

Noble Energy

Weld County, CO (NAD 83)

Sec. 32-T6N-R62W (Wells Ranch AE32)

Wells Ranch AF05-690

05-123-41786

Plan A

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

08 October, 2015

Surface UWI : 05-123-41786

Well Coordinates: 1,404,332.07 N, 3,318,850.39 E (40° 26' 15.50" N, 104° 21' 16.16" W)

Ground Level: 4,716.00 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 AF05-690

KB = 24 @ 4740.00usft (H&P 273)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

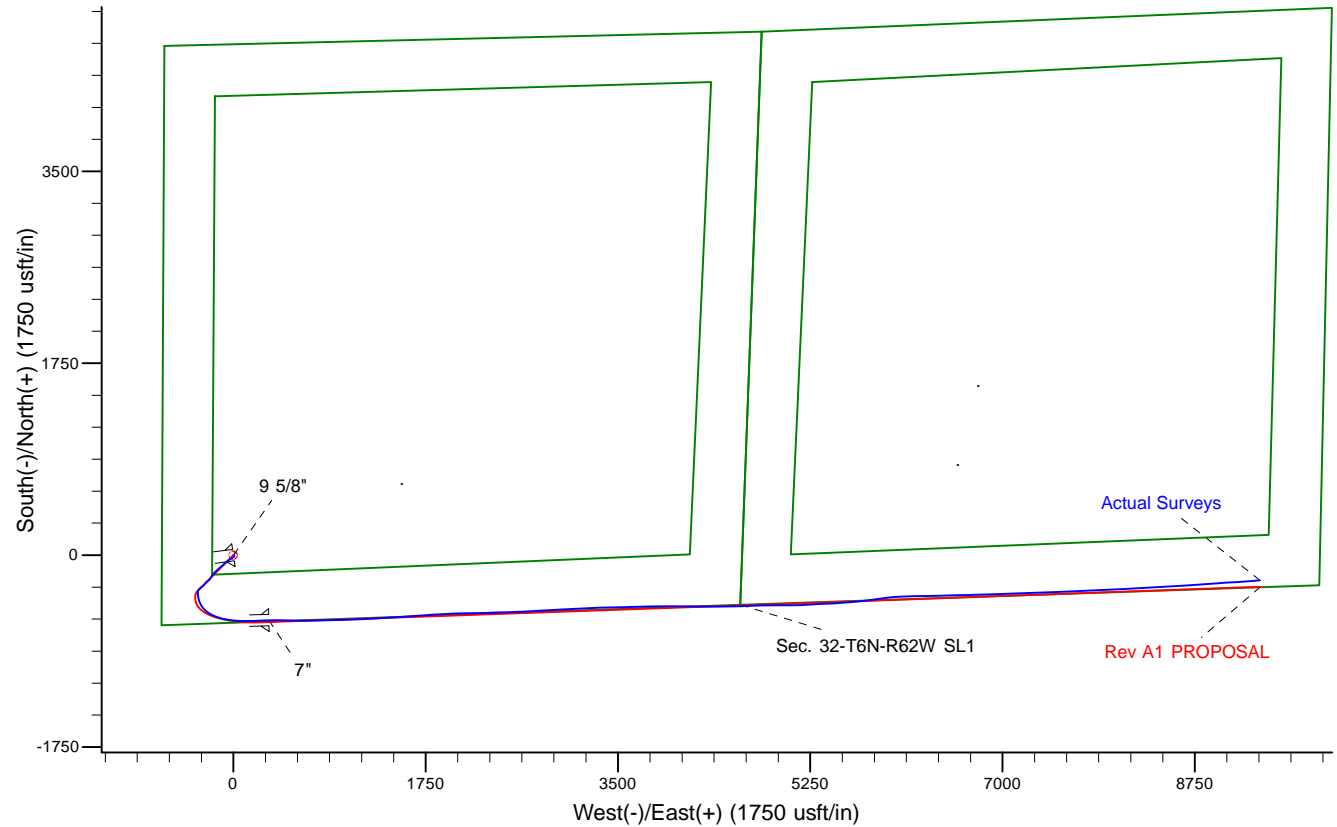
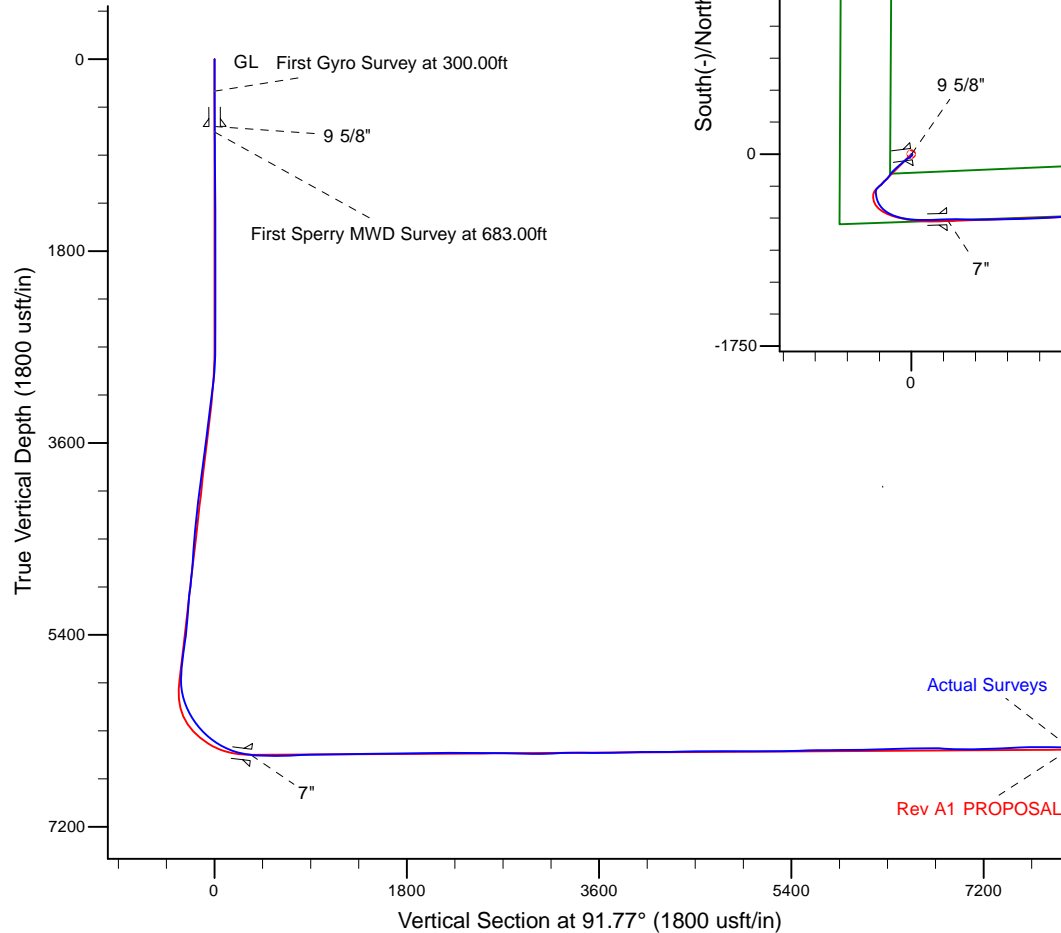
Project: Weld County, CO (NAD 83)
 Site: Sec. 32-T6N-R62W (Wells Ranch AE32)
 Well: Wells Ranch AF05-690
 Wellbore: Plan A
 Design: Actual Surveys



Platted SHL: 615' FSL, 650' FWL
 Platted Lat/Long: 40.43764, -104.35449
 Location: Sec. 32-T6N-R62W

~7" Casing: 3' FSL, 970' FWL
 Lat/Long: 40.436001 N, -104.353357 W
 State Planes - CO Northern: 1,403,739.14 N, 3,319,173.61 E
 Sec. 32-T6N-R62W

Platted BHL: 1' FSL, 535' FEL
 Platted Lat/Long: 40.436673 N, -104.320950 W
 State Planes - CO Northern: 1,404,102.14 N, 3,328,190.40 E
 Location: Sec. 33-T6N-R62W



LEGEND

- Wells Ranch AF05-690, Plan A, Rev A1 PROPOSAL V0
- Actual Surveys

WELL DETAILS: Wells Ranch AF05-690

Ground Level: 4716.00
 KB = 24 @ 4740.00usft (H&P 273)

Created By: Tatiana Gomez
 Created On: 10/8/2015

Design Report for Wells Ranch AF05-690 - 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
300.00	0.15	82.12	300.00	0.05	0.39	0.39	0.05
First Gyro Survey at 300.00ft							
631.00	0.32	82.12	631.00	0.24	1.73	1.72	0.05
9 5/8"							
637.00	0.32	82.12	637.00	0.24	1.76	1.75	0.05
Final Gyro Survey at 637.00ft							
683.00	0.34	82.12	683.00	0.28	2.02	2.01	0.04
First Sperry MWD Survey at 683.00ft							
816.00	0.57	91.32	815.99	0.32	3.07	3.06	0.18
910.00	0.48	90.57	909.99	0.30	3.93	3.92	0.10
1,004.00	0.37	91.01	1,003.99	0.29	4.63	4.62	0.12
1,190.00	0.25	135.17	1,189.98	0.00	5.52	5.52	0.14
1,281.00	0.31	132.46	1,280.98	-0.31	5.84	5.85	0.07
1,372.00	0.44	129.16	1,371.98	-0.70	6.29	6.31	0.14
1,464.00	0.28	151.86	1,463.98	-1.12	6.67	6.70	0.23
1,555.00	0.33	132.81	1,554.98	-1.49	6.97	7.01	0.12
1,647.00	0.31	134.36	1,646.98	-1.85	7.34	7.39	0.02
1,738.00	0.34	167.05	1,737.97	-2.28	7.58	7.64	0.20
1,921.00	0.25	198.90	1,920.97	-3.19	7.57	7.67	0.10
2,195.00	0.37	242.70	2,194.97	-4.16	6.59	6.72	0.09
2,287.00	0.50	185.98	2,286.97	-4.70	6.28	6.43	0.47
2,470.00	0.55	151.82	2,469.96	-6.26	6.62	6.81	0.17
2,561.00	0.82	172.34	2,560.95	-7.29	6.91	7.13	0.40
2,653.00	1.00	176.00	2,652.94	-8.75	7.05	7.32	0.21
2,745.00	2.54	211.48	2,744.90	-11.29	6.04	6.39	1.98
2,839.00	3.43	218.84	2,838.77	-15.25	3.19	3.66	1.03
2,933.00	5.25	232.59	2,932.50	-20.06	-1.99	-1.37	2.22
3,027.00	7.94	237.96	3,025.87	-26.12	-10.91	-10.10	2.93
3,121.00	9.18	241.92	3,118.82	-33.09	-23.03	-21.99	1.46
3,216.00	7.84	241.45	3,212.77	-39.75	-35.41	-34.16	1.41
3,311.00	9.46	230.83	3,306.69	-47.78	-47.15	-45.65	2.39
3,406.00	8.91	228.56	3,400.47	-57.58	-58.72	-56.91	0.69
3,500.00	9.36	228.09	3,493.28	-67.51	-69.87	-67.74	0.49
3,595.00	9.92	228.82	3,586.94	-78.05	-81.77	-79.32	0.60
3,690.00	10.80	229.36	3,680.39	-89.24	-94.69	-91.88	0.93
3,785.00	11.20	228.33	3,773.65	-101.17	-108.33	-105.15	0.47
3,880.00	11.06	228.87	3,866.86	-113.30	-122.09	-118.53	0.18
3,974.00	10.36	228.62	3,959.22	-124.82	-135.22	-131.30	0.75
4,069.00	9.86	228.72	4,052.75	-135.83	-147.74	-143.47	0.53
4,164.00	8.81	224.57	4,146.49	-146.38	-158.96	-154.36	1.31
4,259.00	7.74	223.54	4,240.50	-156.20	-168.47	-163.56	1.14
4,353.00	9.81	219.43	4,333.39	-166.97	-177.92	-172.67	2.30
4,448.00	9.62	216.52	4,427.03	-179.61	-187.79	-182.14	0.55
4,543.00	8.02	215.28	4,520.90	-191.40	-196.34	-190.33	1.70
4,638.00	7.30	208.32	4,615.06	-202.12	-203.03	-196.68	1.23
4,732.00	7.76	216.26	4,708.25	-212.49	-209.62	-202.94	1.21
4,827.00	7.93	226.43	4,802.36	-222.18	-218.16	-211.18	1.47
4,922.00	8.24	229.30	4,896.42	-231.14	-228.07	-220.81	0.54
5,016.00	9.88	227.41	4,989.24	-240.99	-239.11	-231.54	1.77

Design Report for Wells Ranch AF05-690 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,111.00	8.09	222.43	5,083.08	-251.44	-249.62	-241.73	2.05
5,206.00	6.05	217.46	5,177.35	-260.35	-257.18	-249.00	2.24
5,300.00	7.27	224.41	5,270.72	-268.53	-264.35	-255.92	1.55
5,395.00	8.63	228.45	5,364.80	-277.55	-273.89	-265.18	1.55
5,490.00	9.69	232.79	5,458.59	-287.11	-285.60	-276.58	1.33
5,584.00	10.89	227.45	5,551.08	-297.90	-298.44	-289.08	1.63
5,679.00	9.17	224.40	5,644.62	-309.38	-310.35	-300.63	1.89
5,774.00	10.05	209.95	5,738.30	-321.97	-319.78	-309.67	2.69
5,868.00	22.27	180.01	5,828.55	-347.02	-323.90	-313.02	15.34
5,963.00	30.56	169.62	5,913.61	-388.88	-319.55	-307.37	9.96
6,058.00	32.22	153.65	5,994.84	-435.41	-303.92	-290.31	8.91
6,152.00	32.25	143.64	6,074.41	-478.09	-277.91	-263.00	5.67
6,247.00	37.70	129.60	6,152.35	-517.12	-240.42	-224.31	10.20
6,342.00	38.19	115.74	6,227.41	-548.44	-191.49	-174.44	8.97
6,436.00	43.47	106.70	6,298.57	-570.39	-134.25	-116.55	8.42
6,531.00	51.16	99.31	6,362.97	-585.80	-66.29	-48.14	9.90
6,626.00	57.66	95.18	6,418.25	-595.42	10.29	28.70	7.70
6,720.00	65.29	91.79	6,463.12	-600.35	92.66	111.18	8.71
6,815.00	73.65	87.51	6,496.42	-599.72	181.52	199.97	9.76
6,910.00	79.96	86.67	6,518.09	-595.01	273.84	292.11	6.70
6,960.00	82.83	88.54	6,525.57	-592.95	323.23	341.41	6.82
7"							
7,045.00	87.72	91.66	6,532.57	-593.10	407.90	426.05	6.82
7,140.00	89.88	91.19	6,534.56	-595.46	502.85	521.02	2.33
7,234.00	90.68	89.87	6,534.10	-596.33	596.84	614.99	1.64
7,329.00	92.87	90.22	6,531.16	-596.41	691.79	709.90	2.33
7,423.00	92.77	88.97	6,526.54	-595.74	785.67	803.71	1.33
7,518.00	92.03	88.67	6,522.56	-593.79	880.56	898.50	0.84
7,613.00	89.94	88.01	6,520.93	-591.04	975.50	993.31	2.31
7,707.00	90.71	88.51	6,520.39	-588.18	1,069.46	1,087.14	0.98
7,802.00	90.18	86.66	6,519.65	-584.18	1,164.37	1,181.87	2.03
7,896.00	90.65	87.05	6,518.97	-579.02	1,258.22	1,275.53	0.65
7,991.00	91.17	86.56	6,517.47	-573.73	1,353.06	1,370.16	0.75
8,086.00	91.05	86.31	6,515.62	-567.82	1,447.86	1,464.73	0.29
8,180.00	91.20	86.35	6,513.78	-561.81	1,541.65	1,558.29	0.17
8,275.00	91.26	86.44	6,511.74	-555.84	1,636.44	1,652.85	0.11
8,370.00	90.18	85.41	6,510.55	-549.09	1,731.19	1,747.34	1.57
8,464.00	90.55	85.81	6,509.95	-541.89	1,824.91	1,840.80	0.58
8,558.00	90.74	87.08	6,508.89	-536.06	1,918.72	1,934.38	1.37
8,653.00	91.17	88.49	6,507.31	-532.39	2,013.64	2,029.14	1.55
8,747.00	91.05	88.89	6,505.48	-530.24	2,107.59	2,122.98	0.44
8,842.00	89.29	88.76	6,505.20	-528.29	2,202.57	2,217.85	1.86
8,936.00	88.77	88.75	6,506.79	-526.25	2,296.53	2,311.71	0.55
9,030.00	89.11	88.38	6,508.53	-523.90	2,390.49	2,405.54	0.53
9,125.00	90.06	88.11	6,509.22	-520.99	2,485.44	2,500.36	1.04
9,219.00	91.17	87.65	6,508.21	-517.51	2,579.37	2,594.14	1.28
9,314.00	88.77	86.93	6,508.26	-513.02	2,674.25	2,688.84	2.64
9,408.00	88.18	87.16	6,510.76	-508.18	2,768.09	2,782.49	0.67
9,502.00	88.09	86.72	6,513.82	-503.16	2,861.91	2,876.10	0.48
9,597.00	89.72	86.97	6,515.64	-497.93	2,956.75	2,970.73	1.74
9,692.00	91.29	87.37	6,514.80	-493.24	3,051.62	3,065.42	1.71

Design Report for Wells Ranch AF05-690 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,786.00	92.96	86.92	6,511.32	-488.57	3,145.44	3,159.04	1.84
9,881.00	91.85	87.00	6,507.33	-483.53	3,240.22	3,253.62	1.17
9,975.00	90.71	87.86	6,505.23	-479.32	3,334.10	3,347.33	1.52
10,070.00	89.17	88.87	6,505.33	-476.61	3,429.06	3,442.16	1.94
10,164.00	90.22	89.17	6,505.83	-475.00	3,523.04	3,536.04	1.16
10,256.00	90.55	88.88	6,505.21	-473.44	3,615.02	3,627.94	0.48
10,347.00	89.85	88.15	6,504.89	-471.08	3,705.99	3,718.79	1.11
10,439.00	91.33	88.32	6,503.95	-468.24	3,797.94	3,810.60	1.62
10,530.00	92.16	89.38	6,501.18	-466.42	3,888.88	3,901.44	1.48
10,622.00	91.69	90.67	6,498.08	-466.46	3,980.82	3,993.35	1.49
10,714.00	89.29	90.78	6,497.30	-467.62	4,072.81	4,085.32	2.61
10,804.00	89.41	89.92	6,498.32	-468.17	4,162.80	4,175.29	0.96
10,896.00	91.29	90.22	6,497.76	-468.28	4,254.79	4,267.24	2.07
10,988.00	93.70	90.57	6,493.75	-468.92	4,346.70	4,359.12	2.65
11,079.00	89.54	89.19	6,491.18	-468.73	4,437.64	4,450.01	4.82
11,171.00	89.35	88.78	6,492.07	-467.10	4,529.62	4,541.90	0.49
11,262.00	90.03	88.34	6,492.56	-464.81	4,620.59	4,632.75	0.89
11,445.00	90.00	88.06	6,492.52	-459.06	4,803.50	4,815.40	0.15
11,627.00	90.46	90.14	6,491.78	-456.20	4,985.46	4,997.19	1.17
11,719.00	90.49	89.86	6,491.02	-456.20	5,077.46	5,089.14	0.31
11,811.00	89.75	88.00	6,490.83	-454.49	5,169.44	5,181.02	2.18
11,906.00	89.20	86.31	6,491.70	-449.77	5,264.31	5,275.70	1.87
12,001.00	92.34	87.80	6,490.42	-444.89	5,359.16	5,370.36	3.66
12,095.00	92.31	86.72	6,486.61	-440.40	5,452.98	5,463.99	1.15
12,190.00	91.36	86.66	6,483.57	-434.92	5,547.77	5,558.57	1.00
12,285.00	90.62	84.87	6,481.93	-427.90	5,642.49	5,653.03	2.04
12,379.00	90.77	82.43	6,480.79	-417.51	5,735.90	5,746.07	2.60
12,474.00	90.49	81.35	6,479.74	-404.11	5,829.94	5,839.65	1.17
12,569.00	90.22	83.30	6,479.15	-391.42	5,924.09	5,933.36	2.07
12,664.00	91.14	85.42	6,478.03	-382.09	6,018.61	6,027.55	2.43
12,758.00	91.54	88.52	6,475.83	-377.12	6,112.45	6,121.18	3.32
12,853.00	92.34	89.01	6,472.61	-375.07	6,207.37	6,216.00	0.99
12,947.00	90.86	88.38	6,469.99	-372.93	6,301.30	6,309.82	1.71
13,042.00	90.80	88.61	6,468.61	-370.44	6,396.26	6,404.66	0.25
13,137.00	91.88	88.48	6,466.39	-368.03	6,491.20	6,499.48	1.15
13,232.00	91.76	88.99	6,463.37	-365.93	6,586.13	6,594.30	0.55
13,326.00	89.63	88.98	6,462.23	-364.26	6,680.10	6,688.17	2.27
13,421.00	88.03	88.57	6,464.17	-362.23	6,775.06	6,783.02	1.74
13,516.00	86.76	88.08	6,468.49	-359.46	6,869.92	6,877.75	1.43
13,705.00	90.15	87.88	6,473.58	-352.80	7,058.70	7,066.24	1.80
13,800.00	91.23	87.91	6,472.44	-349.31	7,153.63	7,161.01	1.14
13,895.00	92.74	87.50	6,469.15	-345.51	7,248.50	7,255.71	1.65
13,990.00	92.44	87.61	6,464.86	-341.46	7,343.31	7,350.36	0.34
14,085.00	92.90	86.83	6,460.43	-336.86	7,438.10	7,444.96	0.95
14,179.00	92.34	87.26	6,456.13	-332.02	7,531.87	7,538.54	0.75
14,274.00	91.20	88.47	6,453.20	-328.48	7,626.76	7,633.27	1.75
14,369.00	89.48	87.58	6,452.64	-325.21	7,721.70	7,728.06	2.04
14,463.00	89.60	88.04	6,453.39	-321.62	7,815.62	7,821.83	0.51
14,558.00	89.69	87.61	6,453.98	-318.01	7,910.55	7,916.60	0.46
14,653.00	91.02	87.30	6,453.39	-313.79	8,005.46	8,011.33	1.44
14,748.00	91.05	87.47	6,451.67	-309.46	8,100.34	8,106.04	0.18

Design Report for Wells Ranch AF05-690 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
14,937.00	89.20	86.60	6,451.26	-299.68	8,289.08	8,294.38	1.08
15,032.00	90.68	87.09	6,451.36	-294.46	8,383.93	8,389.03	1.64
15,222.00	89.97	86.17	6,450.28	-283.29	8,573.60	8,578.26	0.61
15,316.00	90.83	86.26	6,449.63	-277.08	8,667.39	8,671.81	0.92
15,506.00	92.06	85.74	6,444.84	-263.83	8,856.86	8,860.78	0.70
15,601.00	90.06	86.00	6,443.08	-256.99	8,951.59	8,955.26	2.12
15,695.00	90.00	86.07	6,443.03	-250.49	9,045.37	9,048.79	0.10
15,790.00	91.66	86.47	6,441.65	-244.31	9,140.15	9,143.34	1.80
15,925.00	92.90	85.60	6,436.28	-234.99	9,274.72	9,277.55	1.12
Final Sperry MWD Survey at 15925.00ft							
15,990.91	92.90	85.60	6,432.95	-229.94	9,340.35	9,343.00	0.00
Wells Ranch AF05-690_Rev A1_BHL - Wells Ranch AF05-690_Rev A0_BHL							
15,993.00	92.90	85.60	6,432.84	-229.78	9,342.43	9,345.07	0.00
Straight Line Projection to TD at 15993.00ft							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.05	0.39	First Gyro Survey at 300.00ft
637.00	637.00	0.24	1.76	Final Gyro Survey at 637.00ft
683.00	683.00	0.28	2.02	First Sperry MWD Survey at 683.00ft
15,925.00	6,436.28	-234.99	9,274.72	Final Sperry MWD Survey at 15925.00ft
15,993.00	6,432.84	-229.78	9,342.43	Straight Line Projection to TD at 15993.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wells Ranch AF05-690_Rev A1_BHL	91.77	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
300.00	637.00	Surface Surveys	Flexi-Shot
683.00	6,910.00	Intermediate Surveys	MWD
7,045.00	15,993.00	Production Surveys	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
631.00	631.00	9 5/8"	9-5/8	13-3/4
6,960.00		7"	7	8-3/4

Design Report for Wells Ranch AF05-690 - Actual 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 AF05-690 - actual wellpath misses target center by 0.02usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	0.02	0.00	1,404,332.08	3,318,850.39	40.437640	-104.354490
Wells Ranch AF05-690 - actual wellpath misses target center by 68.62usft at 15990.91usft MD (6432.95 TVD, -229.94 N, 9340.35 E) - Point	0.00	0.00	6,467.00	-289.18	9,346.64	1,404,042.90	3,328,196.68	40.436510	-104.320930
Wells Ranch AF05-690 - actual wellpath misses target center by 68.62usft at 15990.91usft MD (6432.95 TVD, -229.94 N, 9340.35 E) - Point	0.00	0.00	6,467.00	-289.18	9,346.64	1,404,042.90	3,328,196.68	40.436510	-104.320930

Directional Difficulty Index

Average Dogleg over Survey:	1.75 °/100usft	Maximum Dogleg over Survey:	15.34 °/100usft at 5,868.00 usft
Net Tortousity applicable to Plans:	0.99 °/100usft	Directional Difficulty Index:	6.848

Audit Info

North Reference Sheet for Sec. 32-T6N-R62W (Wells Ranch AE32) - Wells Ranch
AF05-690 - Plan A

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

Vertical Depths are relative to KB = 24 @ 4740.00usft (H&P 273). Northing and Easting are relative to Wells Ranch AF 05-690

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: 0.99996215

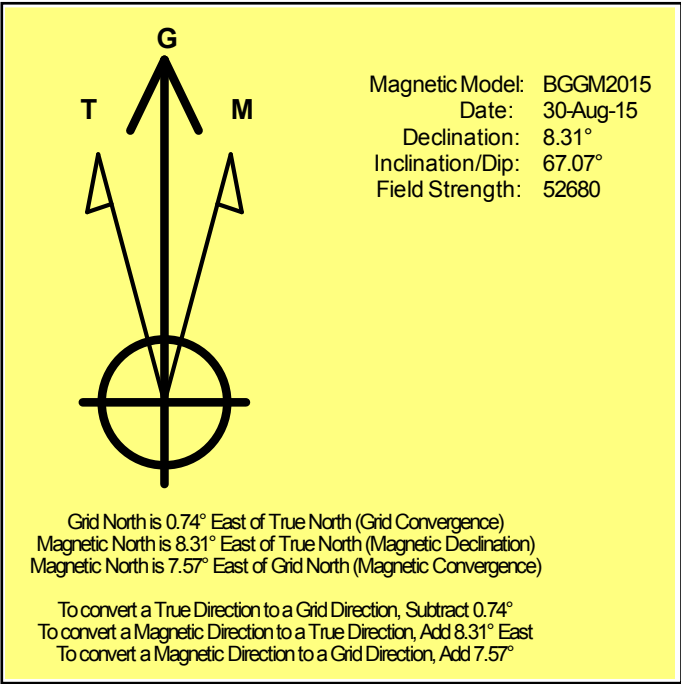
Grid Coordinates of Well: 1,404,332.07 usft N, 3,318,850.39 usft E

Geographical Coordinates of Well: 40° 26' 15.50" N, 104° 21' 16.16" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,993.00usft the Bottom Hole Displacement is 9,345.26usft in the Direction of 91.41° (Grid).

Magnetic Convergence at surface is: -7.57° (30 August 2015, , BGGM2015)



Noble Energy

Weld County, CO (NAD 83)

Sec. 32-T6N-R62W (Wells Ranch AE32)

Wells Ranch AF05-690

05-123-41786

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

08 October, 2015

Well Coordinates: 1,404,332.07 N, 3,318,850.39 E (40° 26' 15.50" N, 104° 21' 16.16" W)

Ground Level: 4,716.00 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 AF05-690

KB = 24 @ 4740.00usft (H&P 273)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Wells Ranch AF05-690 - 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	40.437640	-104.354490	40.437640	-104.354489	1,404,332.07	3,318,850.39
300.00	0.15	82.12	300.00	0.05	0.39	40.437640	-104.354489	40.437641	-104.354484	1,404,332.12	3,318,850.78
631.00	0.32	82.12	631.00	0.24	1.73	40.437641	-104.354484	40.437641	-104.354484	1,404,332.30	3,318,852.12
637.00	0.32	82.12	637.00	0.24	1.76	40.437641	-104.354484	40.437641	-104.354484	1,404,332.31	3,318,852.15
683.00	0.34	82.12	683.00	0.28	2.02	40.437641	-104.354483	40.437641	-104.354483	1,404,332.35	3,318,852.42
816.00	0.57	91.32	815.99	0.32	3.07	40.437641	-104.354479	40.437641	-104.354476	1,404,332.38	3,318,853.47
910.00	0.48	90.57	909.99	0.30	3.93	40.437641	-104.354476	40.437641	-104.354474	1,404,332.37	3,318,854.33
1,004.00	0.37	91.01	1,003.99	0.29	4.63	40.437641	-104.354474	40.437641	-104.354470	1,404,332.36	3,318,855.03
1,190.00	0.25	135.17	1,189.98	0.00	5.52	40.437640	-104.354470	40.437639	-104.354469	1,404,332.06	3,318,855.91
1,281.00	0.31	132.46	1,280.98	-0.31	5.84	40.437639	-104.354469	40.437638	-104.354468	1,404,331.76	3,318,856.23
1,372.00	0.44	129.16	1,371.98	-0.70	6.29	40.437638	-104.354468	40.437637	-104.354466	1,404,331.37	3,318,856.69
1,464.00	0.28	151.86	1,463.98	-1.12	6.67	40.437637	-104.354466	40.437636	-104.354465	1,404,330.95	3,318,857.07
1,555.00	0.33	132.81	1,554.98	-1.49	6.97	40.437636	-104.354465	40.437635	-104.354464	1,404,330.57	3,318,857.36
1,647.00	0.31	134.36	1,646.98	-1.85	7.34	40.437635	-104.354464	40.437634	-104.354463	1,404,330.22	3,318,857.74
1,738.00	0.34	167.05	1,737.97	-2.28	7.58	40.437634	-104.354463	40.437631	-104.354463	1,404,329.78	3,318,857.97
1,921.00	0.25	198.90	1,920.97	-3.19	7.57	40.437631	-104.354463	40.437628	-104.354467	1,404,328.88	3,318,857.96
2,195.00	0.37	242.70	2,194.97	-4.16	6.59	40.437628	-104.354467	40.437627	-104.354468	1,404,327.91	3,318,856.98
2,287.00	0.50	185.98	2,286.97	-4.70	6.28	40.437627	-104.354468	40.437623	-104.354467	1,404,327.37	3,318,856.68
2,470.00	0.55	151.82	2,469.96	-6.26	6.62	40.437623	-104.354467	40.437620	-104.354466	1,404,325.80	3,318,857.01
2,561.00	0.82	172.34	2,560.95	-7.29	6.91	40.437620	-104.354466	40.437616	-104.354465	1,404,324.77	3,318,857.30
2,653.00	1.00	176.00	2,652.94	-8.75	7.05	40.437616	-104.354465	40.437609	-104.354469	1,404,323.32	3,318,857.45
2,745.00	2.54	211.48	2,744.90	-11.29	6.04	40.437609	-104.354469	40.437598	-104.354480	1,404,320.78	3,318,856.44
2,839.00	3.43	218.84	2,838.77	-15.25	3.19	40.437598	-104.354480	40.437585	-104.354498	1,404,316.81	3,318,853.59
2,933.00	5.25	232.59	2,932.50	-20.06	-1.99	40.437585	-104.354498	40.437569	-104.354531	1,404,312.01	3,318,848.41
3,027.00	7.94	237.96	3,025.87	-26.12	-10.91	40.437569	-104.354531	40.437550	-104.354575	1,404,305.95	3,318,839.49
3,121.00	9.18	241.92	3,118.82	-33.09	-23.03	40.437550	-104.354575	40.437532	-104.354619	1,404,298.98	3,318,827.37
3,216.00	7.84	241.45	3,212.77	-39.75	-35.41	40.437532	-104.354619	40.437511	-104.354662	1,404,292.31	3,318,814.99
3,311.00	9.46	230.83	3,306.69	-47.78	-47.15	40.437511	-104.354662	40.437484	-104.354704	1,404,284.29	3,318,803.25
3,406.00	8.91	228.56	3,400.47	-57.58	-58.72	40.437484	-104.354704	40.437457	-104.354744	1,404,274.49	3,318,791.68
3,500.00	9.36	228.09	3,493.28	-67.51	-69.87	40.437457	-104.354744	40.437429	-104.354788	1,404,264.56	3,318,780.53
3,595.00	9.92	228.82	3,586.94	-78.05	-81.77	40.437429	-104.354788	40.437398	-104.354835	1,404,254.01	3,318,768.62
3,690.00	10.80	229.36	3,680.39	-89.24	-94.69	40.437398	-104.354835	40.437366	-104.354884	1,404,242.83	3,318,755.71
3,785.00	11.20	228.33	3,773.65	-101.17	-108.33	40.437366	-104.354884	40.437333	-104.354934	1,404,230.90	3,318,742.07
3,880.00	11.06	228.87	3,866.86	-113.30	-122.09	40.437333	-104.354934	40.437302	-104.354982	1,404,218.77	3,318,728.31
3,974.00	10.36	228.62	3,959.22	-124.82	-135.22	40.437302	-104.354982	40.437272	-104.355027	1,404,207.25	3,318,715.18
4,069.00	9.86	228.72	4,052.75	-135.83	-147.74	40.437272	-104.355027	40.437244	-104.355068	1,404,196.24	3,318,702.66
4,164.00	8.81	224.57	4,146.49	-146.38	-158.96	40.437244	-104.355068	40.437217	-104.355103	1,404,185.69	3,318,691.44
4,259.00	7.74	223.54	4,240.50	-156.20	-168.47	40.437217	-104.355103	40.437188	-104.355137	1,404,175.87	3,318,681.93
4,353.00	9.81	219.43	4,333.39	-166.97	-177.92	40.437188	-104.355137	40.437154	-104.355173	1,404,165.10	3,318,672.48
4,448.00	9.62	216.52	4,427.03	-179.61	-187.79	40.437154	-104.355173	40.437122	-104.355204	1,404,152.47	3,318,662.62
4,543.00	8.02	215.28	4,520.90	-191.40	-196.34	40.437122	-104.355204	40.437092	-104.355229	1,404,140.68	3,318,654.06
4,638.00	7.30	208.32	4,615.06	-202.12	-203.03	40.437092	-104.355229			1,404,129.96	3,318,647.37

Design Report for Wells Ranch AF05-690 - 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)
4,732.00	7.76	216.26	4,708.25	-212.49	-209.62	40.437064	-104.355253	1,404,119.58	3,318,640.79
4,827.00	7.93	226.43	4,802.36	-222.18	-218.16	40.437038	-104.355284	1,404,109.89	3,318,632.25
4,922.00	8.24	229.30	4,896.42	-231.14	-228.07	40.437014	-104.355320	1,404,100.94	3,318,622.34
5,016.00	9.88	227.41	4,989.24	-240.99	-239.11	40.436987	-104.355360	1,404,091.09	3,318,611.29
5,111.00	8.09	222.43	5,083.08	-251.44	-249.62	40.436959	-104.355399	1,404,080.64	3,318,600.78
5,206.00	6.05	217.46	5,177.35	-260.35	-257.18	40.436935	-104.355426	1,404,071.73	3,318,593.23
5,300.00	7.27	224.41	5,270.72	-268.53	-264.35	40.436912	-104.355452	1,404,063.55	3,318,586.05
5,395.00	8.63	228.45	5,364.80	-277.55	-273.89	40.436888	-104.355487	1,404,054.52	3,318,576.51
5,490.00	9.69	232.79	5,458.59	-287.11	-285.60	40.436862	-104.355529	1,404,044.96	3,318,564.81
5,584.00	10.89	227.45	5,551.08	-297.90	-298.44	40.436833	-104.355576	1,404,034.17	3,318,551.97
5,679.00	9.17	224.40	5,644.62	-309.38	-310.35	40.436802	-104.355619	1,404,022.70	3,318,540.06
5,774.00	10.05	209.95	5,738.30	-321.97	-319.78	40.436768	-104.355654	1,404,010.10	3,318,530.62
5,868.00	22.27	180.01	5,828.55	-347.02	-323.90	40.436699	-104.355670	1,403,985.05	3,318,526.50
5,963.00	30.56	169.62	5,913.61	-388.88	-319.55	40.436584	-104.355656	1,403,943.20	3,318,530.86
6,058.00	32.22	153.65	5,994.84	-435.41	-303.92	40.436456	-104.355602	1,403,896.67	3,318,546.48
6,152.00	32.25	143.64	6,074.41	-478.09	-277.91	40.436338	-104.355511	1,403,853.99	3,318,572.49
6,247.00	37.70	129.60	6,152.35	-517.12	-240.42	40.436229	-104.355378	1,403,814.97	3,318,609.99
6,342.00	38.19	115.74	6,227.41	-548.44	-191.49	40.436142	-104.355204	1,403,783.64	3,318,658.91
6,436.00	43.47	106.70	6,298.57	-570.39	-134.25	40.436079	-104.354999	1,403,761.70	3,318,716.15
6,531.00	51.16	99.31	6,362.97	-585.80	-66.29	40.436035	-104.354756	1,403,746.29	3,318,784.11
6,626.00	57.66	95.18	6,418.25	-595.42	10.29	40.436005	-104.354481	1,403,736.67	3,318,860.69
6,720.00	65.29	91.79	6,463.12	-600.35	92.66	40.435989	-104.354185	1,403,731.74	3,318,943.05
6,815.00	73.65	87.51	6,496.42	-599.72	181.52	40.435988	-104.353866	1,403,732.37	3,319,031.90
6,910.00	79.96	86.67	6,518.09	-595.01	273.84	40.435997	-104.353534	1,403,737.08	3,319,124.22
6,960.00	82.83	88.54	6,525.57	-592.95	323.23	40.436001	-104.353357	1,403,739.14	3,319,173.61
7,045.00	87.72	91.66	6,532.57	-593.10	407.90	40.435998	-104.353053	1,403,738.99	3,319,258.28
7,140.00	89.88	91.19	6,534.56	-595.46	502.85	40.435988	-104.352712	1,403,736.62	3,319,353.22
7,234.00	90.68	89.87	6,534.10	-596.33	596.84	40.435982	-104.352374	1,403,735.76	3,319,447.21
7,329.00	92.87	90.22	6,531.16	-596.41	691.79	40.435979	-104.352033	1,403,735.68	3,319,542.15
7,423.00	92.77	88.97	6,526.54	-595.74	785.67	40.435977	-104.351696	1,403,736.34	3,319,636.03
7,518.00	92.03	88.67	6,522.56	-593.79	880.56	40.435979	-104.351355	1,403,738.30	3,319,730.92
7,613.00	89.94	88.01	6,520.93	-591.04	975.50	40.435983	-104.351014	1,403,741.05	3,319,825.86
7,707.00	90.71	88.51	6,520.39	-588.18	1,069.46	40.435988	-104.350676	1,403,743.90	3,319,919.81
7,802.00	90.18	86.66	6,519.65	-584.18	1,164.37	40.435995	-104.350335	1,403,747.91	3,320,014.72
7,896.00	90.65	87.05	6,518.97	-579.02	1,258.22	40.436006	-104.349998	1,403,753.06	3,320,108.57
7,991.00	91.17	86.56	6,517.47	-573.73	1,353.06	40.436017	-104.349657	1,403,758.36	3,320,203.41
8,086.00	91.05	86.31	6,515.62	-567.82	1,447.86	40.436030	-104.349316	1,403,764.26	3,320,298.20
8,180.00	91.20	86.35	6,513.78	-561.81	1,541.65	40.436043	-104.348979	1,403,770.28	3,320,391.99
8,275.00	91.26	86.44	6,511.74	-555.84	1,636.44	40.436056	-104.348638	1,403,776.25	3,320,486.77
8,370.00	90.18	85.41	6,510.55	-549.09	1,731.19	40.436071	-104.348297	1,403,783.00	3,320,581.52
8,464.00	90.55	85.81	6,509.95	-541.89	1,824.91	40.436088	-104.347960	1,403,790.20	3,320,675.24
8,558.00	90.74	87.08	6,508.89	-536.06	1,918.72	40.436101	-104.347623	1,403,796.02	3,320,769.04

Design Report for Wells Ranch AF05-690 - 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)
8,653.00	91.17	88.49	6,507.31	-532.39	2,013.64	40.436107	-104.347282	1,403,799.69	3,320,863.95
8,747.00	91.05	88.89	6,505.48	-530.24	2,107.59	40.436110	-104.346944	1,403,801.84	3,320,957.91
8,842.00	89.29	88.76	6,505.20	-528.29	2,202.57	40.436112	-104.346603	1,403,803.79	3,321,052.88
8,936.00	88.77	88.75	6,506.79	-526.25	2,296.53	40.436114	-104.346266	1,403,805.83	3,321,146.84
9,030.00	89.11	88.38	6,508.53	-523.90	2,390.49	40.436117	-104.345928	1,403,808.19	3,321,240.79
9,125.00	90.06	88.11	6,509.22	-520.99	2,485.44	40.436122	-104.345587	1,403,811.10	3,321,335.74
9,219.00	91.17	87.65	6,508.21	-517.51	2,579.37	40.436128	-104.345249	1,403,814.57	3,321,429.66
9,314.00	88.77	86.93	6,508.26	-513.02	2,674.25	40.436137	-104.344908	1,403,819.06	3,321,524.55
9,408.00	88.18	87.16	6,510.76	-508.18	2,768.09	40.436147	-104.344571	1,403,823.91	3,321,618.38
9,502.00	88.09	86.72	6,513.82	-503.16	2,861.91	40.436157	-104.344234	1,403,828.92	3,321,712.20
9,597.00	89.72	86.97	6,515.64	-497.93	2,956.75	40.436168	-104.343893	1,403,834.15	3,321,807.03
9,692.00	91.29	87.37	6,514.80	-493.24	3,051.62	40.436178	-104.343552	1,403,838.84	3,321,901.90
9,786.00	92.96	86.92	6,511.32	-488.57	3,145.44	40.436187	-104.343214	1,403,843.52	3,321,995.71
9,881.00	91.85	87.00	6,507.33	-483.53	3,240.22	40.436197	-104.342874	1,403,848.55	3,322,090.49
9,975.00	90.71	87.86	6,505.23	-479.32	3,334.10	40.436206	-104.342536	1,403,852.77	3,322,184.37
10,070.00	89.17	88.87	6,505.33	-476.61	3,429.06	40.436210	-104.342195	1,403,855.48	3,322,279.32
10,164.00	90.22	89.17	6,505.83	-475.00	3,523.04	40.436211	-104.341857	1,403,857.08	3,322,373.30
10,256.00	90.55	88.88	6,505.21	-473.44	3,615.02	40.436212	-104.341527	1,403,858.65	3,322,465.28
10,347.00	89.85	88.15	6,504.89	-471.08	3,705.99	40.436215	-104.341200	1,403,861.01	3,322,556.25
10,439.00	91.33	88.32	6,503.95	-468.24	3,797.94	40.436219	-104.340870	1,403,863.84	3,322,648.19
10,530.00	92.16	89.38	6,501.18	-466.42	3,888.88	40.436221	-104.340543	1,403,865.67	3,322,739.13
10,622.00	91.69	90.67	6,498.08	-466.46	3,980.82	40.436218	-104.340213	1,403,865.63	3,322,831.07
10,714.00	89.29	90.78	6,497.30	-467.62	4,072.81	40.436211	-104.339882	1,403,864.46	3,322,923.05
10,804.00	89.41	89.92	6,498.32	-468.17	4,162.80	40.436207	-104.339559	1,403,863.91	3,323,013.04
10,896.00	91.29	90.22	6,497.76	-468.28	4,254.79	40.436203	-104.339229	1,403,863.80	3,323,105.03
10,988.00	93.70	90.57	6,493.75	-468.92	4,346.70	40.436198	-104.338899	1,403,863.17	3,323,196.93
11,079.00	89.54	89.19	6,491.18	-468.73	4,437.64	40.436195	-104.338572	1,403,863.36	3,323,287.86
11,171.00	89.35	88.78	6,492.07	-467.10	4,529.62	40.436196	-104.338241	1,403,864.99	3,323,379.84
11,262.00	90.03	88.34	6,492.56	-464.81	4,620.59	40.436199	-104.337915	1,403,867.27	3,323,470.81
11,445.00	90.00	88.06	6,492.52	-459.06	4,803.50	40.436208	-104.337257	1,403,873.02	3,323,553.71
11,627.00	90.46	90.14	6,491.78	-456.20	4,985.46	40.436210	-104.336604	1,403,875.88	3,323,635.67
11,719.00	90.49	89.86	6,491.02	-456.20	5,077.46	40.436206	-104.336273	1,403,875.88	3,323,727.66
11,811.00	89.75	88.00	6,490.83	-454.49	5,169.44	40.436208	-104.335943	1,403,877.60	3,324,019.64
11,906.00	89.20	86.31	6,491.70	-449.77	5,264.31	40.436217	-104.335602	1,403,882.31	3,324,114.51
12,001.00	92.34	87.80	6,490.42	-444.89	5,359.16	40.436227	-104.335261	1,403,887.19	3,324,209.36
12,095.00	92.31	86.72	6,486.61	-440.40	5,452.98	40.436236	-104.334924	1,403,891.68	3,324,303.17
12,190.00	91.36	86.66	6,483.57	-434.92	5,547.77	40.436248	-104.334583	1,403,897.16	3,324,397.96
12,285.00	90.62	84.87	6,481.93	-427.90	5,642.49	40.436264	-104.334242	1,403,904.18	3,324,492.67
12,379.00	90.77	82.43	6,480.79	-417.51	5,735.90	40.436289	-104.333906	1,403,914.57	3,324,586.08
12,474.00	90.49	81.35	6,479.74	-404.11	5,829.94	40.436322	-104.333568	1,403,927.97	3,324,680.12
12,569.00	90.22	83.30	6,479.15	-391.42	5,924.09	40.436354	-104.333229	1,403,940.66	3,324,774.26
12,664.00	91.14	85.42	6,478.03	-382.09	6,018.61	40.436376	-104.332889	1,403,949.99	3,324,868.78

Design Report for Wells Ranch AF05-690 - 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)
12,758.00	91.54	88.52	6,475.83	-377.12	6,112.45	40.436386	-104.332552	1,403,954.96	3,324,962.61
12,853.00	92.34	89.01	6,472.61	-375.07	6,207.37	40.436388	-104.332211	1,403,957.01	3,325,057.53
12,947.00	90.86	88.38	6,469.99	-372.93	6,301.30	40.436391	-104.331873	1,403,959.15	3,325,151.46
13,042.00	90.80	88.61	6,468.61	-370.44	6,396.26	40.436394	-104.331532	1,403,961.64	3,325,246.41
13,137.00	91.88	88.48	6,466.39	-368.03	6,491.20	40.436397	-104.331191	1,403,964.05	3,325,341.35
13,232.00	91.76	88.99	6,463.37	-365.93	6,586.13	40.436400	-104.330850	1,403,966.15	3,325,436.28
13,326.00	89.63	88.98	6,462.23	-364.26	6,680.10	40.436401	-104.330512	1,403,967.81	3,325,530.25
13,421.00	88.03	88.57	6,464.17	-362.23	6,775.06	40.436403	-104.330171	1,403,969.85	3,325,625.20
13,516.00	86.76	88.08	6,468.49	-359.46	6,869.92	40.436407	-104.329830	1,403,972.62	3,325,720.05
13,705.00	90.15	87.88	6,473.58	-352.80	7,058.70	40.436419	-104.329152	1,403,979.28	3,325,908.83
13,800.00	91.23	87.91	6,472.44	-349.31	7,153.63	40.436425	-104.328810	1,403,982.77	3,326,003.76
13,895.00	92.74	87.50	6,469.15	-345.51	7,248.50	40.436432	-104.328470	1,403,986.57	3,326,098.62
13,990.00	92.44	87.61	6,464.86	-341.46	7,343.31	40.436439	-104.328129	1,403,990.62	3,326,193.43
14,085.00	92.90	86.83	6,460.43	-336.86	7,438.10	40.436449	-104.327788	1,403,995.22	3,326,288.21
14,179.00	92.34	87.26	6,456.13	-332.02	7,531.87	40.436459	-104.327451	1,404,000.06	3,326,381.98
14,274.00	91.20	88.47	6,453.20	-328.48	7,626.76	40.436465	-104.327110	1,404,003.60	3,326,476.86
14,369.00	89.48	87.58	6,452.64	-325.21	7,721.70	40.436470	-104.326769	1,404,006.87	3,326,571.80
14,463.00	89.60	88.04	6,453.39	-321.62	7,815.62	40.436477	-104.326431	1,404,010.46	3,326,665.72
14,558.00	89.69	87.61	6,453.98	-318.01	7,910.55	40.436483	-104.326090	1,404,014.07	3,326,760.65
14,653.00	91.02	87.30	6,453.39	-313.79	8,005.46	40.436491	-104.325749	1,404,018.28	3,326,855.55
14,748.00	91.05	87.47	6,451.67	-309.46	8,100.34	40.436500	-104.325408	1,404,022.62	3,326,950.43
14,937.00	89.20	86.60	6,451.26	-299.68	8,289.08	40.436520	-104.324730	1,404,032.39	3,327,139.16
15,032.00	90.68	87.09	6,451.36	-294.46	8,383.93	40.436531	-104.324389	1,404,037.62	3,327,234.01
15,222.00	89.97	86.17	6,450.28	-283.29	8,573.60	40.436554	-104.323707	1,404,048.79	3,327,423.67
15,316.00	90.83	86.26	6,449.63	-277.08	8,667.39	40.436568	-104.323370	1,404,054.99	3,327,517.45
15,506.00	92.06	85.74	6,444.84	-263.83	8,856.86	40.436598	-104.322688	1,404,068.24	3,327,706.92
15,601.00	90.06	86.00	6,443.08	-256.99	8,951.59	40.436613	-104.322348	1,404,075.08	3,327,801.65
15,695.00	90.00	86.07	6,443.03	-250.49	9,045.37	40.436627	-104.322011	1,404,081.58	3,327,895.42
15,790.00	91.66	86.47	6,441.65	-244.31	9,140.15	40.436641	-104.321670	1,404,087.76	3,327,990.20
15,925.00	92.90	85.60	6,436.28	-234.99	9,274.72	40.436661	-104.321186	1,404,097.09	3,328,124.76
15,990.91	92.90	85.60	6,432.95	-229.94	9,340.35	40.436673	-104.320950	1,404,102.14	3,328,190.40
15,993.00	92.90	85.60	6,432.84	-229.78	9,342.43	40.436673	-104.320943	1,404,102.30	3,328,192.47

Design Report for Wells Ranch AF05-690 - Actual Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.05	0.39	First Gyro Survey at 300.00ft
637.00	637.00	0.24	1.76	Final Gyro Survey at 637.00ft
683.00	683.00	0.28	2.02	First Sperry MWD Survey at 683.00ft
15,925.00	6,436.28	-234.99	9,274.72	Final Sperry MWD Survey at 15925.00ft
15,993.00	6,432.84	-229.78	9,342.43	Straight Line Projection to TD at 15993.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wells Ranch AF05-690_Rev A1_BHL	91.77	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
300.00	637.00	Surface Surveys	Flexi-Shot
683.00	6,910.00	Intermediate Surveys	MWD
7,045.00	15,993.00	Production Surveys	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
631.00	631.00	9 5/8"	9-5/8	13-3/4
6,960.00	6,525.57	7"	7	8-3/4

Design Report for Wells Ranch AF05-690 - Actual 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:	1.75 °/100usft	Maximum Dogleg over Survey:	15.34 °/100usft at 5,868.00 usft
Net Tortosity applicable to Plans:	0.99 °/100usft	Directional Difficulty Index:	6.848

Audit Info

North Reference Sheet for Sec. 32-T6N-R62W (Wells Ranch AE32) - Wells Ranch AF05-690 - Plan A

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

Vertical Depths are relative to KB = 24 @ 4740.00usft (H&P 273). Northing and Easting are relative to Wells Ranch AF05-690

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: 0.99996215

Grid Coordinates of Well: 1,404,332.07 usft N, 3,318,850.39 usft E

Geographical Coordinates of Well: 40° 26' 15.50" N, 104° 21' 16.16" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,993.00usft

the Bottom Hole Displacement is 9,345.26usft in the Direction of 91.41° (Grid).

Magnetic Convergence at surface is: -7.57° (30 August 2015, , BGGM2015)

