

Project: Weld County, CO (NAD 83)
 Site: Sec. 27-T6N-R63W
 Well: Wells Ranch USX AA27-65-1HN
 Wellbore: Plan C
 Design: Final Surveys

Noble Energy



Platted SHL: 1539' FSL, 221' FWL
 Platted Lat/Long: 40.45441° N, 104.43178° W
 Location: Sec. 27-T6N-R63W

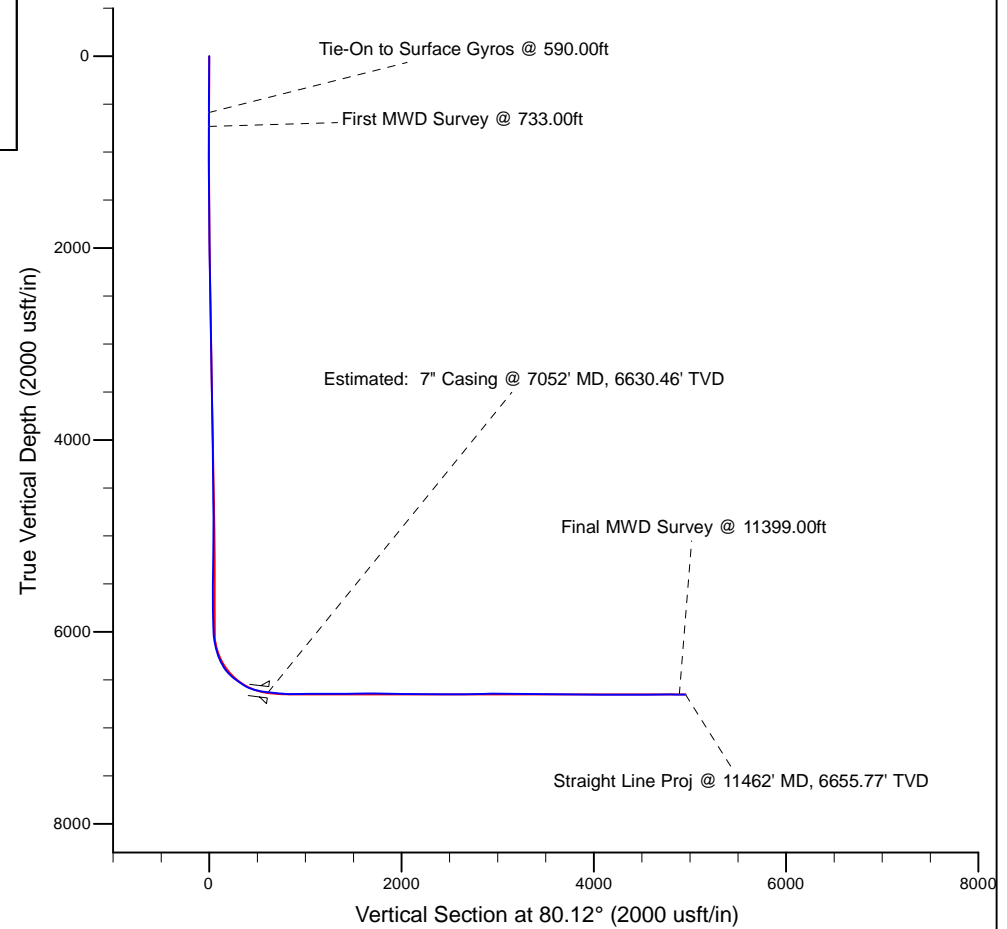
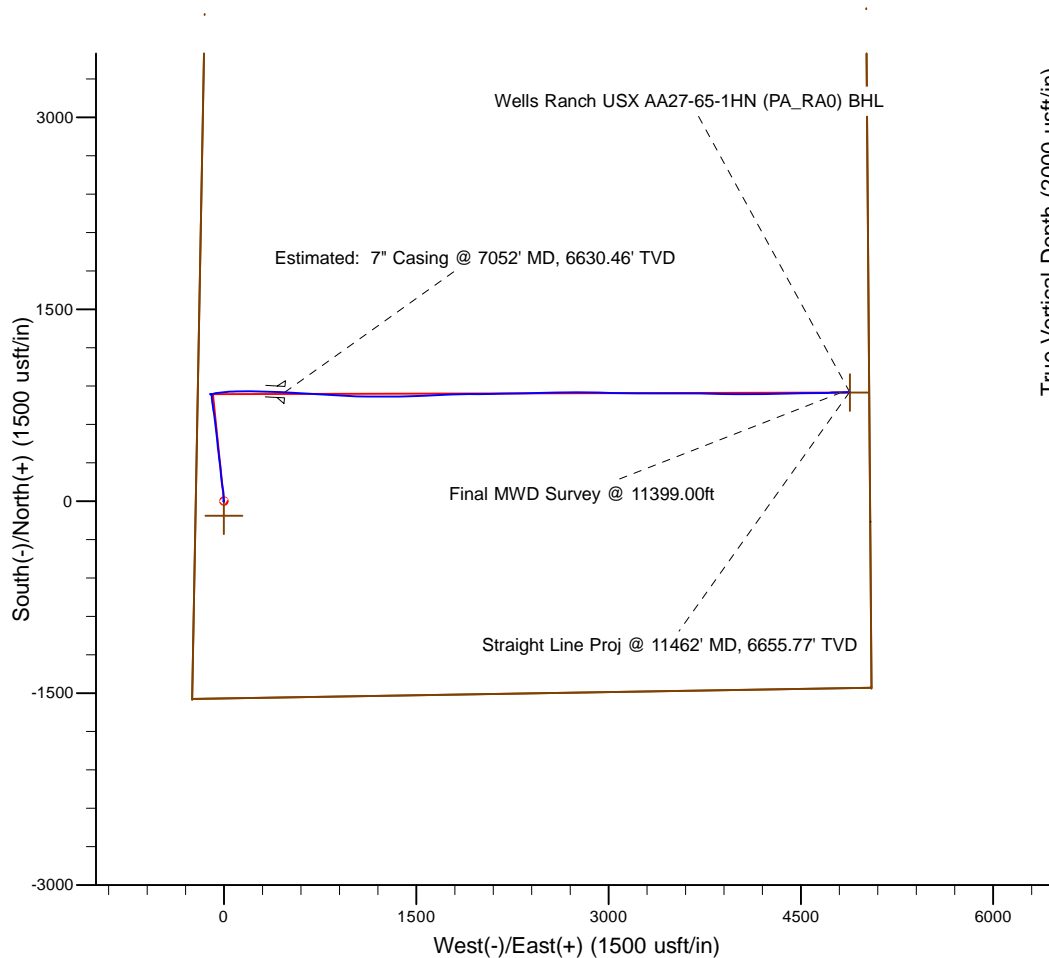
7" Casing: ~2384.34' FSL, ~678.22' FWL
 Lat/Long: 40° 27' 24.241 N, 104° 25' 48.155 W
 State Planes - CO Northern: 1,411,024.73' N, 3,297,737.51' E
 Location: Sec. 27-T6N-R63W

BHL: ~2314.13' FSL, ~152.48' FEL
 Lat/Long: 40° 27' 23.727 N, 104° 24' 51.152 W
 State Planes - CO Northern: 1,411,026.19' N, 3,302,144.12' E
 Location: Sec. 27-T6N-R63W

LEGEND

Wells Ranch USX AA27-65-1HN, Plan C, Rev A0 Proposal V0

Final Surveys



WELL DETAILS: Wells Ranch USX AA27-65-1HN	
Ground Level:	4794.00
RKB 24 ft. @ 4818.00usft (H&P 322)	
Created By:	Fred Hartmann
Created On:	10/24/2013

Noble Energy

Weld County, CO (NAD 83)

Sec. 27-T6N-R63W

Wells Ranch USX AA27-65-1HN - A4

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

24 October, 2013

Well Coordinates: 1,410,172.42 N, 3,297,264.36 E (40° 27' 15.88" N, 104° 25' 54.41" W)

Ground Level: 4,794.00 usft

Local Coordinate Origin:

Centered on Well Wells Ranch USX AA27-65-1HN - Slot A4

Viewing Datum:

RKB 24 ft. @ 4818.00usft (H&P 322)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for Wells Ranch USX AA27-65-1HN - 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
250.00	0.70	259.00	249.99	-0.29	-1.50	-1.53	0.28
497.00	0.00	299.50	496.99	-0.58	-2.98	-3.04	0.28
590.00	0.50	131.80	589.99	-0.85	-2.68	-2.78	0.54
Tie-On to Surface Gyros @ 590.00ft							
733.00	0.28	35.00	732.98	-0.98	-2.01	-2.15	0.42
First MWD Survey @ 733.00ft							
826.00	0.38	162.36	825.98	-1.09	-1.79	-1.95	0.64
919.00	0.28	358.86	918.98	-1.15	-1.70	-1.87	0.70
1,012.00	0.04	217.73	1,011.98	-0.95	-1.72	-1.86	0.34
1,105.00	0.19	287.89	1,104.98	-0.93	-1.89	-2.02	0.19
1,198.00	0.62	279.90	1,197.98	-0.80	-2.53	-2.63	0.47
1,291.00	0.25	356.95	1,290.98	-0.51	-3.04	-3.08	0.66
1,384.00	0.52	295.11	1,383.98	-0.13	-3.43	-3.40	0.49
1,477.00	0.49	331.73	1,476.97	0.40	-4.00	-3.87	0.34
1,571.00	2.22	4.79	1,570.94	2.57	-4.04	-3.54	1.95
1,666.00	5.10	359.77	1,665.74	8.63	-3.90	-2.37	3.05
1,761.00	7.12	357.78	1,760.20	18.74	-4.15	-0.87	2.14
1,856.00	8.13	0.08	1,854.35	31.34	-4.37	1.07	1.11
1,951.00	10.43	357.18	1,948.11	46.64	-4.78	3.29	2.47
2,046.00	11.89	355.23	2,041.31	64.99	-6.02	5.22	1.59
2,140.00	13.78	353.92	2,132.95	85.77	-8.01	6.82	2.03
2,235.00	16.23	350.82	2,224.71	110.13	-11.33	7.73	2.71
2,330.00	15.70	349.51	2,316.05	135.88	-15.79	7.75	0.67
2,425.00	15.56	351.53	2,407.53	161.12	-20.00	7.93	0.59
2,520.00	15.72	355.31	2,499.02	186.55	-22.93	9.40	1.09
2,615.00	15.19	355.31	2,590.58	211.78	-25.00	11.69	0.56
2,710.00	14.21	354.34	2,682.47	235.79	-27.17	13.67	1.06
2,805.00	14.83	355.22	2,774.44	259.51	-29.33	15.61	0.69
2,900.00	16.67	353.03	2,865.87	285.15	-32.00	17.38	2.04
2,995.00	17.66	353.25	2,956.63	312.99	-35.35	18.85	1.04
3,090.00	17.57	353.46	3,047.18	341.54	-38.67	20.47	0.12
3,185.00	17.38	353.31	3,137.80	369.88	-41.96	22.10	0.21
3,279.00	17.53	353.04	3,227.47	397.87	-45.31	23.60	0.18
3,374.00	15.24	351.95	3,318.60	424.44	-48.79	24.72	2.43
3,469.00	14.53	353.48	3,410.42	448.65	-51.89	25.82	0.85
3,564.00	14.35	357.37	3,502.42	472.25	-53.79	28.00	1.04
3,659.00	14.45	353.68	3,594.43	495.79	-55.63	30.22	0.97
3,754.00	16.31	353.47	3,686.03	520.83	-58.45	31.73	1.96
3,849.00	17.60	353.44	3,776.90	548.35	-61.61	33.34	1.36
3,944.00	18.90	352.94	3,867.12	577.89	-65.14	34.93	1.38
4,039.00	18.70	352.82	3,957.05	608.27	-68.94	36.40	0.21
4,134.00	17.08	351.36	4,047.45	637.17	-72.94	37.42	1.77
4,229.00	16.70	352.47	4,138.35	664.50	-76.82	38.28	0.52
4,323.00	16.05	352.60	4,228.54	690.77	-80.27	39.39	0.69
4,418.00	14.84	351.80	4,320.11	715.84	-83.69	40.31	1.29
4,513.00	14.00	353.52	4,412.11	739.30	-86.73	41.35	0.99
4,608.00	13.00	350.87	4,504.49	761.27	-89.72	42.17	1.24
4,703.00	10.96	351.38	4,597.42	780.75	-92.77	42.50	2.15
4,798.00	8.81	351.54	4,691.00	796.87	-95.19	42.88	2.26

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,893.00	7.81	359.53	4,785.00	810.52	-96.32	44.12	1.61
4,988.00	5.48	355.43	4,879.36	821.50	-96.73	45.59	2.50
5,083.00	4.02	349.06	4,974.03	829.29	-97.72	45.95	1.63
5,178.00	2.96	313.74	5,068.86	834.26	-100.13	44.43	2.47
5,273.00	1.60	311.87	5,163.79	836.84	-102.89	42.16	1.43
5,368.00	1.48	294.96	5,258.75	838.24	-104.99	40.33	0.49
5,463.00	0.32	356.45	5,353.74	839.03	-106.12	39.35	1.43
5,557.00	0.49	156.52	5,447.74	838.92	-105.97	39.47	0.85
5,652.00	0.13	216.85	5,542.74	838.46	-105.87	39.49	0.46
5,747.00	0.71	117.48	5,637.74	838.10	-105.42	39.88	0.78
5,842.00	0.96	155.45	5,732.73	837.11	-104.56	40.55	0.62
5,937.00	0.86	123.94	5,827.72	835.99	-103.64	41.26	0.53
5,991.00	0.94	94.87	5,881.71	835.72	-102.86	41.99	0.85
6,078.00	1.21	110.93	5,968.69	835.33	-101.30	43.46	0.46
6,126.00	4.20	72.19	6,016.64	835.69	-99.15	45.64	6.96
6,173.00	7.92	72.76	6,063.37	837.18	-94.42	50.56	7.92
6,220.00	10.13	69.60	6,109.78	839.58	-87.45	57.83	4.82
6,267.00	12.72	71.86	6,155.85	842.63	-78.66	67.02	5.59
6,315.00	16.08	82.74	6,202.34	845.12	-67.03	78.90	8.96
6,410.00	23.24	84.24	6,291.75	848.66	-35.29	110.78	7.55
6,505.00	33.61	83.50	6,375.18	853.53	9.60	155.84	10.92
6,600.00	46.40	88.14	6,447.81	857.65	70.37	216.42	13.82
6,647.00	51.02	89.73	6,478.82	858.28	105.67	251.30	10.15
6,695.00	54.31	89.64	6,507.93	858.49	143.83	288.93	6.86
6,742.00	55.90	90.06	6,534.81	858.59	182.38	326.92	3.46
6,790.00	59.20	90.32	6,560.56	858.46	222.88	366.80	6.89
6,837.00	66.11	90.59	6,582.14	858.12	264.60	407.84	14.71
6,885.00	72.83	90.70	6,598.96	857.62	309.52	452.02	14.00
6,932.00	77.02	91.21	6,611.19	856.86	354.89	496.58	8.98
6,980.00	80.21	92.15	6,620.66	855.48	401.91	542.67	6.92
7,008.00	82.26	92.43	6,624.93	854.37	429.56	569.72	7.39
7,052.00	83.28	92.90	6,630.46	852.34	473.17	612.33	2.56
Estimated: 7" Casing @ 7052' MD, 6630.46' TVD							
7,094.00	84.26	93.35	6,635.02	850.06	514.86	653.01	2.56
7,141.00	84.84	93.38	6,639.48	847.32	561.56	698.56	1.24
7,236.00	87.04	93.34	6,646.21	841.76	656.16	790.80	2.32
7,331.00	88.80	93.01	6,649.66	836.51	750.94	883.28	1.88
7,426.00	91.14	94.02	6,649.71	830.68	845.76	975.69	2.68
7,520.00	91.76	93.61	6,647.33	824.43	939.52	1,066.99	0.79
7,614.00	90.34	91.56	6,645.61	820.19	1,033.40	1,158.75	2.65
7,709.00	89.66	91.30	6,645.61	817.82	1,128.37	1,251.91	0.77
7,804.00	88.52	89.02	6,647.11	817.56	1,223.35	1,345.43	2.68
7,899.00	90.96	89.82	6,647.55	818.52	1,318.33	1,439.18	2.70
7,993.00	91.79	88.35	6,645.29	820.02	1,412.29	1,532.00	1.80
8,088.00	91.17	87.59	6,642.84	823.38	1,507.20	1,626.08	1.03
8,182.00	88.71	87.08	6,642.93	827.75	1,601.09	1,719.33	2.67
8,277.00	88.98	87.51	6,644.85	832.23	1,695.96	1,813.57	0.53
8,372.00	88.64	88.49	6,646.82	835.55	1,790.89	1,907.65	1.09
8,467.00	89.94	89.63	6,648.00	837.11	1,885.86	2,001.48	1.82
8,562.00	89.60	89.25	6,648.38	838.04	1,980.86	2,095.23	0.54
8,656.00	90.68	89.65	6,648.15	838.94	2,074.85	2,187.99	1.23

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,751.00	89.32	89.05	6,648.15	840.02	2,169.84	2,281.76	1.56
8,846.00	88.12	88.69	6,650.27	841.89	2,264.80	2,375.63	1.32
8,941.00	88.92	87.92	6,652.73	844.70	2,359.72	2,469.63	1.17
9,036.00	90.46	88.74	6,653.24	847.47	2,454.68	2,563.65	1.84
9,130.00	91.82	88.88	6,651.37	849.42	2,548.64	2,656.55	1.45
9,225.00	90.62	89.10	6,649.35	851.09	2,643.60	2,750.39	1.28
9,320.00	91.48	90.70	6,647.61	851.26	2,738.58	2,843.99	1.91
9,415.00	91.60	90.07	6,645.05	850.62	2,833.54	2,937.44	0.67
9,510.00	89.78	91.81	6,643.91	849.06	2,928.51	3,030.74	2.65
9,605.00	88.15	91.42	6,645.63	846.38	3,023.46	3,123.82	1.76
9,699.00	89.38	90.85	6,647.65	844.52	3,117.41	3,216.06	1.44
9,795.00	88.89	90.53	6,649.10	843.37	3,213.40	3,310.42	0.61
9,889.00	88.61	90.02	6,651.15	842.92	3,307.37	3,402.93	0.62
9,984.00	89.54	89.29	6,652.69	843.49	3,402.36	3,496.61	1.24
10,079.00	91.45	90.14	6,651.87	843.96	3,497.35	3,590.27	2.20
10,174.00	89.69	90.68	6,650.92	843.28	3,592.33	3,683.73	1.94
10,269.00	89.66	90.49	6,651.46	842.31	3,687.33	3,777.15	0.20
10,363.00	89.29	90.57	6,652.32	841.44	3,781.32	3,869.60	0.40
10,458.00	90.15	91.65	6,652.78	839.60	3,876.30	3,962.86	1.45
10,553.00	88.12	90.52	6,654.22	837.80	3,971.26	4,056.11	2.45
10,648.00	88.67	89.88	6,656.88	837.47	4,066.23	4,149.61	0.89
10,743.00	90.43	89.01	6,657.63	838.39	4,161.21	4,243.35	2.07
10,838.00	90.62	89.38	6,656.76	839.73	4,256.20	4,337.15	0.44
10,932.00	90.09	88.81	6,656.17	841.21	4,350.19	4,430.00	0.83
11,027.00	90.77	88.76	6,655.46	843.23	4,445.16	4,523.92	0.72
11,122.00	90.89	89.49	6,654.08	844.68	4,540.14	4,617.74	0.78
11,217.00	90.68	89.69	6,652.78	845.36	4,635.13	4,711.43	0.31
11,312.00	88.34	87.43	6,653.59	847.74	4,730.08	4,805.39	3.42
11,399.00	89.51	87.79	6,655.23	851.37	4,816.99	4,891.63	1.41
Final MWD Survey @ 11399.00ft							
11,462.00	89.51	87.79	6,655.77	853.80	4,879.94	4,954.07	0.00
Straight Line Proj @ 11462' MD, 6655.77' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
590.00	589.99	-0.85	-2.68	Tie-On to Surface Gyros @ 590.00ft
733.00	732.98	-0.98	-2.01	First MWD Survey @ 733.00ft
11,399.00	6,655.23	851.37	4,816.99	Final MWD Survey @ 11399.00ft
11,462.00	6,655.77	853.80	4,879.94	Straight Line Proj @ 11462' MD, 6655.77' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wells Ranch USX AA27-65-1HN (PC_RA0) BHL	80.12	Slot	0.00	0.00	0.00

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
250.00	590.00	Surface Gyros	Flexi-Shot
733.00	7,008.00	MWD Surveys - Vert/Build	MWD
7,094.00	11,399.00	MWD Surveys - Lateral	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,052.00	6,630.46	Estimated: 7" Casing @ 7052' MD, 6630.46' TVD	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
Wells Ranch USX AA2	0.00	0.00	0.00	-112.96	-1.42	1,410,059.46	3,297,262.94	40° 27' 14.760 N	104° 25' 54.444 W
- actual wellpath misses target center by 112.97usft at 0.14usft MD (0.14 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			0.00	-1,431.19	-247.18	1,408,628.33	3,297,015.77		
Point 2			0.00	-1,344.99	5,051.27	1,408,714.52	3,302,314.03		
Point 3			0.00	3,966.63	5,011.24	1,414,025.95	3,302,274.00		
Point 4			0.00	3,922.15	-150.21	1,413,981.47	3,297,112.74		
Point 5			0.00	-1,431.19	-247.18	1,408,628.33	3,297,015.77		
Wells Ranch USX AA2	0.00	0.00	0.00	-112.96	-1.42	1,410,059.46	3,297,262.94	40° 27' 14.760 N	104° 25' 54.444 W
- actual wellpath misses target center by 112.97usft at 0.14usft MD (0.14 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			0.00	-963.19	220.82	1,409,096.31	3,297,483.75		
Point 2			0.00	-892.99	4,587.77	1,409,166.51	3,301,850.54		
Point 3			0.00	3,502.63	4,554.24	1,413,561.97	3,301,817.01		
Point 4			0.00	3,467.15	300.46	1,413,526.49	3,297,563.39		
Point 5			0.00	-963.19	220.82	1,409,096.31	3,297,483.75		
Wells Ranch USX AA2	0.00	0.00	0.00	0.00	0.00	1,410,172.42	3,297,264.36	40° 27' 15.876 N	104° 25' 54.408 W
- actual wellpath hits target center									
- Point									
Wells Ranch USX AA2	0.00	0.00	6,640.01	572.61	652.38	1,410,745.01	3,297,916.71	40° 27' 21.456 N	104° 25' 45.880 W
- actual wellpath misses target center by 269.01usft at 7246.90usft MD (6646.75 TVD, 841.13 N, 667.03 E)									
- Point									
Wells Ranch USX AA2	0.00	0.00	6,640.02	839.08	493.09	1,411,011.47	3,297,757.43	40° 27' 24.108 N	104° 25' 47.899 W
- actual wellpath misses target center by 14.14usft at 7073.53usft MD (6632.89 TVD, 851.22 N, 494.53 E)									
- Point									
Wells Ranch USX AA2	0.00	0.00	6,652.00	849.93	4,882.42	1,411,022.32	3,302,146.61	40° 27' 23.688 N	104° 24' 51.120 W
- actual wellpath misses target center by 5.94usft at 11462.00usft MD (6655.77 TVD, 853.80 N, 4879.94 E)									
- Point									
Wells Ranch USX AA2	0.00	0.00	6,652.00	849.93	4,882.42	1,411,022.32	3,302,146.61	40° 27' 23.688 N	104° 24' 51.120 W
- actual wellpath misses target center by 5.94usft at 11462.00usft MD (6655.77 TVD, 853.80 N, 4879.94 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.86 °/100usft	Maximum Dogleg over Survey:	14.71 °/100usft at 6,837.00 usft
Net Tortousity applicable to Plans:	0.82 °/100usft	Directional Difficulty Index:	6.333

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Audit Info

North Reference Sheet for Sec. 27-T6N-R63W - Wells Ranch USX AA27-65-1HN -

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 ft. @ 4818.00usft (H&P 322). Northing and Easting are relative to Wells Ranch USX AA27-65-1HN - 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° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996315

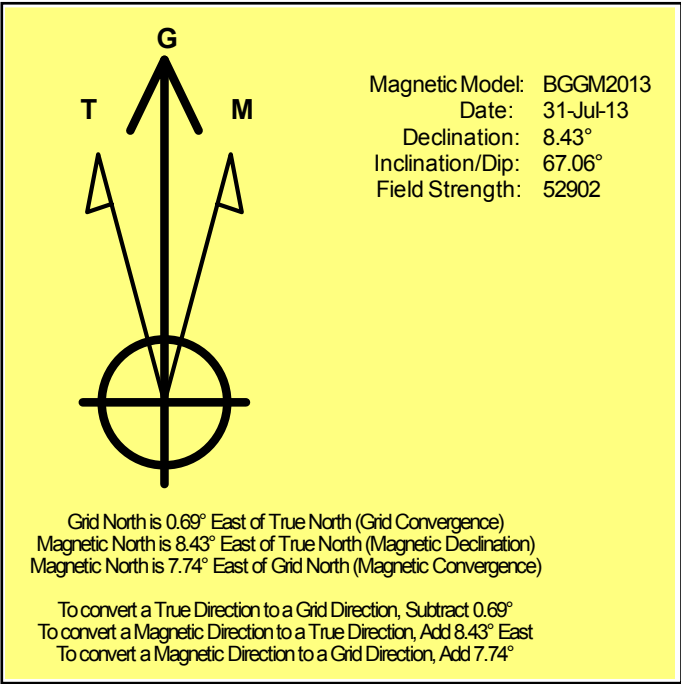
Grid Coordinates of Well: 1,410,172.42 usft N, 3,297,264.36 usft E

Geographical Coordinates of Well: 40° 27' 15.88" N, 104° 25' 54.41" W

Grid Convergence at Surface is: 0.69°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,462.00usft the Bottom Hole Displacement is 4,954.07usft in the Direction of 80.08° (Grid).

Magnetic Convergence at surface is: -7.74° (31 July 2013, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 27-T6N-R63W

Wells Ranch USX AA27-65-1HN - A4

Design: Final Surveys

Sperry Drilling Services

Geodetic Report

24 October, 2013

Well Coordinates: 1,410,172.42 N, 3,297,264.36 E (40° 27' 15.88" N, 104° 25' 54.41" W)

Ground Level: 4,794.00 usft

Local Coordinate Origin:

Centered on Well Wells Ranch USX AA27-65-1HN - Slot A4

Viewing Datum:

RKB 24 ft. @ 4818.00usft (H&P 322)

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40° 27' 15.876 N	104° 25' 54.408 W	1,410,172.42	3,297,264.36
250.00	0.70	259.00	249.99	-0.29	-1.50	40° 27' 15.873 N	104° 25' 54.427 W	1,410,172.13	3,297,262.86
497.00	0.00	299.50	496.99	-0.58	-2.98	40° 27' 15.871 N	104° 25' 54.447 W	1,410,171.84	3,297,261.38
590.00	0.50	131.80	589.99	-0.85	-2.68	40° 27' 15.868 N	104° 25' 54.443 W	1,410,171.57	3,297,261.68
733.00	0.28	35.00	732.98	-0.98	-2.01	40° 27' 15.866 N	104° 25' 54.434 W	1,410,171.44	3,297,262.35
826.00	0.38	162.36	825.98	-1.09	-1.79	40° 27' 15.865 N	104° 25' 54.431 W	1,410,171.33	3,297,262.57
919.00	0.28	358.86	918.98	-1.15	-1.70	40° 27' 15.865 N	104° 25' 54.430 W	1,410,171.27	3,297,262.66
1,012.00	0.04	217.73	1,011.98	-0.95	-1.72	40° 27' 15.867 N	104° 25' 54.430 W	1,410,171.47	3,297,262.64
1,105.00	0.19	287.89	1,104.98	-0.93	-1.89	40° 27' 15.867 N	104° 25' 54.433 W	1,410,171.49	3,297,262.47
1,198.00	0.62	279.90	1,197.98	-0.80	-2.53	40° 27' 15.868 N	104° 25' 54.441 W	1,410,171.62	3,297,261.83
1,291.00	0.25	356.95	1,290.98	-0.51	-3.04	40° 27' 15.871 N	104° 25' 54.447 W	1,410,171.91	3,297,261.32
1,384.00	0.52	295.11	1,383.98	-0.13	-3.43	40° 27' 15.875 N	104° 25' 54.452 W	1,410,172.29	3,297,260.93
1,477.00	0.49	331.73	1,476.97	0.40	-4.00	40° 27' 15.880 N	104° 25' 54.460 W	1,410,172.82	3,297,260.36
1,571.00	2.22	4.79	1,570.94	2.57	-4.04	40° 27' 15.902 N	104° 25' 54.460 W	1,410,174.99	3,297,260.32
1,666.00	5.10	359.77	1,665.74	8.63	-3.90	40° 27' 15.962 N	104° 25' 54.457 W	1,410,181.05	3,297,260.46
1,761.00	7.12	357.78	1,760.20	18.74	-4.15	40° 27' 16.062 N	104° 25' 54.459 W	1,410,191.16	3,297,260.21
1,856.00	8.13	0.08	1,854.35	31.34	-4.37	40° 27' 16.186 N	104° 25' 54.460 W	1,410,203.76	3,297,259.99
1,951.00	10.43	357.18	1,948.11	46.64	-4.78	40° 27' 16.337 N	104° 25' 54.463 W	1,410,219.06	3,297,259.58
2,046.00	11.89	355.23	2,041.31	64.99	-6.02	40° 27' 16.519 N	104° 25' 54.476 W	1,410,237.40	3,297,258.34
2,140.00	13.78	353.92	2,132.95	85.77	-8.01	40° 27' 16.724 N	104° 25' 54.498 W	1,410,258.19	3,297,256.35
2,235.00	16.23	350.82	2,224.71	110.13	-11.33	40° 27' 16.965 N	104° 25' 54.537 W	1,410,282.55	3,297,253.03
2,330.00	15.70	349.51	2,316.05	135.88	-15.79	40° 27' 17.220 N	104° 25' 54.591 W	1,410,308.29	3,297,248.58
2,425.00	15.56	351.53	2,407.53	161.12	-20.00	40° 27' 17.470 N	104° 25' 54.642 W	1,410,333.53	3,297,244.36
2,520.00	15.72	355.31	2,499.02	186.55	-22.93	40° 27' 17.722 N	104° 25' 54.676 W	1,410,358.96	3,297,241.43
2,615.00	15.19	355.31	2,590.58	211.78	-25.00	40° 27' 17.971 N	104° 25' 54.698 W	1,410,384.19	3,297,239.36
2,710.00	14.21	354.34	2,682.47	235.79	-27.17	40° 27' 18.209 N	104° 25' 54.723 W	1,410,408.20	3,297,237.19
2,805.00	14.83	355.22	2,774.44	259.51	-29.33	40° 27' 18.444 N	104° 25' 54.747 W	1,410,431.92	3,297,235.03
2,900.00	16.67	353.03	2,865.87	285.15	-32.00	40° 27' 18.697 N	104° 25' 54.777 W	1,410,457.56	3,297,232.36
2,995.00	17.66	353.25	2,956.63	312.99	-35.35	40° 27' 18.973 N	104° 25' 54.816 W	1,410,485.39	3,297,229.02
3,090.00	17.57	353.46	3,047.18	341.54	-38.67	40° 27' 19.255 N	104° 25' 54.855 W	1,410,513.95	3,297,225.69
3,185.00	17.38	353.31	3,137.80	369.88	-41.96	40° 27' 19.536 N	104° 25' 54.893 W	1,410,542.29	3,297,222.40
3,279.00	17.53	353.04	3,227.47	397.87	-45.31	40° 27' 19.813 N	104° 25' 54.932 W	1,410,570.28	3,297,219.05
3,374.00	15.24	351.95	3,318.60	424.44	-48.79	40° 27' 20.076 N	104° 25' 54.973 W	1,410,596.85	3,297,215.57
3,469.00	14.53	353.48	3,410.42	448.65	-51.89	40° 27' 20.315 N	104° 25' 55.009 W	1,410,621.05	3,297,212.47
3,564.00	14.35	357.37	3,502.42	472.25	-53.79	40° 27' 20.549 N	104° 25' 55.030 W	1,410,644.65	3,297,210.58
3,659.00	14.45	353.68	3,594.43	495.79	-55.63	40° 27' 20.781 N	104° 25' 55.050 W	1,410,668.19	3,297,208.73
3,754.00	16.31	353.47	3,686.03	520.83	-58.45	40° 27' 21.029 N	104° 25' 55.083 W	1,410,693.23	3,297,205.91
3,849.00	17.60	353.44	3,776.90	548.35	-61.61	40° 27' 21.301 N	104° 25' 55.120 W	1,410,720.75	3,297,202.75
3,944.00	18.90	352.94	3,867.12	577.89	-65.14	40° 27' 21.594 N	104° 25' 55.161 W	1,410,750.29	3,297,199.22
4,039.00	18.70	352.82	3,957.05	608.27	-68.94	40° 27' 21.894 N	104° 25' 55.205 W	1,410,780.66	3,297,195.42
4,134.00	17.08	351.36	4,047.45	637.17	-72.94	40° 27' 22.180 N	104° 25' 55.252 W	1,410,809.57	3,297,191.43
4,229.00	16.70	352.47	4,138.35	664.50	-76.82	40° 27' 22.451 N	104° 25' 55.298 W	1,410,836.89	3,297,187.54

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Latitude	Longitude	Northing	Easting
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)
4,323.00	16.05	352.60	4,228.54	690.77	-80.27	40° 27' 22.711 N	104° 25' 55.339 W	1,410,863.17	3,297,184.10
4,418.00	14.84	351.80	4,320.11	715.84	-83.69	40° 27' 22.959 N	104° 25' 55.379 W	1,410,888.23	3,297,180.67
4,513.00	14.00	353.52	4,412.11	739.30	-86.73	40° 27' 23.191 N	104° 25' 55.415 W	1,410,911.69	3,297,177.64
4,608.00	13.00	350.87	4,504.49	761.27	-89.72	40° 27' 23.409 N	104° 25' 55.450 W	1,410,933.66	3,297,174.65
4,703.00	10.96	351.38	4,597.42	780.75	-92.77	40° 27' 23.601 N	104° 25' 55.486 W	1,410,953.14	3,297,171.60
4,798.00	8.81	351.54	4,691.00	796.87	-95.19	40° 27' 23.761 N	104° 25' 55.515 W	1,410,969.26	3,297,169.17
4,893.00	7.81	359.53	4,785.00	810.52	-96.32	40° 27' 23.896 N	104° 25' 55.528 W	1,410,982.91	3,297,168.05
4,988.00	5.48	355.43	4,879.36	821.50	-96.73	40° 27' 24.005 N	104° 25' 55.531 W	1,410,993.89	3,297,167.64
5,083.00	4.02	349.06	4,974.03	829.29	-97.72	40° 27' 24.082 N	104° 25' 55.543 W	1,411,001.68	3,297,166.64
5,178.00	2.96	313.74	5,068.86	834.26	-100.13	40° 27' 24.131 N	104° 25' 55.573 W	1,411,006.65	3,297,164.24
5,273.00	1.60	311.87	5,163.79	836.84	-102.89	40° 27' 24.157 N	104° 25' 55.609 W	1,411,009.23	3,297,161.48
5,368.00	1.48	294.96	5,258.75	838.24	-104.99	40° 27' 24.171 N	104° 25' 55.635 W	1,411,010.63	3,297,159.38
5,463.00	0.32	356.45	5,353.74	839.03	-106.12	40° 27' 24.179 N	104° 25' 55.650 W	1,411,011.41	3,297,158.25
5,557.00	0.49	156.52	5,447.74	838.92	-105.97	40° 27' 24.178 N	104° 25' 55.648 W	1,411,011.31	3,297,158.39
5,652.00	0.13	216.85	5,542.74	838.46	-105.87	40° 27' 24.173 N	104° 25' 55.647 W	1,411,010.85	3,297,158.49
5,747.00	0.71	117.48	5,637.74	838.10	-105.42	40° 27' 24.170 N	104° 25' 55.641 W	1,411,010.49	3,297,158.95
5,842.00	0.96	155.45	5,732.73	837.11	-104.56	40° 27' 24.160 N	104° 25' 55.630 W	1,411,009.50	3,297,159.80
5,937.00	0.86	123.94	5,827.72	835.99	-103.64	40° 27' 24.149 N	104° 25' 55.618 W	1,411,008.37	3,297,160.72
5,991.00	0.94	94.87	5,881.71	835.72	-102.86	40° 27' 24.146 N	104° 25' 55.608 W	1,411,008.11	3,297,161.50
6,078.00	1.21	110.93	5,968.69	835.33	-101.30	40° 27' 24.142 N	104° 25' 55.588 W	1,411,007.72	3,297,163.07
6,126.00	4.20	72.19	6,016.64	835.69	-99.15	40° 27' 24.145 N	104° 25' 55.560 W	1,411,008.08	3,297,165.22
6,173.00	7.92	72.76	6,063.37	837.18	-94.42	40° 27' 24.159 N	104° 25' 55.499 W	1,411,009.56	3,297,169.95
6,220.00	10.13	69.60	6,109.78	839.58	-87.45	40° 27' 24.182 N	104° 25' 55.408 W	1,411,011.97	3,297,176.92
6,267.00	12.72	71.86	6,155.85	842.63	-78.66	40° 27' 24.211 N	104° 25' 55.294 W	1,411,015.02	3,297,185.71
6,315.00	16.08	82.74	6,202.34	845.12	-67.03	40° 27' 24.234 N	104° 25' 55.143 W	1,411,017.50	3,297,197.33
6,410.00	23.24	84.24	6,291.75	848.66	-35.29	40° 27' 24.266 N	104° 25' 54.732 W	1,411,021.05	3,297,229.07
6,505.00	33.61	83.50	6,375.18	853.53	9.60	40° 27' 24.308 N	104° 25' 54.151 W	1,411,025.92	3,297,273.96
6,600.00	46.40	88.14	6,447.81	857.65	70.37	40° 27' 24.342 N	104° 25' 53.364 W	1,411,030.03	3,297,334.73
6,647.00	51.02	89.73	6,478.82	858.28	105.67	40° 27' 24.344 N	104° 25' 52.907 W	1,411,030.67	3,297,370.03
6,695.00	54.31	89.64	6,507.93	858.49	143.83	40° 27' 24.341 N	104° 25' 52.414 W	1,411,030.88	3,297,408.18
6,742.00	55.90	90.06	6,534.81	858.59	182.38	40° 27' 24.338 N	104° 25' 51.915 W	1,411,030.98	3,297,446.73
6,790.00	59.20	90.32	6,560.56	858.46	222.88	40° 27' 24.332 N	104° 25' 51.391 W	1,411,030.85	3,297,487.23
6,837.00	66.11	90.59	6,582.14	858.12	264.60	40° 27' 24.323 N	104° 25' 50.852 W	1,411,030.51	3,297,528.95
6,885.00	72.83	90.70	6,598.96	857.62	309.52	40° 27' 24.313 N	104° 25' 50.271 W	1,411,030.01	3,297,573.87
6,932.00	77.02	91.21	6,611.19	856.86	354.89	40° 27' 24.300 N	104° 25' 49.684 W	1,411,029.25	3,297,619.23
6,980.00	80.21	92.15	6,620.66	855.48	401.91	40° 27' 24.281 N	104° 25' 49.076 W	1,411,027.87	3,297,666.26
7,008.00	82.26	92.43	6,624.93	854.37	429.56	40° 27' 24.267 N	104° 25' 48.718 W	1,411,026.76	3,297,693.91
7,052.00	83.28	92.90	6,630.46	852.34	473.17	40° 27' 24.241 N	104° 25' 48.155 W	1,411,024.73	3,297,737.51
7,094.00	84.26	93.35	6,635.02	850.06	514.86	40° 27' 24.214 N	104° 25' 47.616 W	1,411,022.45	3,297,779.20
7,141.00	84.84	93.38	6,639.48	847.32	561.56	40° 27' 24.181 N	104° 25' 47.012 W	1,411,019.71	3,297,825.90
7,236.00	87.04	93.34	6,646.21	841.76	656.16	40° 27' 24.115 N	104° 25' 45.789 W	1,411,014.15	3,297,920.49
7,331.00	88.80	93.01	6,649.66	836.51	750.94	40° 27' 24.052 N	104° 25' 44.564 W	1,411,008.90	3,298,015.28

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
7,426.00	91.14	94.02	6,649.71	830.68	845.76	40° 27' 23.983 N	104° 25' 43.338 W	1,411,003.07	3,298,110.09
7,520.00	91.76	93.61	6,647.33	824.43	939.52	40° 27' 23.910 N	104° 25' 42.127 W	1,410,996.82	3,298,203.84
7,614.00	90.34	91.56	6,645.61	820.19	1,033.40	40° 27' 23.857 N	104° 25' 40.913 W	1,410,992.58	3,298,297.72
7,709.00	89.66	91.30	6,645.61	817.82	1,128.37	40° 27' 23.822 N	104° 25' 39.685 W	1,410,990.21	3,298,392.69
7,804.00	88.52	89.02	6,647.11	817.56	1,223.35	40° 27' 23.808 N	104° 25' 38.456 W	1,410,989.95	3,298,487.66
7,899.00	90.96	89.82	6,647.55	818.52	1,318.33	40° 27' 23.806 N	104° 25' 37.227 W	1,410,990.91	3,298,582.65
7,993.00	91.79	88.35	6,645.29	820.02	1,412.29	40° 27' 23.810 N	104° 25' 36.012 W	1,410,992.41	3,298,676.60
8,088.00	91.17	87.59	6,642.84	823.38	1,507.20	40° 27' 23.832 N	104° 25' 34.784 W	1,410,995.77	3,298,771.51
8,182.00	88.71	87.08	6,642.93	827.75	1,601.09	40° 27' 23.864 N	104° 25' 33.568 W	1,411,000.14	3,298,865.39
8,277.00	88.98	87.51	6,644.85	832.23	1,695.96	40° 27' 23.897 N	104° 25' 32.341 W	1,411,004.62	3,298,960.26
8,372.00	88.64	88.49	6,646.82	835.55	1,790.89	40° 27' 23.918 N	104° 25' 31.112 W	1,411,007.94	3,299,055.18
8,467.00	89.94	89.63	6,648.00	837.11	1,885.86	40° 27' 23.922 N	104° 25' 29.883 W	1,411,009.50	3,299,150.15
8,562.00	89.60	89.25	6,648.38	838.04	1,980.86	40° 27' 23.920 N	104° 25' 28.654 W	1,411,010.43	3,299,245.14
8,656.00	90.68	89.65	6,648.15	838.94	2,074.85	40° 27' 23.917 N	104° 25' 27.438 W	1,411,011.33	3,299,339.13
8,751.00	89.32	89.05	6,648.15	840.02	2,169.84	40° 27' 23.917 N	104° 25' 26.210 W	1,411,012.41	3,299,434.12
8,846.00	88.12	88.69	6,650.27	841.89	2,264.80	40° 27' 23.924 N	104° 25' 24.981 W	1,411,014.28	3,299,529.07
8,941.00	88.92	87.92	6,652.73	844.70	2,359.72	40° 27' 23.940 N	104° 25' 23.753 W	1,411,017.09	3,299,624.00
9,036.00	90.46	88.74	6,653.24	847.47	2,454.68	40° 27' 23.956 N	104° 25' 22.524 W	1,411,019.86	3,299,718.95
9,130.00	91.82	88.88	6,651.37	849.42	2,548.64	40° 27' 23.964 N	104° 25' 21.308 W	1,411,021.81	3,299,812.90
9,225.00	90.62	89.10	6,649.35	851.09	2,643.60	40° 27' 23.969 N	104° 25' 20.080 W	1,411,023.48	3,299,907.86
9,320.00	91.48	90.70	6,647.61	851.26	2,738.58	40° 27' 23.960 N	104° 25' 18.851 W	1,411,023.65	3,300,002.84
9,415.00	91.60	90.07	6,645.05	850.62	2,833.54	40° 27' 23.942 N	104° 25' 17.623 W	1,411,023.01	3,300,097.80
9,510.00	89.78	91.81	6,643.91	849.06	2,928.51	40° 27' 23.915 N	104° 25' 16.395 W	1,411,021.45	3,300,192.77
9,605.00	88.15	91.42	6,645.63	846.38	3,023.46	40° 27' 23.877 N	104° 25' 15.167 W	1,411,018.77	3,300,287.71
9,699.00	89.38	90.85	6,647.65	844.52	3,117.41	40° 27' 23.847 N	104° 25' 13.952 W	1,411,016.91	3,300,381.66
9,795.00	88.89	90.53	6,649.10	843.37	3,213.40	40° 27' 23.825 N	104° 25' 12.710 W	1,411,015.76	3,300,477.64
9,889.00	88.61	90.02	6,651.15	842.92	3,307.37	40° 27' 23.809 N	104° 25' 11.495 W	1,411,015.31	3,300,571.61
9,984.00	89.54	89.29	6,652.69	843.49	3,402.36	40° 27' 23.803 N	104° 25' 10.266 W	1,411,015.88	3,300,666.59
10,079.00	91.45	90.14	6,651.87	843.96	3,497.35	40° 27' 23.796 N	104° 25' 9.037 W	1,411,016.35	3,300,761.58
10,174.00	89.69	90.68	6,650.92	843.28	3,592.33	40° 27' 23.778 N	104° 25' 7.809 W	1,411,015.67	3,300,856.56
10,269.00	89.66	90.49	6,651.46	842.31	3,687.33	40° 27' 23.757 N	104° 25' 6.580 W	1,411,014.70	3,300,951.55
10,363.00	89.29	90.57	6,652.32	841.44	3,781.32	40° 27' 23.737 N	104° 25' 5.364 W	1,411,013.83	3,301,045.54
10,458.00	90.15	91.65	6,652.78	839.60	3,876.30	40° 27' 23.707 N	104° 25' 4.136 W	1,411,011.99	3,301,140.52
10,553.00	88.12	90.52	6,654.22	837.80	3,971.26	40° 27' 23.678 N	104° 25' 2.908 W	1,411,010.19	3,301,235.48
10,648.00	88.67	89.88	6,656.88	837.47	4,066.23	40° 27' 23.664 N	104° 25' 1.680 W	1,411,009.86	3,301,330.44
10,743.00	90.43	89.01	6,657.63	838.39	4,161.21	40° 27' 23.661 N	104° 25' 0.451 W	1,411,010.78	3,301,425.42
10,838.00	90.62	89.38	6,656.76	839.73	4,256.20	40° 27' 23.663 N	104° 24' 59.222 W	1,411,012.12	3,301,520.40
10,932.00	90.09	88.81	6,656.17	841.21	4,350.19	40° 27' 23.666 N	104° 24' 58.006 W	1,411,013.60	3,301,614.39
11,027.00	90.77	88.76	6,655.46	843.23	4,445.16	40° 27' 23.675 N	104° 24' 56.777 W	1,411,015.61	3,301,709.36
11,122.00	90.89	89.49	6,654.08	844.68	4,540.14	40° 27' 23.677 N	104° 24' 55.548 W	1,411,017.06	3,301,804.33
11,217.00	90.68	89.69	6,652.78	845.36	4,635.13	40° 27' 23.673 N	104° 24' 54.320 W	1,411,017.74	3,301,899.32
11,312.00	88.34	87.43	6,653.59	847.74	4,730.08	40° 27' 23.685 N	104° 24' 53.091 W	1,411,020.13	3,301,994.27

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
11,399.00	89.51	87.79	6,655.23	851.37	4,816.99	40° 27' 23.710 N	104° 24' 51.966 W	1,411,023.76	3,302,081.17
11,462.00	89.51	87.79	6,655.77	853.80	4,879.94	40° 27' 23.727 N	104° 24' 51.152 W	1,411,026.19	3,302,144.12

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
590.00	589.99	-0.85	-2.68	Tie-On to Surface Gyros @ 590.00ft
733.00	732.98	-0.98	-2.01	First MWD Survey @ 733.00ft
11,399.00	6,655.23	851.37	4,816.99	Final MWD Survey @ 11399.00ft
11,462.00	6,655.77	853.80	4,879.94	Straight Line Proj @ 11462' MD, 6655.77' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wells Ranch USX AA27-65-1HN (PC_RA0) BHL	80.12	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
250.00	590.00	Surface Gyros	Flexi-Shot
733.00	7,008.00	MWD Surveys - Vert/Build	MWD
7,094.00	11,399.00	MWD Surveys - Lateral	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,052.00	6,630.46	Estimated: 7" Casing @ 7052' MD, 6630.46' TVD	7	8-3/4

Design Report for Wells Ranch USX AA27-65-1HN - Final Surveys

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	1.86 °/100usft	Maximum Dogleg over Survey:	14.71 °/100usft at 6,837.00 usft
Net Tortousity applicable to Plans:	0.82 °/100usft	Directional Difficulty Index:	6.333

Audit Info

North Reference Sheet for Sec. 27-T6N-R63W - Wells Ranch USX AA27-65-1HN -

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 ft. @ 4818.00usft (H&P 322). Northing and Easting are relative to Wells Ranch USX AA27-65-1HN - 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° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996315

Grid Coordinates of Well: 1,410,172.42 usft N, 3,297,264.36 usft E

Geographical Coordinates of Well: 40° 27' 15.88" N, 104° 25' 54.41" W

Grid Convergence at Surface is: 0.69°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,462.00usft

the Bottom Hole Displacement is 4,954.07usft in the Direction of 80.08° (Grid).

Magnetic Convergence at surface is: -7.74° (31 July 2013, , BGGM2013)

