

Noble Energy

Weld County, CO (NAD 83)
Sec. 1-T5N-R64W (Lucci 1 PAD)
Lucci B03-69HNL

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

15 April, 2013

Well Coordinates: 1,402,731.61 N, 3,276,792.25 E (40°26' 04.70" N, 104°30' 20.30" W)
Ground Level: 4,617.00 ft

Local Coordinate Origin:	Centered on Well Lucci B03-69HNL - Slot A1
Viewing Datum:	KB=24' @ 4641.00ft (H&P 315)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 2003.16 Build: 431

HALLIBURTON

Design Report for Lucci B03-69HNL - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (7100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
633.00	0.00	0.00	633.00	0.00	0.00	0.00	0.00
Tie On To Surface Casing Assumed Vertical							
720.00	0.51	157.30	720.00	-0.36	0.15	-0.16	0.59
First MWD Survey							
997.00	0.50	194.21	996.99	-2.67	0.33	-0.40	0.12
1,280.00	0.51	135.40	1,279.98	-4.76	0.91	-1.03	0.18
1,565.00	0.65	136.78	1,564.96	-6.84	2.91	-3.08	0.05
1,850.00	1.52	144.64	1,849.91	-11.10	6.20	-6.48	0.31
1,945.00	0.67	212.07	1,944.90	-12.60	6.64	-6.95	1.48
2,040.00	1.21	273.01	2,039.88	-13.02	5.34	-5.67	1.12
2,135.00	0.98	283.02	2,134.87	-12.78	3.55	-3.87	0.31
2,419.00	1.02	307.60	2,418.83	-10.69	-0.82	0.55	0.15
2,704.00	0.70	287.59	2,703.79	-8.62	-4.49	4.27	0.15
2,988.00	1.64	247.71	2,987.74	-9.64	-9.91	9.66	0.42
3,083.00	1.39	274.22	3,082.70	-10.07	-12.31	12.05	0.77
3,178.00	0.87	286.10	3,177.68	-9.78	-14.16	13.90	0.60
3,463.00	2.31	245.93	3,462.57	-11.53	-21.48	21.18	0.61
3,558.00	1.01	263.91	3,557.53	-12.39	-24.06	23.74	1.46
3,653.00	0.14	302.14	3,652.53	-12.42	-24.99	24.67	0.95
3,748.00	1.59	42.35	3,747.52	-11.39	-24.20	23.90	1.71
3,843.00	1.35	31.24	3,842.48	-9.46	-22.73	22.49	0.39
4,127.00	1.44	342.56	4,126.41	-3.19	-22.07	21.98	0.41
4,412.00	2.06	337.01	4,411.28	4.94	-25.14	25.26	0.23
4,697.00	2.79	329.77	4,696.02	15.65	-30.63	31.02	0.28
4,792.00	3.22	352.70	4,790.89	20.29	-32.14	32.64	1.33
4,887.00	3.81	358.10	4,885.71	26.10	-32.58	33.23	0.71
4,982.00	5.72	359.11	4,980.38	33.98	-32.76	33.61	2.01
5,077.00	6.83	0.64	5,074.81	44.37	-32.77	33.88	1.18
5,172.00	7.32	358.01	5,169.09	56.06	-32.92	34.32	0.62
5,267.00	7.45	4.99	5,263.30	68.25	-32.59	34.31	0.95
5,362.00	9.31	5.17	5,357.28	82.04	-31.36	33.43	1.96
5,456.00	8.98	1.74	5,450.09	96.94	-30.45	32.90	0.68
5,551.00	9.34	7.59	5,543.88	112.00	-29.21	32.04	1.05
5,646.00	10.73	3.33	5,637.42	128.47	-27.68	30.92	1.66
5,741.00	10.32	358.57	5,730.83	145.80	-27.38	31.06	1.01
5,836.00	10.30	350.04	5,824.30	162.68	-29.06	33.17	1.61
5,910.00	10.35	350.93	5,897.10	175.76	-31.25	35.69	0.23
6,016.00	16.01	341.11	6,000.28	199.01	-37.49	42.52	5.72
6,064.00	20.27	336.37	6,045.88	212.90	-42.97	48.34	9.39
6,111.00	23.47	335.19	6,089.50	228.86	-50.16	55.94	6.87
6,159.00	27.02	331.97	6,132.91	247.16	-59.30	65.54	7.93
6,206.00	30.99	327.90	6,174.01	266.85	-70.75	77.48	9.43
6,254.00	34.20	320.92	6,214.46	287.80	-85.83	93.09	10.29
6,301.00	37.14	316.63	6,252.64	308.38	-103.91	111.68	8.21
6,349.00	38.21	309.17	6,290.65	328.30	-125.38	133.65	9.75
6,396.00	37.61	299.98	6,327.76	344.66	-149.09	157.77	12.07
6,444.00	41.26	297.62	6,364.83	359.32	-175.81	184.85	8.22
6,491.00	45.35	295.79	6,399.03	373.79	-204.61	214.01	9.10
6,539.00	48.03	290.45	6,431.96	387.46	-236.72	246.45	9.83

Design Report for Lucci B03-69HNL - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,586.00	50.43	284.85	6,462.67	398.21	-270.62	280.62	10.37
6,634.00	55.28	284.22	6,491.64	407.80	-307.65	317.87	10.16
6,681.00	59.09	281.02	6,517.11	416.41	-346.19	356.61	9.92
6,729.00	63.75	278.60	6,540.07	423.57	-387.71	398.30	10.67
6,775.00	68.01	279.25	6,558.87	430.08	-429.17	439.92	9.35
6,823.00	72.77	279.95	6,574.97	437.63	-473.74	484.67	10.01
6,870.00	76.40	278.10	6,587.46	444.73	-518.48	529.57	8.60
6,918.00	78.01	274.65	6,598.10	449.92	-564.99	576.20	7.77
6,974.00	83.04	273.16	6,607.31	453.67	-620.08	631.36	9.36
7,028.00	85.15	272.42	6,612.87	456.29	-673.73	685.06	4.14
7" Casing Point Estimated From Section Lines 90' FSL 60' FEL (Not a survey point)							
7,126.00	88.98	271.09	6,617.89	459.28	-771.53	782.91	4.14
7,221.00	89.17	269.85	6,619.42	460.06	-866.52	877.88	1.32
7,316.00	88.30	268.41	6,621.52	458.62	-961.48	972.78	1.77
7,411.00	89.20	267.70	6,623.59	455.40	-1,056.40	1,067.59	1.21
7,506.00	89.32	266.79	6,624.82	450.83	-1,151.28	1,162.32	0.97
7,601.00	89.54	267.30	6,625.76	445.93	-1,246.15	1,257.04	0.58
7,696.00	90.68	270.38	6,625.58	444.01	-1,341.12	1,351.92	3.46
7,790.00	90.34	271.25	6,624.74	445.35	-1,435.10	1,445.91	0.99
7,885.00	90.37	271.31	6,624.15	447.47	-1,530.08	1,540.91	0.07
7,980.00	89.85	269.29	6,623.97	447.97	-1,625.07	1,635.89	2.20
8,075.00	89.63	268.18	6,624.40	445.87	-1,720.04	1,730.78	1.19
8,170.00	88.27	267.09	6,626.14	441.95	-1,814.94	1,825.55	1.83
8,265.00	89.63	269.12	6,627.88	438.81	-1,909.87	1,920.36	2.57
8,360.00	89.60	269.39	6,628.52	437.57	-2,004.86	2,015.29	0.29
8,455.00	89.04	268.79	6,629.65	436.07	-2,099.84	2,110.20	0.86
8,549.00	86.98	266.63	6,632.91	432.31	-2,193.70	2,203.93	3.17
8,644.00	88.03	266.65	6,637.05	426.75	-2,288.44	2,298.51	1.11
8,739.00	88.95	267.53	6,639.55	421.93	-2,383.28	2,393.20	1.34
8,834.00	91.29	268.37	6,639.35	418.53	-2,478.22	2,488.01	2.62
8,929.00	91.36	268.72	6,637.16	416.12	-2,573.16	2,582.87	0.38
9,023.00	91.20	269.24	6,635.06	414.45	-2,667.12	2,676.76	0.58
9,118.00	92.04	269.91	6,632.37	413.74	-2,762.08	2,771.67	1.13
9,213.00	89.60	268.98	6,631.01	412.82	-2,857.06	2,866.59	2.75
9,308.00	89.69	270.73	6,631.60	412.58	-2,952.05	2,961.55	1.84
9,403.00	89.41	271.82	6,632.35	414.70	-3,047.02	3,056.54	1.18
9,498.00	89.63	271.71	6,633.14	417.62	-3,141.97	3,151.54	0.26
9,593.00	89.63	270.09	6,633.76	419.11	-3,236.96	3,246.53	1.71
9,688.00	87.35	268.32	6,636.26	417.80	-3,331.91	3,341.41	3.04
9,783.00	87.07	267.23	6,640.88	414.11	-3,426.72	3,436.10	1.18
9,877.00	88.61	267.40	6,644.43	409.71	-3,520.55	3,529.79	1.65
9,972.00	89.91	267.22	6,645.65	405.26	-3,615.43	3,624.53	1.38
10,067.00	90.96	268.46	6,644.93	401.67	-3,710.36	3,719.34	1.71
10,162.00	89.01	266.92	6,644.96	397.85	-3,805.27	3,814.12	2.62
10,257.00	89.60	267.79	6,646.11	393.46	-3,900.16	3,908.87	1.11
10,352.00	90.12	268.14	6,646.34	390.09	-3,995.10	4,003.70	0.66
10,447.00	90.00	267.86	6,646.24	386.77	-4,090.05	4,098.52	0.32
10,542.00	90.18	267.09	6,646.09	382.59	-4,184.95	4,193.30	0.83
10,637.00	91.54	268.45	6,644.67	378.89	-4,279.87	4,288.08	2.02
10,732.00	91.32	268.73	6,642.30	376.56	-4,374.81	4,382.94	0.37
10,827.00	91.82	268.51	6,639.69	374.27	-4,469.74	4,477.78	0.57

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,922.00	91.11	268.93	6,637.27	372.15	-4,564.69	4,572.64	0.87
11,017.00	89.01	269.59	6,637.17	370.92	-4,659.67	4,667.57	2.32
11,110.00	89.48	269.45	6,638.39	370.14	-4,752.66	4,760.51	0.53
11,202.00	90.06	269.81	6,638.76	369.55	-4,844.66	4,852.46	0.74
11,295.00	91.60	271.81	6,637.41	370.86	-4,937.63	4,945.44	2.71
11,387.00	90.28	271.42	6,635.90	373.45	-5,029.58	5,037.42	1.50
11,480.00	89.60	271.82	6,636.00	376.08	-5,122.54	5,130.42	0.85
11,574.00	89.54	271.90	6,636.71	379.13	-5,216.49	5,224.42	0.11
11,666.00	88.68	269.12	6,638.14	379.95	-5,308.47	5,316.38	3.16
11,758.00	86.82	268.45	6,641.75	378.00	-5,400.37	5,408.21	2.15
11,851.00	86.61	267.96	6,647.08	375.10	-5,493.17	5,500.91	0.57
11,943.00	86.73	267.47	6,652.42	371.43	-5,584.94	5,592.55	0.55
12,037.00	88.15	268.27	6,656.62	367.94	-5,678.78	5,686.27	1.73
12,129.00	90.06	267.94	6,658.06	364.90	-5,770.72	5,778.10	2.11
12,222.00	90.77	267.71	6,657.38	361.37	-5,863.65	5,870.91	0.80
12,315.00	90.28	267.31	6,656.53	357.33	-5,956.55	5,963.69	0.68
12,408.00	90.03	267.38	6,656.28	353.02	-6,049.45	6,056.45	0.28
12,501.00	90.06	268.55	6,656.21	349.72	-6,142.39	6,149.28	1.26
12,593.00	89.11	269.23	6,656.87	347.94	-6,234.37	6,241.18	1.27
12,685.00	90.43	269.94	6,657.24	347.27	-6,326.37	6,333.13	1.63
12,778.00	91.73	268.71	6,655.49	346.18	-6,419.34	6,426.04	1.92
12,870.00	91.66	268.17	6,652.77	343.68	-6,511.26	6,517.88	0.59
12,964.00	92.62	267.70	6,649.26	340.29	-6,605.14	6,611.63	1.14
13,059.00	92.13	268.01	6,645.32	336.74	-6,699.99	6,706.36	0.61
13,154.00	90.89	267.99	6,642.82	333.42	-6,794.90	6,801.16	1.31
13,249.00	89.66	267.71	6,642.36	329.86	-6,889.83	6,895.97	1.33
13,344.00	89.97	267.62	6,642.67	325.99	-6,984.75	6,990.76	0.34
13,439.00	90.56	267.19	6,642.23	321.69	-7,079.65	7,085.52	0.77
13,534.00	90.68	268.63	6,641.20	318.22	-7,174.58	7,180.33	1.52
13,629.00	90.12	269.27	6,640.54	316.48	-7,269.56	7,275.24	0.90
13,724.00	89.97	268.83	6,640.46	314.91	-7,364.54	7,370.15	0.49
13,819.00	89.29	268.48	6,641.08	312.68	-7,459.51	7,465.04	0.81
13,914.00	92.25	268.25	6,639.80	309.97	-7,554.46	7,559.88	3.13
14,009.00	92.59	268.01	6,635.79	306.87	-7,649.32	7,654.64	0.44
14,104.00	89.45	267.51	6,634.10	303.16	-7,744.22	7,749.41	3.35
14,198.00	87.59	267.26	6,636.53	298.87	-7,838.09	7,843.14	2.00
14,293.00	86.67	268.09	6,641.28	295.02	-7,932.89	7,937.81	1.30
14,388.00	86.08	268.69	6,647.29	292.36	-8,027.66	8,032.49	0.88
14,483.00	86.14	270.18	6,653.73	291.42	-8,122.43	8,127.21	1.57
14,578.00	88.36	271.88	6,658.29	293.13	-8,217.30	8,222.09	2.94
14,673.00	89.51	271.01	6,660.06	295.53	-8,312.25	8,317.07	1.52
14,768.00	89.81	270.45	6,660.62	296.74	-8,407.24	8,412.06	0.67
14,863.00	89.45	270.30	6,661.23	297.36	-8,502.24	8,507.04	0.41
14,958.00	90.06	270.03	6,661.64	297.63	-8,597.23	8,602.01	0.70
15,053.00	91.63	269.99	6,660.24	297.65	-8,692.22	8,696.97	1.65
15,148.00	92.56	270.42	6,656.77	297.99	-8,787.16	8,791.88	1.08
15,243.00	90.22	269.99	6,654.46	298.33	-8,882.12	8,886.83	2.50
15,337.00	89.17	269.14	6,654.96	297.61	-8,976.11	8,980.77	1.44
15,432.00	90.56	268.93	6,655.19	296.01	-9,071.10	9,075.68	1.48
15,527.00	89.63	269.02	6,655.03	294.31	-9,166.08	9,170.59	0.98
15,622.00	89.11	268.69	6,656.07	292.42	-9,261.06	9,265.49	0.65

Design Report for Lucci B03-69HNL - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
15,717.00	90.40	268.22	6,656.48	289.85	-9,356.02	9,360.36	1.45
15,812.00	89.48	268.48	6,656.58	287.12	-9,450.98	9,455.22	1.01
15,907.00	90.34	268.47	6,656.73	284.59	-9,545.94	9,550.09	0.91
16,002.00	90.77	267.48	6,655.81	281.23	-9,640.88	9,644.91	1.14
16,097.00	91.11	267.12	6,654.25	276.76	-9,735.76	9,739.65	0.52
16,192.00	91.48	267.07	6,652.10	271.95	-9,830.61	9,834.35	0.39
16,287.00	90.46	265.77	6,650.49	266.02	-9,925.41	9,928.96	1.74
16,382.00	88.55	263.51	6,651.32	257.14	-10,019.98	10,023.28	3.11
16,477.00	87.81	264.27	6,654.33	247.04	-10,114.39	10,117.41	1.12
16,571.00	87.41	266.96	6,658.25	239.86	-10,208.03	10,210.83	2.89
16,666.00	86.61	269.69	6,663.21	237.08	-10,302.85	10,305.55	2.99
16,761.00	87.63	270.06	6,667.98	236.88	-10,397.73	10,400.39	1.14
16,856.00	87.91	270.45	6,671.68	237.30	-10,492.65	10,495.30	0.51
16,937.00	88.43	271.17	6,674.27	238.44	-10,573.60	10,576.25	1.10
Final MWD Survey							
17,000.00	88.43	271.17	6,675.99	239.73	-10,636.57	10,639.23	0.00
Bit Projection at TD - Estimated BHL 39' FSL 530' FWL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
633.00	633.00	0.00	0.00	Tie On To Surface Casing Assumed Vertical
720.00	720.00	-0.36	0.15	First MWD Survey
7,028.00	6,612.87	456.29	-673.73	7" Casing Point Estimated From Section Lines 90' FSL 60' FEL (Not a survey point)
16,937.00	6,674.27	238.44	-10,573.60	Final MWD Survey
17,000.00	6,675.99	239.73	-10,636.57	Bit Projection at TD
17,000.00	6,675.99	239.73	-10,636.57	Estimated BHL 39' FSL 530' FWL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Lucci B03-69HNL_PlanA - Rev0_BH	271.45	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
633.00	7,028.00	MWD Surveys	MWD
7,028.00	17,000.00	MWD Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,028.00	6,612.87	7"	7	7-1/2

Design Report for Lucci B03-69HNL - MWD Survey

Targets

Target Name - hit/miss target - Shane	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-10,710.00	-266.00		1,402,465.62	3,266,082.66		
Point 2			-6,356.00	-168.00		1,402,563.62	3,270,436.49		
Point 3			-6,353.00	-2,357.00		1,400,374.70	3,270,439.49		
Point 4			-10,685.00	-2,443.00		1,400,288.71	3,266,107.66		
Point 5			-10,710.00	-266.00		1,402,465.62	3,266,082.66		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-5,466.00	2,922.00		1,405,653.50	3,271,326.46		
Point 2			-1,098.00	3,002.00		1,405,733.50	3,275,694.29		
Point 3			-1,071.00	825.00		1,403,556.58	3,275,721.29		
Point 4			-5,426.00	752.00		1,403,483.58	3,271,366.46		
Point 5			-5,466.00	2,922.00		1,405,653.50	3,271,326.46		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-5,926.00	2,922.00		1,405,653.50	3,270,866.48		
Point 2			-638.00	3,002.00		1,405,733.50	3,276,154.27		
Point 3			-611.00	365.00		1,403,096.60	3,276,181.27		
Point 4			-5,886.00	292.00		1,403,023.60	3,270,906.47		
Point 5			-5,926.00	2,922.00		1,405,653.50	3,270,866.48		
Lucci	0.00	0.00	5,950.00	173.54	-30.60	1,402,905.15	3,276,761.65	40.435117	-104.505743
- actual wellpath misses target center by 12.97ft at 5961.02ft MD (5947.05 TVD, 185.84 N, -33.45 E)									
- Circle (radius 35.00)									
Lucci	0.00	0.00	6,671.75	269.23	-10,634.80	1,403,000.83	3,266,157.85	40.435700	-104.543830
- actual wellpath misses target center by 29.83ft at 16998.72ft MD (6675.96 TVD, 239.70 N, -10635.29 E)									
- Point									
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-5,426.00	-168.00		1,402,563.62	3,271,366.46		
Point 2			-1,071.00	-95.00		1,402,636.62	3,275,721.29		
Point 3			-1,072.00	-2,280.00		1,400,451.70	3,275,720.29		
Point 4			-5,433.00	-2,357.00		1,400,374.70	3,271,359.46		
Point 5			-5,426.00	-168.00		1,402,563.62	3,271,366.46		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-11,204.00	2,762.00		1,405,493.51	3,265,588.68		
Point 2			-5,926.00	2,922.00		1,405,653.50	3,270,866.48		
Point 3			-5,886.00	292.00		1,403,023.60	3,270,906.47		
Point 4			-11,170.00	194.00		1,402,925.61	3,265,622.67		
Point 5			-11,204.00	2,762.00		1,405,493.51	3,265,588.68		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-11,170.00	194.00		1,402,925.61	3,265,622.67		
Point 2			-5,886.00	292.00		1,403,023.60	3,270,906.47		
Point 3			-5,893.00	-2,357.00		1,400,374.70	3,270,899.47		
Point 4			-11,145.00	-2,443.00		1,400,288.71	3,265,647.67		
Point 5			-11,170.00	194.00		1,402,925.61	3,265,622.67		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1			-5,886.00	292.00		1,403,023.60	3,270,906.47		
Point 2			-611.00	365.00		1,403,096.60	3,276,181.27		
Point 3			-612.00	-2,280.00		1,400,451.70	3,276,180.27		

Design Report for Lucci B03-69HNL - MWD Survey

Point 4				-5,893.00	-2,357.00	1,400,374.70	3,270,899.47		
Point 5				-5,886.00	292.00	1,403,023.60	3,270,906.47		
Lucci	0.00	0.00	4,700.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath misses target center by 34.53ft at 4699.73ft MD (4698.74 TVD, 15.77 N, -30.70 E)									
- Circle (radius 10.00)									
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1				-151.00	-95.00	1,402,636.62	3,276,641.26		
Point 2				4,237.00	-2.00	1,402,729.61	3,281,029.09		
Point 3				4,270.00	-2,176.00	1,400,555.70	3,281,062.09		
Point 4				-152.00	-2,280.00	1,400,451.70	3,276,640.26		
Point 5				-151.00	-95.00	1,402,636.62	3,276,641.26		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1				-10,744.00	2,762.00	1,405,493.51	3,266,048.66		
Point 2				-6,386.00	2,922.00	1,405,653.50	3,270,406.49		
Point 3				-6,346.00	752.00	1,403,483.58	3,270,446.49		
Point 4				-10,710.00	654.00	1,403,385.59	3,266,082.66		
Point 5				-10,744.00	2,762.00	1,405,493.51	3,266,048.66		
Lucci			6,620.13	448.86	-777.38	1,403,180.46	3,276,014.90	40.435896	-104.508414
- actual wellpath misses target center by 10.74ft at 7131.80ft MD (6617.99 TVD, 459.39 N, -777.33 E)									
- Rectangle (sides W100.00 H16.00 D9,859.19)									
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1				-638.00	3,002.00	1,405,733.50	3,276,154.27		
Point 2				4,664.00	3,091.00	1,405,822.50	3,281,456.07		
Point 3				4,697.00	458.00	1,403,189.60	3,281,489.07		
Point 4				-611.00	365.00	1,403,096.60	3,276,181.27		
Point 5				-638.00	3,002.00	1,405,733.50	3,276,154.27		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1				-611.00	365.00	1,403,096.60	3,276,181.27		
Point 2				4,697.00	458.00	1,403,189.60	3,281,489.07		
Point 3				4,730.00	-2,176.00	1,400,555.70	3,281,522.07		
Point 4				-612.00	-2,280.00	1,400,451.70	3,276,180.27		
Point 5				-611.00	365.00	1,403,096.60	3,276,181.27		
Lucci	0.00	0.00	0.00	0.00	0.00	1,402,731.61	3,276,792.25	40.434640	-104.505640
- actual wellpath hits target center									
- Polygon									
Point 1				-178.00	3,002.00	1,405,733.50	3,276,614.26		
Point 2				4,204.00	3,091.00	1,405,822.50	3,280,996.09		
Point 3				4,237.00	918.00	1,403,649.58	3,281,029.09		
Point 4				-151.00	825.00	1,403,556.58	3,276,641.26		
Point 5				-178.00	3,002.00	1,405,733.50	3,276,614.26		
Lucci	0.00	0.00	6,615.57	451.00	-660.00	1,403,182.60	3,276,132.28	40.435898	-104.507993
- actual wellpath misses target center by 6.11ft at 7014.38ft MD (6611.65 TVD, 455.69 N, -660.18 E)									
- Point									

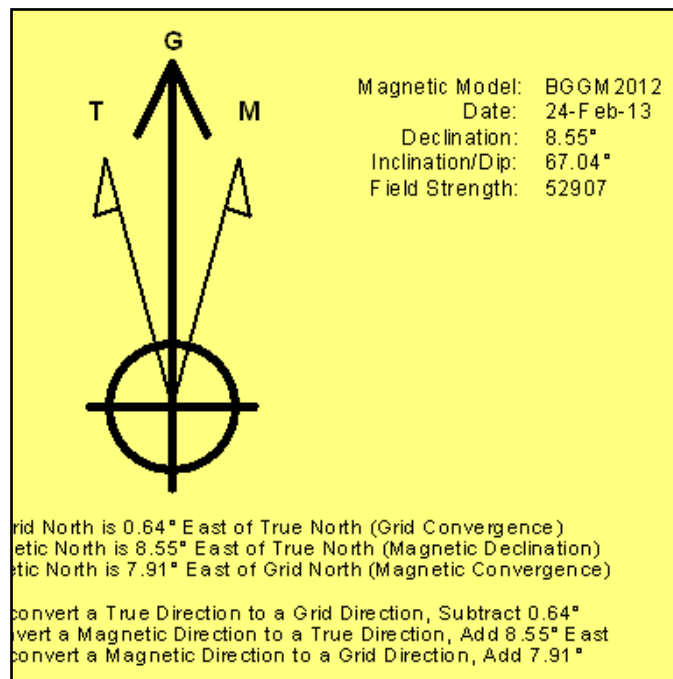
North Reference Sheet for Sec. 1-T5N-R64W (Lucci 1 PAD) - Lucci B03-69HNL

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.
Vertical Depths are relative to KB=24' @ 4641.00ft (H&P 315). Northing and Easting are relative to Lucci B03-69HNL - Slot A1
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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996198

Grid Coordinates of Well: 1,402,731.61 ft N, 3,276,792.25 ft E
Geographical Coordinates of Well: 40°26' 04.70" N, 104°30' 20.30" W
Grid Convergence at Surface is: 0.64°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,000.00ft
the Bottom Hole Displacement is 10,639.27ft in the Direction of 271.29°(Grid).

Magnetic Convergence at surface is: -7.91°(24 February 2013, , BGGM2012)

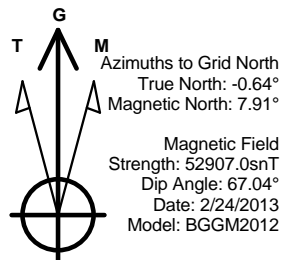


Project: Weld County, CO (NAD 83)
Site: Sec. 1-T5N-R64W (Lucci 1 PAD)
Well: Lucci B03-69HNL

Noble Energy

HALLIBURTON

Sperry Drilling

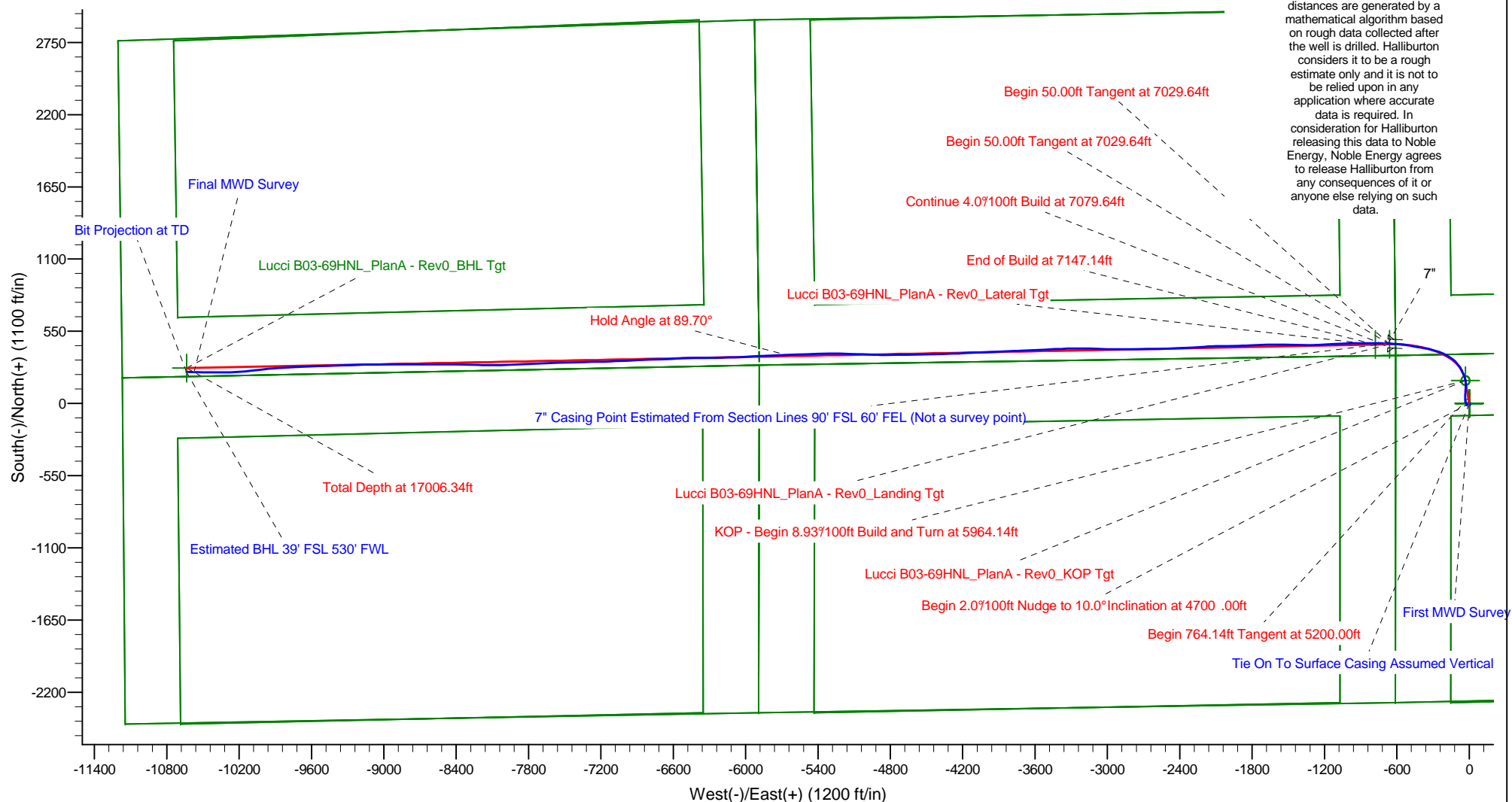


LEGEND

- Lucci B03-69HNL, Plan A, Plan A - Rev 0 Proposal V0
- MWD Survey

Permitted BHL: 75' FSL, 535' FWL

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Lucci B03-69HNL well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

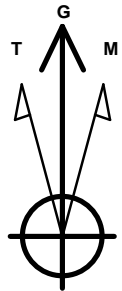


Project: Weld County, CO (NAD 83)
Site: Sec. 1-T5N-R64W (Lucci 1 PAD)
Well: Lucci B03-69HNL

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.64°
Magnetic North: 7.91°

Magnetic Field
Strength: 52907.0snT
Dip Angle: 67.04°
Date: 2/24/2013
Model: BGGM2012

LEGEND

— Lucci B03-69HNL, Plan A, Plan A - Rev 0 Proposal V0
— MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Lucci B03-69HNL well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

