

Noble Energy

Weld County, CO (NAD 83)

Sec. 31-T6N-R63W (Wells Ranch State A36)

Wells Ranch State A36-625

05-123-41507

Original Wellbore

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

04 August, 2015

Surface UWI : 05-123-41507

Well Coordinates: 1,404,806.70 N, 3,286,238.90 E (40° 26' 24.14" N, 104° 28' 17.83" W)

Ground Level: 4,659.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 73

Centered on Well Wells Ranch State A36-625

RF @ 4689.00usft (HP 321)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

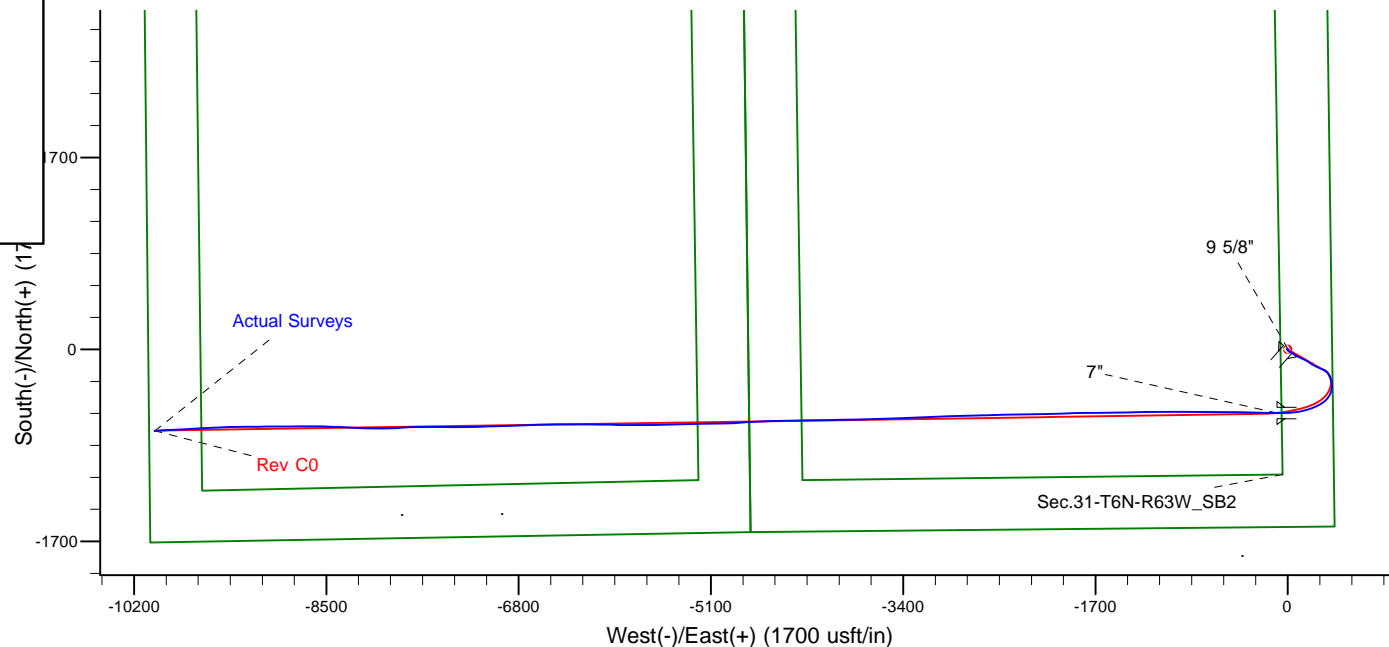
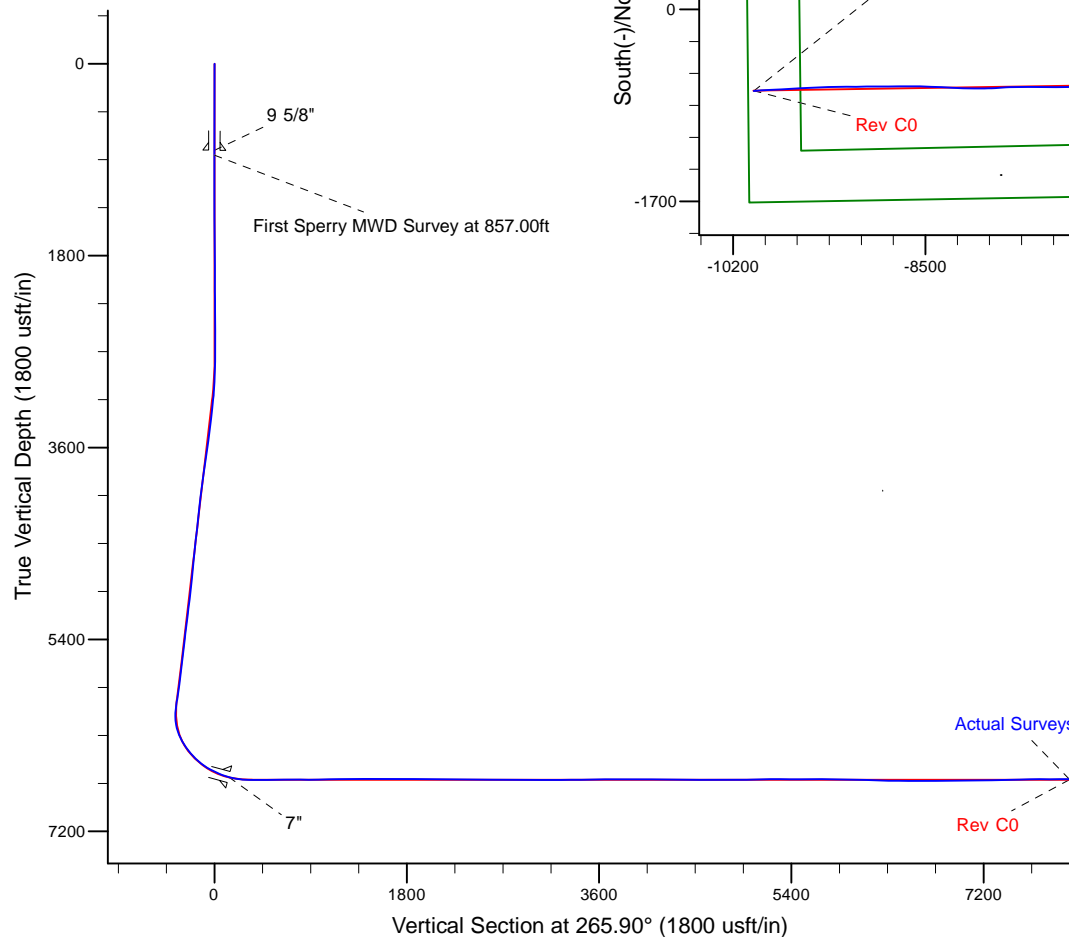
Project: Weld County, CO (NAD 83)
 Site: Sec. 31-T6N-R63W (Wells Ranch State A36)
 Well: Wells Ranch State A36-625
 Wellbore: Original Wellbore
 Design: Actual Surveys



Platted SHL: 1574' FSL, 390' FEL
 Platted Lat/Long: 40.440040, -104.471620
 Location: Sec. 31-T6N-R63W

~7" Casing: 490' FEL, 1010' FSL
 Lat/Long: 40.438496 N, -104.471980 W
 State Planes - CO Northern: 1,404,243.04 N, 3,286,145.18 E
 Sec. 31-T6N-R63W

Platted BHL: 990' FSL, 50' FWL
 Platted Lat/Long: 40.438383 N, -104.507407 W
 State Planes - CO Northern: 1,404,089.55 N, 3,276,285.16 E
 Location: Sec. 36-T6N-R64W



LEGEND

Wells Ranch State A36-625, Original Wellbore, Rev C0 V0
 Actual Surveys

WELL DETAILS: Wells Ranch State A36-625	
Ground Level:	4659.00
RF @ 4689.00usft (HP 321)	
Created By:	Tatiana Gomez
Created On:	8/4/2015

Design Report for Wells Ranch State A36-625 - Actual 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
811.00	0.25	41.28	811.00	1.31	1.15	-1.24	0.03
9 5/8"							
857.00	0.26	41.28	857.00	1.46	1.28	-1.38	0.03
First Sperry MWD Survey at 857.00ft							
919.00	0.34	41.55	919.00	1.70	1.50	-1.62	0.13
1,011.00	0.29	51.49	1,010.99	2.05	1.86	-2.00	0.08
1,103.00	0.22	1.45	1,102.99	2.38	2.05	-2.21	0.24
1,208.00	0.18	313.41	1,207.99	2.69	1.93	-2.12	0.16
1,300.00	0.29	269.55	1,299.99	2.79	1.60	-1.79	0.22
1,392.00	0.55	269.52	1,391.99	2.78	0.92	-1.12	0.28
1,485.00	0.47	267.03	1,484.99	2.76	0.09	-0.29	0.09
1,576.00	0.63	283.17	1,575.98	2.85	-0.77	0.56	0.24
1,668.00	0.65	293.02	1,667.98	3.17	-1.74	1.51	0.12
1,761.00	0.80	286.40	1,760.97	3.56	-2.85	2.59	0.18
1,854.00	0.63	284.32	1,853.96	3.87	-3.97	3.68	0.18
1,945.00	0.13	5.86	1,944.96	4.10	-4.44	4.14	0.69
2,037.00	0.41	0.07	2,036.96	4.53	-4.43	4.09	0.31
2,129.00	0.54	210.44	2,128.96	4.49	-4.65	4.32	1.00
2,221.00	0.56	218.43	2,220.95	3.76	-5.15	4.86	0.09
2,313.00	0.61	204.09	2,312.95	2.96	-5.63	5.40	0.17
2,404.00	0.62	195.75	2,403.94	2.05	-5.96	5.80	0.10
2,497.00	0.53	202.69	2,496.94	1.16	-6.26	6.16	0.12
2,588.00	0.47	184.83	2,587.94	0.40	-6.45	6.41	0.18
2,680.00	0.40	187.30	2,679.93	-0.29	-6.53	6.53	0.08
2,772.00	1.75	147.74	2,771.92	-1.80	-5.82	5.93	1.59
2,863.00	2.74	130.36	2,862.85	-4.38	-3.42	3.72	1.31
2,955.00	3.95	133.90	2,954.69	-8.00	0.54	0.03	1.33
3,050.00	5.28	135.67	3,049.38	-13.40	5.95	-4.98	1.41
3,145.00	7.13	123.66	3,143.82	-19.79	13.92	-12.46	2.37
3,240.00	7.65	118.61	3,238.03	-26.09	24.37	-22.44	0.88
3,334.00	8.27	119.25	3,331.13	-32.39	35.77	-33.36	0.67
3,429.00	8.52	124.62	3,425.11	-39.72	47.52	-44.55	0.87
3,524.00	9.06	119.76	3,518.99	-47.44	59.80	-56.25	0.97
3,619.00	9.51	117.86	3,612.75	-54.82	73.23	-69.12	0.57
3,713.00	9.80	117.15	3,705.42	-62.10	87.22	-82.55	0.33
3,808.00	9.96	116.32	3,799.01	-69.43	101.78	-96.55	0.23
3,903.00	8.21	114.41	3,892.81	-75.87	115.32	-109.59	1.87
3,998.00	7.50	113.92	3,986.92	-81.19	127.16	-121.03	0.75
4,093.00	7.76	116.18	4,081.08	-86.53	138.59	-132.04	0.42
4,188.00	7.85	115.58	4,175.20	-92.17	150.19	-143.21	0.13
4,282.00	7.44	116.31	4,268.36	-97.63	161.44	-154.04	0.45
4,377.00	8.22	123.08	4,362.48	-104.07	172.64	-164.75	1.27
4,472.00	7.99	124.01	4,456.53	-111.47	183.81	-175.36	0.28
4,567.00	7.55	125.09	4,550.66	-118.75	194.39	-185.39	0.49
4,661.00	7.03	126.68	4,643.90	-125.73	204.05	-194.53	0.59
4,756.00	6.34	127.34	4,738.25	-132.39	212.89	-202.86	0.73
4,850.00	7.44	113.27	4,831.58	-137.94	222.60	-212.16	2.13
4,945.00	8.08	115.78	4,925.71	-143.28	234.27	-223.41	0.76
5,039.00	7.80	115.38	5,018.81	-148.88	245.98	-234.69	0.30

Design Report for Wells Ranch State A36-625 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,134.00	6.97	115.25	5,113.02	-154.10	257.02	-245.33	0.87
5,228.00	8.32	114.90	5,206.18	-159.40	268.34	-256.25	1.44
5,323.00	7.35	111.31	5,300.29	-164.50	280.24	-267.75	1.14
5,417.00	8.54	114.21	5,393.39	-169.55	292.21	-279.32	1.34
5,512.00	7.63	113.42	5,487.44	-174.95	304.43	-291.13	0.96
5,701.00	6.24	110.42	5,675.06	-183.52	325.57	-311.60	0.76
5,795.00	11.58	132.83	5,767.92	-191.73	337.29	-322.70	6.67
5,843.00	12.48	134.24	5,814.86	-198.62	344.54	-329.44	1.97
5,890.00	14.57	143.05	5,860.56	-206.89	351.73	-336.02	6.23
5,938.00	17.47	148.73	5,906.69	-217.88	359.10	-342.59	6.86
5,984.00	20.94	151.92	5,950.13	-231.03	366.56	-349.08	7.88
6,032.00	24.38	157.32	5,994.42	-247.75	374.42	-355.72	8.37
6,079.00	27.47	163.87	6,036.70	-267.12	381.17	-361.08	8.95
6,127.00	29.79	167.87	6,078.83	-289.42	386.75	-365.05	6.27
6,174.00	30.27	175.51	6,119.53	-312.65	390.14	-366.76	8.19
6,222.00	30.73	183.92	6,160.91	-336.96	390.25	-365.13	8.94
6,269.00	31.58	192.44	6,201.15	-360.97	386.77	-359.94	9.54
6,317.00	33.21	200.85	6,241.70	-385.54	379.38	-350.81	9.97
6,363.00	34.88	210.16	6,279.84	-408.70	368.28	-338.08	11.89
6,411.00	35.54	218.18	6,319.08	-431.55	352.75	-320.96	9.73
6,458.00	35.94	226.19	6,357.25	-451.85	334.35	-301.15	9.99
6,506.00	36.67	234.84	6,395.96	-469.86	312.45	-278.02	10.77
6,553.00	38.97	239.07	6,433.09	-485.55	288.29	-252.80	7.37
6,648.00	46.03	248.06	6,503.15	-513.74	230.83	-193.46	9.79
6,696.00	49.79	251.44	6,535.32	-526.03	197.41	-159.26	9.41
6,742.00	54.02	253.90	6,563.70	-536.79	162.86	-124.02	10.11
6,790.00	57.10	257.60	6,590.85	-546.51	124.50	-85.07	9.03
6,837.00	59.38	261.82	6,615.60	-553.62	85.20	-45.35	9.04
6,932.00	67.13	266.76	6,658.34	-561.93	0.87	39.35	9.38
6,980.00	71.31	269.30	6,675.36	-563.46	-43.97	84.18	10.01
7,032.00	74.97	270.20	6,690.44	-563.67	-93.72	133.83	7.23
7"							
7,121.00	81.24	271.67	6,708.78	-562.24	-180.75	220.53	7.23
7,215.00	87.94	271.74	6,717.64	-559.46	-274.24	313.58	7.13
7,310.00	91.97	270.90	6,717.71	-557.27	-369.20	408.13	4.33
7,405.00	90.59	270.54	6,715.59	-556.08	-464.16	502.77	1.50
7,500.00	90.92	270.00	6,714.34	-555.63	-559.15	597.49	0.67
7,594.00	89.54	271.00	6,713.96	-554.81	-653.14	691.18	1.81
7,689.00	89.35	270.46	6,714.88	-553.60	-748.13	785.84	0.60
7,783.00	90.89	270.57	6,714.69	-552.75	-842.12	879.53	1.64
7,878.00	90.83	269.70	6,713.26	-552.53	-937.11	974.26	0.92
7,973.00	90.83	269.34	6,711.88	-553.33	-1,032.10	1,069.06	0.38
8,067.00	90.99	269.35	6,710.39	-554.40	-1,126.08	1,162.87	0.17
8,162.00	90.28	270.01	6,709.34	-554.93	-1,221.07	1,257.66	1.02
8,256.00	89.88	269.13	6,709.21	-555.64	-1,315.07	1,351.47	1.03
8,351.00	90.46	268.92	6,708.92	-557.25	-1,410.05	1,446.32	0.65
8,446.00	89.57	268.94	6,708.90	-559.03	-1,505.04	1,541.19	0.94
8,540.00	89.57	269.02	6,709.61	-560.70	-1,599.02	1,635.05	0.09
8,635.00	90.77	269.38	6,709.32	-562.03	-1,694.01	1,729.89	1.32
8,730.00	90.06	269.37	6,708.64	-563.06	-1,789.00	1,824.71	0.75
8,825.00	90.12	268.42	6,708.49	-564.89	-1,883.98	1,919.58	1.00

Design Report for Wells Ranch State A36-625 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,920.00	89.35	268.49	6,708.93	-567.46	-1,978.94	2,014.48	0.81
9,014.00	89.66	268.77	6,709.74	-569.70	-2,072.91	2,108.37	0.44
9,109.00	89.60	268.37	6,710.35	-572.07	-2,167.88	2,203.27	0.43
9,204.00	89.45	268.41	6,711.14	-574.74	-2,262.84	2,298.17	0.16
9,299.00	89.14	269.05	6,712.31	-576.85	-2,357.81	2,393.05	0.75
9,393.00	88.83	269.47	6,713.97	-578.06	-2,451.79	2,486.87	0.56
9,488.00	89.97	269.25	6,714.97	-579.12	-2,546.77	2,581.69	1.22
9,583.00	88.77	267.52	6,716.01	-581.80	-2,641.73	2,676.59	2.22
9,677.00	90.49	269.33	6,716.62	-584.38	-2,735.68	2,770.49	2.66
9,772.00	90.03	268.68	6,716.19	-586.03	-2,830.66	2,865.35	0.84
9,867.00	89.54	267.49	6,716.54	-589.21	-2,925.61	2,960.28	1.35
9,962.00	90.34	268.16	6,716.64	-592.81	-3,020.54	3,055.22	1.10
10,056.00	89.94	267.74	6,716.41	-596.18	-3,114.48	3,149.16	0.62
10,151.00	90.03	267.32	6,716.44	-600.27	-3,209.39	3,244.12	0.45
10,246.00	90.52	267.62	6,715.98	-604.46	-3,304.30	3,339.08	0.60
10,340.00	90.92	268.13	6,714.80	-607.95	-3,398.22	3,433.02	0.69
10,435.00	90.28	268.19	6,713.81	-611.00	-3,493.17	3,527.94	0.68
10,530.00	90.18	267.81	6,713.43	-614.31	-3,588.11	3,622.88	0.41
10,625.00	90.83	267.87	6,712.59	-617.89	-3,683.04	3,717.82	0.69
10,719.00	90.62	268.55	6,711.40	-620.83	-3,776.98	3,811.73	0.76
10,814.00	89.75	269.34	6,711.09	-622.58	-3,871.97	3,906.60	1.24
10,909.00	89.97	269.59	6,711.32	-623.47	-3,966.96	4,001.41	0.35
11,004.00	89.17	268.66	6,712.04	-624.92	-4,061.94	4,096.26	1.29
11,098.00	89.63	268.69	6,713.02	-627.09	-4,155.91	4,190.14	0.49
11,189.00	90.06	269.38	6,713.27	-628.62	-4,246.90	4,281.00	0.89
11,281.00	90.46	269.53	6,712.85	-629.50	-4,338.90	4,372.82	0.46
11,373.00	88.27	268.78	6,713.87	-630.85	-4,430.87	4,464.66	2.52
11,466.00	89.63	268.28	6,715.57	-633.24	-4,523.82	4,557.55	1.56
11,557.00	88.64	267.96	6,716.95	-636.23	-4,614.76	4,648.47	1.14
11,649.00	90.18	266.50	6,717.90	-640.67	-4,706.65	4,740.43	2.31
11,742.00	90.31	266.36	6,717.50	-646.46	-4,799.46	4,833.43	0.21
11,835.00	91.14	266.73	6,716.32	-652.07	-4,892.29	4,926.41	0.98
11,926.00	92.06	268.14	6,713.78	-656.14	-4,983.16	5,017.34	1.85
12,018.00	91.33	269.09	6,711.06	-658.36	-5,075.09	5,109.19	1.30
12,110.00	89.88	269.39	6,710.09	-659.58	-5,167.07	5,201.03	1.61
12,202.00	89.41	269.08	6,710.66	-660.81	-5,259.06	5,292.87	0.61
12,294.00	89.69	269.49	6,711.38	-661.96	-5,351.05	5,384.71	0.54
12,385.00	90.03	268.61	6,711.60	-663.46	-5,442.04	5,475.57	1.04
12,478.00	89.75	267.74	6,711.78	-666.43	-5,534.99	5,568.49	0.98
12,569.00	90.80	268.08	6,711.34	-669.74	-5,625.93	5,659.43	1.21
12,661.00	90.40	270.11	6,710.38	-671.20	-5,717.91	5,751.28	2.25
12,753.00	88.89	270.71	6,710.95	-670.54	-5,809.90	5,842.99	1.77
12,844.00	88.49	271.27	6,713.03	-668.97	-5,900.86	5,933.61	0.76
12,936.00	88.58	271.05	6,715.38	-667.11	-5,992.81	6,025.19	0.26
13,031.00	88.09	270.67	6,718.14	-665.68	-6,087.76	6,119.79	0.65
13,126.00	88.40	270.50	6,721.05	-664.71	-6,182.71	6,214.43	0.37
13,220.00	88.61	270.13	6,723.51	-664.19	-6,276.68	6,308.12	0.45
13,314.00	89.60	269.81	6,724.97	-664.24	-6,370.66	6,401.87	1.11
13,409.00	89.72	269.63	6,725.54	-664.71	-6,465.66	6,496.65	0.23
13,504.00	89.91	268.85	6,725.84	-665.97	-6,560.65	6,591.49	0.85
13,598.00	90.74	268.76	6,725.31	-667.93	-6,654.63	6,685.37	0.89

Design Report for Wells Ranch State A36-625 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,693.00	89.88	267.57	6,724.80	-670.97	-6,749.58	6,780.29	1.55
13,787.00	89.75	266.72	6,725.10	-675.65	-6,843.46	6,874.27	0.91
13,882.00	91.48	268.37	6,724.08	-679.72	-6,938.36	6,969.21	2.52
13,976.00	91.23	269.13	6,721.86	-681.77	-7,032.31	7,063.07	0.85
14,070.00	89.82	267.70	6,721.00	-684.37	-7,126.26	7,156.97	2.14
14,165.00	90.52	268.76	6,720.71	-687.31	-7,221.22	7,251.89	1.34
14,259.00	91.76	270.84	6,718.84	-687.63	-7,315.19	7,345.65	2.58
14,354.00	91.29	270.00	6,716.32	-686.94	-7,410.15	7,440.32	1.01
14,449.00	91.66	269.54	6,713.87	-687.32	-7,505.12	7,535.07	0.62
14,543.00	91.02	270.40	6,711.67	-687.37	-7,599.09	7,628.80	1.14
14,638.00	90.06	269.30	6,710.78	-687.62	-7,694.09	7,723.57	1.54
14,732.00	89.75	266.93	6,710.93	-690.71	-7,788.03	7,817.49	2.54
14,827.00	90.52	266.34	6,710.71	-696.28	-7,882.86	7,912.48	1.02
14,921.00	91.23	268.98	6,709.27	-700.12	-7,976.77	8,006.42	2.91
15,016.00	91.02	270.60	6,707.41	-700.47	-8,071.74	8,101.18	1.72
15,111.00	91.14	272.15	6,705.62	-698.19	-8,166.70	8,195.72	1.64
15,205.00	89.57	273.28	6,705.03	-693.74	-8,260.58	8,289.05	2.06
15,300.00	89.78	272.23	6,705.57	-689.17	-8,355.47	8,383.37	1.13
15,395.00	90.31	272.31	6,705.50	-685.41	-8,450.40	8,477.78	0.56
15,489.00	87.41	271.30	6,707.37	-682.45	-8,544.32	8,571.25	3.27
15,583.00	87.81	269.83	6,711.29	-681.52	-8,638.23	8,664.86	1.62
15,678.00	88.00	269.37	6,714.76	-682.19	-8,733.16	8,759.59	0.52
15,773.00	88.15	269.30	6,717.95	-683.29	-8,828.10	8,854.37	0.17
15,867.00	90.00	269.95	6,719.47	-683.90	-8,922.09	8,948.15	2.09
15,962.00	90.62	269.91	6,718.96	-684.02	-9,017.08	9,042.92	0.65
16,057.00	91.23	269.60	6,717.42	-684.43	-9,112.07	9,137.69	0.72
16,151.00	92.00	269.29	6,714.77	-685.34	-9,206.03	9,231.47	0.88
16,246.00	90.22	269.57	6,712.93	-686.28	-9,301.00	9,326.27	1.90
16,340.00	88.92	268.15	6,713.64	-688.15	-9,394.98	9,420.13	2.05
16,435.00	89.66	267.69	6,714.82	-691.60	-9,489.90	9,515.07	0.92
16,529.00	88.74	265.45	6,716.13	-697.22	-9,583.72	9,609.04	2.58
16,624.00	89.20	266.21	6,717.84	-704.13	-9,678.45	9,704.03	0.94
16,718.00	89.57	268.00	6,718.85	-708.87	-9,772.32	9,798.00	1.94
16,813.00	89.66	267.86	6,719.48	-712.31	-9,867.26	9,892.93	0.18
16,900.00	89.45	265.72	6,720.16	-717.18	-9,954.11	9,979.92	2.47
Final Sperry MWD Survey at 16900.00ft							
16,964.00	89.45	265.72	6,720.77	-721.95	-10,017.93	10,043.91	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
857.00	857.00	1.46	1.28	First Sperry MWD Survey at 857.00ft
16,900.00	6,720.16	-717.18	-9,954.11	Final Sperry MWD Survey at 16900.00ft
16,964.00	6,720.77	-721.95	-10,017.93	Straight Line Projection to TD at 16964.00ft

Design Report for Wells Ranch State A36-625 - Actual Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Wells Ranch State A36-625_Rev C0_BHL	265.90	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
857.00	6,980.00	Intermediate Surveys	MWD+IFR1+MS_WY
7,121.00	16,964.00	Production Surveys	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
811.00	811.00	9 5/8"	9-5/8	13-3/4
7,032.00	6,690.44	7"	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 State A36 - actual wellpath misses target center by 36.06usft at 7138.40usft MD (6711.25 TVD, -561.74 N, -197.97 E) - Point	0.00	0.00	6,686.51	-587.80	-201.10	1,404,218.92	3,286,037.81	40.438433	-104.472367
Wells Ranch State A36 - actual wellpath misses target center by 30.94usft at 16964.00usft MD (6720.77 TVD, -721.95 N, -10017.93 E) - Point	0.00	0.00	6,690.00	-718.95	-10,018.98	1,404,087.77	3,276,220.30	40.438380	-104.507640
Wells Ranch State A36 - actual wellpath misses target center by 26.14usft at 7140.76usft MD (6711.55 TVD, -561.67 N, -200.31 E) - Point	0.00	0.00	6,711.51	-587.80	-201.10	1,404,218.92	3,286,037.81	40.438433	-104.472367
Wells Ranch State A36 - actual wellpath misses target center by 6.59usft at 16964.00usft MD (6720.77 TVD, -721.95 N, -10017.93 E) - Point	0.00	0.00	6,715.00	-718.95	-10,018.98	1,404,087.77	3,276,220.30	40.438380	-104.507640
Wells Ranch State A36 - actual wellpath misses target center by 6.59usft at 16964.00usft MD (6720.77 TVD, -721.95 N, -10017.93 E) - Point	0.00	0.00	6,715.00	-718.95	-10,018.98	1,404,087.77	3,276,220.30	40.438380	-104.507640

Directional Difficulty Index

Average Dogleg over Survey:	1.61 °/100usft	Maximum Dogleg over Survey:	11.89 °/100usft at 6,363.00 usft
Net Tortousity applicable to Plans:	0.89 °/100usft	Directional Difficulty Index:	6.883

Audit Info

North Reference Sheet for Sec. 31-T6N-R63W (Wells Ranch State A36) - Wells Ranch State A36-625 - Original Wellbore

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

Vertical Depths are relative to RF @ 4689.00usft (HP 321). Northing and Easting are relative to Wells Ranch State A36-625

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996229

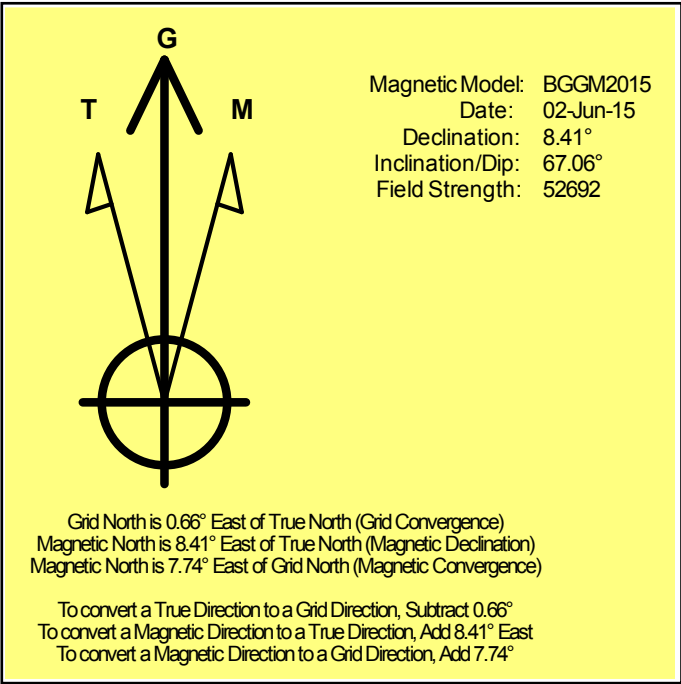
Grid Coordinates of Well: 1,404,806.70 usft N, 3,286,238.90 usft E

Geographical Coordinates of Well: 40° 26' 24.14" N, 104° 28' 17.83" W

Grid Convergence at Surface is: 0.66°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,964.00usft the Bottom Hole Displacement is 10,043.91usft in the Direction of 265.88° (Grid).

Magnetic Convergence at surface is: -7.74° (2 June 2015, , BGGM2015)



Noble Energy

Weld County, CO (NAD 83)

Sec. 31-T6N-R63W (Wells Ranch State A36)

Wells Ranch State A36-625

05-123-41507

Original Wellbore

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

04 August, 2015

Well Coordinates: 1,404,806.70 N, 3,286,238.90 E (40° 26' 24.14" N, 104° 28' 17.83" W)

Ground Level: 4,659.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 73

Centered on Well Wells Ranch State A36-625

RF @ 4689.00usft (HP 321)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Wells Ranch State A36-625 - Actual 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)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.440040	-104.471620	40.440040	-104.471620	1,404,806.70	3,286,238.90
811.00	0.25	41.28	811.00	1.31	1.15	40.440044	-104.471616	40.440044	-104.471616	1,404,808.00	3,286,240.05
857.00	0.26	41.28	857.00	1.46	1.28	40.440044	-104.471616	40.440044	-104.471616	1,404,808.16	3,286,240.18
919.00	0.34	41.55	919.00	1.70	1.50	40.440045	-104.471615	40.440045	-104.471615	1,404,808.40	3,286,240.40
1,011.00	0.29	51.49	1,010.99	2.05	1.86	40.440046	-104.471613	40.440046	-104.471613	1,404,808.75	3,286,240.76
1,103.00	0.22	1.45	1,102.99	2.38	2.05	40.440047	-104.471613	40.440047	-104.471613	1,404,809.07	3,286,240.95
1,208.00	0.18	313.41	1,207.99	2.69	1.93	40.440047	-104.471613	40.440047	-104.471613	1,404,809.39	3,286,240.83
1,300.00	0.29	269.55	1,299.99	2.79	1.60	40.440048	-104.471614	40.440048	-104.471614	1,404,809.48	3,286,240.50
1,392.00	0.55	269.52	1,391.99	2.78	0.92	40.440048	-104.471617	40.440048	-104.471617	1,404,809.48	3,286,239.82
1,485.00	0.47	267.03	1,484.99	2.76	0.09	40.440048	-104.471620	40.440048	-104.471620	1,404,809.45	3,286,238.99
1,576.00	0.63	283.17	1,575.98	2.85	-0.77	40.440048	-104.471623	40.440048	-104.471623	1,404,809.55	3,286,238.14
1,668.00	0.65	293.02	1,667.98	3.17	-1.74	40.440049	-104.471626	40.440049	-104.471626	1,404,809.87	3,286,237.16
1,761.00	0.80	286.40	1,760.97	3.56	-2.85	40.440050	-104.471630	40.440050	-104.471630	1,404,810.26	3,286,236.05
1,854.00	0.63	284.32	1,853.96	3.87	-3.97	40.440051	-104.471634	40.440051	-104.471634	1,404,810.57	3,286,234.94
1,945.00	0.13	5.86	1,944.96	4.10	-4.44	40.440051	-104.471636	40.440051	-104.471636	1,404,810.79	3,286,234.46
2,037.00	0.41	0.07	2,036.96	4.53	-4.43	40.440053	-104.471636	40.440053	-104.471636	1,404,811.23	3,286,234.47
2,129.00	0.54	210.44	2,128.96	4.49	-4.65	40.440053	-104.471637	40.440053	-104.471637	1,404,811.18	3,286,234.25
2,221.00	0.56	218.43	2,220.95	3.76	-5.15	40.440051	-104.471639	40.440051	-104.471639	1,404,810.46	3,286,233.75
2,313.00	0.61	204.09	2,312.95	2.96	-5.63	40.440048	-104.471640	40.440048	-104.471640	1,404,809.66	3,286,233.28
2,404.00	0.62	195.75	2,403.94	2.05	-5.96	40.440046	-104.471642	40.440046	-104.471642	1,404,808.74	3,286,232.94
2,497.00	0.53	202.69	2,496.94	1.16	-6.26	40.440043	-104.471643	40.440043	-104.471643	1,404,807.86	3,286,232.64
2,588.00	0.47	184.83	2,587.94	0.40	-6.45	40.440041	-104.471643	40.440041	-104.471643	1,404,807.10	3,286,232.45
2,680.00	0.40	187.30	2,679.93	-0.29	-6.53	40.440039	-104.471644	40.440039	-104.471644	1,404,806.41	3,286,232.37
2,772.00	1.75	147.74	2,771.92	-1.80	-5.82	40.440035	-104.471641	40.440035	-104.471641	1,404,804.90	3,286,233.08
2,863.00	2.74	130.36	2,862.85	-4.38	-3.42	40.440028	-104.471633	40.440028	-104.471633	1,404,802.32	3,286,235.48
2,955.00	3.95	133.90	2,954.69	-8.00	0.54	40.440018	-104.471619	40.440018	-104.471619	1,404,798.69	3,286,239.44
3,050.00	5.28	135.67	3,049.38	-13.40	5.95	40.440003	-104.471599	40.440003	-104.471599	1,404,793.30	3,286,244.85
3,145.00	7.13	123.66	3,143.82	-19.79	13.92	40.439985	-104.471571	40.439985	-104.471571	1,404,786.90	3,286,252.82
3,240.00	7.65	118.61	3,238.03	-26.09	24.37	40.439968	-104.471534	40.439968	-104.471534	1,404,780.61	3,286,263.27
3,334.00	8.27	119.25	3,331.13	-32.39	35.77	40.439950	-104.471493	40.439950	-104.471493	1,404,774.31	3,286,274.67
3,429.00	8.52	124.62	3,425.11	-39.72	47.52	40.439930	-104.471451	40.439930	-104.471451	1,404,766.97	3,286,286.42
3,524.00	9.06	119.76	3,518.99	-47.44	59.80	40.439908	-104.471407	40.439908	-104.471407	1,404,759.26	3,286,298.70
3,619.00	9.51	117.86	3,612.75	-54.82	73.23	40.439887	-104.471359	40.439887	-104.471359	1,404,751.88	3,286,312.13
3,713.00	9.80	117.15	3,705.42	-62.10	87.22	40.439867	-104.471310	40.439867	-104.471310	1,404,744.60	3,286,326.12
3,808.00	9.96	116.32	3,799.01	-69.43	101.78	40.439846	-104.471258	40.439846	-104.471258	1,404,737.27	3,286,340.67
3,903.00	8.21	114.41	3,892.81	-75.87	115.32	40.439828	-104.471209	40.439828	-104.471209	1,404,730.82	3,286,354.22
3,998.00	7.50	113.92	3,986.92	-81.19	127.16	40.439813	-104.471167	40.439813	-104.471167	1,404,725.51	3,286,366.06
4,093.00	7.76	116.18	4,081.08	-86.53	138.59	40.439798	-104.471126	40.439798	-104.471126	1,404,720.16	3,286,377.48
4,188.00	7.85	115.58	4,175.20	-92.17	150.19	40.439782	-104.471085	40.439782	-104.471085	1,404,714.53	3,286,389.09
4,282.00	7.44	116.31	4,268.36	-97.63	161.44	40.439767	-104.471044	40.439767	-104.471044	1,404,709.06	3,286,400.33
4,377.00	8.22	123.08	4,362.48	-104.07	172.64	40.439749	-104.471004	40.439749	-104.471004	1,404,702.63	3,286,411.54
4,472.00	7.99	124.01	4,456.53	-111.47	183.81	40.439728	-104.470965	40.439728	-104.470965	1,404,695.23	3,286,422.70

Design Report for Wells Ranch State A36-625 - Actual 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)
4,567.00	7.55	125.09	4,550.66	-118.75	194.39	40.439708	-104.470927	1,404,687.95	3,286,433.28
4,661.00	7.03	126.68	4,643.90	-125.73	204.05	40.439688	-104.470892	1,404,680.97	3,286,442.95
4,756.00	6.34	127.34	4,738.25	-132.39	212.89	40.439670	-104.470861	1,404,674.31	3,286,451.78
4,850.00	7.44	113.27	4,831.58	-137.94	222.60	40.439654	-104.470826	1,404,668.76	3,286,461.50
4,945.00	8.08	115.78	4,925.71	-143.28	234.27	40.439639	-104.470785	1,404,663.43	3,286,473.16
5,039.00	7.80	115.38	5,018.81	-148.88	245.98	40.439624	-104.470743	1,404,657.82	3,286,484.87
5,134.00	6.97	115.25	5,113.02	-154.10	257.02	40.439609	-104.470703	1,404,652.60	3,286,495.91
5,228.00	8.32	114.90	5,206.18	-159.40	268.34	40.439594	-104.470663	1,404,647.30	3,286,507.23
5,323.00	7.35	111.31	5,300.29	-164.50	280.24	40.439580	-104.470620	1,404,642.20	3,286,519.13
5,417.00	8.54	114.21	5,393.39	-169.55	292.21	40.439565	-104.470578	1,404,637.15	3,286,531.10
5,512.00	7.63	113.42	5,487.44	-174.95	304.43	40.439550	-104.470534	1,404,631.75	3,286,543.32
5,701.00	6.24	110.42	5,675.06	-183.52	325.57	40.439526	-104.470458	1,404,623.18	3,286,564.46
5,795.00	11.58	132.83	5,767.92	-191.73	337.29	40.439503	-104.470417	1,404,614.98	3,286,576.18
5,843.00	12.48	134.24	5,814.86	-198.62	344.54	40.439484	-104.470391	1,404,608.08	3,286,583.42
5,890.00	14.57	143.05	5,860.56	-206.89	351.73	40.439461	-104.470365	1,404,599.81	3,286,590.62
5,938.00	17.47	148.73	5,906.69	-217.88	359.10	40.439431	-104.470339	1,404,588.83	3,286,597.99
5,984.00	20.94	151.92	5,950.13	-231.03	366.56	40.439394	-104.470313	1,404,575.67	3,286,605.44
6,032.00	24.38	157.32	5,994.42	-247.75	374.42	40.439348	-104.470286	1,404,558.96	3,286,613.30
6,079.00	27.47	163.87	6,036.70	-267.12	381.17	40.439295	-104.470262	1,404,539.58	3,286,620.06
6,127.00	29.79	167.87	6,078.83	-289.42	386.75	40.439233	-104.470243	1,404,517.29	3,286,625.64
6,174.00	30.27	175.51	6,119.53	-312.65	390.14	40.439169	-104.470232	1,404,494.06	3,286,629.02
6,222.00	30.73	183.92	6,160.91	-336.96	390.25	40.439103	-104.470232	1,404,469.75	3,286,629.13
6,269.00	31.58	192.44	6,201.15	-360.97	386.77	40.439037	-104.470246	1,404,445.74	3,286,625.66
6,317.00	33.21	200.85	6,241.70	-385.54	379.38	40.438970	-104.470274	1,404,421.17	3,286,618.27
6,363.00	34.88	210.16	6,279.84	-408.70	368.28	40.438907	-104.470314	1,404,398.01	3,286,607.17
6,411.00	35.54	218.18	6,319.08	-431.55	352.75	40.438844	-104.470371	1,404,375.16	3,286,591.64
6,458.00	35.94	226.19	6,357.25	-451.85	334.35	40.438789	-104.470438	1,404,354.87	3,286,573.23
6,506.00	36.67	234.84	6,395.96	-469.86	312.45	40.438740	-104.470517	1,404,336.85	3,286,551.34
6,553.00	38.97	239.07	6,433.09	-485.55	288.29	40.438698	-104.470605	1,404,321.17	3,286,527.18
6,648.00	46.03	248.06	6,503.15	-513.74	230.83	40.438623	-104.470812	1,404,292.98	3,286,469.72
6,696.00	49.79	251.44	6,535.32	-526.03	197.41	40.438590	-104.470933	1,404,280.68	3,286,436.31
6,742.00	54.02	253.90	6,563.70	-536.79	162.86	40.438562	-104.471058	1,404,269.93	3,286,401.76
6,790.00	57.10	257.60	6,590.85	-546.51	124.50	40.438536	-104.471196	1,404,260.21	3,286,363.40
6,837.00	59.38	261.82	6,615.60	-553.62	85.20	40.438518	-104.471337	1,404,253.09	3,286,324.09
6,932.00	67.13	266.76	6,658.34	-561.93	0.87	40.438498	-104.471641	1,404,244.79	3,286,239.77
6,980.00	71.31	269.30	6,675.36	-563.46	-43.97	40.438495	-104.471802	1,404,243.26	3,286,194.93
7,032.00	74.97	270.20	6,690.44	-563.67	-93.72	40.438496	-104.471980	1,404,243.04	3,286,145.18
7,121.00	81.24	271.67	6,708.78	-562.24	-180.75	40.438503	-104.472293	1,404,244.48	3,286,058.15
7,215.00	87.94	271.74	6,717.64	-559.46	-274.24	40.438513	-104.472629	1,404,247.26	3,285,964.67
7,310.00	91.97	270.90	6,717.71	-557.27	-369.20	40.438522	-104.472970	1,404,249.45	3,285,869.72
7,405.00	90.59	270.54	6,715.59	-556.08	-464.16	40.438529	-104.473311	1,404,250.64	3,285,774.76
7,500.00	90.92	270.00	6,714.34	-555.63	-559.15	40.438533	-104.473652	1,404,251.09	3,285,679.77

Design Report for Wells Ranch State A36-625 - Actual 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)
7,594.00	89.54	271.00	6,713.96	-554.81	-653.14	40.438538	-104.473990	1,404,251.91	3,285,585.78
7,689.00	89.35	270.46	6,714.88	-553.60	-748.13	40.438544	-104.474331	1,404,253.12	3,285,490.80
7,783.00	90.89	270.57	6,714.69	-552.75	-842.12	40.438550	-104.474668	1,404,253.96	3,285,396.81
7,878.00	90.83	269.70	6,713.26	-552.53	-937.11	40.438553	-104.475010	1,404,254.19	3,285,301.82
7,973.00	90.83	269.34	6,711.88	-553.33	-1,032.10	40.438554	-104.475351	1,404,253.39	3,285,206.84
8,067.00	90.99	269.35	6,710.39	-554.40	-1,126.08	40.438554	-104.475688	1,404,252.32	3,285,112.86
8,162.00	90.28	270.01	6,709.34	-554.93	-1,221.07	40.438556	-104.476030	1,404,251.79	3,285,017.87
8,256.00	89.88	269.13	6,709.21	-555.64	-1,315.07	40.438557	-104.476367	1,404,251.08	3,284,923.88
8,351.00	90.46	268.92	6,708.92	-557.25	-1,410.05	40.438555	-104.476709	1,404,249.46	3,284,828.90
8,446.00	89.57	268.94	6,708.90	-559.03	-1,505.04	40.438553	-104.477050	1,404,247.69	3,284,733.92
8,540.00	89.57	269.02	6,709.61	-560.70	-1,599.02	40.438552	-104.477388	1,404,246.02	3,284,639.94
8,635.00	90.77	269.38	6,709.32	-562.03	-1,694.01	40.438551	-104.477729	1,404,244.69	3,284,544.96
8,730.00	90.06	269.37	6,708.64	-563.06	-1,789.00	40.438551	-104.478070	1,404,243.65	3,284,449.97
8,825.00	90.12	268.42	6,708.49	-564.89	-1,883.98	40.438549	-104.478411	1,404,241.82	3,284,354.99
8,920.00	89.35	268.49	6,708.93	-567.46	-1,978.94	40.438545	-104.478753	1,404,239.26	3,284,260.03
9,014.00	89.66	268.77	6,709.74	-569.70	-2,072.91	40.438542	-104.479090	1,404,237.01	3,284,166.07
9,109.00	89.60	268.37	6,710.35	-572.07	-2,167.88	40.438539	-104.479432	1,404,234.64	3,284,071.10
9,204.00	89.45	268.41	6,711.14	-574.74	-2,262.84	40.438534	-104.479773	1,404,231.97	3,283,976.15
9,299.00	89.14	269.05	6,712.31	-576.85	-2,357.81	40.438532	-104.480114	1,404,229.87	3,283,881.18
9,393.00	88.83	269.47	6,713.97	-578.06	-2,451.79	40.438531	-104.480452	1,404,228.66	3,283,787.21
9,488.00	89.97	269.25	6,714.97	-579.12	-2,546.77	40.438531	-104.480793	1,404,227.59	3,283,692.22
9,583.00	88.77	267.52	6,716.01	-581.80	-2,641.73	40.438527	-104.481134	1,404,224.92	3,283,597.28
9,677.00	90.49	269.33	6,716.62	-584.38	-2,735.68	40.438523	-104.481472	1,404,222.33	3,283,503.32
9,772.00	90.03	268.68	6,716.19	-586.03	-2,830.66	40.438521	-104.481813	1,404,220.68	3,283,408.34
9,867.00	89.54	267.49	6,716.54	-589.21	-2,925.61	40.438516	-104.482154	1,404,217.51	3,283,313.40
9,962.00	90.34	268.16	6,716.64	-592.81	-3,020.54	40.438509	-104.482495	1,404,213.90	3,283,218.48
10,056.00	89.94	267.74	6,716.41	-596.18	-3,114.48	40.438502	-104.482833	1,404,210.54	3,283,124.54
10,151.00	90.03	267.32	6,716.44	-600.27	-3,209.39	40.438494	-104.483174	1,404,206.45	3,283,029.63
10,246.00	90.52	267.62	6,715.98	-604.46	-3,304.30	40.438486	-104.483515	1,404,202.26	3,282,934.73
10,340.00	90.92	268.13	6,714.80	-607.95	-3,398.22	40.438479	-104.483853	1,404,198.77	3,282,840.81
10,435.00	90.28	268.19	6,713.81	-611.00	-3,493.17	40.438474	-104.484194	1,404,195.72	3,282,745.87
10,530.00	90.18	267.81	6,713.43	-614.31	-3,588.11	40.438467	-104.484535	1,404,192.40	3,282,650.93
10,625.00	90.83	267.87	6,712.59	-617.89	-3,683.04	40.438461	-104.484876	1,404,188.82	3,282,556.00
10,719.00	90.62	268.55	6,711.40	-620.83	-3,776.98	40.438455	-104.485214	1,404,185.89	3,282,462.06
10,814.00	89.75	269.34	6,711.09	-622.58	-3,871.97	40.438454	-104.485555	1,404,184.14	3,282,367.08
10,909.00	89.97	269.59	6,711.32	-623.47	-3,966.96	40.438454	-104.485896	1,404,183.25	3,282,272.09
11,004.00	89.17	268.66	6,712.04	-624.92	-4,061.94	40.438453	-104.486238	1,404,181.80	3,282,177.11
11,098.00	89.63	268.69	6,713.02	-627.09	-4,155.91	40.438450	-104.486575	1,404,179.63	3,282,083.14
11,189.00	90.06	269.38	6,713.27	-628.62	-4,246.90	40.438449	-104.486902	1,404,178.10	3,281,992.16
11,281.00	90.46	269.53	6,712.85	-629.50	-4,338.90	40.438449	-104.487233	1,404,177.22	3,281,900.17
11,373.00	88.27	268.78	6,713.87	-630.85	-4,430.87	40.438448	-104.487563	1,404,175.86	3,281,808.20
11,466.00	89.63	268.28	6,715.57	-633.24	-4,523.82	40.438445	-104.487897	1,404,173.48	3,281,715.25

Design Report for Wells Ranch State A36-625 - Actual 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)
11,557.00	88.64	267.96	6,716.95	-636.23	-4,614.76	40.438440	-104.488224	1,404,170.49	3,281,624.31
11,649.00	90.18	266.50	6,717.90	-640.67	-4,706.65	40.438430	-104.488554	1,404,166.05	3,281,532.43
11,742.00	90.31	266.36	6,717.50	-646.46	-4,799.46	40.438417	-104.488888	1,404,160.26	3,281,439.62
11,835.00	91.14	266.73	6,716.32	-652.07	-4,892.29	40.438405	-104.489221	1,404,154.65	3,281,346.80
11,926.00	92.06	268.14	6,713.78	-656.14	-4,983.16	40.438396	-104.489548	1,404,150.58	3,281,255.93
12,018.00	91.33	269.09	6,711.06	-658.36	-5,075.09	40.438393	-104.489878	1,404,148.36	3,281,164.00
12,110.00	89.88	269.39	6,710.09	-659.58	-5,167.07	40.438393	-104.490209	1,404,147.14	3,281,072.02
12,202.00	89.41	269.08	6,710.66	-660.81	-5,259.06	40.438392	-104.490539	1,404,145.91	3,280,980.04
12,294.00	89.69	269.49	6,711.38	-661.96	-5,351.05	40.438392	-104.490870	1,404,144.76	3,280,888.05
12,385.00	90.03	268.61	6,711.60	-663.46	-5,442.04	40.438391	-104.491197	1,404,143.26	3,280,797.07
12,478.00	89.75	267.74	6,711.78	-666.43	-5,534.99	40.438385	-104.491531	1,404,140.29	3,280,704.12
12,569.00	90.80	268.08	6,711.34	-669.74	-5,625.93	40.438379	-104.491858	1,404,136.98	3,280,613.19
12,661.00	90.40	270.11	6,710.38	-671.20	-5,717.91	40.438378	-104.492188	1,404,135.52	3,280,521.21
12,753.00	88.89	270.71	6,710.95	-670.54	-5,809.90	40.438383	-104.492518	1,404,136.18	3,280,429.22
12,844.00	88.49	271.27	6,713.03	-668.97	-5,900.86	40.438390	-104.492845	1,404,137.75	3,280,338.26
12,936.00	88.58	271.05	6,715.38	-667.11	-5,992.81	40.438398	-104.493175	1,404,139.61	3,280,246.32
13,031.00	88.09	270.67	6,718.14	-665.68	-6,087.76	40.438405	-104.493516	1,404,141.04	3,280,151.37
13,126.00	88.40	270.50	6,721.05	-664.71	-6,182.71	40.438410	-104.493857	1,404,142.01	3,280,056.42
13,220.00	88.61	270.13	6,723.51	-664.19	-6,276.68	40.438415	-104.494195	1,404,142.53	3,279,962.46
13,314.00	89.60	269.81	6,724.97	-664.24	-6,370.66	40.438417	-104.494533	1,404,142.48	3,279,868.48
13,409.00	89.72	269.63	6,725.54	-664.71	-6,465.66	40.438419	-104.494874	1,404,142.01	3,279,773.48
13,504.00	89.91	268.85	6,725.84	-665.97	-6,560.65	40.438419	-104.495215	1,404,140.75	3,279,678.50
13,598.00	90.74	268.76	6,725.31	-667.93	-6,654.63	40.438416	-104.495553	1,404,138.79	3,279,584.52
13,693.00	89.88	267.57	6,724.80	-670.97	-6,749.58	40.438411	-104.495894	1,404,135.75	3,279,489.58
13,787.00	89.75	266.72	6,725.10	-675.65	-6,843.46	40.438401	-104.496231	1,404,131.07	3,279,395.70
13,882.00	91.48	268.37	6,724.08	-679.72	-6,938.36	40.438393	-104.496572	1,404,127.00	3,279,300.80
13,976.00	91.23	269.13	6,721.86	-681.77	-7,032.31	40.438390	-104.496910	1,404,124.95	3,279,206.86
14,070.00	89.82	267.70	6,721.00	-684.37	-7,126.26	40.438386	-104.497248	1,404,122.35	3,279,112.91
14,165.00	90.52	268.76	6,720.71	-687.31	-7,221.22	40.438381	-104.497589	1,404,119.42	3,279,017.96
14,259.00	91.76	270.84	6,718.84	-687.63	-7,315.19	40.438383	-104.497926	1,404,119.09	3,278,923.99
14,354.00	91.29	270.00	6,716.32	-686.94	-7,410.15	40.438387	-104.498268	1,404,119.78	3,278,829.03
14,449.00	91.66	269.54	6,713.87	-687.32	-7,505.12	40.438389	-104.498609	1,404,119.40	3,278,734.06
14,543.00	91.02	270.40	6,711.67	-687.37	-7,599.09	40.438392	-104.498946	1,404,119.35	3,278,640.09
14,638.00	90.06	269.30	6,710.78	-687.62	-7,694.09	40.438394	-104.499288	1,404,119.10	3,278,545.11
14,732.00	89.75	266.93	6,710.93	-690.71	-7,788.03	40.438389	-104.499625	1,404,116.01	3,278,451.17
14,827.00	90.52	266.34	6,710.71	-696.28	-7,882.86	40.438376	-104.499966	1,404,110.44	3,278,356.34
14,921.00	91.23	268.98	6,709.27	-700.12	-7,976.77	40.438369	-104.500303	1,404,106.60	3,278,262.44
15,016.00	91.02	270.60	6,707.41	-700.47	-8,071.74	40.438371	-104.500645	1,404,106.25	3,278,167.46
15,111.00	91.14	272.15	6,705.62	-698.19	-8,166.70	40.438380	-104.500986	1,404,108.53	3,278,072.51
15,205.00	89.57	273.28	6,705.03	-693.74	-8,260.58	40.438395	-104.501323	1,404,112.98	3,277,978.63
15,300.00	89.78	272.23	6,705.57	-689.17	-8,355.47	40.438411	-104.501663	1,404,117.55	3,277,883.75
15,395.00	90.31	272.31	6,705.50	-685.41	-8,450.40	40.438424	-104.502004	1,404,121.31	3,277,788.82

Design Report for Wells Ranch State A36-625 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Geographic Coordinates Latitude (usft)	Longitude (usft)	UTM Coordinates Northing (usft)	Easting (usft)
15,489.00	87.41	271.30	6,707.37	-682.45	-8,544.32	40.438435	-104.502342	1,404,124.27	3,277,694.90
15,583.00	87.81	269.83	6,711.29	-681.52	-8,638.23	40.438440	-104.502679	1,404,125.20	3,277,601.00
15,678.00	88.00	269.37	6,714.76	-682.19	-8,733.16	40.438441	-104.503020	1,404,124.53	3,277,506.07
15,773.00	88.15	269.30	6,717.95	-683.29	-8,828.10	40.438441	-104.503361	1,404,123.43	3,277,411.13
15,867.00	90.00	269.95	6,719.47	-683.90	-8,922.09	40.438443	-104.503699	1,404,122.82	3,277,317.15
15,962.00	90.62	269.91	6,718.96	-684.02	-9,017.08	40.438445	-104.504040	1,404,122.70	3,277,222.16
16,057.00	91.23	269.60	6,717.42	-684.43	-9,112.07	40.438447	-104.504381	1,404,122.30	3,277,127.17
16,151.00	92.00	269.29	6,714.77	-685.34	-9,206.03	40.438447	-104.504719	1,404,121.39	3,277,033.22
16,246.00	90.22	269.57	6,712.93	-686.28	-9,301.00	40.438448	-104.505060	1,404,120.44	3,276,938.25
16,340.00	88.92	268.15	6,713.64	-688.15	-9,394.98	40.438445	-104.505397	1,404,118.57	3,276,844.28
16,435.00	89.66	267.69	6,714.82	-691.60	-9,489.90	40.438439	-104.505739	1,404,115.12	3,276,749.35
16,529.00	88.74	265.45	6,716.13	-697.22	-9,583.72	40.438426	-104.506076	1,404,109.50	3,276,655.54
16,624.00	89.20	266.21	6,717.84	-704.13	-9,678.45	40.438410	-104.506416	1,404,102.59	3,276,560.81
16,718.00	89.57	268.00	6,718.85	-708.87	-9,772.32	40.438400	-104.506754	1,404,097.85	3,276,466.95
16,813.00	89.66	267.86	6,719.48	-712.31	-9,867.26	40.438394	-104.507095	1,404,094.42	3,276,372.01
16,900.00	89.45	265.72	6,720.16	-717.18	-9,954.11	40.438383	-104.507407	1,404,089.55	3,276,285.16
16,964.00	89.45	265.72	6,720.77	-721.95	-10,017.93	40.438372	-104.507637	1,404,084.77	3,276,221.35

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
857.00	857.00	1.46	1.28	First Sperry MWD Survey at 857.00ft
16,900.00	6,720.16	-717.18	-9,954.11	Final Sperry MWD Survey at 16900.00ft
16,964.00	6,720.77	-721.95	-10,017.93	Straight Line Projection to TD at 16964.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	Wells Ranch State A36-625_Rev C0_BHL	265.90	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
857.00	6,980.00	Intermediate Surveys	MWD+IFR1+MS_WY
7,121.00	16,964.00	Production Surveys	MWD+IFR1+MS_WY

Design Report for Wells Ranch State A36-625 - Actual Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
811.00	811.00	9 5/8"	9-5/8	13-3/4
7,032.00	6,690.44	7"	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:	1.61 °/100usft	Maximum Dogleg over Survey:	11.89 °/100usft at 6,363.00 usft
Net Tortosity applicable to Plans:	0.89 °/100usft	Directional Difficulty Index:	6.883

Audit Info

North Reference Sheet for Sec. 31-T6N-R63W (Wells Ranch State A36) - Wells Ranch State A36-625 - Original Wellbore

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

Vertical Depths are relative to RF @ 4689.00usft (HP 321). Northing and Easting are relative to Wells Ranch State A36-625

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996229

Grid Coordinates of Well: 1,404,806.70 usft N, 3,286,238.90 usft E

Geographical Coordinates of Well: 40° 26' 24.14" N, 104° 28' 17.83" W

Grid Convergence at Surface is: 0.66°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,964.00usft

the Bottom Hole Displacement is 10,043.91usft in the Direction of 265.88° (Grid).

Magnetic Convergence at surface is: -7.74° (2 June 2015, , BGGM2015)

