

Project: Weld County, CO (NAD 83)  
 Site: Sec. 18-T6N-R62W (Wells Ranch USX 13 North PAD)  
 Well: Wells Ranch USX AA13-68-1HN  
 Wellbore: Plan A  
 Design: Final Surveys

# Noble Energy



Platted SHL: 977' FNL, 65' FWL  
 Platted Lat/Long: 40.49115° N, 104.37510° W  
 Location: Sec. 18-T6N-R62W

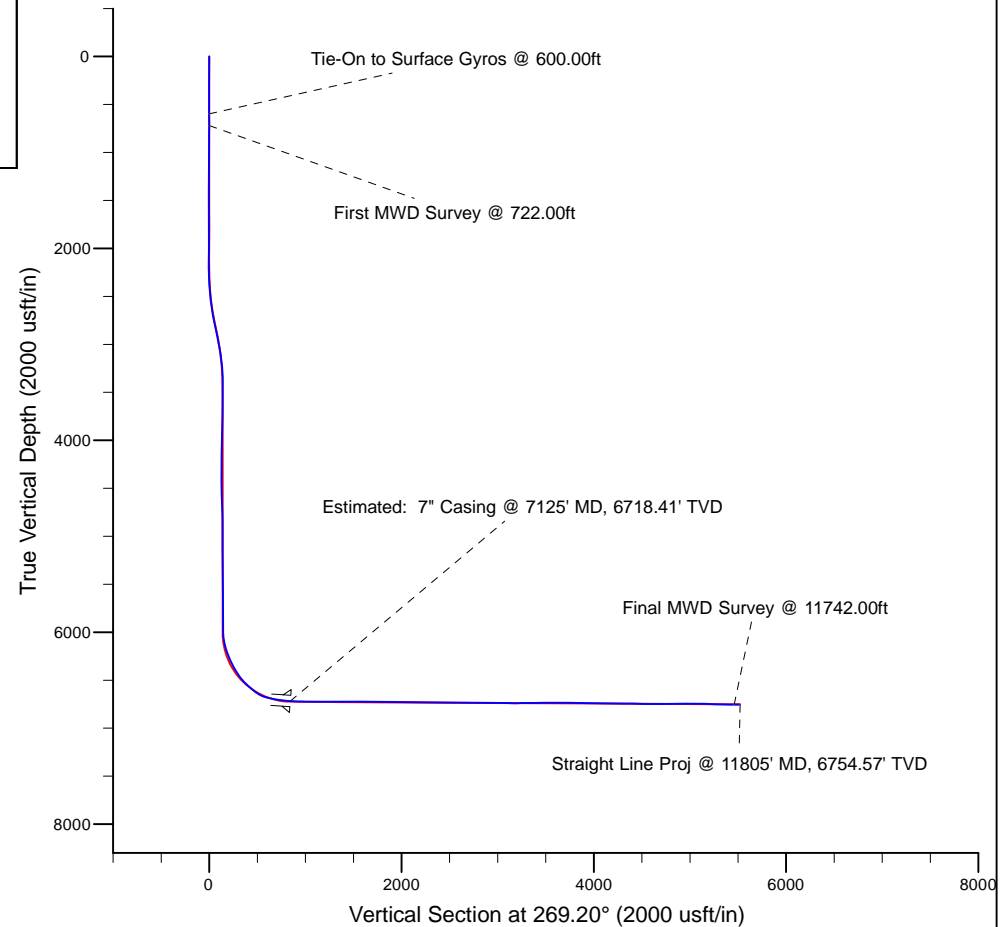
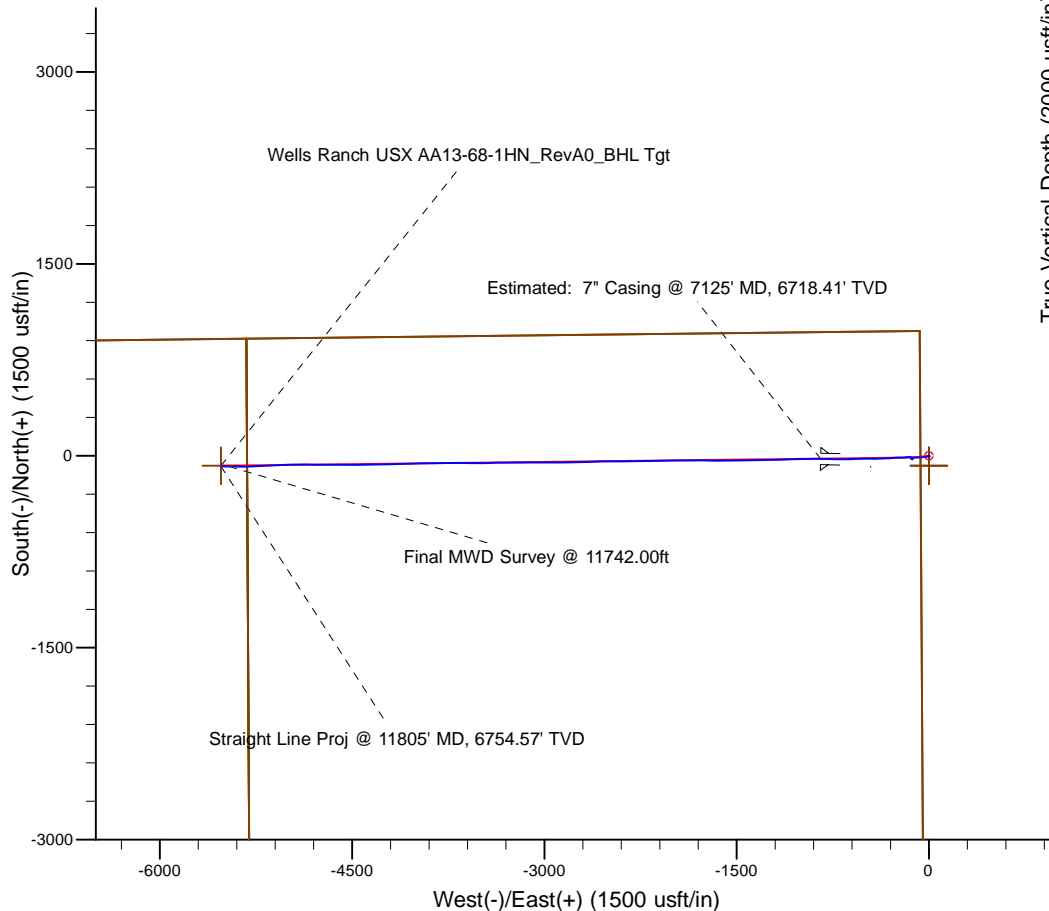
7" Casing: ~991.06' FNL, ~779.36' FEL  
 Lat/Long: 40° 29' 28.005 N, 104° 22' 41.295 W  
 State Planes - CO Northern: 1,423,726.54' N, 3,312,022.11' E  
 Location: Sec. 13-T6N-R63W

BHL: ~995.96' FNL, ~203.64' FEL  
 Lat/Long: 40° 29' 28.019 N, 104° 23' 41.846 W  
 State Planes - CO Northern: 1,423,669.17' N, 3,307,344.26' E  
 Location: Sec. 14-T6N-R63W

LEGEND

Wells Ranch USX AA13-68-1HN, Plan A, Rev A0 Proposal V0

Final Surveys



WELL DETAILS: Wells Ranch USX AA13-68-1HN	
Ground Level:	4851.00
KB=30' @ 4881.00usft (H&P 321)	
Created By:	Fred Hartmann
Created On:	10/30/2013

# Noble Energy

Weld County, CO (NAD 83)

Sec. 18-T6N-R62W (Wells Ranch USX 13 North PAD)

Wells Ranch USX AA13-68-1HN - A3

Design: Final Surveys

## Sperry Drilling Services

### Final Survey Report

30 October, 2013

Well Coordinates: 1,423,750.89 N, 3,312,866.67 E (40° 29' 28.14" N, 104° 22' 30.36" W)

Ground Level: 4,851.00 usft

Local Coordinate Origin:

Centered on Well Wells Ranch USX AA13-68-1HN - Slot A3

Viewing Datum:

KB=30' @ 4881.00usft (H&P 321)

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 AA13-68-1HN - 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
300.00	0.30	19.07	300.00	0.74	0.26	-0.27	0.10
600.00	0.20	279.07	600.00	1.57	0.00	-0.02	0.13
<b>Tie-On to Surface Gyros @ 600.00ft</b>							
722.00	0.19	117.15	722.00	1.51	-0.03	0.01	0.32
<b>First MWD Survey @ 722.00ft</b>							
814.00	0.34	140.00	814.00	1.23	0.28	-0.29	0.20
907.00	0.25	139.66	906.99	0.86	0.59	-0.60	0.10
999.00	0.66	136.23	998.99	0.33	1.08	-1.09	0.45
1,091.00	0.76	163.62	1,090.98	-0.64	1.62	-1.61	0.38
1,182.00	0.65	152.85	1,181.98	-1.68	2.03	-2.00	0.19
1,274.00	0.58	146.10	1,273.97	-2.53	2.52	-2.49	0.11
1,367.00	0.79	150.40	1,366.97	-3.48	3.10	-3.06	0.23
1,459.00	1.34	133.84	1,458.95	-4.77	4.19	-4.13	0.68
1,554.00	1.01	339.25	1,553.94	-4.76	4.70	-4.63	2.41
1,649.00	0.71	335.70	1,648.93	-3.44	4.16	-4.11	0.32
1,744.00	0.88	343.48	1,743.92	-2.21	3.71	-3.68	0.21
1,838.00	0.89	327.65	1,837.91	-0.90	3.11	-3.10	0.26
1,933.00	0.50	75.98	1,932.91	-0.17	3.12	-3.12	1.21
2,028.00	0.31	87.33	2,027.90	-0.06	3.78	-3.78	0.22
2,123.00	1.07	89.26	2,122.90	-0.04	4.92	-4.92	0.80
2,218.00	1.23	236.68	2,217.89	-0.59	4.96	-4.95	2.32
2,312.00	2.91	242.94	2,311.82	-2.23	1.99	-1.96	1.80
2,407.00	4.67	252.20	2,406.61	-4.50	-3.84	3.90	1.96
2,502.00	6.46	256.94	2,501.16	-6.89	-12.73	12.82	1.94
2,596.00	7.22	258.27	2,594.49	-9.29	-23.66	23.79	0.83
2,691.00	9.61	270.81	2,688.47	-10.39	-37.44	37.58	3.16
2,786.00	11.53	267.36	2,781.86	-10.72	-54.86	55.00	2.13
2,881.00	11.73	268.83	2,874.91	-11.35	-74.00	74.15	0.38
2,975.00	11.98	265.16	2,966.90	-12.37	-93.27	93.43	0.84
3,070.00	10.12	260.18	3,060.14	-14.63	-111.32	111.51	2.20
3,165.00	7.45	276.15	3,154.03	-15.39	-125.67	125.87	3.78
3,260.00	4.09	279.21	3,248.53	-14.19	-135.14	135.33	3.55
3,354.00	2.00	274.71	3,342.40	-13.52	-140.09	140.26	2.24
3,449.00	1.33	157.26	3,437.38	-14.40	-141.31	141.50	3.02
3,544.00	1.40	163.94	3,532.35	-16.53	-140.57	140.78	0.18
3,639.00	1.82	156.86	3,627.31	-19.03	-139.65	139.90	0.49
3,734.00	1.35	120.00	3,722.28	-20.98	-138.09	138.37	1.15
3,829.00	1.40	110.31	3,817.25	-21.94	-136.03	136.32	0.25
3,924.00	1.57	115.77	3,912.22	-22.91	-133.77	134.08	0.23
4,019.00	1.50	118.40	4,007.18	-24.07	-131.51	131.83	0.10
4,114.00	1.57	94.49	4,102.15	-24.76	-129.12	129.45	0.67
4,208.00	0.33	274.19	4,196.14	-24.84	-128.10	128.43	2.02
4,303.00	0.52	176.73	4,291.14	-25.25	-128.35	128.69	0.69
4,398.00	0.41	255.93	4,386.14	-25.76	-128.65	129.00	0.63
4,493.00	0.92	327.71	4,481.13	-25.20	-129.39	129.73	0.93
4,588.00	1.51	306.46	4,576.11	-23.81	-130.81	131.12	0.77
4,683.00	1.49	289.01	4,671.08	-22.67	-132.98	133.28	0.48
4,777.00	1.94	261.26	4,765.04	-22.51	-135.71	136.01	0.99
4,872.00	1.42	283.44	4,860.00	-22.48	-138.44	138.74	0.87

## Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,967.00	0.91	18.77	4,954.98	-21.49	-139.34	139.63	1.85
5,062.00	0.71	25.48	5,049.97	-20.25	-138.85	139.12	0.23
5,156.00	0.81	359.17	5,143.97	-19.06	-138.61	138.86	0.38
5,251.00	0.76	317.66	5,238.96	-17.92	-139.04	139.28	0.59
5,346.00	1.10	295.25	5,333.95	-17.07	-140.29	140.51	0.52
5,441.00	0.62	312.03	5,428.93	-16.33	-141.50	141.71	0.57
5,535.00	0.40	277.61	5,522.93	-15.95	-142.20	142.41	0.39
5,630.00	0.62	335.69	5,617.93	-15.44	-142.74	142.94	0.56
5,725.00	0.90	347.13	5,712.92	-14.24	-143.12	143.30	0.33
5,820.00	1.27	337.96	5,807.90	-12.54	-143.68	143.84	0.43
5,902.00	0.75	321.03	5,889.89	-11.28	-144.36	144.50	0.72
5,964.00	0.53	328.61	5,951.89	-10.72	-144.76	144.90	0.38
6,009.00	0.88	288.86	5,996.88	-10.43	-145.20	145.33	1.29
6,057.00	5.15	269.54	6,044.81	-10.33	-147.70	147.83	9.02
6,104.00	10.37	271.23	6,091.36	-10.25	-154.05	154.17	11.12
6,152.00	13.94	270.81	6,138.27	-10.08	-164.15	164.27	7.44
6,198.00	17.34	266.82	6,182.57	-10.38	-176.54	176.67	7.75
6,246.00	20.50	264.85	6,227.97	-11.53	-192.06	192.20	6.72
6,293.00	23.20	268.46	6,271.59	-12.52	-209.51	209.66	6.41
6,341.00	26.04	269.05	6,315.22	-12.95	-229.50	229.66	5.94
6,388.00	27.83	266.20	6,357.12	-13.85	-250.76	250.93	4.69
6,436.00	30.35	264.27	6,399.07	-15.80	-274.01	274.21	5.60
6,483.00	33.47	266.01	6,438.96	-17.89	-298.76	298.98	6.92
6,531.00	38.60	267.76	6,477.76	-19.40	-326.95	327.19	10.90
6,577.00	42.91	267.62	6,512.60	-20.61	-356.95	357.20	9.37
6,625.00	45.94	267.85	6,546.88	-21.93	-390.52	390.78	6.32
6,672.00	48.59	269.55	6,578.77	-22.71	-425.02	425.30	6.23
6,720.00	51.25	270.90	6,609.67	-22.55	-461.75	462.02	5.94
6,767.00	56.22	269.98	6,637.47	-22.27	-499.63	499.89	10.69
6,815.00	64.83	268.43	6,661.06	-22.87	-541.37	541.64	18.16
6,862.00	73.60	268.10	6,677.72	-24.21	-585.25	585.53	18.67
6,910.00	78.04	268.68	6,689.48	-25.51	-631.76	632.05	9.32
6,957.00	80.23	269.07	6,698.34	-26.42	-677.90	678.20	4.73
7,005.00	81.52	270.81	6,705.95	-26.47	-725.29	725.59	4.48
7,051.00	83.62	271.15	6,711.90	-25.69	-770.90	771.18	4.62
7,076.00	84.72	270.93	6,714.44	-25.23	-795.76	796.04	4.49
7,125.00	85.99	271.13	6,718.41	-24.35	-844.59	844.85	2.62
Estimated: 7" Casing @ 7125' MD, 6718.41' TVD							
7,155.00	86.76	271.26	6,720.31	-23.73	-874.52	874.77	2.62
7,184.00	87.04	271.38	6,721.88	-23.06	-903.47	903.71	1.05
7,279.00	90.31	267.32	6,724.07	-24.14	-998.41	998.65	5.49
7,374.00	88.95	267.13	6,724.69	-28.74	-1,093.29	1,093.59	1.45
7,468.00	90.62	269.78	6,725.04	-31.27	-1,187.25	1,187.57	3.33
7,563.00	90.25	268.85	6,724.32	-32.41	-1,282.24	1,282.56	1.05
7,658.00	90.55	269.22	6,723.65	-34.01	-1,377.22	1,377.56	0.50
7,753.00	89.60	268.67	6,723.53	-35.76	-1,472.20	1,472.56	1.16
7,847.00	89.82	269.53	6,724.01	-37.24	-1,566.19	1,566.56	0.94
7,942.00	89.08	269.98	6,724.92	-37.64	-1,661.18	1,661.55	0.91
8,037.00	88.27	270.66	6,727.11	-37.11	-1,756.16	1,756.50	1.11
8,131.00	89.66	270.77	6,728.81	-35.94	-1,850.13	1,850.45	1.48
8,226.00	90.83	270.51	6,728.41	-34.88	-1,945.12	1,945.42	1.26

## Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,321.00	89.54	268.12	6,728.10	-36.01	-2,040.11	2,040.41	2.86
8,415.00	89.32	268.07	6,729.03	-39.14	-2,134.05	2,134.39	0.24
8,510.00	90.31	269.92	6,729.34	-40.80	-2,229.03	2,229.38	2.21
8,605.00	88.43	269.64	6,730.39	-41.17	-2,324.02	2,324.37	2.00
8,700.00	87.72	269.46	6,733.58	-41.91	-2,418.96	2,419.31	0.77
8,795.00	92.10	269.41	6,733.73	-42.85	-2,513.93	2,514.29	4.61
8,890.00	89.48	268.08	6,732.42	-44.93	-2,608.89	2,609.26	3.09
8,984.00	87.59	267.43	6,734.82	-48.61	-2,702.78	2,703.20	2.13
9,079.00	88.61	269.96	6,737.97	-50.77	-2,797.70	2,798.13	2.87
9,174.00	89.04	269.69	6,739.92	-51.06	-2,892.68	2,893.11	0.53
9,269.00	91.57	270.29	6,739.41	-51.08	-2,987.67	2,988.09	2.74
9,364.00	89.01	269.17	6,738.93	-51.53	-3,082.66	3,083.07	2.94
9,459.00	89.38	269.25	6,740.27	-52.84	-3,177.64	3,178.06	0.40
9,554.00	91.36	270.31	6,739.65	-53.20	-3,272.63	3,273.05	2.36
9,649.00	90.22	268.84	6,738.34	-53.91	-3,367.61	3,368.04	1.96
9,743.00	91.51	269.12	6,736.92	-55.58	-3,461.58	3,462.02	1.40
9,838.00	89.26	270.40	6,736.29	-55.98	-3,556.57	3,557.01	2.72
9,933.00	89.63	270.14	6,737.21	-55.53	-3,651.57	3,651.99	0.48
10,028.00	89.97	270.14	6,737.54	-55.30	-3,746.57	3,746.97	0.36
10,123.00	89.97	269.04	6,737.59	-55.98	-3,841.56	3,841.97	1.16
10,218.00	88.80	268.71	6,738.61	-57.84	-3,936.54	3,936.96	1.28
10,313.00	87.90	267.67	6,741.34	-60.84	-4,031.45	4,031.90	1.45
10,408.00	88.98	268.31	6,743.93	-64.17	-4,126.35	4,126.85	1.32
10,502.00	89.97	268.97	6,744.79	-66.40	-4,220.32	4,220.84	1.27
10,597.00	90.59	269.32	6,744.33	-67.82	-4,315.31	4,315.83	0.75
10,692.00	89.01	268.86	6,744.66	-69.33	-4,410.29	4,410.83	1.73
10,787.00	88.64	269.88	6,746.61	-70.37	-4,505.27	4,505.81	1.14
10,882.00	88.86	270.19	6,748.68	-70.32	-4,600.24	4,600.78	0.40
10,977.00	90.55	269.88	6,749.17	-70.26	-4,695.24	4,695.76	1.81
11,072.00	89.72	270.83	6,748.94	-69.67	-4,790.23	4,790.74	1.33
11,166.00	90.80	271.06	6,748.52	-68.12	-4,884.22	4,884.69	1.17
11,261.00	91.32	268.31	6,746.76	-68.64	-4,979.19	4,979.66	2.95
11,356.00	90.18	268.31	6,745.52	-71.44	-5,074.14	5,074.64	1.20
11,451.00	88.34	265.32	6,746.74	-76.72	-5,168.97	5,169.54	3.70
11,546.00	87.56	267.59	6,750.14	-82.59	-5,263.72	5,264.36	2.53
11,641.00	88.52	270.26	6,753.39	-84.37	-5,358.64	5,359.29	2.99
11,736.00	89.97	271.02	6,754.64	-83.31	-5,453.62	5,454.25	1.72
11,742.00	90.06	271.33	6,754.64	-83.19	-5,459.62	5,460.25	5.38
<b>Final MWD Survey @ 11742.00ft</b>							
11,805.00	90.06	271.33	6,754.57	-81.72	-5,522.60	5,523.21	0.00
<b>Straight Line Proj @ 11805' MD, 6754.57' TVD</b>							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.00	600.00	1.57	0.00	Tie-On to Surface Gyros @ 600.00ft
722.00	722.00	1.51	-0.03	First MWD Survey @ 722.00ft
11,742.00	6,754.64	-83.19	-5,459.62	Final MWD Survey @ 11742.00ft
11,805.00	6,754.57	-81.72	-5,522.60	Straight Line Proj @ 11805' MD, 6754.57' TVD

## Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Wells Ranch USX AA13-68-1HN_RevA0_BHL Tgt	269.20	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
300.00	600.00	Surface Gyros	Flexi-Shot
722.00	7,076.00	MWD Surveys - Vert/Build	MWD
7,155.00	11,742.00	MWD Surveys - Lateral	MWD

### Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,125.00	6,718.41	Estimated: 7" Casing @ 7125' MD, 6718.41' TVD	7	8-3/4

## Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys

**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 AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	592.00	-532.00	1,424,266.37	3,312,335.66	
Point 2				4.00	-3,796.00	-501.00	1,419,878.52	3,312,366.66	
Point 3				4.00	-3,851.00	-4,838.00	1,419,823.52	3,308,029.80	
Point 4				4.00	533.00	-4,865.00	1,424,207.37	3,308,002.81	
Point 5				4.00	592.00	-532.00	1,424,266.37	3,312,335.66	
Wells Ranch USX AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	993.00	-5,325.00	1,424,667.35	3,307,542.82	
Point 2				4.00	-4,311.00	-5,298.00	1,419,363.54	3,307,569.82	
Point 3				4.00	-4,366.00	-10,628.00	1,419,308.54	3,302,240.00	
Point 4				4.00	935.00	-10,662.00	1,424,609.36	3,302,206.00	
Point 5				4.00	993.00	-5,325.00	1,424,667.35	3,307,542.82	
Wells Ranch USX AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	533.00	-5,785.00	1,424,207.37	3,307,082.84	
Point 2				4.00	-3,851.00	-5,758.00	1,419,823.52	3,307,109.84	
Point 3				4.00	-3,906.00	-10,168.00	1,419,768.52	3,302,699.99	
Point 4				4.00	475.00	-10,202.00	1,424,149.37	3,302,665.99	
Point 5				4.00	533.00	-5,785.00	1,424,207.37	3,307,082.84	
Wells Ranch USX AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	1,172.00	5,320.00	1,424,846.35	3,318,187.46	
Point 2				4.00	-4,095.00	5,394.00	1,419,579.53	3,318,261.45	
Point 3				4.00	-4,256.00	-41.00	1,419,418.54	3,312,826.64	
Point 4				4.00	1,052.00	-72.00	1,424,726.35	3,312,795.64	
Point 5				4.00	1,172.00	5,320.00	1,424,846.35	3,318,187.46	
Wells Ranch USX AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	712.00	4,860.00	1,424,386.36	3,317,727.47	
Point 2				4.00	-3,635.00	4,934.00	1,420,039.51	3,317,801.47	
Point 3				4.00	-3,796.00	419.00	1,419,878.52	3,313,286.62	
Point 4				4.00	592.00	388.00	1,424,266.37	3,313,255.63	
Point 5				4.00	712.00	4,860.00	1,424,386.36	3,317,727.47	
Wells Ranch USX AA1	0.00	0.00	4.00	-76.50	0.97	1,423,674.39	3,312,867.64	40° 29' 27.384 N	104° 22' 30.360 W
- actual wellpath misses target center by 76.51usft at 3.81usft MD (3.81 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				4.00	1,052.00	-72.00	1,424,726.35	3,312,795.64	
Point 2				4.00	-4,256.00	-41.00	1,419,418.54	3,312,826.64	
Point 3				4.00	-4,311.00	-5,298.00	1,419,363.54	3,307,569.82	
Point 4				4.00	993.00	-5,325.00	1,424,667.35	3,307,542.82	
Point 5				4.00	1,052.00	-72.00	1,424,726.35	3,312,795.64	
Wells Ranch USX AA1	0.00	0.00	6,751.93	-76.74	-5,523.44	1,423,674.15	3,307,343.42	40° 29' 28.068 N	104° 23' 41.856 W
- actual wellpath misses target center by 5.70usft at 11805.00usft MD (6754.57 TVD, -81.72 N, -5522.60 E)									
- Point									

**Directional Difficulty Index**

Average Dogleg over Survey:	1.90 °/100usft	Maximum Dogleg over Survey:	18.67 °/100usft at 6,862.00 usft
Net Tortousity applicable to Plans:	0.94 °/100usft	Directional Difficulty Index:	6.341

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**Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys**

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*Audit Info*



North Reference Sheet for Sec. 18-T6N-R62W (Wells Ranch USX 13 North PAD) - Wells Ranch USX AA13-68-1HN

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

Vertical Depths are relative to KB=30' @ 4881.00usft (H&P 321). Northing and Easting are relative to Wells Ranch USX AA 13-68-1HN - Slot A3

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: 0.99996563

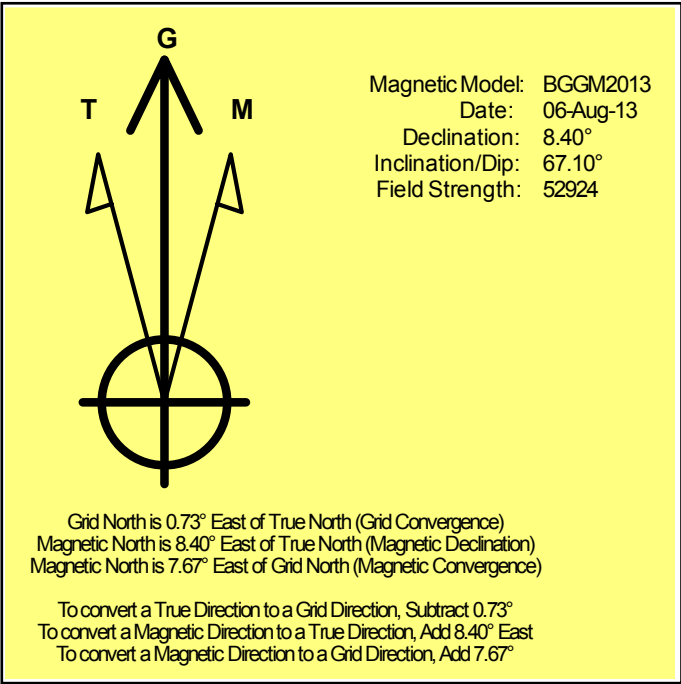
Grid Coordinates of Well: 1,423,750.89 usft N, 3,312,866.67 usft E

Geographical Coordinates of Well: 40° 29' 28.14" N, 104° 22' 30.36" W

Grid Convergence at Surface is: 0.73°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,805.00usft the Bottom Hole Displacement is 5,523.21usft in the Direction of 269.15° (Grid).

Magnetic Convergence at surface is: -7.67° ( 6 August 2013, , BGGM2013)



# Noble Energy

Weld County, CO (NAD 83)

Sec. 18-T6N-R62W (Wells Ranch USX 13 North PAD)

Wells Ranch USX AA13-68-1HN - A3

Design: Final Surveys

## Sperry Drilling Services

### Geodetic Report

30 October, 2013

Well Coordinates: 1,423,750.89 N, 3,312,866.67 E (40° 29' 28.14" N, 104° 22' 30.36" W)

Ground Level: 4,851.00 usft

Local Coordinate Origin:

Centered on Well Wells Ranch USX AA13-68-1HN - Slot A3

Viewing Datum:

KB=30' @ 4881.00usft (H&P 321)

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 AA13-68-1HN - 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° 29' 28.140 N	104° 22' 30.360 W	1,423,750.89	3,312,866.67
300.00	0.30	19.07	300.00	0.74	0.26	40° 29' 28.147 N	104° 22' 30.357 W	1,423,751.63	3,312,866.93
600.00	0.20	279.07	600.00	1.57	0.00	40° 29' 28.155 N	104° 22' 30.360 W	1,423,752.46	3,312,866.67
722.00	0.19	117.15	722.00	1.51	-0.03	40° 29' 28.155 N	104° 22' 30.360 W	1,423,752.40	3,312,866.64
814.00	0.34	140.00	814.00	1.23	0.28	40° 29' 28.152 N	104° 22' 30.356 W	1,423,752.12	3,312,866.95
907.00	0.25	139.66	906.99	0.86	0.59	40° 29' 28.148 N	104° 22' 30.352 W	1,423,751.75	3,312,867.26
999.00	0.66	136.23	998.99	0.33	1.08	40° 29' 28.143 N	104° 22' 30.346 W	1,423,751.22	3,312,867.75
1,091.00	0.76	163.62	1,090.98	-0.64	1.62	40° 29' 28.133 N	104° 22' 30.339 W	1,423,750.25	3,312,868.29
1,182.00	0.65	152.85	1,181.98	-1.68	2.03	40° 29' 28.123 N	104° 22' 30.334 W	1,423,749.21	3,312,868.70
1,274.00	0.58	146.10	1,273.97	-2.53	2.52	40° 29' 28.115 N	104° 22' 30.328 W	1,423,748.36	3,312,869.19
1,367.00	0.79	150.40	1,366.97	-3.48	3.10	40° 29' 28.105 N	104° 22' 30.320 W	1,423,747.41	3,312,869.77
1,459.00	1.34	133.84	1,458.95	-4.77	4.19	40° 29' 28.092 N	104° 22' 30.306 W	1,423,746.12	3,312,870.86
1,554.00	1.01	339.25	1,553.94	-4.76	4.70	40° 29' 28.092 N	104° 22' 30.300 W	1,423,746.13	3,312,871.37
1,649.00	0.71	335.70	1,648.93	-3.44	4.16	40° 29' 28.105 N	104° 22' 30.307 W	1,423,747.45	3,312,870.83
1,744.00	0.88	343.48	1,743.92	-2.21	3.71	40° 29' 28.118 N	104° 22' 30.312 W	1,423,748.69	3,312,870.38
1,838.00	0.89	327.65	1,837.91	-0.90	3.11	40° 29' 28.131 N	104° 22' 30.320 W	1,423,749.99	3,312,869.78
1,933.00	0.50	75.98	1,932.91	-0.17	3.12	40° 29' 28.138 N	104° 22' 30.320 W	1,423,750.72	3,312,869.79
2,028.00	0.31	87.33	2,027.90	-0.06	3.78	40° 29' 28.139 N	104° 22' 30.311 W	1,423,750.83	3,312,870.45
2,123.00	1.07	89.26	2,122.90	-0.04	4.92	40° 29' 28.139 N	104° 22' 30.296 W	1,423,750.85	3,312,871.59
2,218.00	1.23	236.68	2,217.89	-0.59	4.96	40° 29' 28.134 N	104° 22' 30.296 W	1,423,750.30	3,312,871.63
2,312.00	2.91	242.94	2,311.82	-2.23	1.99	40° 29' 28.118 N	104° 22' 30.335 W	1,423,748.66	3,312,868.66
2,407.00	4.67	252.20	2,406.61	-4.50	-3.84	40° 29' 28.096 N	104° 22' 30.410 W	1,423,746.39	3,312,862.83
2,502.00	6.46	256.94	2,501.16	-6.89	-12.73	40° 29' 28.073 N	104° 22' 30.526 W	1,423,744.00	3,312,853.94
2,596.00	7.22	258.27	2,594.49	-9.29	-23.66	40° 29' 28.051 N	104° 22' 30.668 W	1,423,741.60	3,312,843.01
2,691.00	9.61	270.81	2,688.47	-10.39	-37.44	40° 29' 28.042 N	104° 22' 30.846 W	1,423,740.50	3,312,829.23
2,786.00	11.53	267.36	2,781.86	-10.72	-54.86	40° 29' 28.041 N	104° 22' 31.072 W	1,423,740.17	3,312,811.82
2,881.00	11.73	268.83	2,874.91	-11.35	-74.00	40° 29' 28.037 N	104° 22' 31.319 W	1,423,739.54	3,312,792.68
2,975.00	11.98	265.16	2,966.90	-12.37	-93.27	40° 29' 28.029 N	104° 22' 31.569 W	1,423,738.52	3,312,773.40
3,070.00	10.12	260.18	3,060.14	-14.63	-111.32	40° 29' 28.009 N	104° 22' 31.803 W	1,423,736.26	3,312,755.35
3,165.00	7.45	276.15	3,154.03	-15.39	-125.67	40° 29' 28.004 N	104° 22' 31.989 W	1,423,735.50	3,312,741.00
3,260.00	4.09	279.21	3,248.53	-14.19	-135.14	40° 29' 28.017 N	104° 22' 32.111 W	1,423,736.70	3,312,731.53
3,354.00	2.00	274.71	3,342.40	-13.52	-140.09	40° 29' 28.024 N	104° 22' 32.175 W	1,423,737.37	3,312,726.59
3,449.00	1.33	157.26	3,437.38	-14.40	-141.31	40° 29' 28.015 N	104° 22' 32.191 W	1,423,736.49	3,312,725.36
3,544.00	1.40	163.94	3,532.35	-16.53	-140.57	40° 29' 27.994 N	104° 22' 32.182 W	1,423,734.36	3,312,726.11
3,639.00	1.82	156.86	3,627.31	-19.03	-139.65	40° 29' 27.969 N	104° 22' 32.170 W	1,423,731.86	3,312,727.02
3,734.00	1.35	120.00	3,722.28	-20.98	-138.09	40° 29' 27.950 N	104° 22' 32.151 W	1,423,729.91	3,312,728.58
3,829.00	1.40	110.31	3,817.25	-21.94	-136.03	40° 29' 27.940 N	104° 22' 32.124 W	1,423,728.95	3,312,730.64
3,924.00	1.57	115.77	3,912.22	-22.91	-133.77	40° 29' 27.930 N	104° 22' 32.095 W	1,423,727.98	3,312,732.90
4,019.00	1.50	118.40	4,007.18	-24.07	-131.51	40° 29' 27.919 N	104° 22' 32.066 W	1,423,726.82	3,312,735.17
4,114.00	1.57	94.49	4,102.15	-24.76	-129.12	40° 29' 27.912 N	104° 22' 32.035 W	1,423,726.13	3,312,737.56
4,208.00	0.33	274.19	4,196.14	-24.84	-128.10	40° 29' 27.911 N	104° 22' 32.022 W	1,423,726.05	3,312,738.57
4,303.00	0.52	176.73	4,291.14	-25.25	-128.35	40° 29' 27.907 N	104° 22' 32.025 W	1,423,725.64	3,312,738.32

## Design Report for Wells Ranch USX AA13-68-1HN - 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)
4,398.00	0.41	255.93	4,386.14	-25.76	-128.65	40° 29' 27.902 N	104° 22' 32.029 W	1,423,725.13	3,312,738.02
4,493.00	0.92	327.71	4,481.13	-25.20	-129.39	40° 29' 27.907 N	104° 22' 32.039 W	1,423,725.69	3,312,737.28
4,588.00	1.51	306.46	4,576.11	-23.81	-130.81	40° 29' 27.921 N	104° 22' 32.057 W	1,423,727.08	3,312,735.87
4,683.00	1.49	289.01	4,671.08	-22.67	-132.98	40° 29' 27.933 N	104° 22' 32.085 W	1,423,728.22	3,312,733.69
4,777.00	1.94	261.26	4,765.04	-22.51	-135.71	40° 29' 27.935 N	104° 22' 32.120 W	1,423,728.38	3,312,730.97
4,872.00	1.42	283.44	4,860.00	-22.48	-138.44	40° 29' 27.935 N	104° 22' 32.155 W	1,423,728.41	3,312,728.23
4,967.00	0.91	18.77	4,954.98	-21.49	-139.34	40° 29' 27.945 N	104° 22' 32.167 W	1,423,729.40	3,312,727.33
5,062.00	0.71	25.48	5,049.97	-20.25	-138.85	40° 29' 27.957 N	104° 22' 32.160 W	1,423,730.64	3,312,727.83
5,156.00	0.81	359.17	5,143.97	-19.06	-138.61	40° 29' 27.969 N	104° 22' 32.157 W	1,423,731.83	3,312,728.07
5,251.00	0.76	317.66	5,238.96	-17.92	-139.04	40° 29' 27.980 N	104° 22' 32.162 W	1,423,732.97	3,312,727.63
5,346.00	1.10	295.25	5,333.95	-17.07	-140.29	40° 29' 27.989 N	104° 22' 32.178 W	1,423,733.82	3,312,726.38
5,441.00	0.62	312.03	5,428.93	-16.33	-141.50	40° 29' 27.996 N	104° 22' 32.194 W	1,423,734.56	3,312,725.18
5,535.00	0.40	277.61	5,522.93	-15.95	-142.20	40° 29' 28.000 N	104° 22' 32.203 W	1,423,734.94	3,312,724.47
5,630.00	0.62	335.69	5,617.93	-15.44	-142.74	40° 29' 28.005 N	104° 22' 32.210 W	1,423,735.45	3,312,723.93
5,725.00	0.90	347.13	5,712.92	-14.24	-143.12	40° 29' 28.017 N	104° 22' 32.215 W	1,423,736.65	3,312,723.56
5,820.00	1.27	337.96	5,807.90	-12.54	-143.68	40° 29' 28.034 N	104° 22' 32.222 W	1,423,738.35	3,312,722.99
5,902.00	0.75	321.03	5,889.89	-11.28	-144.36	40° 29' 28.047 N	104° 22' 32.230 W	1,423,739.61	3,312,722.32
5,964.00	0.53	328.61	5,951.89	-10.72	-144.76	40° 29' 28.052 N	104° 22' 32.235 W	1,423,740.17	3,312,721.91
6,009.00	0.88	288.86	5,996.88	-10.43	-145.20	40° 29' 28.055 N	104° 22' 32.241 W	1,423,740.46	3,312,721.48
6,057.00	5.15	269.54	6,044.81	-10.33	-147.70	40° 29' 28.056 N	104° 22' 32.273 W	1,423,740.56	3,312,718.97
6,104.00	10.37	271.23	6,091.36	-10.25	-154.05	40° 29' 28.058 N	104° 22' 32.355 W	1,423,740.64	3,312,712.63
6,152.00	13.94	270.81	6,138.27	-10.08	-164.15	40° 29' 28.061 N	104° 22' 32.486 W	1,423,740.81	3,312,702.53
6,198.00	17.34	266.82	6,182.57	-10.38	-176.54	40° 29' 28.060 N	104° 22' 32.646 W	1,423,740.51	3,312,690.14
6,246.00	20.50	264.85	6,227.97	-11.53	-192.06	40° 29' 28.050 N	104° 22' 32.847 W	1,423,739.36	3,312,674.62
6,293.00	23.20	268.46	6,271.59	-12.52	-209.51	40° 29' 28.043 N	104° 22' 33.073 W	1,423,738.37	3,312,657.17
6,341.00	26.04	269.05	6,315.22	-12.95	-229.50	40° 29' 28.041 N	104° 22' 33.332 W	1,423,737.94	3,312,637.18
6,388.00	27.83	266.20	6,357.12	-13.85	-250.76	40° 29' 28.035 N	104° 22' 33.608 W	1,423,737.04	3,312,615.91
6,436.00	30.35	264.27	6,399.07	-15.80	-274.01	40° 29' 28.018 N	104° 22' 33.909 W	1,423,735.09	3,312,592.66
6,483.00	33.47	266.01	6,438.96	-17.89	-298.76	40° 29' 28.001 N	104° 22' 34.229 W	1,423,733.00	3,312,567.92
6,531.00	38.60	267.76	6,477.76	-19.40	-326.95	40° 29' 27.989 N	104° 22' 34.594 W	1,423,731.49	3,312,539.73
6,577.00	42.91	267.62	6,512.60	-20.61	-356.95	40° 29' 27.981 N	104° 22' 34.983 W	1,423,730.28	3,312,509.73
6,625.00	45.94	267.85	6,546.88	-21.93	-390.52	40° 29' 27.972 N	104° 22' 35.418 W	1,423,728.96	3,312,476.17
6,672.00	48.59	269.55	6,578.77	-22.71	-425.02	40° 29' 27.969 N	104° 22' 35.864 W	1,423,728.19	3,312,441.66
6,720.00	51.25	270.90	6,609.67	-22.55	-461.75	40° 29' 27.975 N	104° 22' 36.340 W	1,423,728.34	3,312,404.94
6,767.00	56.22	269.98	6,637.47	-22.27	-499.63	40° 29' 27.983 N	104° 22' 36.830 W	1,423,728.62	3,312,367.06
6,815.00	64.83	268.43	6,661.06	-22.87	-541.37	40° 29' 27.982 N	104° 22' 37.370 W	1,423,728.02	3,312,325.32
6,862.00	73.60	268.10	6,677.72	-24.21	-585.25	40° 29' 27.974 N	104° 22' 37.938 W	1,423,726.68	3,312,281.44
6,910.00	78.04	268.68	6,689.48	-25.51	-631.76	40° 29' 27.967 N	104° 22' 38.540 W	1,423,725.38	3,312,234.94
6,957.00	80.23	269.07	6,698.34	-26.42	-677.90	40° 29' 27.964 N	104° 22' 39.138 W	1,423,724.47	3,312,188.79
7,005.00	81.52	270.81	6,705.95	-26.47	-725.29	40° 29' 27.969 N	104° 22' 39.751 W	1,423,724.42	3,312,141.40
7,051.00	83.62	271.15	6,711.90	-25.69	-770.90	40° 29' 27.983 N	104° 22' 40.341 W	1,423,725.20	3,312,095.80
7,076.00	84.72	270.93	6,714.44	-25.23	-795.76	40° 29' 27.990 N	104° 22' 40.663 W	1,423,725.66	3,312,070.94

## Design Report for Wells Ranch USX AA13-68-1HN - 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)
7,125.00	85.99	271.13	6,718.41	-24.35	-844.59	40° 29' 28.005 N	104° 22' 41.295 W	1,423,726.54	3,312,022.11
7,155.00	86.76	271.26	6,720.31	-23.73	-874.52	40° 29' 28.015 N	104° 22' 41.682 W	1,423,727.16	3,311,992.18
7,184.00	87.04	271.38	6,721.88	-23.06	-903.47	40° 29' 28.025 N	104° 22' 42.056 W	1,423,727.83	3,311,963.23
7,279.00	90.31	267.32	6,724.07	-24.14	-998.41	40° 29' 28.026 N	104° 22' 43.285 W	1,423,726.75	3,311,868.29
7,374.00	88.95	267.13	6,724.69	-28.74	-1,093.29	40° 29' 27.993 N	104° 22' 44.514 W	1,423,722.15	3,311,773.41
7,468.00	90.62	269.78	6,725.04	-31.27	-1,187.25	40° 29' 27.980 N	104° 22' 45.730 W	1,423,719.62	3,311,679.46
7,563.00	90.25	268.85	6,724.32	-32.41	-1,282.24	40° 29' 27.980 N	104° 22' 46.960 W	1,423,718.48	3,311,584.48
7,658.00	90.55	269.22	6,723.65	-34.01	-1,377.22	40° 29' 27.976 N	104° 22' 48.189 W	1,423,716.88	3,311,489.50
7,753.00	89.60	268.67	6,723.53	-35.76	-1,472.20	40° 29' 27.971 N	104° 22' 49.419 W	1,423,715.13	3,311,394.52
7,847.00	89.82	269.53	6,724.01	-37.24	-1,566.19	40° 29' 27.968 N	104° 22' 50.635 W	1,423,713.66	3,311,300.53
7,942.00	89.08	269.98	6,724.92	-37.64	-1,661.18	40° 29' 27.976 N	104° 22' 51.865 W	1,423,713.25	3,311,205.54
8,037.00	88.27	270.66	6,727.11	-37.11	-1,756.16	40° 29' 27.993 N	104° 22' 53.094 W	1,423,713.78	3,311,110.58
8,131.00	89.66	270.77	6,728.81	-35.94	-1,850.13	40° 29' 28.016 N	104° 22' 54.310 W	1,423,714.95	3,311,016.60
8,226.00	90.83	270.51	6,728.41	-34.88	-1,945.12	40° 29' 28.038 N	104° 22' 55.539 W	1,423,716.01	3,310,921.62
8,321.00	89.54	268.12	6,728.10	-36.01	-2,040.11	40° 29' 28.039 N	104° 22' 56.769 W	1,423,714.88	3,310,826.63
8,415.00	89.32	268.07	6,729.03	-39.14	-2,134.05	40° 29' 28.020 N	104° 22' 57.985 W	1,423,711.75	3,310,732.69
8,510.00	90.31	269.92	6,729.34	-40.80	-2,229.03	40° 29' 28.015 N	104° 22' 59.214 W	1,423,710.09	3,310,637.72
8,605.00	88.43	269.64	6,730.39	-41.17	-2,324.02	40° 29' 28.023 N	104° 23' 0.444 W	1,423,709.72	3,310,542.73
8,700.00	87.72	269.46	6,733.58	-41.91	-2,418.96	40° 29' 28.028 N	104° 23' 1.673 W	1,423,708.98	3,310,447.79
8,795.00	92.10	269.41	6,733.73	-42.85	-2,513.93	40° 29' 28.030 N	104° 23' 2.902 W	1,423,708.04	3,310,352.82
8,890.00	89.48	268.08	6,732.42	-44.93	-2,608.89	40° 29' 28.022 N	104° 23' 4.131 W	1,423,705.96	3,310,257.87
8,984.00	87.59	267.43	6,734.82	-48.61	-2,702.78	40° 29' 27.997 N	104° 23' 5.347 W	1,423,702.28	3,310,163.98
9,079.00	88.61	269.96	6,737.97	-50.77	-2,797.70	40° 29' 27.987 N	104° 23' 6.576 W	1,423,700.12	3,310,069.07
9,174.00	89.04	269.69	6,739.92	-51.06	-2,892.68	40° 29' 27.996 N	104° 23' 7.805 W	1,423,699.83	3,309,974.09
9,269.00	91.57	270.29	6,739.41	-51.08	-2,987.67	40° 29' 28.008 N	104° 23' 9.034 W	1,423,699.81	3,309,879.11
9,364.00	89.01	269.17	6,738.93	-51.53	-3,082.66	40° 29' 28.015 N	104° 23' 10.264 W	1,423,699.36	3,309,784.12
9,459.00	89.38	269.25	6,740.27	-52.84	-3,177.64	40° 29' 28.014 N	104° 23' 11.493 W	1,423,698.05	3,309,689.14
9,554.00	91.36	270.31	6,739.65	-53.20	-3,272.63	40° 29' 28.022 N	104° 23' 12.722 W	1,423,697.69	3,309,594.15
9,649.00	90.22	268.84	6,738.34	-53.91	-3,367.61	40° 29' 28.027 N	104° 23' 13.952 W	1,423,696.98	3,309,499.17
9,743.00	91.51	269.12	6,736.92	-55.58	-3,461.58	40° 29' 28.022 N	104° 23' 15.168 W	1,423,695.31	3,309,405.20
9,838.00	89.26	270.40	6,736.29	-55.98	-3,556.57	40° 29' 28.030 N	104° 23' 16.398 W	1,423,694.91	3,309,310.22
9,933.00	89.63	270.14	6,737.21	-55.53	-3,651.57	40° 29' 28.046 N	104° 23' 17.627 W	1,423,695.36	3,309,215.23
10,028.00	89.97	270.14	6,737.54	-55.30	-3,746.57	40° 29' 28.060 N	104° 23' 18.856 W	1,423,695.59	3,309,120.23
10,123.00	89.97	269.04	6,737.59	-55.98	-3,841.56	40° 29' 28.065 N	104° 23' 20.086 W	1,423,694.91	3,309,025.24
10,218.00	88.80	268.71	6,738.61	-57.84	-3,936.54	40° 29' 28.059 N	104° 23' 21.315 W	1,423,693.05	3,308,930.27
10,313.00	87.90	267.67	6,741.34	-60.84	-4,031.45	40° 29' 28.041 N	104° 23' 22.544 W	1,423,690.05	3,308,835.36
10,408.00	88.98	268.31	6,743.93	-64.17	-4,126.35	40° 29' 28.020 N	104° 23' 23.773 W	1,423,686.72	3,308,740.46
10,502.00	89.97	268.97	6,744.79	-66.40	-4,220.32	40° 29' 28.009 N	104° 23' 24.990 W	1,423,684.49	3,308,646.49
10,597.00	90.59	269.32	6,744.33	-67.82	-4,315.31	40° 29' 28.007 N	104° 23' 26.219 W	1,423,683.07	3,308,551.51
10,692.00	89.01	268.86	6,744.66	-69.33	-4,410.29	40° 29' 28.004 N	104° 23' 27.449 W	1,423,681.56	3,308,456.53
10,787.00	88.64	269.88	6,746.61	-70.37	-4,505.27	40° 29' 28.005 N	104° 23' 28.678 W	1,423,680.52	3,308,361.56
10,882.00	88.86	270.19	6,748.68	-70.32	-4,600.24	40° 29' 28.018 N	104° 23' 29.907 W	1,423,680.58	3,308,266.59

## Design Report for Wells Ranch USX AA13-68-1HN - 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)
10,977.00	90.55	269.88	6,749.17	-70.26	-4,695.24	40° 29' 28.030 N	104° 23' 31.136 W	1,423,680.63	3,308,171.59
11,072.00	89.72	270.83	6,748.94	-69.67	-4,790.23	40° 29' 28.047 N	104° 23' 32.366 W	1,423,681.22	3,308,076.60
11,166.00	90.80	271.06	6,748.52	-68.12	-4,884.22	40° 29' 28.074 N	104° 23' 33.582 W	1,423,682.77	3,307,982.62
11,261.00	91.32	268.31	6,746.76	-68.64	-4,979.19	40° 29' 28.081 N	104° 23' 34.811 W	1,423,682.25	3,307,887.65
11,356.00	90.18	268.31	6,745.52	-71.44	-5,074.14	40° 29' 28.065 N	104° 23' 36.040 W	1,423,679.45	3,307,792.70
11,451.00	88.34	265.32	6,746.74	-76.72	-5,168.97	40° 29' 28.025 N	104° 23' 37.268 W	1,423,674.17	3,307,697.88
11,546.00	87.56	267.59	6,750.14	-82.59	-5,263.72	40° 29' 27.978 N	104° 23' 38.496 W	1,423,668.30	3,307,603.13
11,641.00	88.52	270.26	6,753.39	-84.37	-5,358.64	40° 29' 27.972 N	104° 23' 39.724 W	1,423,666.52	3,307,508.22
11,736.00	89.97	271.02	6,754.64	-83.31	-5,453.62	40° 29' 27.994 N	104° 23' 40.953 W	1,423,667.58	3,307,413.24
11,742.00	90.06	271.33	6,754.64	-83.19	-5,459.62	40° 29' 27.996 N	104° 23' 41.031 W	1,423,667.71	3,307,407.24
11,805.00	90.06	271.33	6,754.57	-81.72	-5,522.60	40° 29' 28.019 N	104° 23' 41.846 W	1,423,669.17	3,307,344.26

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.00	600.00	1.57	0.00	Tie-On to Surface Gyros @ 600.00ft
722.00	722.00	1.51	-0.03	First MWD Survey @ 722.00ft
11,742.00	6,754.64	-83.19	-5,459.62	Final MWD Survey @ 11742.00ft
11,805.00	6,754.57	-81.72	-5,522.60	Straight Line Proj @ 11805' MD, 6754.57' TVD

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wells Ranch USX AA13-68-1HN_RevA0_BHL Tgt	269.20	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
300.00	600.00	Surface Gyros	Flexi-Shot
722.00	7,076.00	MWD Surveys - Vert/Build	MWD
7,155.00	11,742.00	MWD Surveys - Lateral	MWD

## Design Report for Wells Ranch USX AA13-68-1HN - Final Surveys

### Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,125.00	6,718.41	Estimated: 7" Casing @ 7125' MD, 6718.41' TVD	7	8-3/4

### 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:	1.90 °/100usft	Maximum Dogleg over Survey:	18.67 °/100usft at 6,862.00 usft
Net Tortousity applicable to Plans:	0.94 °/100usft	Directional Difficulty Index:	6.341

### Audit Info

## North Reference Sheet for Sec. 18-T6N-R62W (Wells Ranch USX 13 North PAD) - Wells Ranch USX AA13-68-1HN

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

Vertical Depths are relative to KB=30' @ 4881.00usft (H&P 321). Northing and Easting are relative to Wells Ranch USX AA13-68-1HN - Slot A3

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: 0.99996563

Grid Coordinates of Well: 1,423,750.89 usft N, 3,312,866.67 usft E

Geographical Coordinates of Well: 40° 29' 28.14" N, 104° 22' 30.36" W

Grid Convergence at Surface is: 0.73°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,805.00usft

the Bottom Hole Displacement is 5,523.21usft in the Direction of 269.15° (Grid).

Magnetic Convergence at surface is: -7.67° ( 6 August 2013, , BGGM2013)

