.31	268.61	2.30
3,825.00	11.03	310.23	3,797.63	168.34	-291.18	294.96	0.88
3,920.00	11.56	310.60	3,890.79	180.41	-305.35	309.40	0.56
4,015.00	9.72	308.13	3,984.16	191.55	-318.88	323.19	2.00
4,110.00	8.81	304.05	4,077.92	200.58	-331.22	335.73	1.18
4,300.00	6.39	298.40	4,266.24	213.76	-352.58	357.38	1.33
4,394.00	7.45	294.91	4,359.55	218.81	-362.71	367.62	1.21
4,489.00	7.13	297.27	4,453.78	224.11	-373.53	378.57	0.46
4,584.00	7.90	305.50	4,547.97	230.60	-384.09	389.27	1.39
4,679.00	6.31	310.86	4,642.24	237.81	-393.35	398.70	1.81
4,774.00	6.53	301.26	4,736.64	244.02	-401.92	407.40	1.15
4,964.00	5.15	291.35	4,925.66	252.74	-419.10	424.78	0.90
5,059.00	6.06	278.76	5,020.21	255.05	-428.03	433.76	1.60
5,155.00	5.38	273.33	5,115.73	256.09	-437.53	443.28	0.90
5,250.00	5.16	274.49	5,210.33	256.68	-446.23	451.99	0.26
5,345.00	4.32	269.34	5,305.00	256.97	-454.07	459.84	0.99
5,535.00	2.14	289.42	5,494.69	258.07	-464.57	470.36	1.28
5,630.00	1.51	356.39	5,589.65	259.91	-466.32	472.15	2.19
5,725.00	1.79	0.17	5,684.62	262.64	-466.40	472.29	0.32
5,820.00	1.35	25.55	5,779.58	265.13	-465.91	471.86	0.86

Design Report for Colt A13-662 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,915.00	2.37	29.17	5,874.53	267.86	-464.47	470.48	1.08
6,010.00	0.62	17.21	5,969.49	270.07	-463.36	469.43	1.86
6,105.00	4.07	267.27	6,064.42	270.40	-466.58	472.65	4.55
6,199.00	9.15	272.16	6,157.76	270.52	-477.39	483.46	5.43
6,294.00	11.21	266.25	6,251.26	270.20	-494.15	500.21	2.43
6,389.00	17.29	267.00	6,343.30	268.86	-517.49	523.51	6.40
6,484.00	23.20	270.45	6,432.39	268.26	-550.33	556.33	6.34
6,579.00	30.50	271.28	6,517.09	268.95	-593.20	599.20	7.69
6,674.00	37.35	267.69	6,595.88	268.33	-646.16	652.14	7.51
6,768.00	44.81	266.85	6,666.69	265.35	-707.81	713.71	7.96
6,863.00	57.55	266.42	6,726.12	260.99	-781.55	787.32	13.42
6,958.00	72.47	268.73	6,766.14	257.46	-867.33	873.00	15.86
7,016.00	79.34	270.48	6,780.26	257.09	-923.55	929.19	12.20
7,155.00	89.85	272.80	6,793.34	261.07	-1,061.67	1,067.37	7.74
7,247.00	89.88	271.38	6,793.56	264.42	-1,153.61	1,159.36	1.54
7,340.00	90.09	270.46	6,793.58	265.92	-1,246.59	1,252.36	1.01
7,433.00	89.69	267.92	6,793.76	264.60	-1,339.58	1,345.28	2.76
7,526.00	89.45	265.82	6,794.46	259.53	-1,432.43	1,438.00	2.27
7,633.00	90.74	270.90	6,794.28	256.46	-1,539.35	1,544.82	4.90
7,714.00	91.73	271.45	6,792.53	258.12	-1,620.31	1,625.80	1.40
7,809.00	92.87	271.32	6,788.72	260.42	-1,715.20	1,720.72	1.21
7,904.00	92.19	270.87	6,784.53	262.23	-1,810.09	1,815.62	0.86
7,999.00	90.92	271.59	6,781.95	264.27	-1,905.03	1,910.59	1.54
8,094.00	89.32	271.27	6,781.75	266.64	-2,000.00	2,005.58	1.72
8,189.00	89.75	275.46	6,782.52	272.22	-2,094.81	2,100.50	4.43
8,284.00	89.17	273.05	6,783.42	279.26	-2,189.54	2,195.36	2.61
8,379.00	89.48	275.69	6,784.54	286.50	-2,284.25	2,290.21	2.80
8,474.00	88.55	268.41	6,786.17	289.90	-2,379.11	2,385.12	7.72
8,569.00	88.92	269.11	6,788.27	287.84	-2,474.06	2,480.01	0.83
8,664.00	89.04	272.58	6,789.96	289.24	-2,569.02	2,574.97	3.65
8,759.00	89.29	270.83	6,791.34	292.07	-2,663.97	2,669.96	1.86
8,853.00	88.68	268.65	6,793.01	291.64	-2,757.94	2,763.90	2.41
8,949.00	89.72	269.82	6,794.35	290.36	-2,853.92	2,859.83	1.63
9,044.00	89.75	266.72	6,794.79	287.49	-2,948.87	2,954.68	3.26
9,139.00	90.43	265.97	6,794.64	281.44	-3,043.67	3,049.32	1.07
9,234.00	91.66	265.79	6,792.91	274.61	-3,138.41	3,143.88	1.31
9,329.00	88.67	265.44	6,792.63	267.35	-3,233.12	3,238.40	3.17
9,424.00	88.00	264.89	6,795.39	259.35	-3,327.74	3,332.81	0.91
9,520.00	89.51	267.67	6,797.48	253.12	-3,423.50	3,428.40	3.29
9,614.00	89.48	267.40	6,798.31	249.08	-3,517.41	3,522.20	0.29
9,709.00	88.43	264.31	6,800.04	242.22	-3,612.14	3,616.74	3.43
9,804.00	89.01	264.68	6,802.16	233.10	-3,706.67	3,711.04	0.72
9,899.00	90.62	265.04	6,802.47	224.59	-3,801.29	3,805.44	1.74
9,994.00	90.71	265.89	6,801.37	217.08	-3,895.98	3,899.93	0.90
10,089.00	90.80	267.18	6,800.12	211.34	-3,990.80	3,994.59	1.36
10,184.00	90.43	267.72	6,799.10	207.12	-4,085.70	4,089.37	0.69
10,278.00	89.72	268.03	6,798.97	203.63	-4,179.63	4,183.20	0.82
10,373.00	89.48	271.76	6,799.64	203.46	-4,274.62	4,278.15	3.93
10,468.00	88.52	270.33	6,801.30	205.19	-4,369.58	4,373.14	1.81
10,564.00	90.15	272.75	6,802.41	207.77	-4,465.53	4,469.12	3.04
10,659.00	90.52	273.45	6,801.85	212.91	-4,560.39	4,564.07	0.83

Design Report for Colt A13-662 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
10,753.00	90.71	273.16	6,800.85	218.32	-4,654.23	4,658.01	0.37
10,848.00	88.77	271.32	6,801.28	222.04	-4,749.14	4,752.98	2.81
10,943.00	89.04	270.99	6,803.09	223.95	-4,844.11	4,847.97	0.45
11,038.00	90.34	271.40	6,803.61	225.93	-4,939.08	4,942.96	1.43
11,133.00	90.15	270.03	6,803.20	227.12	-5,034.07	5,037.95	1.46
11,228.00	90.93	269.79	6,802.30	226.97	-5,129.07	5,132.92	0.86
11,323.00	90.65	268.42	6,800.99	225.49	-5,224.04	5,227.84	1.47
11,418.00	90.15	266.83	6,800.33	221.55	-5,318.96	5,322.64	1.75
11,513.00	90.22	265.91	6,800.02	215.53	-5,413.77	5,417.28	0.97
11,608.00	90.18	266.93	6,799.69	209.60	-5,508.58	5,511.93	1.07
11,703.00	90.49	265.75	6,799.14	203.54	-5,603.38	5,606.57	1.28
11,798.00	90.77	267.97	6,798.09	198.33	-5,698.23	5,701.27	2.36
11,892.00	89.85	270.25	6,797.58	196.87	-5,792.21	5,795.20	2.62
11,988.00	88.89	271.40	6,798.64	198.26	-5,888.19	5,891.18	1.56
12,083.00	89.14	271.18	6,800.27	200.40	-5,983.15	5,986.17	0.35
12,178.00	90.59	271.06	6,800.50	202.25	-6,078.13	6,081.17	1.53
12,272.00	88.15	271.07	6,801.53	204.00	-6,172.10	6,175.15	2.60
12,367.00	88.34	270.89	6,804.44	205.62	-6,267.04	6,270.11	0.28
12,462.00	88.74	271.14	6,806.86	207.31	-6,362.00	6,365.07	0.50
12,557.00	89.60	270.68	6,808.24	208.81	-6,456.97	6,460.06	1.03
12,652.00	89.75	269.97	6,808.78	209.35	-6,551.97	6,555.04	0.76
12,747.00	89.45	268.68	6,809.44	208.23	-6,646.96	6,649.98	1.39
12,843.00	90.77	270.87	6,809.25	207.86	-6,742.95	6,745.94	2.66
12,938.00	91.30	271.22	6,807.54	209.59	-6,837.92	6,840.92	0.67
13,032.00	89.72	269.34	6,806.70	210.05	-6,931.91	6,934.90	2.61
13,127.00	89.91	269.00	6,807.01	208.67	-7,026.89	7,029.83	0.41
13,221.00	89.94	267.60	6,807.13	205.88	-7,120.85	7,123.70	1.49
13,236.00	89.38	266.70	6,807.22	205.14	-7,135.83	7,138.66	7.07
Last MWD Survey at 13236' MD							
13,303.00	89.38	266.70	6,807.95	201.28	-7,202.72	7,205.44	0.00
Straight Projection to Bit at 13303' MD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
347.00	347.00	0.00	0.00	First Gyro Survey
741.00	741.00	-0.54	0.43	Last Gyro Survey
1,020.00	1,019.99	-1.89	1.11	First MWD Survey
13,236.00	6,807.22	205.14	-7,135.83	Last MWD Survey at 13236' MD
13,303.00	6,807.95	201.28	-7,202.72	Straight Projection to Bit at 13303' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Colt A13-662_BHL	271.31	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
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Design Report for Colt A13-662 - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
347.00	741.00	Gyro Surveys	Flexi-Shot
1,020.00	7,016.00	Intermediate Surveys	MWD+IFR1+MS_WY
7,155.00	13,303.00	Production Surveys	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
923.00	923.00	9 5/8"	9-5/8	13-3/4
7,070.00	6,788.35	7"	7	8-3/4

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
Colt A13-662_BHL	0.00	0.00	6,809.15	165.03	-7,203.86	1,422,422.42	3,279,614.55	40.488600	-104.494700
- actual wellpath misses target center by 36.29usft at 13303.00usft MD (6807.95 TVD, 201.28 N, -7202.72 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.96 °/100usft	Maximum Dogleg over Survey:	15.86 °/100usft at 6,958.00 usft
Net Tortousity applicable to Plans:	1.15 °/100usft	Directional Difficulty Index:	6.572

Audit Info

North Reference Sheet for Sec. 17-T6N-R63W - Colt A13-662 - Original Wellbore

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

Vertical Depths are relative to KB @ 4685.00usft (HP 343). Northing and Easting are relative to Colt A13-662

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: 0.99996539

Grid Coordinates of Well: 1,422,257.40 usft N, 3,286,818.16 usft E

Geographical Coordinates of Well: 40° 29' 16.51" N, 104° 28' 07.72" W

Grid Convergence at Surface is: 0.67°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,303.00usft the Bottom Hole Displacement is 7,205.53usft in the Direction of 271.60° (Grid).

Magnetic Convergence at surface is: -7.65° (3 March 2015, , BGGM2014)

