

Noble Energy

Weld County, CO (NAD 83)
Sec. 25-T4N-R65W (Shelton 25 PAD)
Shelton PC G24-75HN

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

04 April, 2013

Well Coordinates: 1,349,614.67 N, 3,247,986.09 E (40° 17' 22.85" N, 104° 36' 39.71" W)
Ground Level: 4,793.00 ft

Local Coordinate Origin:	Centered on Well Shelton PC G24-75HN - Slot A4
Viewing Datum:	KB=30' @ 4823.00ft (H&P 321)
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 Shelton PC G24-75HN - 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
679.00	0.00	0.00	679.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 679.00ft							
813.00	0.86	331.77	812.99	0.89	-0.48	0.90	0.64
First MWD Survey							
1,089.00	0.60	6.50	1,088.97	4.17	-1.30	4.21	0.18
1,364.00	0.10	108.88	1,363.97	5.54	-0.91	5.56	0.23
1,646.00	0.52	349.03	1,645.96	6.71	-0.93	6.73	0.20
1,741.00	0.69	338.87	1,740.96	7.66	-1.21	7.70	0.22
1,836.00	3.01	325.83	1,835.90	10.27	-2.82	10.35	2.46
1,930.00	3.80	329.90	1,929.74	15.01	-5.77	15.17	0.88
2,025.00	5.61	333.60	2,024.41	21.89	-9.42	22.17	1.93
2,120.00	6.99	342.47	2,118.84	31.56	-13.23	31.95	1.77
2,215.00	9.31	342.53	2,212.87	44.40	-17.27	44.91	2.45
2,310.00	12.16	338.65	2,306.20	61.05	-23.22	61.73	3.09
2,404.00	12.08	342.79	2,398.11	79.66	-29.74	80.53	0.93
2,500.00	13.58	344.63	2,491.71	100.12	-35.69	101.16	1.62
2,595.00	13.34	344.99	2,584.10	121.46	-41.49	122.66	0.26
2,690.00	15.17	344.02	2,676.17	144.00	-47.75	145.38	1.94
2,785.00	15.36	342.70	2,767.82	167.97	-54.92	169.55	0.42
2,880.00	14.81	343.83	2,859.55	191.64	-62.04	193.43	0.66
2,974.00	14.31	343.49	2,950.53	214.32	-68.69	216.30	0.54
3,069.00	11.72	340.72	3,043.08	234.68	-75.21	236.85	2.80
3,164.00	13.64	343.35	3,135.76	254.52	-81.60	256.88	2.12
3,259.00	12.39	340.92	3,228.32	274.89	-88.15	277.43	1.44
3,354.00	10.18	335.97	3,321.48	292.20	-94.90	294.94	2.54
3,449.00	8.27	333.56	3,415.25	305.99	-101.36	308.91	2.06
3,543.00	6.72	329.66	3,508.44	316.79	-107.15	319.88	1.73
3,638.00	7.07	340.70	3,602.76	327.10	-111.88	330.33	1.44
3,733.00	5.88	332.33	3,697.15	336.92	-116.07	340.28	1.60
3,828.00	5.23	347.18	3,791.71	345.45	-119.29	348.90	1.65
3,923.00	2.88	351.69	3,886.47	352.04	-120.60	355.52	2.49
4,018.00	0.78	65.01	3,981.42	354.68	-120.36	358.15	2.91
4,302.00	0.92	128.37	4,265.40	354.09	-116.82	357.46	0.32
4,587.00	0.41	166.73	4,550.38	351.68	-114.79	354.99	0.23
4,872.00	1.39	137.28	4,835.34	348.14	-112.21	351.37	0.37
4,967.00	1.12	130.82	4,930.32	346.68	-110.72	349.87	0.32
5,252.00	1.56	174.09	5,215.24	340.99	-108.21	344.11	0.38
5,347.00	0.34	183.20	5,310.23	339.42	-108.09	342.54	1.29
5,631.00	1.12	234.09	5,594.21	336.96	-110.38	340.14	0.33
5,916.00	1.37	188.41	5,879.15	331.97	-113.12	335.24	0.35
6,189.00	0.72	179.75	6,152.10	327.04	-113.59	330.33	0.24
6,250.00	0.77	151.84	6,213.09	326.30	-113.40	329.58	0.59
6,293.00	0.19	154.71	6,256.09	325.98	-113.23	329.25	1.36
6,341.00	5.09	3.17	6,304.03	328.04	-113.08	331.30	10.95
6,388.00	10.93	8.69	6,350.55	334.53	-112.29	337.77	12.51
6,436.00	14.67	7.60	6,397.35	345.05	-110.80	348.24	7.80
6,483.00	17.41	4.18	6,442.52	357.97	-109.50	361.11	6.17
6,531.00	20.95	0.18	6,487.85	373.71	-108.95	376.84	7.85
6,577.00	24.89	359.94	6,530.21	391.62	-108.93	394.73	8.57

Design Report for Shelton PC G24-75HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,625.00	28.04	359.78	6,573.18	413.01	-108.99	416.11	6.56
6,672.00	30.71	359.68	6,614.13	436.06	-109.10	439.16	5.70
6,720.00	34.40	358.44	6,654.58	461.88	-109.53	464.98	7.81
6,767.00	38.52	358.50	6,692.37	489.80	-110.28	492.91	8.75
6,815.00	42.14	0.13	6,728.96	520.85	-110.63	523.96	7.86
6,862.00	46.46	1.32	6,762.59	553.66	-110.20	556.74	9.36
6,910.00	50.33	1.77	6,794.46	589.53	-109.23	592.57	8.09
6,957.00	54.13	0.69	6,823.24	626.67	-108.44	629.66	8.30
7,005.00	57.08	359.90	6,850.35	666.27	-108.24	669.24	6.28
7,052.00	60.03	358.48	6,874.87	706.36	-108.82	709.33	6.79
7,100.00	63.30	357.80	6,897.65	748.58	-110.20	751.57	6.92
7,146.00	65.65	358.86	6,917.47	790.07	-111.40	793.08	5.51
7,194.00	68.94	0.28	6,936.00	834.34	-111.73	837.34	7.39
7,241.00	73.41	2.36	6,951.16	878.80	-110.69	881.74	10.40
7,289.00	77.70	2.91	6,963.13	925.22	-108.55	928.08	9.01
7,329.00	80.58	4.20	6,970.67	964.42	-106.11	967.19	7.87
7,374.00	83.65	3.02	6,976.84	1,008.90	-103.31	1,011.57	7.30
Estimated 7" Casing Point: 726' FSL, 2547' FEL (Not a Survey Point)							
7,410.00	86.11	2.09	6,980.05	1,044.72	-101.71	1,047.32	7.30
7,505.00	87.25	358.25	6,985.55	1,139.54	-101.43	1,142.09	4.21
7,600.00	90.31	357.30	6,987.57	1,234.44	-105.12	1,237.05	3.37
7,694.00	88.49	356.33	6,988.55	1,328.28	-110.35	1,331.01	2.19
7,789.00	91.94	359.67	6,988.19	1,423.20	-113.66	1,425.98	5.06
7,884.00	93.15	359.48	6,983.97	1,518.10	-114.36	1,520.86	1.28
7,979.00	90.59	359.54	6,980.88	1,613.04	-115.17	1,615.78	2.70
8,074.00	89.23	0.23	6,981.03	1,708.03	-115.36	1,710.74	1.60
8,168.00	89.54	358.92	6,982.04	1,802.02	-116.07	1,804.71	1.43
8,263.00	90.22	0.85	6,982.24	1,897.02	-116.26	1,899.67	2.16
8,358.00	91.79	358.25	6,980.58	1,991.99	-117.01	1,994.62	3.20
8,453.00	88.43	358.43	6,980.40	2,086.93	-119.77	2,089.60	3.54
8,548.00	88.00	357.80	6,983.35	2,181.84	-122.89	2,184.55	0.81
8,642.00	88.27	357.61	6,986.42	2,275.71	-126.66	2,278.50	0.35
8,737.00	87.87	356.61	6,989.62	2,370.53	-131.44	2,373.43	1.12
8,832.00	89.66	358.02	6,991.66	2,465.40	-135.89	2,468.38	2.40
8,927.00	90.98	358.90	6,991.12	2,560.36	-138.44	2,563.38	1.67
9,022.00	91.29	357.31	6,989.23	2,655.29	-141.58	2,658.36	1.70
9,116.00	91.54	358.39	6,986.91	2,749.19	-145.10	2,752.32	1.17
9,211.00	91.76	0.61	6,984.17	2,844.14	-145.93	2,847.26	2.35
9,306.00	92.44	359.98	6,980.69	2,939.08	-145.44	2,942.13	0.98
9,401.00	90.00	359.18	6,978.67	3,034.05	-146.13	3,037.08	2.70
9,496.00	89.48	358.92	6,979.11	3,129.03	-147.71	3,132.07	0.62
9,591.00	88.61	1.54	6,980.69	3,224.01	-147.34	3,226.99	2.90
9,686.00	88.31	0.15	6,983.24	3,318.96	-145.94	3,321.86	1.49
9,781.00	88.58	359.47	6,985.82	3,413.93	-146.25	3,416.79	0.77
9,876.00	88.49	358.09	6,988.25	3,508.87	-148.27	3,511.75	1.45
9,970.00	91.02	0.23	6,988.66	3,602.85	-149.65	3,605.72	3.52
10,065.00	93.17	359.83	6,985.19	3,697.78	-149.60	3,700.61	2.30
10,159.00	91.02	1.89	6,981.76	3,791.69	-148.18	3,794.44	3.16
10,254.00	90.09	1.02	6,980.84	3,886.66	-145.77	3,889.29	1.34
10,348.00	90.22	1.88	6,980.58	3,980.63	-143.39	3,983.14	0.93
10,443.00	90.31	4.15	6,980.15	4,075.49	-138.40	4,077.81	2.38

Design Report for Shelton PC G24-75HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,537.00	88.31	0.69	6,981.28	4,169.38	-134.43	4,171.54	4.25
10,632.00	86.66	358.46	6,985.45	4,264.27	-135.14	4,266.41	2.92
10,727.00	87.22	356.96	6,990.52	4,359.06	-138.93	4,361.27	1.68
10,822.00	90.12	355.59	6,992.72	4,453.82	-145.10	4,456.17	3.38
10,917.00	91.36	358.42	6,991.49	4,548.67	-150.07	4,551.13	3.25
11,011.00	92.22	357.50	6,988.55	4,642.56	-153.41	4,645.08	1.33
11,106.00	91.48	359.09	6,985.48	4,737.47	-156.24	4,740.03	1.84
11,201.00	90.34	359.40	6,983.98	4,832.45	-157.49	4,835.00	1.25
11,295.00	91.23	0.66	6,982.69	4,926.44	-157.44	4,928.94	1.64
11,390.00	91.26	359.68	6,980.62	5,021.41	-157.15	5,023.87	1.03
11,411.00	91.45	359.09	6,980.12	5,042.40	-157.38	5,044.86	2.96
Final MWD Survey							
11,471.00	91.45	359.09	6,978.60	5,102.38	-158.33	5,104.83	0.00
Survey Projection to TD - Estimated BHL: 535' FNL, 2584' FEL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
679.00	679.00	0.00	0.00	Surface Casing Assumed Vertical at 679.00ft
813.00	812.99	0.89	-0.48	First MWD Survey
7,374.00	6,976.84	1,008.90	-103.31	Estimated 7" Casing Point: 726' FSL, 2547' FEL (Not a Survey Point)
11,411.00	6,980.12	5,042.40	-157.38	Final MWD Survey
11,471.00	6,978.60	5,102.38	-158.33	Survey Projection to TD
11,471.00	6,978.60	5,102.38	-158.33	Estimated BHL: 535' FNL, 2584' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N_S (ft)	Origin +E-W (ft)	Start TVD (ft)
Target	Shelton PC G24-75HN_PlanB - Rev0_BHL Tgt	358.27	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
679.00	11,471.00	Sperry MWD Surveys	MWD
7,374.00	11,471.00	Sperry MWD Surveys	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,374.00	6,976.84	7" Csg	7	8-3/4

Design Report for Shelton PC G24-75HN - 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
Shelton PC	0.00	0.00	6,981.09	5,102.62	-154.36	1,354,717.07	3,247,831.74	40.30369	-104.61140
- actual wellpath misses target center by 4.69ft at 11471.00ft MD (6978.60 TVD, 5102.38 N, -158.33 E)									
- Point									
Shelton PC	0.00	0.00	-2.00	0.67	66.95	1,349,615.34	3,248,053.04	40.28968	-104.61079
- actual wellpath misses target center by 66.99ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			2,446.95	301.67		1,349,916.33	3,250,432.94		
Point 2			-2,815.05	266.67		1,349,881.33	3,245,171.16		
Point 3			-2,776.05	5,633.67		1,355,248.10	3,245,210.16		
Point 4			2,422.95	5,642.67		1,355,257.10	3,250,408.94		
Point 5			2,446.95	301.67		1,349,916.33	3,250,432.94		
Shelton PC	0.00	0.00	-2.00	0.67	66.95	1,349,615.34	3,248,053.04	40.28968	-104.61079
- actual wellpath misses target center by 66.99ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			2,446.95	301.67		1,349,916.33	3,250,432.94		
Point 2			2,471.95	-4,970.33		1,344,644.55	3,250,457.94		
Point 3			-2,757.05	-5,022.33		1,344,592.55	3,245,229.16		
Point 4			-2,815.05	266.67		1,349,881.33	3,245,171.16		
Point 5			2,446.95	301.67		1,349,916.33	3,250,432.94		
Shelton PC	0.00	0.00	-2.00	0.67	66.95	1,349,615.34	3,248,053.04	40.28968	-104.61079
- actual wellpath misses target center by 66.99ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			1,986.95	761.67		1,350,376.31	3,249,972.96		
Point 2			-2,355.05	726.67		1,350,341.31	3,245,631.14		
Point 3			-2,321.05	5,173.67		1,354,788.12	3,245,665.14		
Point 4			1,962.95	5,182.67		1,354,797.12	3,249,948.96		
Point 5			1,986.95	761.67		1,350,376.31	3,249,972.96		
Shelton PC	0.00	0.00	-2.00	0.67	66.95	1,349,615.34	3,248,053.04	40.28968	-104.61079
- actual wellpath misses target center by 66.99ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			1,986.95	-158.33		1,349,456.34	3,249,972.96		
Point 2			2,011.95	-4,510.33		1,345,104.53	3,249,997.96		
Point 3			-2,297.05	-4,562.33		1,345,052.53	3,245,689.14		
Point 4			-2,355.05	-193.33		1,349,421.35	3,245,631.14		
Point 5			1,986.95	-158.33		1,349,456.34	3,249,972.96		

North Reference Sheet for Sec. 25-T4N-R65W (Shelton 25 PAD) - Shelton PC G24-75HN

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

Vertical Depths are relative to KB=30' @ 4823.00ft (H&P 321). Northing and Easting are relative to Shelton PC G24-75HN - Slot A4

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 -105.50000°, Longitude Origin:0.00000°, Latitude Origin:40.78333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995708

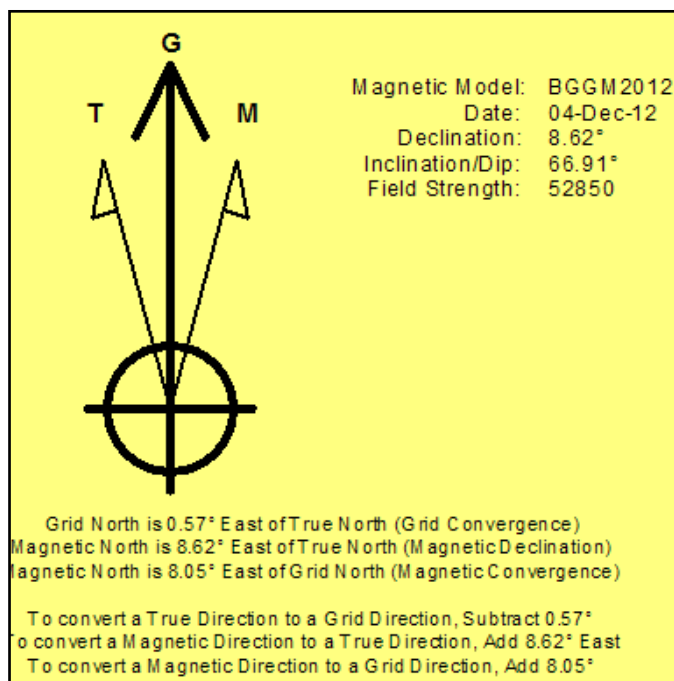
Grid Coordinates of Well: 1,349,614.67 ft N, 3,247,986.09 ft E

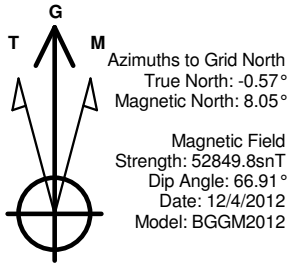
Geographical Coordinates of Well: 40° 17' 22.85" N, 104° 36' 39.71" W

Grid Convergence at Surface is: 0.57°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,471.00ft the Bottom Hole Displacement is 5,104.83ft in the Direction of 358.22° (Grid).

Magnetic Convergence at surface is: -8.05° (4 December 2012, , BGGM2012)



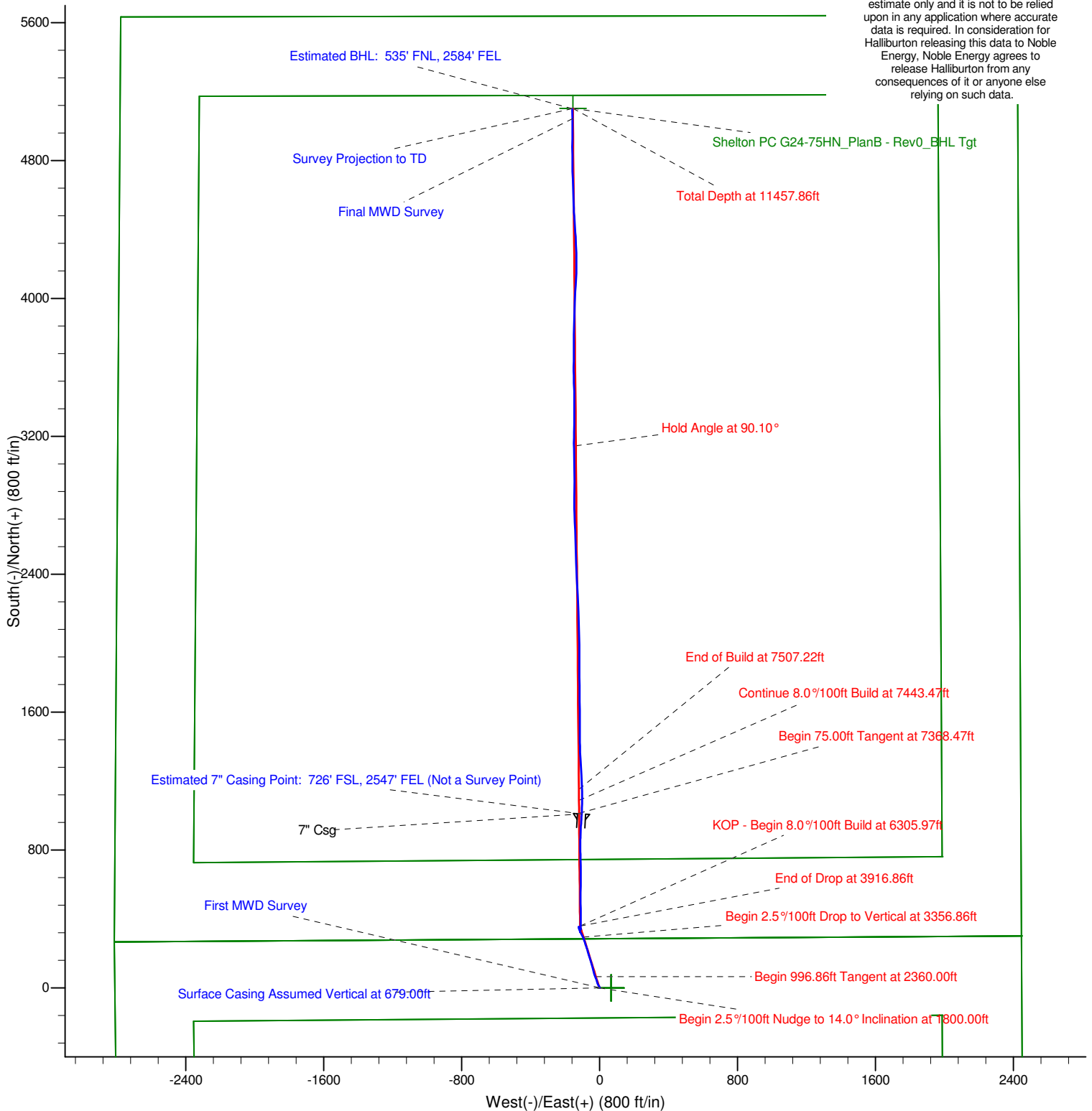


LEGEND

- Shelton PC G24-75HN, Plan B, Plan B - Rev 0 Proposal V0
- MWD Survey

Permitted BHL: 535' FNL, 2580' FEL

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Shelton PC G24-75HN 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.

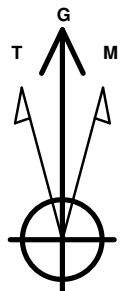


Project: Weld County, CO (NAD 83)
Site: Sec. 25-T4N-R65W (Shelton 25 PAD)
Well: Shelton PC G24-75HN

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.57°
Magnetic North: 8.05°

Magnetic Field
Strength: 52849.8snT
Dip Angle: 66.91°
Date: 12/4/2012
Model: BGGM2012

LEGEND

- Shelton PC G24-75HN, Plan B, Plan B - Rev 0 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Shelton PC G24-75HN 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.

