

Noble Energy

Weld County, CO (NAD 83)

Sec. 29-T6N-R62W (Wells Ranch USX AE29 PAD)

Wells Ranch USX AE29-62-1HN - A2

Design: MWD Survey

Sperry Drilling Services Standard Report

26 May, 2012

Well Coordinates: 1,409,522.72 N, 3,318,766.64 E (40° 27' 06.80" N, 104° 21' 16.38" W)
Ground Level: 4,769.00 ft

Local Coordinate Origin:	Centered on Well Wells Ranch USX AE29-62-1HN -
Viewing Datum:	KB @ 4793.00ft (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: 43I	

HALLIBURTON

Design Report for Wells Ranch USX AE29-62-1HN - 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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00
800.00	0.21	301.98	800.00	0.05	-0.08	-0.08	0.21
900.00	0.17	300.04	900.00	0.23	-0.37	-0.37	0.04
1,000.00	0.11	296.19	1,000.00	0.34	-0.59	-0.58	0.05
1,100.00	0.06	285.76	1,100.00	0.40	-0.73	-0.73	0.05
1,200.00	0.01	243.34	1,200.00	0.41	-0.80	-0.79	0.05
1,300.00	0.06	86.24	1,300.00	0.41	-0.75	-0.75	0.07
1,400.00	0.13	84.41	1,400.00	0.42	-0.59	-0.58	0.07
1,500.00	0.24	75.68	1,500.00	0.46	-0.28	-0.28	0.11
1,600.00	0.41	67.77	1,600.00	0.65	0.25	0.26	0.17
1,700.00	0.58	64.49	1,699.99	1.00	1.03	1.05	0.17
1,800.00	0.57	49.83	1,799.99	1.53	1.95	1.97	0.15
1,900.00	0.53	20.22	1,899.98	2.29	2.49	2.52	0.28
2,000.00	0.64	354.00	1,999.98	3.28	2.60	2.63	0.28
2,100.00	0.95	346.16	2,099.97	4.60	2.32	2.37	0.33
2,200.00	1.32	344.29	2,199.95	6.51	1.81	1.88	0.37
2,300.00	1.69	343.24	2,299.91	9.04	1.07	1.17	0.37
2,400.00	1.31	288.80	2,399.88	10.96	-0.37	-0.25	1.41
2,500.00	1.58	301.00	2,499.85	11.94	-2.67	-2.53	0.41
2,600.00	3.04	225.30	2,599.78	10.81	-5.79	-5.67	3.06
2,700.00	5.07	194.74	2,699.53	4.58	-8.77	-8.72	2.90
2,800.00	6.38	185.95	2,799.02	-5.37	-10.55	-10.61	1.57
2,900.00	7.13	175.02	2,898.36	-16.76	-10.61	-10.80	1.49
3,000.00	9.47	171.19	2,997.27	-31.32	-8.43	-8.78	2.40
3,100.00	10.20	174.14	3,095.77	-48.45	-6.58	-7.12	0.89
3,200.00	9.57	172.88	3,194.21	-65.87	-4.29	-5.03	0.67
3,300.00	8.88	173.94	3,293.02	-81.16	-2.86	-3.76	0.71
3,400.00	9.13	178.71	3,391.71	-97.17	-1.07	-2.16	0.79
3,500.00	9.21	186.99	3,490.49	-112.71	-2.49	-3.75	1.32
3,600.00	10.04	182.55	3,589.08	-129.34	-4.07	-5.52	1.11
3,700.00	9.44	180.02	3,687.55	-146.76	-4.22	-5.87	0.74
3,800.00	8.11	180.83	3,786.39	-161.94	-4.30	-6.11	1.33
3,900.00	6.16	177.82	3,885.59	-174.53	-4.33	-6.28	1.99
4,000.00	3.25	177.62	3,985.23	-182.86	-3.87	-5.91	2.90
4,100.00	0.76	105.28	4,085.17	-185.86	-3.26	-5.34	3.11
4,200.00	0.75	71.28	4,185.16	-185.51	-1.89	-3.97	0.44
4,300.00	0.61	64.52	4,285.15	-185.07	-0.79	-2.86	0.16
4,400.00	0.48	54.01	4,385.15	-184.60	0.03	-2.04	0.16
4,500.00	0.45	60.15	4,485.14	-184.16	0.70	-1.36	0.06
4,600.00	0.42	67.14	4,585.14	-183.82	1.38	-0.68	0.06
4,700.00	0.38	69.11	4,685.14	-183.59	2.04	-0.01	0.04
4,800.00	0.32	34.39	4,785.14	-183.23	2.51	0.46	0.22
4,900.00	0.40	1.60	4,885.13	-182.65	2.68	0.64	0.22

Design Report for Wells Ranch USX AE29-62-1HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,000.00	0.47	341.74	4,985.13	-181.87	2.56	0.52	0.16
5,100.00	0.40	317.51	5,085.13	-181.22	2.19	0.16	0.19
5,200.00	0.43	290.79	5,185.12	-180.83	1.61	-0.42	0.19
5,300.00	0.48	272.41	5,285.12	-180.69	0.82	-1.20	0.15
5,400.00	0.52	259.61	5,385.12	-180.75	-0.04	-2.07	0.12
5,500.00	0.58	249.10	5,485.11	-181.02	-0.97	-2.99	0.12
5,600.00	0.51	259.14	5,585.11	-181.35	-1.90	-3.93	0.12
5,700.00	0.47	289.69	5,685.10	-181.31	-2.70	-4.73	0.26
5,800.00	1.15	49.87	5,785.10	-180.61	-3.07	-5.09	1.45
5,900.00	10.46	75.69	5,884.52	-178.16	5.93	3.93	9.43
6,000.00	18.17	86.33	5,981.28	-174.30	30.54	28.58	8.11
6,100.00	24.58	91.34	6,074.11	-173.37	67.56	65.62	6.67
6,200.00	33.17	91.12	6,161.75	-174.90	115.49	113.52	8.58
6,300.00	41.83	87.57	6,240.40	-173.01	177.04	175.10	8.92
6,400.00	46.85	90.93	6,312.21	-172.79	246.59	244.64	5.54
6,500.00	55.39	92.13	6,375.00	-175.21	324.25	322.27	8.59
6,600.00	62.93	90.50	6,426.28	-177.50	409.99	407.97	7.68
6,700.00	71.49	89.58	6,464.83	-177.61	502.15	500.13	8.60
6,800.00	79.67	89.18	6,489.75	-176.20	598.90	596.89	8.19
6,900.00	86.37	88.76	6,501.80	-174.59	698.10	696.10	6.71
7,000.00	90.55	87.48	6,503.04	-171.54	798.02	796.05	4.37
7,100.00	90.75	86.38	6,501.94	-165.80	897.84	895.93	1.12
7,200.00	90.85	86.81	6,500.51	-159.78	997.65	995.80	0.44
7,300.00	90.27	87.62	6,499.47	-154.89	1,097.53	1,095.72	1.00
7,400.00	90.09	88.33	6,499.19	-151.36	1,197.46	1,195.69	0.73
7,500.00	89.36	88.66	6,499.68	-148.70	1,297.42	1,295.68	0.80
7,600.00	89.61	90.11	6,500.49	-147.68	1,397.41	1,395.67	1.47
7,700.00	89.06	90.81	6,501.95	-148.50	1,497.40	1,495.64	0.89
7,800.00	90.23	90.96	6,502.10	-150.27	1,597.38	1,595.59	1.18
7,900.00	89.19	89.94	6,503.03	-150.93	1,697.37	1,695.57	1.45
8,000.00	90.07	89.44	6,503.59	-150.45	1,797.36	1,795.57	1.01
8,100.00	89.96	89.71	6,503.19	-149.14	1,897.35	1,895.56	0.29
8,200.00	89.37	90.73	6,504.18	-150.13	1,997.34	1,995.53	1.18
8,300.00	89.45	89.19	6,504.97	-150.44	2,097.33	2,095.52	1.54
8,400.00	89.26	87.91	6,506.25	-147.36	2,197.28	2,195.49	1.30
8,500.00	89.79	87.86	6,507.21	-143.70	2,297.20	2,295.45	0.53
8,600.00	89.72	87.07	6,507.33	-139.52	2,397.11	2,395.40	0.80
8,700.00	89.60	86.21	6,508.10	-133.54	2,496.93	2,495.28	0.86
8,800.00	90.39	87.02	6,508.26	-127.26	2,596.73	2,595.14	1.13
8,900.00	89.51	85.79	6,507.93	-121.57	2,696.56	2,695.03	1.52
9,000.00	89.59	86.24	6,509.00	-114.17	2,796.28	2,794.83	0.47
9,100.00	90.60	87.09	6,508.91	-108.39	2,896.11	2,894.72	1.32
9,200.00	89.90	87.06	6,508.32	-103.35	2,995.98	2,994.64	0.71
9,300.00	89.88	88.12	6,508.55	-99.09	3,095.89	3,094.59	1.06
9,400.00	90.05	89.88	6,508.60	-97.40	3,195.87	3,194.58	1.77
9,500.00	89.96	90.33	6,508.67	-97.68	3,295.87	3,294.57	0.46
9,600.00	90.49	89.78	6,508.12	-97.67	3,395.87	3,394.56	0.77
9,700.00	89.86	89.96	6,507.80	-97.50	3,495.87	3,494.56	0.66
9,800.00	89.08	89.59	6,508.67	-97.26	3,595.86	3,594.55	0.86
9,900.00	88.44	88.37	6,511.07	-95.61	3,695.82	3,694.52	1.38

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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,000.00	88.65	87.04	6,513.60	-91.43	3,795.70	3,794.43	1.35
10,100.00	89.32	86.47	6,515.60	-85.68	3,895.51	3,894.31	0.88
10,200.00	90.73	85.71	6,515.60	-79.05	3,995.29	3,994.15	1.60
10,300.00	91.43	85.13	6,513.40	-70.83	4,094.92	4,093.87	0.90
10,400.00	91.70	85.27	6,510.74	-62.40	4,194.53	4,193.57	0.31
10,500.00	91.84	86.38	6,507.58	-54.90	4,294.20	4,293.31	1.12
10,600.00	90.92	89.03	6,504.99	-50.67	4,394.06	4,393.22	2.81
10,700.00	89.58	89.13	6,504.54	-49.44	4,494.05	4,493.22	1.35
10,800.00	89.41	89.13	6,505.49	-47.90	4,594.03	4,593.21	0.16
10,900.00	89.72	89.19	6,506.20	-46.46	4,694.02	4,693.21	0.32
11,000.00	89.48	88.89	6,506.96	-44.82	4,794.01	4,793.20	0.39
11,100.00	89.54	88.33	6,507.72	-42.39	4,893.97	4,893.19	0.56
11,200.00	89.68	88.14	6,508.70	-39.12	4,993.91	4,993.16	0.24
11,300.00	89.79	88.73	6,508.57	-36.33	5,093.87	5,093.15	0.60
11,400.00	88.70	88.99	6,510.14	-34.56	5,193.84	5,193.13	1.12
11,500.00	88.31	88.95	6,512.78	-32.66	5,293.79	5,293.09	0.39
11,600.00	88.47	89.05	6,515.76	-30.93	5,393.73	5,393.05	0.19
11,700.00	90.49	89.27	6,517.13	-29.42	5,493.70	5,493.03	2.04
11,800.00	91.36	89.07	6,514.99	-28.10	5,593.67	5,593.01	0.89
11,900.00	91.87	88.28	6,512.29	-25.88	5,693.61	5,692.96	0.94
12,000.00	91.66	87.39	6,509.06	-22.10	5,793.48	5,792.87	0.91
12,100.00	88.81	85.79	6,508.35	-16.24	5,893.29	5,892.74	3.27
12,200.00	88.10	86.46	6,511.25	-9.30	5,993.01	5,992.53	0.98
12,300.00	88.89	87.32	6,513.91	-3.88	6,092.83	6,092.40	1.17
12,400.00	89.21	88.28	6,515.65	-0.06	6,192.74	6,192.35	1.01
12,500.00	91.04	88.85	6,515.35	2.38	6,292.70	6,292.33	1.91
12,600.00	91.74	88.57	6,512.61	4.53	6,392.64	6,392.29	0.75
12,700.00	90.65	87.83	6,510.73	7.83	6,492.56	6,492.24	1.32
12,800.00	90.45	88.00	6,509.65	11.50	6,592.49	6,592.21	0.26
12,900.00	89.62	87.98	6,509.52	14.83	6,692.43	6,692.18	0.83
13,000.00	89.19	87.51	6,510.92	18.86	6,792.34	6,792.13	0.64
13,100.00	90.17	87.43	6,511.66	23.33	6,892.24	6,892.07	0.99
13,200.00	90.87	86.95	6,510.41	27.99	6,992.12	6,992.00	0.85
13,300.00	90.74	84.99	6,508.98	34.65	7,091.88	7,091.83	1.97
13,400.00	90.33	82.64	6,507.95	45.57	7,191.27	7,191.33	2.38
13,500.00	89.96	84.38	6,507.76	58.05	7,290.48	7,290.67	1.78
13,600.00	90.48	84.76	6,507.59	66.57	7,390.12	7,390.40	0.65
13,700.00	90.62	83.84	6,506.46	76.57	7,489.61	7,490.00	0.93
13,800.00	90.71	83.47	6,505.34	87.70	7,588.98	7,589.49	0.38
13,900.00	90.66	83.76	6,504.11	98.89	7,688.34	7,688.97	0.29
14,000.00	90.73	87.60	6,502.91	106.75	7,788.01	7,788.71	3.85
14,100.00	90.65	88.89	6,501.69	109.66	7,887.95	7,888.69	1.29
14,200.00	90.91	87.95	6,500.32	112.37	7,987.91	7,988.66	0.97
14,300.00	90.65	86.44	6,498.98	117.37	8,087.77	8,088.58	1.53
14,400.00	90.60	86.82	6,497.88	123.58	8,187.57	8,188.44	0.38
14,500.00	90.49	88.88	6,496.94	126.55	8,287.51	8,288.41	2.05
14,600.00	90.53	87.00	6,496.08	130.51	8,387.42	8,388.36	1.87
14,700.00	90.72	87.78	6,495.00	135.66	8,487.28	8,488.27	0.80
14,800.00	90.83	89.79	6,493.59	137.16	8,587.26	8,588.25	2.01
14,900.00	90.52	90.13	6,492.30	137.41	8,687.25	8,688.24	0.45
15,000.00	90.42	90.55	6,491.73	136.60	8,787.24	8,788.22	0.43

Design Report for Wells Ranch USX AE29-62-1HN - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
15,100.00	90.47	90.01	6,490.75	135.94	8,887.24	8,888.20	0.54
15,200.00	90.53	89.08	6,490.07	136.75	8,987.23	8,988.20	0.93
15,300.00	91.10	88.24	6,488.69	139.11	9,087.19	9,088.18	1.02
15,400.00	90.88	88.25	6,486.69	142.42	9,187.11	9,188.13	0.22
15,500.00	90.36	88.57	6,485.65	145.15	9,287.07	9,288.11	0.61
15,600.00	89.14	88.27	6,485.93	147.79	9,387.03	9,388.10	1.26
15,700.00	89.17	87.95	6,487.63	151.13	9,486.96	9,488.06	0.32
15,756.00	89.17	87.95	6,488.44	153.13	9,542.92	9,544.04	0.00

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	Wells Ranch USX AE29-62-1HN_PlanB - Rev0_BHL Tgt	89.36	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
747.00	15,756.00	MWD Sperry Surveys	MWD

Design Report for Wells Ranch USX AE29-62-1HN - 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
Wells Ranch USX AE2	0.00	0.00	0.00	36.42	-0.47	1,409,559.14	3,318,766.17	40° 27' 7.164 N	104° 21' 16.380 W
- actual wellpath misses target center by 36.43ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				5,352.53	42.42	1,409,565.14	3,324,118.97		
Point 2				5,241.53	4,437.42	1,413,959.98	3,324,007.97		
Point 3				9,614.53	4,627.42	1,414,149.97	3,328,380.81		
Point 4				9,621.53	260.42	1,409,783.14	3,328,387.81		
Point 5				5,352.53	42.42	1,409,565.14	3,324,118.97		
Wells Ranch USX AE2	0.00	0.00	6,508.00	106.93	9,545.37	1,409,629.65	3,328,311.65	40° 27' 6.624 N	104° 19' 12.900 W
- actual wellpath misses target center by 50.23ft at 15756.00ft MD (6488.44 TVD, 153.13 N, 9542.92 E)									
- Point									
Wells Ranch USX AE2	0.00	0.00	0.00	36.42	-0.47	1,409,559.14	3,318,766.17	40° 27' 7.164 N	104° 21' 16.380 W
- actual wellpath misses target center by 36.43ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-544.47	-546.58	1,408,976.17	3,318,222.19		
Point 2				-515.47	4,755.42	1,414,277.97	3,318,251.19		
Point 3				4,781.53	4,897.42	1,414,419.96	3,323,547.99		
Point 4				4,892.53	-417.58	1,409,105.16	3,323,658.99		
Point 5				-544.47	-546.58	1,408,976.17	3,318,222.19		
Wells Ranch USX AE2	0.00	0.00	0.00	36.42	-0.47	1,409,559.14	3,318,766.17	40° 27' 7.164 N	104° 21' 16.380 W
- actual wellpath misses target center by 36.43ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4,892.53	-417.58	1,409,105.16	3,323,658.99		
Point 2				4,781.53	4,897.42	1,414,419.96	3,323,547.99		
Point 3				10,074.53	5,087.42	1,414,609.96	3,328,840.80		
Point 4				10,081.53	-199.58	1,409,323.15	3,328,847.79		
Point 5				4,892.53	-417.58	1,409,105.16	3,323,658.99		
Wells Ranch USX AE2	0.00	0.00	0.00	36.42	-0.47	1,409,559.14	3,318,766.17	40° 27' 7.164 N	104° 21' 16.380 W
- actual wellpath misses target center by 36.43ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-84.47	-86.58	1,409,436.15	3,318,682.17		
Point 2				-55.47	4,295.42	1,413,817.99	3,318,711.17		
Point 3				4,321.53	4,437.42	1,413,959.98	3,323,088.01		
Point 4				4,432.53	42.42	1,409,565.14	3,323,199.00		
Point 5				-84.47	-86.58	1,409,436.15	3,318,682.17		

**North Reference Sheet for Sec. 29-T6N-R62W (Wells Ranch USX AE29 PAD) -
Wells Ranch USX AE29-62-1HN**

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

Vertical Depths are relative to KB @ 4793.00ft (H&P 315). Northing and Easting are relative to Wells Ranch USX AE29-62-1HN - Slot A2

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: 0.99996299

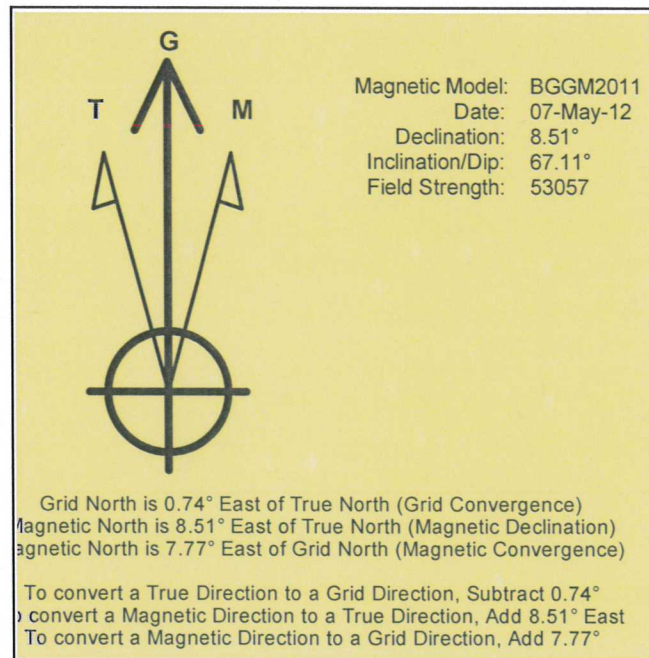
Grid Coordinates of Well: 1,409,522.72 ft N, 3,318,766.64 ft E

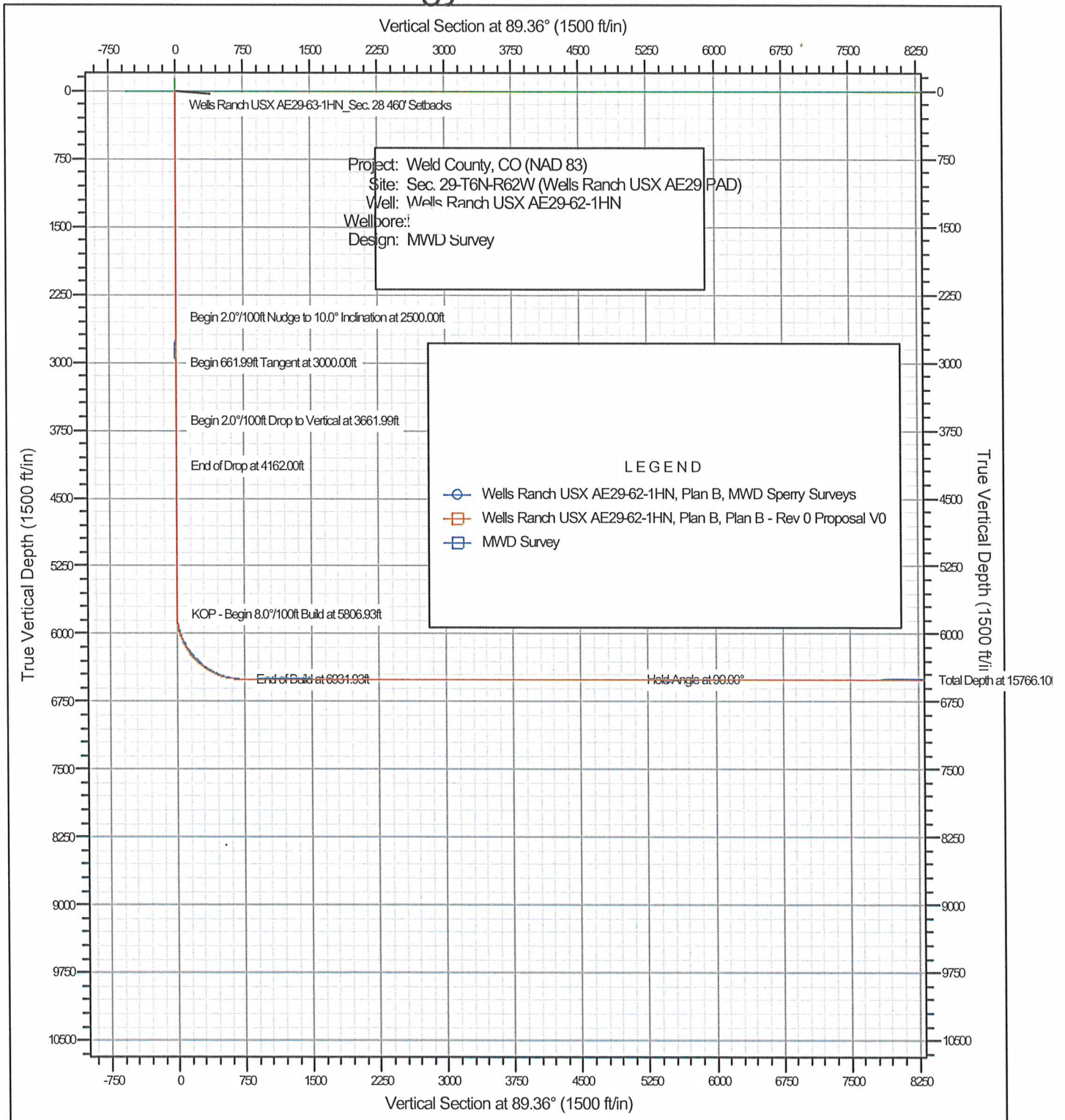
Geographical Coordinates of Well: 40° 27' 06.80" N, 104° 21' 16.38" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,756.00ft
the Bottom Hole Displacement is 9,544.15ft in the Direction of 89.08° (Grid).

Magnetic Convergence at surface is: -7.77° (7 May 2012, , BGGM2011)





Project: Weld County, CO (NAD 83)
Site: Sec. 29-T6N-R62W (Wells Ranch USX AE29-PAD)
Well: Wells Ranch USX AE29-62-1HN
Wellbore: .
Design: MWD Survey

HALLIBURTON

Noble Energy

