

Continental Resources, Inc.

Weld County, CO
Sec. 31-T8N-R61W
Staudinger 1-31H

Sidetrack #1

Design: MWD Survey

Sperry Drilling Services Standard Report

12 December, 2011

Well Coordinates: 1,472,783.87 N, 3,349,070.23 E (40° 37' 27.82" N, 104° 14' 32.81" W)
Ground Level: 4,980.00 ft

Local Coordinate Origin:	Centered on Well Staudinger 1-31H
Viewing Datum:	RKB 16' @ 4996.00ft (Cyclone 12)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 2003.16 Build: 431

HALLIBURTON

HALLIBURTON**Design Report for Staudinger 1-31H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
546.00	0.71	206.26	545.99	-3.03	-1.50	3.00	0.13
638.00	0.62	215.12	637.98	-3.95	-2.04	3.90	0.15
728.00	0.92	209.02	727.97	-4.98	-2.67	4.92	0.35
820.00	1.08	216.90	819.96	-6.32	-3.54	6.23	0.23
910.00	1.19	212.94	909.94	-7.78	-4.56	7.67	0.15
1,002.00	1.14	202.06	1,001.92	-9.43	-5.43	9.30	0.25
1,093.00	1.23	209.44	1,092.90	-11.12	-6.25	10.97	0.19
1,184.00	1.53	207.38	1,183.88	-13.05	-7.28	12.87	0.33
1,275.00	1.59	203.64	1,274.84	-15.29	-8.35	15.08	0.13
1,366.00	1.50	205.20	1,365.81	-17.52	-9.36	17.29	0.11
1,456.00	0.69	150.31	1,455.79	-19.06	-9.60	18.82	1.38
1,548.00	0.87	129.81	1,547.78	-19.99	-8.78	19.77	0.36
1,642.00	0.94	137.71	1,641.77	-21.01	-7.72	20.82	0.15
1,735.00	0.89	154.56	1,734.76	-22.23	-6.89	22.06	0.29
1,828.00	0.77	143.30	1,827.75	-23.38	-6.21	23.23	0.22
1,921.00	0.68	133.11	1,920.74	-24.26	-5.43	24.13	0.17
2,013.00	0.39	115.02	2,012.74	-24.77	-4.75	24.65	0.36
2,107.00	0.44	151.36	2,106.74	-25.22	-4.29	25.11	0.28
2,201.00	0.47	166.03	2,200.73	-25.91	-4.02	25.81	0.13
2,295.00	0.32	205.77	2,294.73	-26.52	-4.04	26.42	0.32
2,389.00	0.20	213.07	2,388.73	-26.90	-4.25	26.79	0.13
2,483.00	0.44	202.19	2,482.73	-27.37	-4.47	27.25	0.26
2,577.00	0.71	191.71	2,576.73	-28.27	-4.73	28.15	0.31
2,671.00	0.47	209.64	2,670.72	-29.18	-5.04	29.05	0.32
2,765.00	0.34	203.71	2,764.72	-29.77	-5.34	29.63	0.15
2,858.00	0.17	214.21	2,857.72	-30.13	-5.53	29.99	0.19
2,952.00	0.18	114.38	2,951.72	-30.31	-5.47	30.17	0.28
3,045.00	0.22	93.55	3,044.72	-30.38	-5.16	30.25	0.09
3,139.00	0.00	338.00	3,138.72	-30.39	-4.98	30.26	0.23
3,232.00	0.25	128.79	3,231.72	-30.52	-4.82	30.40	0.27
3,326.00	0.44	173.18	3,325.71	-31.01	-4.62	30.89	0.33
3,419.00	0.46	201.89	3,418.71	-31.71	-4.72	31.59	0.24
3,512.00	0.72	205.25	3,511.71	-32.58	-5.11	32.45	0.28
3,606.00	0.74	82.46	3,605.70	-33.04	-4.76	32.91	1.36
3,700.00	1.01	90.06	3,699.69	-32.96	-3.33	32.87	0.31
3,791.00	1.05	92.41	3,790.68	-32.99	-1.69	32.94	0.06
3,885.00	1.55	67.90	3,884.65	-32.55	0.35	32.55	0.78
3,979.00	1.59	59.11	3,978.62	-31.40	2.65	31.46	0.26
4,073.00	1.87	60.04	4,072.58	-29.97	5.09	30.08	0.30
4,166.00	2.01	18.35	4,165.53	-27.66	6.92	27.82	1.49
4,259.00	2.40	25.85	4,258.46	-24.36	8.28	24.55	0.52
4,352.00	1.00	13.67	4,351.41	-21.82	9.32	22.04	1.55
4,446.00	1.51	16.93	4,445.39	-19.84	9.88	20.07	0.55
4,540.00	1.81	16.40	4,539.35	-17.23	10.66	17.48	0.32
4,633.00	0.96	13.55	4,632.32	-15.06	11.26	15.33	0.92
4,727.00	0.95	359.83	4,726.31	-13.52	11.44	13.79	0.24
4,821.00	1.02	10.97	4,820.30	-11.92	11.60	12.19	0.22
4,915.00	1.30	0.29	4,914.28	-10.03	11.76	10.31	0.38
5,009.00	1.45	355.49	5,008.25	-7.78	11.67	8.06	0.20

Design Report for Staudinger 1-31H - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,103.00	1.55	0.13	5,102.22	-5.32	11.58	5.60	0.17
5,197.00	1.56	8.74	5,196.18	-2.79	11.78	3.07	0.25
5,291.00	1.73	355.01	5,290.15	-0.11	11.85	0.39	0.46
5,385.00	0.83	15.70	5,384.12	1.96	11.91	-1.67	1.06
5,478.00	1.20	18.10	5,477.11	3.53	12.40	-3.24	0.40
5,572.00	1.50	30.67	5,571.08	5.53	13.33	-5.21	0.45
5,666.00	0.63	85.21	5,665.07	6.63	14.47	-6.28	1.32
5,760.00	0.75	172.40	5,759.06	6.06	15.07	-5.70	1.02
5,853.00	0.40	159.03	5,852.06	5.16	15.26	-4.79	0.40
5,915.00	0.44	150.75	5,914.05	4.75	15.46	-4.37	0.12
5,946.00	0.37	112.00	5,945.05	4.61	15.61	-4.23	0.89
6,009.00	2.08	190.32	6,008.04	3.40	15.59	-3.03	3.23
6,040.00	5.56	193.74	6,038.97	1.39	15.14	-1.03	11.24
6,072.00	7.35	196.00	6,070.76	-2.08	14.20	2.42	5.65
6,102.00	7.75	192.96	6,100.50	-5.90	13.22	6.21	1.88
6,133.00	9.07	192.12	6,131.17	-10.32	12.24	10.62	4.28
6,164.00	11.50	188.17	6,161.67	-15.77	11.29	16.04	8.16
6,195.00	13.99	185.01	6,191.90	-22.57	10.52	22.81	8.34
6,226.00	17.28	182.01	6,221.75	-30.90	10.03	31.13	10.93
6,258.00	21.43	180.16	6,251.94	-41.50	9.85	41.73	13.11
6,288.00	24.85	182.10	6,279.52	-53.29	9.60	53.50	11.68
6,319.00	27.93	183.71	6,307.29	-67.04	8.89	67.24	10.20
6,351.00	31.32	185.60	6,335.10	-82.80	7.60	82.96	10.99
6,382.00	34.12	189.44	6,361.18	-99.41	5.38	99.51	11.24
6,413.00	36.88	191.36	6,386.42	-117.11	2.12	117.12	9.60
6,445.00	38.70	192.26	6,411.70	-136.30	-1.89	136.21	5.94
6,476.00	40.50	189.20	6,435.59	-155.71	-5.56	155.53	8.56
6,507.00	42.61	189.69	6,458.79	-175.99	-8.94	175.73	6.89
6,539.00	46.16	189.61	6,481.65	-198.05	-12.69	197.69	11.10
6,570.00	50.89	188.69	6,502.18	-220.98	-16.37	220.52	15.42
6,602.00	54.93	187.77	6,521.47	-246.24	-20.02	245.69	12.83
6,633.00	59.19	185.96	6,538.33	-272.06	-23.12	271.43	14.59
6,664.00	63.08	183.72	6,553.29	-299.11	-25.40	298.41	14.05
6,695.00	68.19	182.01	6,566.08	-327.30	-26.80	326.56	17.23
6,726.00	72.71	181.79	6,576.45	-356.49	-27.77	355.72	14.60
6,758.00	76.41	180.97	6,584.96	-387.32	-28.51	386.52	11.82
6,789.00	79.36	180.37	6,591.47	-417.62	-28.86	416.81	9.70
6,821.00	81.56	179.96	6,596.77	-449.18	-28.95	448.35	6.99
6,913.00	86.17	180.34	6,606.60	-540.63	-29.20	539.77	5.03
6,975.00	86.41	180.82	6,610.61	-602.49	-29.82	601.60	0.86
7,038.00	88.76	182.13	6,613.27	-665.41	-31.44	664.46	4.27
7,101.00	90.68	181.73	6,613.58	-728.37	-33.56	727.36	3.11
7,164.00	91.73	182.28	6,612.25	-791.32	-35.77	790.23	1.88
7,227.00	90.93	180.93	6,610.79	-854.27	-37.53	853.13	2.49
7,290.00	91.23	181.23	6,609.60	-917.25	-38.72	916.06	0.67
7,355.00	89.94	179.10	6,608.94	-982.24	-38.91	981.03	3.83
7,418.00	91.73	179.03	6,608.02	-1,045.22	-37.88	1,044.01	2.84
7,481.00	92.10	179.04	6,605.92	-1,108.18	-36.82	1,106.98	0.59
7,544.00	92.59	177.08	6,603.34	-1,171.09	-34.69	1,169.92	3.20
7,608.00	90.12	177.55	6,601.82	-1,235.00	-31.69	1,233.88	3.93

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7,639.00	89.94	177.38	6,601.81	-1,265.96	-30.32	1,264.87	0.80
7,702.00	90.06	177.74	6,601.81	-1,328.91	-27.64	1,327.86	0.60
7,766.00	90.19	178.12	6,601.67	-1,392.87	-25.33	1,391.86	0.63
7,798.00	89.51	176.08	6,601.75	-1,424.82	-23.71	1,423.84	6.72
7,861.00	90.86	175.30	6,601.55	-1,487.64	-18.97	1,486.76	2.47
7,924.00	91.24	175.49	6,600.39	-1,550.43	-13.91	1,549.65	0.67
7,987.00	91.17	174.96	6,599.07	-1,613.20	-8.67	1,612.52	0.85
8,050.00	91.79	175.77	6,597.44	-1,675.97	-3.58	1,675.40	1.62
8,112.00	91.98	175.17	6,595.40	-1,737.74	1.31	1,737.27	1.01
8,175.00	92.90	176.02	6,592.72	-1,800.50	6.15	1,800.12	1.99
8,238.00	92.59	176.69	6,589.70	-1,863.30	10.15	1,863.00	1.17
8,300.00	89.57	176.75	6,588.54	-1,925.18	13.69	1,924.95	4.87
8,363.00	88.95	176.36	6,589.35	-1,988.06	17.48	1,987.90	1.16
8,428.00	92.04	177.66	6,588.79	-2,052.96	20.87	2,052.87	5.16
8,491.00	93.22	177.97	6,585.90	-2,115.84	23.27	2,115.79	1.94
8,555.00	93.03	179.81	6,582.41	-2,179.73	24.51	2,179.69	2.89
8,587.00	92.97	179.52	6,580.73	-2,211.69	24.69	2,211.64	0.92
8,619.00	93.09	179.89	6,579.04	-2,243.64	24.86	2,243.59	1.21
8,683.00	91.98	180.57	6,576.21	-2,307.58	24.60	2,307.50	2.03
8,746.00	92.16	180.45	6,573.93	-2,370.54	24.04	2,370.43	0.34
8,809.00	90.80	180.61	6,572.31	-2,433.51	23.46	2,433.37	2.17
8,872.00	89.51	180.01	6,572.14	-2,496.51	23.12	2,496.34	2.26
8,936.00	88.15	180.85	6,573.44	-2,560.49	22.64	2,560.30	2.50
8,999.00	88.33	181.26	6,575.38	-2,623.45	21.48	2,623.21	0.71
9,062.00	87.84	181.54	6,577.48	-2,686.40	19.94	2,686.10	0.90
9,125.00	90.12	182.87	6,578.61	-2,749.33	17.52	2,748.96	4.19
9,189.00	90.19	182.71	6,578.43	-2,813.26	14.40	2,812.79	0.27
9,252.00	91.42	183.60	6,577.55	-2,876.15	10.93	2,875.59	2.41
9,316.00	90.99	183.70	6,576.20	-2,940.01	6.86	2,939.33	0.69
9,380.00	91.05	183.42	6,575.06	-3,003.88	2.89	3,003.08	0.45
9,443.00	89.88	183.05	6,574.55	-3,066.77	-0.67	3,065.87	1.95
9,507.00	89.88	182.75	6,574.68	-3,130.69	-3.91	3,129.69	0.47
9,570.00	87.65	182.12	6,576.04	-3,193.61	-6.58	3,192.54	3.68
9,633.00	87.71	181.72	6,578.59	-3,256.53	-8.69	3,255.38	0.64
9,698.00	87.03	181.12	6,581.58	-3,321.44	-10.30	3,320.23	1.39
9,762.00	87.53	181.39	6,584.61	-3,385.35	-11.70	3,384.09	0.89
9,826.00	88.52	182.31	6,586.82	-3,449.28	-13.77	3,447.95	2.11
9,889.00	90.31	181.63	6,587.46	-3,512.23	-15.93	3,510.84	3.04
9,953.00	90.43	181.73	6,587.05	-3,576.21	-17.81	3,574.75	0.24
10,016.00	90.43	181.41	6,586.58	-3,639.18	-19.53	3,637.66	0.51
10,079.00	90.31	181.50	6,586.17	-3,702.16	-21.13	3,700.58	0.24
10,142.00	89.94	181.10	6,586.03	-3,765.14	-22.56	3,763.51	0.86
10,205.00	88.95	178.97	6,586.64	-3,828.13	-22.60	3,826.49	3.73
10,269.00	89.32	181.46	6,587.61	-3,892.12	-22.84	3,890.45	3.93
10,333.00	91.73	182.45	6,587.02	-3,956.08	-25.02	3,954.33	4.07
10,398.00	91.79	182.21	6,585.03	-4,020.99	-27.67	4,019.17	0.38
10,462.00	91.98	181.93	6,582.92	-4,084.91	-29.98	4,083.02	0.53
10,525.00	92.10	180.74	6,580.68	-4,147.86	-31.44	4,145.91	1.90
10,588.00	91.48	179.70	6,578.71	-4,210.82	-31.68	4,208.85	1.92
10,652.00	91.05	178.23	6,577.30	-4,274.80	-30.53	4,272.83	2.39
10,716.00	89.57	177.85	6,576.95	-4,338.76	-28.34	4,336.83	2.39

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10,780.00	87.47	177.59	6,578.60	-4,402.68	-25.79	4,400.79	3.31
10,845.00	87.41	177.50	6,581.51	-4,467.56	-23.01	4,465.72	0.17
10,909.00	87.04	177.59	6,584.60	-4,531.42	-20.28	4,529.63	0.59
10,973.00	87.53	178.09	6,587.64	-4,595.30	-17.87	4,593.55	1.09
11,037.00	88.52	179.52	6,589.84	-4,659.25	-16.53	4,657.51	2.72
11,100.00	89.75	181.27	6,590.79	-4,722.24	-16.97	4,720.47	3.39
11,163.00	90.31	180.67	6,590.76	-4,785.23	-18.03	4,783.42	1.30
11,194.00	90.49	181.08	6,590.54	-4,816.22	-18.51	4,814.39	1.44
11,257.00	91.17	181.54	6,589.63	-4,879.20	-19.95	4,877.31	1.30
11,319.00	91.79	182.07	6,588.03	-4,941.15	-21.90	4,939.20	1.32
11,380.00	91.23	182.07	6,586.42	-5,002.09	-24.10	5,000.07	0.92
11,442.00	91.36	180.05	6,585.02	-5,064.06	-25.25	5,061.99	3.26
11,503.00	90.93	180.69	6,583.80	-5,125.04	-25.64	5,122.95	1.26
11,565.00	88.33	179.49	6,584.20	-5,187.04	-25.74	5,184.92	4.62
11,626.00	87.90	179.43	6,586.21	-5,248.00	-25.16	5,245.88	0.71
11,687.00	89.38	178.84	6,587.66	-5,308.97	-24.24	5,306.86	2.61
11,749.00	89.51	178.77	6,588.26	-5,370.96	-22.95	5,368.86	0.24
11,813.00	90.25	177.82	6,588.39	-5,434.93	-21.05	5,432.86	1.88
11,877.00	91.24	177.68	6,587.56	-5,498.87	-18.53	5,496.84	1.56
11,940.00	91.30	177.67	6,586.16	-5,561.80	-15.98	5,559.82	0.10
12,004.00	91.79	177.76	6,584.44	-5,625.73	-13.43	5,623.79	0.78
12,068.00	91.30	177.86	6,582.71	-5,689.66	-10.98	5,687.76	0.78
12,130.00	91.05	179.06	6,581.44	-5,751.62	-9.32	5,749.74	1.98
12,193.00	90.43	179.44	6,580.63	-5,814.61	-8.49	5,812.73	1.15
12,257.00	90.06	180.22	6,580.35	-5,878.61	-8.30	5,876.72	1.35
12,319.00	89.94	179.93	6,580.35	-5,940.61	-8.38	5,938.70	0.51
12,382.00	90.68	179.88	6,580.01	-6,003.61	-8.28	6,001.68	1.18
12,445.00	89.69	179.30	6,579.81	-6,066.61	-7.83	6,064.67	1.82
12,508.00	90.37	179.11	6,579.78	-6,129.60	-6.96	6,127.67	1.12
12,572.00	91.54	179.63	6,578.71	-6,193.59	-6.25	6,191.65	2.00
12,635.00	90.93	180.43	6,577.35	-6,256.57	-6.28	6,254.62	1.60
12,699.00	89.81	181.25	6,576.94	-6,320.56	-7.22	6,318.57	2.17
12,762.00	89.32	180.26	6,577.42	-6,383.55	-8.05	6,381.52	1.75
12,826.00	89.07	180.51	6,578.32	-6,447.54	-8.48	6,445.48	0.55
12,889.00	89.75	180.79	6,578.96	-6,510.54	-9.20	6,508.44	1.17
12,952.00	88.08	181.12	6,580.16	-6,573.51	-10.25	6,571.37	2.70
13,016.00	88.08	181.53	6,582.30	-6,637.46	-11.73	6,635.27	0.64
13,079.00	88.09	181.51	6,584.41	-6,700.40	-13.40	6,698.15	0.04
13,143.00	89.75	180.48	6,585.61	-6,764.38	-14.51	6,762.08	3.05
13,206.00	89.26	181.68	6,586.16	-6,827.36	-15.70	6,825.02	2.06
13,269.00	90.43	180.66	6,586.33	-6,890.35	-16.98	6,887.96	2.46
13,332.00	91.73	180.68	6,585.14	-6,953.33	-17.72	6,950.90	2.06
13,395.00	92.16	180.40	6,583.00	-7,016.29	-18.31	7,013.83	0.81
13,458.00	89.51	179.87	6,582.08	-7,079.28	-18.46	7,076.80	4.29
13,521.00	89.81	179.92	6,582.46	-7,142.28	-18.34	7,139.78	0.48
13,584.00	90.49	181.06	6,582.29	-7,205.28	-18.88	7,202.75	2.11
13,648.00	91.05	180.85	6,581.43	-7,269.26	-19.95	7,266.69	0.93
13,711.00	91.67	180.82	6,579.94	-7,332.24	-20.87	7,329.62	0.99
13,774.00	92.23	180.95	6,577.79	-7,395.19	-21.84	7,392.54	0.91
13,837.00	92.10	180.72	6,575.41	-7,458.14	-22.76	7,455.44	0.42
13,900.00	90.80	179.73	6,573.82	-7,521.12	-23.00	7,518.40	2.59

HALLIBURTON**Design Report for Staudinger 1-31H - MWD Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
13,964.00	88.58	179.60	6,574.17	-7,585.11	-22.63	7,582.38	3.47
14,027.00	88.52	179.71	6,575.76	-7,648.09	-22.25	7,645.35	0.20
14,090.00	88.45	179.67	6,577.43	-7,711.07	-21.91	7,708.32	0.13
14,153.00	88.83	179.45	6,578.92	-7,774.05	-21.43	7,771.29	0.70
14,216.00	88.76	179.14	6,580.25	-7,837.03	-20.65	7,834.27	0.50
14,279.00	89.69	178.09	6,581.10	-7,900.00	-19.13	7,897.27	2.23
14,342.00	90.93	178.73	6,580.76	-7,962.98	-17.38	7,960.26	2.21
14,406.00	91.05	179.12	6,579.65	-8,026.95	-16.18	8,024.25	0.64
14,469.00	91.85	180.29	6,578.06	-8,089.93	-15.86	8,087.22	2.25
14,532.00	91.36	180.86	6,576.29	-8,152.90	-16.49	8,150.16	1.19
14,596.00	91.05	180.70	6,574.95	-8,216.88	-17.36	8,214.10	0.55
14,658.00	90.80	181.52	6,573.95	-8,278.86	-18.56	8,276.03	1.38
14,722.00	92.47	182.72	6,572.12	-8,342.79	-20.93	8,339.88	3.21
14,785.00	89.81	182.47	6,570.87	-8,405.71	-23.78	8,402.71	4.24
14,849.00	90.87	182.95	6,570.49	-8,469.63	-26.80	8,466.55	1.82
14,944.00	88.77	181.31	6,570.78	-8,564.56	-30.33	8,561.36	2.80
15,007.00	89.20	181.07	6,571.90	-8,627.53	-31.64	8,624.29	0.78
15,071.00	89.51	181.42	6,572.62	-8,691.52	-33.03	8,688.22	0.73
15,134.00	90.56	181.53	6,572.58	-8,754.49	-34.65	8,751.14	1.68
15,197.00	91.11	181.41	6,571.66	-8,817.47	-36.27	8,814.05	0.89
15,259.00	91.36	181.18	6,570.33	-8,879.44	-37.67	8,875.97	0.55
15,323.00	90.49	181.72	6,569.30	-8,943.41	-39.29	8,939.89	1.60
15,386.00	90.99	181.70	6,568.48	-9,006.37	-41.17	9,002.79	0.79
15,449.00	89.51	180.11	6,568.21	-9,069.36	-42.17	9,065.73	3.45
15,512.00	90.37	181.46	6,568.27	-9,132.35	-43.03	9,128.69	2.54
15,575.00	89.94	180.01	6,568.10	-9,195.35	-43.84	9,191.64	2.40
15,638.00	89.94	180.55	6,568.17	-9,258.34	-44.14	9,254.62	0.86
15,701.00	90.19	181.80	6,568.10	-9,321.33	-45.44	9,317.55	2.02
15,763.00	90.99	183.83	6,567.46	-9,383.25	-48.48	9,379.38	3.52
15,826.00	90.31	183.05	6,566.74	-9,446.13	-52.26	9,442.15	1.64
15,890.00	90.49	182.98	6,566.30	-9,510.04	-55.63	9,505.96	0.30
15,991.00	90.84	182.98	6,565.12	-9,610.90	-60.88	9,606.66	0.35

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	178.62	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
546.00	5,853.00	Original Wellbore MWD Surveys	MWD
5,853.00	15,991.00	Side Track 1	MWD

HALLIBURTON**Design Report for Staudinger 1-31H - MWD Survey****Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Staudinger 1-31H Se	0.00	359.19	0.00	0.00	0.00	1,472,783.87	3,349,070.23	40° 37' 27.818 N	104° 14' 32.813 W
- actual wellpath hits target center									
- Polygon									
Point 1				98.95	-348.63	1,472,435.25	3,349,169.18		
Point 2				66.90	-9,724.03	1,463,060.06	3,349,137.14		
Point 3				-3,918.11	-9,821.55	1,462,962.54	3,345,152.21		
Point 4				-3,935.21	-435.85	1,472,348.03	3,345,135.10		
Staudinger 1-31H Bl	0.00	359.19	6,600.00	-9,664.79	-34.29	1,463,119.29	3,349,035.94	40° 35' 52.332 N	104° 14' 35.034 W
- actual wellpath misses target center by 69.48ft at 15991.00ft MD (6565.12 TVD, -9610.90 N, -60.88 E)									
- Point									
Staudinger 1-31H Se	0.00	359.19	0.00	0.00	0.00	1,472,783.87	3,349,070.23	40° 37' 27.818 N	104° 14' 32.813 W
- actual wellpath hits target center									
- Polygon									
Point 1				690.38	259.82	1,473,043.69	3,349,760.60		
Point 2				675.35	-10,315.46	1,462,468.64	3,349,745.57		
Point 3				-4,509.54	-10,430.00	1,462,354.10	3,344,560.79		
Point 4				-4,543.66	155.58	1,472,939.45	3,344,526.67		
Staudinger 1-31H Ct	0.00	359.19	0.00	0.00	0.00	1,472,783.87	3,349,070.23	40° 37' 27.818 N	104° 14' 32.813 W
- actual wellpath hits target center									
- Polygon									
Point 1				682.74	-5,053.83	1,467,730.16	3,349,752.96		
Point 2				-4,542.61	-5,136.94	1,467,647.05	3,344,527.72		

North Reference Sheet for Sec. 31-T8N-R61W - Staudinger 1-31H - Sidetrack #1

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

Vertical Depths are relative to RKB 16' @ 4996.00ft (Cyclone 12). Northing and Easting are relative to Staudinger 1-31H

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99997807

Grid Coordinates of Well: 1,472,783.87 ft N, 3,349,070.23 ft E

Geographical Coordinates of Well: 40° 37' 27.82" N, 104° 14' 32.81" W

Grid Convergence at Surface is: 0.81°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,991.00ft
the Bottom Hole Displacement is 9,611.09ft in the Direction of 180.36° (Grid).

Magnetic Convergence at surface is: -7.71° (11 November 2011, , BGM2011)

