

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 29 T3N-R65W

Wardell 3N-20HZ

Plan E Rev 0

Design: Actual Field Surveys

## Sperry Drilling Services Standard Report

27 June, 2012

Well Coordinates: 1,313,356.31 N, 3,226,504.27 E (40° 11' 26.58" N, 104° 41' 21.20" W)

Ground Level: 4,879.00 ft

Local Coordinate Origin:

Centered on Well Wardell 3N-20HZ

Viewing Datum:

RKB=25ft @ 4904.00ft (HP 308)

TVDs to System:

N

North Reference:

True

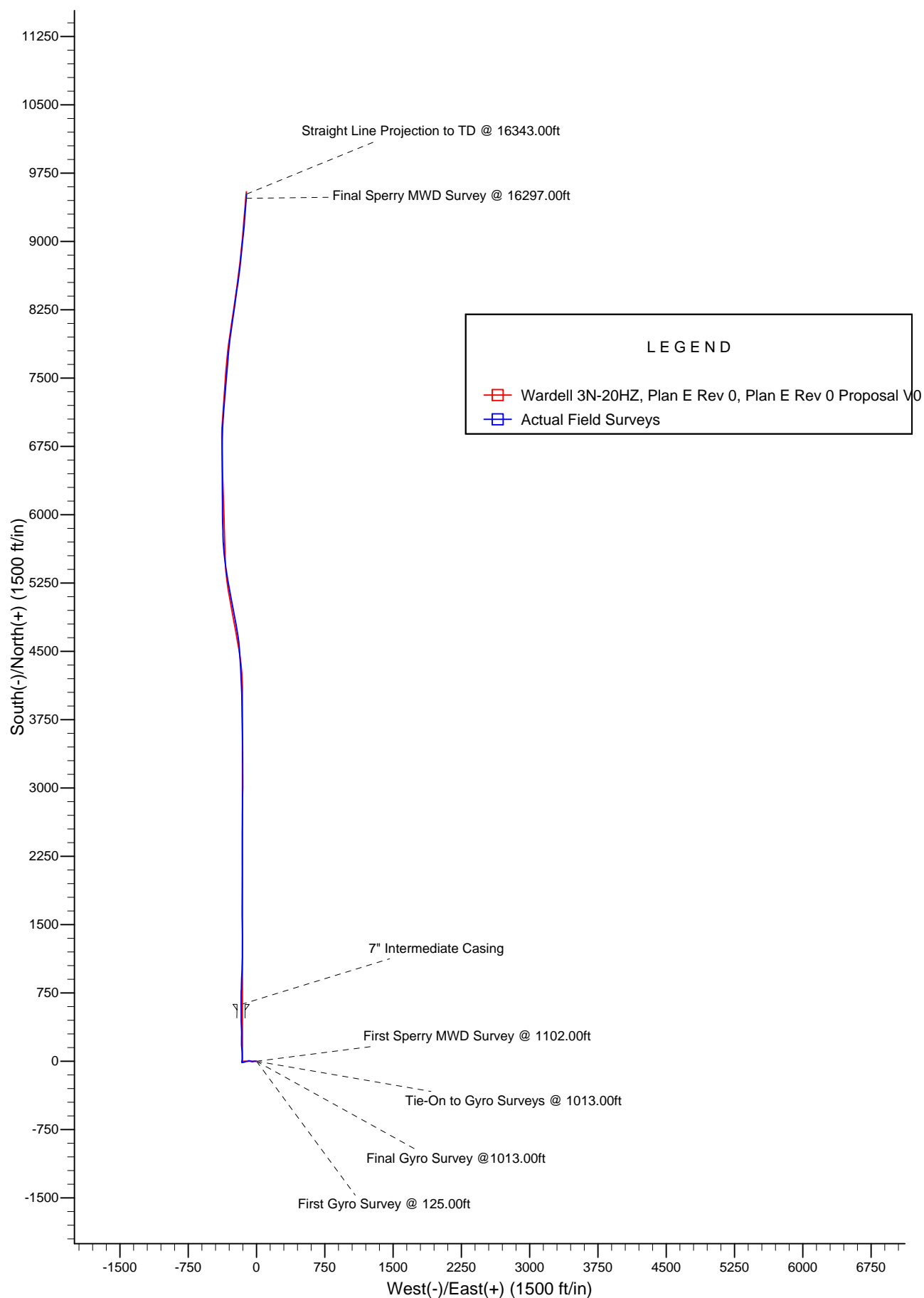
Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

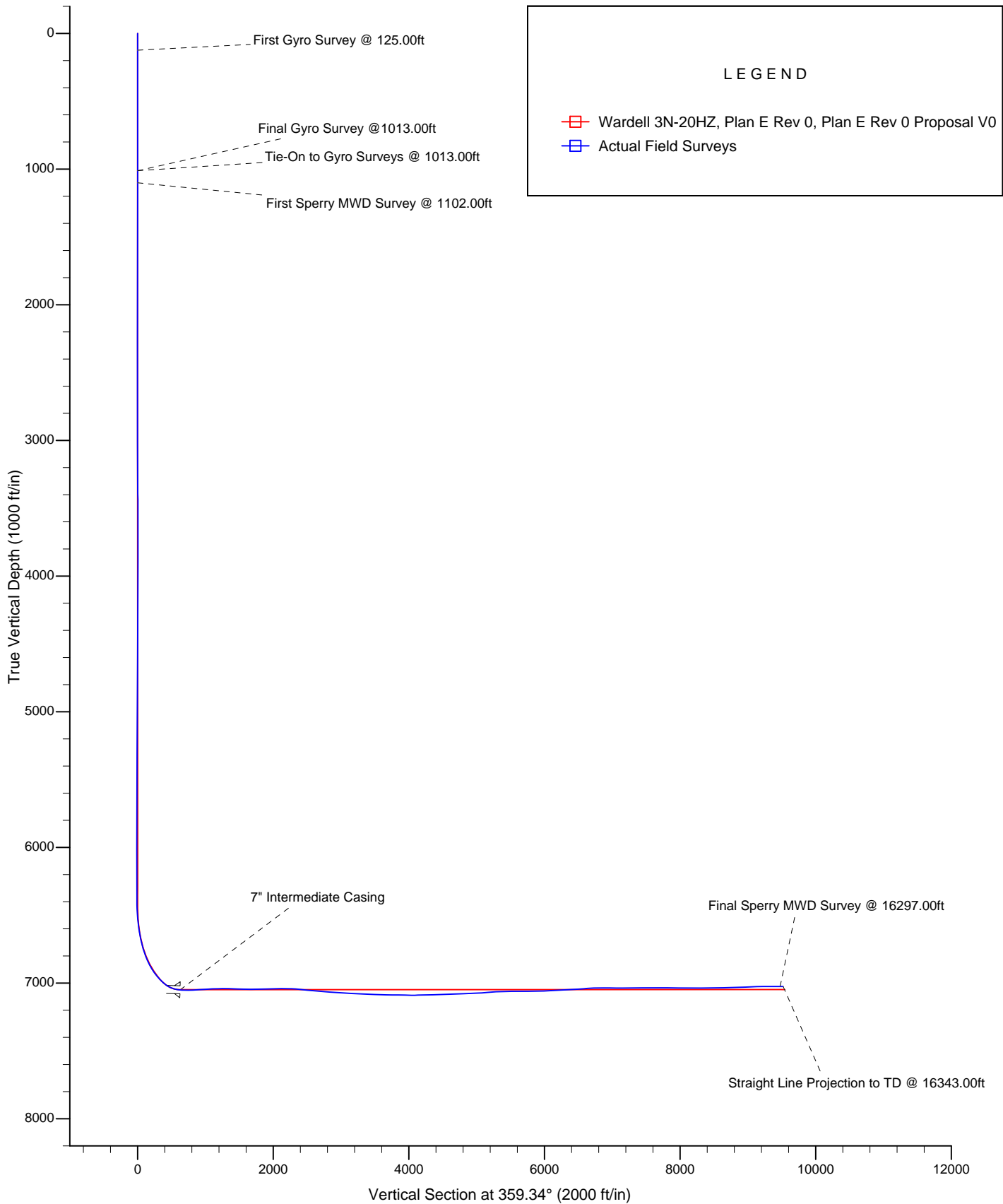
**HALLIBURTON**



Project: Weld County, CO (NAD 83)  
Site: Sec. 29 T3N-R65W  
Well: Wardell 3N-20HZ

# Anadarko Petroleum Corp.

**HALLIBURTON**  
Sperry Drilling



**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.15	31.31	125.00	0.14	0.09	0.14	0.12
<b>First Gyro Survey @ 125.00ft</b>							
225.00	0.35	242.27	225.00	0.11	-0.12	0.11	0.48
325.00	0.17	343.97	325.00	0.11	-0.43	0.11	0.42
425.00	0.22	230.25	425.00	0.13	-0.62	0.14	0.33
525.00	0.14	81.58	525.00	0.02	-0.64	0.03	0.35
625.00	0.17	297.13	625.00	0.11	-0.66	0.12	0.30
725.00	0.06	119.37	725.00	0.15	-0.74	0.16	0.23
825.00	0.18	358.66	825.00	0.28	-0.70	0.29	0.22
925.00	0.14	289.80	925.00	0.48	-0.82	0.49	0.18
1,013.00	0.09	150.32	1,013.00	0.46	-0.89	0.47	0.25
<b>Final Gyro Survey @1013.00ft - Tie-On to Gyro Surveys @ 1013.00ft</b>							
1,102.00	0.55	257.12	1,102.00	0.30	-1.27	0.32	0.65
<b>First Sperry MWD Survey @ 1102.00ft</b>							
1,194.00	2.12	270.33	1,193.97	0.21	-3.40	0.25	1.73
1,286.00	1.82	277.48	1,285.91	0.41	-6.55	0.49	0.42
1,378.00	2.22	268.76	1,377.86	0.57	-9.78	0.68	0.55
1,470.00	1.89	263.60	1,469.80	0.36	-13.07	0.51	0.41
1,562.00	1.97	279.43	1,561.75	0.45	-16.14	0.63	0.58
1,654.00	1.52	259.08	1,653.70	0.48	-18.89	0.69	0.83
1,746.00	2.26	267.61	1,745.65	0.17	-21.90	0.42	0.86
1,837.00	2.59	260.08	1,836.57	-0.26	-25.72	0.04	0.50
1,929.00	2.34	261.73	1,928.49	-0.89	-29.63	-0.54	0.28
2,021.00	2.38	253.60	2,020.41	-1.70	-33.32	-1.31	0.37
2,113.00	2.48	250.75	2,112.33	-2.89	-37.03	-2.46	0.17
2,207.00	2.14	262.44	2,206.25	-3.79	-40.69	-3.32	0.62
2,302.00	2.31	271.53	2,301.18	-3.98	-44.36	-3.46	0.41
2,397.00	1.88	279.00	2,396.12	-3.68	-47.82	-3.13	0.54
2,491.00	1.30	261.24	2,490.08	-3.60	-50.39	-3.02	0.80
2,585.00	1.27	292.87	2,584.06	-3.36	-52.41	-2.75	0.75
2,680.00	0.93	272.53	2,679.04	-2.92	-54.15	-2.29	0.54
2,775.00	0.65	307.04	2,774.03	-2.56	-55.35	-1.92	0.57
2,869.00	1.72	283.18	2,868.01	-1.92	-57.15	-1.25	1.23
2,963.00	1.47	280.76	2,961.97	-1.37	-59.71	-0.68	0.28
3,058.00	1.70	300.58	3,056.94	-0.42	-62.12	0.29	0.62
3,152.00	1.55	294.74	3,150.90	0.82	-64.47	1.56	0.24
3,247.00	1.24	306.24	3,245.87	1.96	-66.47	2.73	0.44
3,342.00	0.65	303.74	3,340.86	2.87	-67.74	3.65	0.62
3,437.00	2.24	274.65	3,435.83	3.32	-70.04	4.13	1.79
3,532.00	1.93	267.64	3,530.76	3.40	-73.49	4.25	0.42
3,627.00	1.45	295.16	3,625.72	3.85	-76.18	4.73	0.98
3,722.00	0.91	256.84	3,720.70	4.19	-78.00	5.09	0.98
3,817.00	1.50	283.24	3,815.68	4.30	-79.95	5.23	0.84
3,912.00	1.05	280.66	3,910.66	4.75	-82.01	5.70	0.48
4,008.00	2.22	278.55	4,006.62	5.19	-84.71	6.17	1.22
4,102.00	2.15	260.20	4,100.55	5.16	-88.25	6.18	0.74
4,197.00	3.38	246.01	4,195.44	3.71	-92.57	4.79	1.47
4,292.00	3.44	240.59	4,290.27	1.18	-97.61	2.31	0.35
4,387.00	2.28	252.32	4,385.15	-0.80	-101.89	0.38	1.36

**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,481.00	2.13	246.16	4,479.08	-2.07	-105.27	-0.85	0.30
4,576.00	2.23	279.68	4,574.02	-2.47	-108.71	-1.21	1.33
4,670.00	2.17	255.01	4,667.95	-2.63	-112.23	-1.33	1.00
4,765.00	2.28	277.97	4,762.88	-2.83	-115.84	-1.49	0.94
4,860.00	1.52	271.09	4,857.83	-2.54	-118.97	-1.17	0.83
4,954.00	1.71	237.37	4,951.79	-3.28	-121.40	-1.87	1.02
5,049.00	2.10	229.73	5,046.74	-5.17	-123.92	-3.73	0.49
5,144.00	1.67	243.42	5,141.69	-6.91	-126.49	-5.45	0.65
5,238.00	1.64	240.29	5,235.65	-8.19	-128.88	-6.70	0.10
5,333.00	1.45	242.59	5,330.62	-9.42	-131.13	-7.90	0.21
5,428.00	1.48	254.62	5,425.59	-10.30	-133.38	-8.75	0.32
5,523.00	2.55	274.38	5,520.53	-10.46	-136.67	-8.88	1.33
5,617.00	2.39	263.79	5,614.44	-10.51	-140.70	-8.88	0.51
5,712.00	1.89	263.69	5,709.37	-10.90	-144.23	-9.23	0.53
5,807.00	1.24	248.84	5,804.34	-11.44	-146.74	-9.74	0.80
5,902.00	1.75	254.92	5,899.30	-12.19	-149.10	-10.46	0.56
5,996.00	1.60	221.32	5,993.27	-13.55	-151.35	-11.80	1.04
6,091.00	1.24	277.16	6,088.24	-14.42	-153.25	-12.64	1.44
6,186.00	2.14	287.02	6,183.20	-13.77	-155.97	-11.96	0.99
6,281.00	1.55	295.89	6,278.15	-12.69	-158.82	-10.85	0.69
6,376.00	0.94	310.75	6,373.13	-11.62	-160.56	-9.76	0.72
6,408.00	1.36	322.18	6,405.12	-11.15	-161.00	-9.28	1.49
6,439.00	3.29	352.89	6,436.10	-9.98	-161.33	-8.11	7.20
6,471.00	5.41	6.23	6,468.00	-7.56	-161.28	-5.70	7.30
6,502.00	8.18	8.94	6,498.78	-3.93	-160.78	-2.07	8.99
6,534.00	10.42	9.85	6,530.36	1.17	-159.93	3.02	7.01
6,566.00	13.30	6.48	6,561.67	7.68	-159.02	9.52	9.25
6,597.00	15.73	5.41	6,591.68	15.41	-158.22	17.24	7.89
6,629.00	18.50	3.73	6,622.26	24.79	-157.48	26.61	8.79
6,661.00	20.67	2.21	6,652.41	35.50	-156.93	37.32	6.97
6,692.00	23.84	359.68	6,681.10	47.24	-156.76	49.05	10.68
6,724.00	26.62	358.30	6,710.04	60.87	-157.01	62.69	8.88
6,756.00	29.45	357.36	6,738.28	75.90	-157.58	77.72	8.95
6,787.00	32.82	357.32	6,764.81	91.91	-158.33	93.74	10.87
6,819.00	35.93	357.29	6,791.22	109.96	-159.18	111.79	9.72
6,851.00	39.00	357.30	6,816.62	129.40	-160.09	131.24	9.59
6,882.00	42.08	356.09	6,840.17	149.51	-161.26	151.37	10.25
6,914.00	45.23	355.52	6,863.32	171.54	-162.88	173.41	9.92
6,946.00	48.83	356.84	6,885.13	194.89	-164.43	196.79	11.65
6,977.00	52.70	0.04	6,904.74	218.89	-165.07	220.78	14.82
7,009.00	56.55	2.06	6,923.26	244.97	-164.58	246.86	13.09
7,041.00	57.80	2.29	6,940.61	271.84	-163.56	273.71	3.95
7,073.00	58.85	0.27	6,957.41	299.06	-162.95	300.93	6.29
7,104.00	61.81	359.16	6,972.76	325.99	-163.09	327.86	10.04
7,136.00	64.68	358.36	6,987.16	354.56	-163.71	356.43	9.24
7,167.00	66.60	357.27	6,999.95	382.78	-164.79	384.66	6.97
7,199.00	68.72	357.86	7,012.11	412.35	-166.05	414.24	6.84
7,231.00	72.18	357.83	7,022.82	442.47	-167.18	444.38	10.81
7,262.00	75.68	358.95	7,031.40	472.25	-168.01	474.16	11.81
7,294.00	79.41	359.68	7,038.30	503.49	-168.39	505.40	11.87
7,326.00	81.98	359.90	7,043.47	535.06	-168.50	536.98	8.06

**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,357.00	84.69	0.44	7,047.07	565.85	-168.41	567.76	8.91
7,379.00	85.46	0.77	7,048.96	587.77	-168.18	589.67	3.81
7,416.00	88.31	0.58	7,050.97	624.71	-167.74	626.61	7.73
<b>7" Intermediate Casing</b>							
7,417.00	88.39	0.57	7,051.00	625.70	-167.73	627.61	7.73
7,449.00	88.39	0.11	7,051.89	657.69	-167.54	659.59	1.44
7,512.00	89.13	359.88	7,053.26	720.68	-167.55	722.57	1.23
7,607.00	91.73	1.90	7,052.54	815.65	-166.08	817.52	3.47
7,702.00	91.85	1.95	7,049.58	910.55	-162.89	912.37	0.14
7,797.00	92.04	2.15	7,046.35	1,005.43	-159.49	1,007.21	0.29
7,892.00	91.05	1.66	7,043.79	1,100.35	-156.33	1,102.08	1.16
7,988.00	90.80	1.25	7,042.24	1,196.30	-153.90	1,198.00	0.50
8,083.00	90.00	0.08	7,041.58	1,291.29	-152.79	1,292.97	1.49
8,178.00	89.26	358.97	7,042.19	1,386.28	-153.58	1,387.97	1.40
8,273.00	88.33	358.69	7,044.19	1,481.24	-155.52	1,482.94	1.02
8,368.00	89.51	359.85	7,045.98	1,576.21	-156.73	1,577.92	1.74
8,462.00	90.00	0.32	7,046.38	1,670.21	-156.59	1,671.91	0.72
8,557.00	90.80	0.59	7,045.72	1,765.21	-155.84	1,766.89	0.89
8,651.00	90.37	359.69	7,044.76	1,859.20	-155.61	1,860.88	1.06
8,746.00	90.49	0.02	7,044.05	1,954.20	-155.85	1,955.87	0.37
8,840.00	91.36	359.77	7,042.53	2,048.18	-156.02	2,049.85	0.96
8,935.00	89.81	0.24	7,041.56	2,143.17	-156.01	2,144.84	1.70
9,030.00	89.63	0.23	7,042.02	2,238.17	-155.62	2,239.82	0.19
9,125.00	87.53	0.10	7,044.38	2,333.14	-155.35	2,334.78	2.21
9,219.00	86.84	359.70	7,048.99	2,427.02	-155.51	2,428.66	0.85
9,314.00	86.73	0.36	7,054.32	2,521.87	-155.46	2,523.50	0.70
9,409.00	87.90	0.45	7,058.77	2,616.76	-154.79	2,618.38	1.24
9,503.00	87.34	0.57	7,062.68	2,710.68	-153.95	2,712.28	0.61
9,598.00	88.21	0.38	7,066.36	2,805.60	-153.17	2,807.19	0.94
9,693.00	88.58	0.45	7,069.02	2,900.56	-152.48	2,902.14	0.40
9,787.00	88.40	0.31	7,071.50	2,994.53	-151.86	2,996.09	0.24
9,882.00	87.90	0.07	7,074.57	3,089.48	-151.54	3,091.03	0.58
9,977.00	87.90	0.26	7,078.05	3,184.41	-151.27	3,185.95	0.20
10,072.00	88.58	359.63	7,080.97	3,279.37	-151.36	3,280.90	0.98
10,167.00	88.89	359.45	7,083.06	3,374.34	-152.12	3,375.88	0.38
10,262.00	89.26	0.01	7,084.60	3,469.33	-152.57	3,470.86	0.71
10,356.00	89.13	359.35	7,085.92	3,563.32	-153.09	3,564.85	0.72
10,451.00	89.07	358.79	7,087.41	3,658.29	-154.64	3,659.84	0.59
10,546.00	89.81	359.04	7,088.34	3,753.27	-156.43	3,754.83	0.82
10,641.00	89.75	359.10	7,088.70	3,848.26	-157.98	3,849.83	0.09
10,736.00	89.26	359.62	7,089.53	3,943.25	-159.04	3,944.82	0.75
10,831.00	89.81	357.89	7,090.30	4,038.22	-161.10	4,039.81	1.91
10,926.00	91.17	357.54	7,089.48	4,133.14	-164.89	4,134.77	1.48
11,021.00	90.86	356.50	7,087.80	4,227.99	-169.83	4,229.67	1.14
11,116.00	90.62	356.78	7,086.57	4,322.82	-175.39	4,324.56	0.39
11,211.00	90.87	357.01	7,085.34	4,417.67	-180.54	4,419.47	0.36
11,306.00	90.12	355.73	7,084.52	4,512.48	-186.55	4,514.33	1.56
11,401.00	90.74	353.52	7,083.80	4,607.05	-195.45	4,609.00	2.42
11,495.00	92.29	350.79	7,081.32	4,700.12	-208.28	4,702.22	3.34
11,590.00	91.11	349.52	7,078.50	4,793.68	-224.51	4,795.96	1.82
11,684.00	91.42	349.68	7,076.43	4,886.11	-241.48	4,888.58	0.37

**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,779.00	90.31	348.73	7,074.99	4,979.42	-259.27	4,982.09	1.54
11,873.00	91.91	349.84	7,073.17	5,071.76	-276.74	5,074.62	2.07
11,968.00	92.90	349.41	7,069.18	5,165.12	-293.83	5,168.18	1.14
12,063.00	90.93	349.99	7,066.01	5,258.53	-310.81	5,261.78	2.16
12,095.00	91.73	349.96	7,065.27	5,290.04	-316.38	5,293.35	2.50
12,126.00	91.66	350.56	7,064.35	5,320.58	-321.62	5,323.94	1.95
12,158.00	91.61	351.12	7,063.44	5,352.15	-326.71	5,355.58	1.76
12,252.00	90.99	352.54	7,061.30	5,445.17	-340.07	5,448.75	1.65
12,347.00	90.00	353.61	7,060.48	5,539.48	-351.52	5,543.18	1.53
12,442.00	89.88	355.56	7,060.58	5,634.05	-360.48	5,637.84	2.06
12,536.00	90.00	357.47	7,060.68	5,727.87	-366.20	5,731.73	2.04
12,631.00	89.69	358.84	7,060.94	5,822.82	-369.26	5,826.70	1.48
12,726.00	91.24	358.84	7,060.17	5,917.79	-371.18	5,921.69	1.63
12,820.00	91.36	359.36	7,058.03	6,011.75	-372.66	6,015.67	0.57
12,915.00	91.67	359.29	7,055.52	6,106.71	-373.77	6,110.63	0.33
13,010.00	91.36	359.12	7,053.01	6,201.67	-375.09	6,205.60	0.37
13,105.00	91.17	359.55	7,050.91	6,296.64	-376.19	6,300.58	0.49
13,200.00	91.67	0.00	7,048.56	6,391.61	-376.57	6,395.54	0.71
13,295.00	91.98	0.28	7,045.53	6,486.56	-376.34	6,490.49	0.44
13,389.00	92.23	359.98	7,042.08	6,580.50	-376.12	6,584.41	0.42
13,484.00	92.10	0.00	7,038.49	6,675.43	-376.14	6,679.34	0.14
13,579.00	90.49	359.92	7,036.35	6,770.40	-376.21	6,774.31	1.70
13,674.00	89.88	1.60	7,036.04	6,865.39	-374.95	6,869.27	1.88
13,769.00	89.32	2.37	7,036.70	6,960.33	-371.66	6,964.17	1.00
13,864.00	90.12	3.91	7,037.17	7,055.18	-366.45	7,058.95	1.83
13,959.00	90.06	4.51	7,037.02	7,149.93	-359.48	7,153.61	0.63
14,054.00	90.00	4.50	7,036.97	7,244.63	-352.02	7,248.22	0.06
14,149.00	90.43	4.60	7,036.61	7,339.33	-344.48	7,342.83	0.46
14,244.00	90.25	5.08	7,036.05	7,433.99	-336.46	7,437.39	0.54
14,339.00	90.25	4.91	7,035.63	7,528.63	-328.19	7,531.93	0.18
14,434.00	90.25	4.98	7,035.22	7,623.28	-320.00	7,626.47	0.07
14,528.00	89.63	4.54	7,035.32	7,716.95	-312.20	7,720.05	0.81
14,560.00	90.43	4.22	7,035.30	7,748.86	-309.76	7,751.93	2.69
14,591.00	89.69	5.72	7,035.27	7,779.74	-307.07	7,782.77	5.40
14,623.00	90.00	5.30	7,035.35	7,811.59	-304.00	7,814.59	1.63
14,655.00	90.06	5.66	7,035.34	7,843.45	-300.95	7,846.40	1.14
14,686.00	89.63	7.00	7,035.42	7,874.26	-297.53	7,877.17	4.54
14,718.00	89.69	6.79	7,035.61	7,906.02	-293.69	7,908.89	0.68
14,813.00	88.95	8.38	7,036.74	8,000.18	-281.15	8,002.90	1.85
14,908.00	89.75	7.71	7,037.82	8,094.24	-267.85	8,096.80	1.10
15,003.00	89.88	8.24	7,038.12	8,188.32	-254.67	8,190.72	0.57
15,098.00	90.37	7.69	7,037.92	8,282.40	-241.51	8,284.64	0.78
15,193.00	90.37	8.11	7,037.30	8,376.50	-228.45	8,378.58	0.44
15,288.00	90.49	8.07	7,036.59	8,470.55	-215.08	8,472.47	0.13
15,383.00	91.11	8.37	7,035.26	8,564.56	-201.50	8,566.32	0.73
15,478.00	90.31	7.60	7,034.09	8,658.64	-188.31	8,660.24	1.17
15,573.00	89.88	6.28	7,033.93	8,752.94	-176.83	8,754.40	1.46
15,667.00	90.87	5.38	7,033.31	8,846.45	-167.28	8,847.79	1.42
15,762.00	91.42	5.56	7,031.41	8,940.99	-158.23	8,942.23	0.61
15,857.00	91.54	5.55	7,028.96	9,035.52	-149.03	9,036.64	0.13
15,952.00	90.86	5.79	7,026.97	9,130.03	-139.65	9,131.04	0.76

**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
16,047.00	90.49	4.44	7,025.85	9,224.64	-131.18	9,225.54	1.47
16,141.00	90.06	4.18	7,025.40	9,318.38	-124.12	9,319.19	0.53
16,236.00	90.00	4.58	7,025.35	9,413.10	-116.86	9,413.82	0.43
16,297.00	90.25	3.98	7,025.22	9,473.93	-112.31	9,474.59	1.07
<b>Final Sperry MWD Survey @ 16297.00ft</b>							
16,343.00	90.25	3.98	7,025.02	9,519.82	-109.12	9,520.44	0.00
<b>Straight Line Projection to TD @ 16343.00ft</b>							

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	0.14	0.09	First Gyro Survey @ 125.00ft
1,013.00	1,013.00	0.46	-0.89	Final Gyro Survey @ 1013.00ft
1,013.00	1,013.00	0.46	-0.89	Tie-On to Gyro Surveys @ 1013.00ft
1,102.00	1,102.00	0.30	-1.27	First Sperry MWD Survey @ 1102.00ft
16,297.00	7,025.22	9,473.93	-112.31	Final Sperry MWD Survey @ 16297.00ft
16,343.00	7,025.02	9,519.82	-109.12	Straight Line Projection to TD @ 16343.00ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Wardell 3N-20HZ_BHL ReLoc2	359.34	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
125.00	1,013.00	Surface Gyros	NS-GYRO-MS
1,071.00	7,379.00	Sperry MWD Surveys - Build	MWD
7,417.00	16,343.00	Sperry MWD Surveys - Lateral	MWD

**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,416.00	7,050.97	7" Intermediate Casing	7	8-3/4



## Design Report for Wardell 3N-20HZ - Actual Field Surveys

**Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Land Spacing Unit	0.00	0.00	0.00	0.00	0.00	,356.305127	,6,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1				41.12	10,009.10	1,323,364.94	3,226,453.88		
Point 2				54.44	4,718.95	1,318,075.35	3,226,515.56		
Wardell 3N-20HZ_P	0.00	0.00	7,049.00	7,650.00	-330.00	,002.642310	,6,104.358232	40.211716	-104.690403
- actual wellpath misses target center by 18.50ft at 14459.82ft MD (7035.14 TVD, 7649.00 N, -317.79 E)									
- Point									
Wardell 3N-20HZ_P	0.00	0.00	7,049.00	6,750.00	-380.00	,102.261137	,6,062.590940	40.209246	-104.690582
- actual wellpath misses target center by 12.99ft at 13558.32ft MD (7036.59 TVD, 6749.72 N, -376.18 E)									
- Point									
Wardell 3N-20HZ_S	0.00	0.00	0.00	0.00	0.00	,356.305127	,6,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1				-2,094.51	-556.81	1,312,780.39	3,224,415.03		
Point 2				532.12	-562.07	1,312,799.15	3,227,041.49		
Point 3				3,159.26	-565.99	1,312,819.25	3,229,668.44		
Point 4				3,158.91	2,077.83	1,315,462.84	3,229,643.92		
Point 5				3,159.59	4,733.99	1,318,118.78	3,229,620.31		
Point 6				3,159.59	4,733.99	1,318,118.78	3,229,620.31		
Point 7				3,168.90	7,367.66	1,320,752.32	3,229,605.54		
Point 8				3,201.71	10,001.20	1,323,385.93	3,229,614.27		
Point 9				538.27	10,004.54	1,323,364.92	3,226,951.03		
Point 10				-2,125.07	10,008.19	1,323,344.22	3,224,287.88		
Point 11				-2,128.68	7,351.82	1,320,688.04	3,224,308.56		
Point 12				-2,111.96	4,695.15	1,318,031.75	3,224,349.56		
Point 13				-2,111.96	4,695.15	1,318,031.75	3,224,349.56		
Point 14				-2,103.21	2,057.36	1,315,394.26	3,224,382.43		
Wardell 3N-20HZ_S	0.00	0.00	0.00	0.00	0.00	,356.305127	,6,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1				-2,111.96	4,695.15	1,318,031.75	3,224,349.56		
Point 2				523.82	4,714.65	1,318,075.35	3,226,984.94		
Point 3				3,159.59	4,733.99	1,318,118.78	3,229,620.31		
Wardell 3N-20HZ_P	0.00	0.00	7,049.00	4,050.00	-154.00	,404.555298	,6,313.257329	40.201834	-104.689772
- actual wellpath misses target center by 42.00ft at 10842.84ft MD (7090.32 TVD, 4050.05 N, -161.54 E)									
- Point									
Wardell 3N-20HZ_P	0.00	0.00	7,049.00	8,650.00	-195.00	,003.792177	,6,230.204073	40.214461	-104.689919
- actual wellpath misses target center by 15.84ft at 15468.33ft MD (7034.15 TVD, 8649.06 N, -189.59 E)									
- Point									
Wardell 3N-20HZ_B	0.00	0.00	7,049.00	9,545.38	-110.57	,899.868525	,6,306.440698	40.216919	-104.689617
- actual wellpath misses target center by 35.08ft at 16343.00ft MD (7025.02 TVD, 9519.82 N, -109.12 E)									
- Point									
Wardell 3N-20HZ_S	0.00	0.00	0.00	0.00	0.00	,356.305127	,6,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1				-1,636.02	-97.71	1,313,243.65	3,224,869.28		
Point 2				532.92	-102.05	1,313,259.14	3,227,038.08		
Point 3				2,699.18	-105.29	1,313,275.70	3,229,204.19		
Point 4				2,698.89	2,077.86	1,315,458.67	3,229,183.94		
Point 5				2,699.45	4,270.58	1,317,651.21	3,229,164.45		
Point 6				2,701.18	5,190.66	1,318,571.22	3,229,157.77		
Point 7				2,708.89	7,371.34	1,320,751.79	3,229,145.54		
Point 8				2,735.93	9,541.76	1,322,922.27	3,229,152.73		
Point 9				537.67	9,544.52	1,322,904.94	3,226,954.63		
Point 10				-1,665.68	9,547.54	1,322,887.81	3,224,751.44		
Point 11				-1,668.66	7,352.96	1,320,693.39	3,224,768.53		
Point 12				-1,654.85	5,158.56	1,318,499.30	3,224,802.40		
Point 13				-1,650.42	4,238.53	1,317,579.39	3,224,815.24		
Point 14				-1,643.19	2,058.89	1,315,400.00	3,224,842.40		

**Design Report for Wardell 3N-20HZ - Actual Field Surveys**

Wardell 3N-20HZ_P	0.00	0.00	7,049.00	5,110.00	-300.00	,463.130984	!6,157.578322	40.204744	-104.690295
- actual wellpath misses target center by 27.74ft at 11915.78ft MD (7071.58 TVD, 5113.83 N, -284.35 E)									
- Point									
Wardell 3N-20HZ_S	0.00	0.00	0.00	0.00	0.00	,356.305127	!6,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Point									

## North Reference Sheet for Sec. 29 T3N-R65W - Wardell 3N-20HZ - Plan E Rev 0

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

Vertical Depths are relative to RKB=25ft @ 4904.00ft (HP 308). Northing and Easting are relative to Wardell 3N-20HZ

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: 3,000,000.000644ft, False Northing: 1,000,000.001308ft, Scale Reduction: 0.99995739

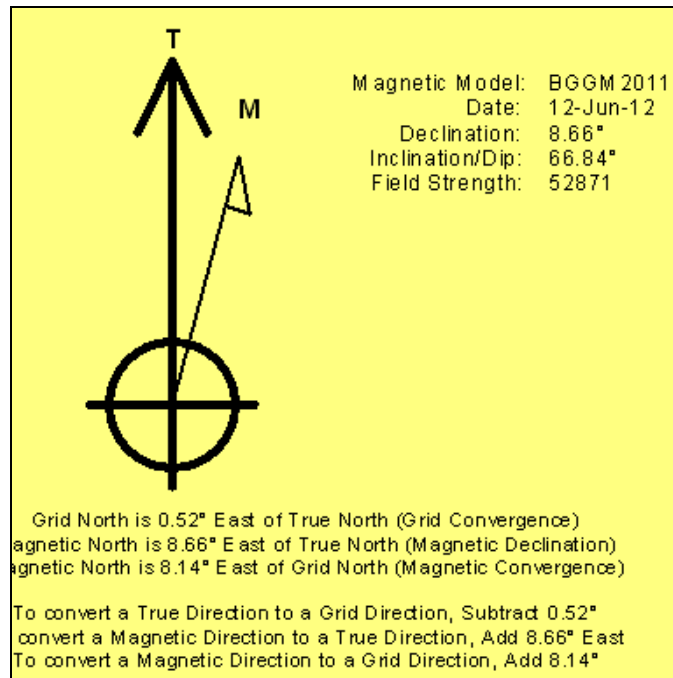
Grid Coordinates of Well: 1,313,356.305127 ft N, 3,226,504.272526 ft E

Geographical Coordinates of Well: 40° 11' 26.58" N, 104° 41' 21.20" W

Grid Convergence at Surface is: 0.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,343.00ft  
the Bottom Hole Displacement is 9,520.44ft in the Direction of 359.34° (True).

Magnetic Convergence at surface is: -8.14° (12 June 2012, , BGGM2011)



# **Anadarko Petroleum Corp.**

**Weld County, CO (NAD 83)**

**Sec. 29 T3N-R65W**

**Wardell 3N-20HZ**

**Plan E Rev 0**

**Design: Actual Field Surveys**

## **Survey Report - Geographic**

**27 June, 2012**

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

<b>Project</b>	Weld County, CO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	Sec. 29 T3N-R65W				
Site Position:		Northing:	1,313,179.460366ft	Latitude:	40.190185
From:	Lat/Long	Easting:	3,228,349.544428ft	Longitude:	-104.682622
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.53 °

Well	Wardell 3N-20HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,313,356.305127 ft	Latitude:	40.190717
	+E/-W	0.00 ft	Easting:	3,226,504.272526 ft	Longitude:	-104.689221
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,879.00 ft

<b>Wellbore</b>	Plan E Rev 0				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2011	2012-06-12	8.66	66.84	52,871

<b>Design</b>	Actual Field Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	359.34	

<b>Survey Program</b>	<b>Date</b>	2012-06-27			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
125.00	1,013.00	Surface Gyros (Plan E Rev 0)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,071.00	7,379.00	Sperry MWD Surveys - Build (Plan E Rev	MWD	MWD - Standard	
7,417.00	16,343.00	Sperry MWD Surveys - Lateral (Plan E Re	MWD	MWD - Standard	

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	13,356.305127	26,504.272526	40.190717	-104.689221	
125.00	0.15	31.31	125.00	0.14	0.09	13,356.445689	26,504.356272	40.190717	-104.689221	
First Gyro Survey @ 125.00ft										
225.00	0.35	242.27	225.00	0.11	-0.12	13,356.413559	26,504.154237	40.190717	-104.689221	
325.00	0.17	343.97	325.00	0.11	-0.43	13,356.411178	26,503.842939	40.190717	-104.689223	
425.00	0.22	230.25	425.00	0.13	-0.62	13,356.429274	26,503.654200	40.190717	-104.689223	
525.00	0.14	81.58	525.00	0.02	-0.64	13,356.324164	26,503.628411	40.190717	-104.689223	
625.00	0.17	297.13	625.00	0.11	-0.66	13,356.409595	26,503.616455	40.190717	-104.689223	
725.00	0.06	119.37	725.00	0.15	-0.74	13,356.450772	26,503.529679	40.190717	-104.689224	
825.00	0.18	358.66	825.00	0.28	-0.70	13,356.582502	26,503.570431	40.190718	-104.689224	
925.00	0.14	289.80	925.00	0.48	-0.82	13,356.779822	26,503.450003	40.190718	-104.689224	
1,013.00	0.09	150.32	1,013.00	0.46	-0.89	13,356.755583	26,503.383292	40.190718	-104.689224	
Final Gyro Survey @1013.00ft - Tie-On to Gyro Surveys @ 1013.00ft										
1,102.00	0.55	257.12	1,102.00	0.30	-1.27	13,356.596155	26,503.002943	40.190718	-104.689226	
First Sperry MWD Survey @ 1102.00ft										
1,194.00	2.12	270.33	1,193.97	0.21	-3.40	13,356.488035	26,500.871717	40.190718	-104.689233	
1,286.00	1.82	277.48	1,285.91	0.41	-6.55	13,356.659204	26,497.720002	40.190718	-104.689244	
1,378.00	2.22	268.76	1,377.86	0.57	-9.78	13,356.781287	26,494.488888	40.190718	-104.689256	
1,470.00	1.89	263.60	1,469.80	0.36	-13.07	13,356.543560	26,491.201926	40.190718	-104.689268	
1,562.00	1.97	279.43	1,561.75	0.45	-16.14	13,356.605480	26,488.133744	40.190718	-104.689279	
1,654.00	1.52	259.08	1,653.70	0.48	-18.89	13,356.608196	26,485.375648	40.190718	-104.689289	
1,746.00	2.26	267.61	1,745.65	0.17	-21.90	13,356.273897	26,482.368167	40.190717	-104.689299	
1,837.00	2.59	260.08	1,836.57	-0.26	-25.72	13,355.809993	26,478.554352	40.190716	-104.689313	
1,929.00	2.34	261.73	1,928.49	-0.89	-29.63	13,355.146082	26,474.654200	40.190714	-104.689327	
2,021.00	2.38	253.60	2,020.41	-1.70	-33.32	13,354.302912	26,470.970765	40.190712	-104.689340	
2,113.00	2.48	250.75	2,112.33	-2.89	-37.03	13,353.073505	26,467.270328	40.190709	-104.689354	
2,207.00	2.14	262.44	2,206.25	-3.79	-40.69	13,352.138713	26,463.619045	40.190707	-104.689367	
2,302.00	2.31	271.53	2,301.18	-3.98	-44.36	13,351.922915	26,459.948849	40.190706	-104.689380	
2,397.00	1.88	279.00	2,396.12	-3.68	-47.82	13,352.186213	26,456.493446	40.190707	-104.689392	
2,491.00	1.30	261.24	2,490.08	-3.60	-50.39	13,352.241460	26,453.916127	40.190707	-104.689401	
2,585.00	1.27	292.87	2,584.06	-3.36	-52.41	13,352.465487	26,451.900376	40.190708	-104.689409	
2,680.00	0.93	272.53	2,679.04	-2.92	-54.15	13,352.892729	26,450.156223	40.190709	-104.689415	
2,775.00	0.65	307.04	2,774.03	-2.56	-55.35	13,353.240353	26,448.952697	40.190710	-104.689419	
2,869.00	1.72	283.18	2,868.01	-1.92	-57.15	13,353.866706	26,447.147761	40.190712	-104.689426	
2,963.00	1.47	280.76	2,961.97	-1.37	-59.71	13,354.390032	26,444.584905	40.190713	-104.689435	
3,058.00	1.70	300.58	3,056.94	-0.42	-62.12	13,355.312311	26,442.166173	40.190716	-104.689443	
3,152.00	1.55	294.74	3,150.90	0.82	-64.47	13,356.532069	26,439.799996	40.190719	-104.689452	
3,247.00	1.24	306.24	3,245.87	1.96	-66.47	13,357.659110	26,437.793704	40.190722	-104.689459	
3,342.00	0.65	303.74	3,340.86	2.87	-67.74	13,358.554333	26,436.508345	40.190725	-104.689463	
3,437.00	2.24	274.65	3,435.83	3.32	-70.04	13,358.983116	26,434.205714	40.190726	-104.689472	
3,532.00	1.93	267.64	3,530.76	3.40	-73.49	13,359.036213	26,430.756400	40.190726	-104.689484	
3,627.00	1.45	295.16	3,625.72	3.85	-76.18	13,359.456764	26,428.066197	40.190727	-104.689494	
3,722.00	0.91	256.84	3,720.70	4.19	-78.00	13,359.779341	26,426.240704	40.190728	-104.689500	
3,817.00	1.50	283.24	3,815.68	4.30	-79.95	13,359.874576	26,424.294874	40.190729	-104.689507	
3,912.00	1.05	280.66	3,910.66	4.75	-82.01	13,360.301445	26,422.225195	40.190730	-104.689515	
4,008.00	2.22	278.55	4,006.62	5.19	-84.71	13,360.715852	26,419.518204	40.190731	-104.689524	
4,102.00	2.15	260.20	4,100.55	5.16	-88.25	13,360.654063	26,415.980828	40.190731	-104.689537	
4,197.00	3.38	246.01	4,195.44	3.71	-92.57	13,359.172731	26,411.679582	40.190727	-104.689552	
4,292.00	3.44	240.59	4,290.27	1.18	-97.61	13,356.588641	26,406.661766	40.190720	-104.689570	
4,387.00	2.28	252.32	4,385.15	-0.80	-101.89	13,354.576075	26,402.396702	40.190715	-104.689586	
4,481.00	2.13	246.16	4,479.08	-2.07	-105.27	13,353.271377	26,399.029340	40.190711	-104.689598	
4,576.00	2.23	279.68	4,574.02	-2.47	-108.71	13,352.837192	26,395.596416	40.190710	-104.689610	
4,670.00	2.17	255.01	4,667.95	-2.63	-112.23	13,352.652205	26,392.076175	40.190710	-104.689623	
4,765.00	2.28	277.97	4,762.88	-2.83	-115.84	13,352.416037	26,388.469460	40.190709	-104.689636	
4,860.00	1.52	271.09	4,857.83	-2.54	-118.97	13,352.673372	26,385.335868	40.190710	-104.689647	

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
4,954.00	1.71	237.37	4,951.79	-3.28	-121.40	13,351.918686	26,382.915069	40.190708	-104.689656
5,049.00	2.10	229.73	5,046.74	-5.17	-123.92	13,350.006390	26,380.410750	40.190703	-104.689665
5,144.00	1.67	243.42	5,141.69	-6.91	-126.49	13,348.238573	26,377.860838	40.190698	-104.689674
5,238.00	1.64	240.29	5,235.65	-8.19	-128.88	13,346.937272	26,375.479494	40.190694	-104.689682
5,333.00	1.45	242.59	5,330.62	-9.42	-131.13	13,345.689747	26,373.243149	40.190691	-104.689690
5,428.00	1.48	254.62	5,425.59	-10.30	-133.38	13,344.790537	26,371.001444	40.190689	-104.689698
5,523.00	2.55	274.38	5,520.53	-10.46	-136.67	13,344.596481	26,367.713033	40.190688	-104.689710
5,617.00	2.39	263.79	5,614.44	-10.51	-140.70	13,344.507292	26,363.680390	40.190688	-104.689725
5,712.00	1.89	263.69	5,709.37	-10.90	-144.23	13,344.088632	26,360.157916	40.190687	-104.689737
5,807.00	1.24	248.84	5,804.34	-11.44	-146.74	13,343.522438	26,357.647352	40.190686	-104.689746
5,902.00	1.75	254.92	5,899.30	-12.19	-149.10	13,342.752480	26,355.295138	40.190683	-104.689755
5,996.00	1.60	221.32	5,993.27	-13.55	-151.35	13,341.372953	26,353.055340	40.190680	-104.689763
6,091.00	1.24	277.16	6,088.24	-14.42	-153.25	13,340.487695	26,351.167750	40.190677	-104.689770
6,186.00	2.14	287.02	6,183.20	-13.77	-155.97	13,341.110119	26,348.446066	40.190679	-104.689779
6,281.00	1.55	295.89	6,278.15	-12.69	-158.82	13,342.164161	26,345.584481	40.190682	-104.689789
6,376.00	0.94	310.75	6,373.13	-11.62	-160.56	13,343.217803	26,343.828605	40.190685	-104.689796
6,408.00	1.36	322.18	6,405.12	-11.15	-161.00	13,343.685138	26,343.392624	40.190686	-104.689797
6,439.00	3.29	352.89	6,436.10	-9.98	-161.33	13,344.855423	26,343.046201	40.190690	-104.689798
6,471.00	5.41	6.23	6,468.00	-7.56	-161.28	13,347.266791	26,343.074208	40.190696	-104.689798
6,502.00	8.18	8.94	6,498.78	-3.93	-160.78	13,350.903128	26,343.542364	40.190706	-104.689796
6,534.00	10.42	9.85	6,530.36	1.17	-159.93	13,356.011132	26,344.344581	40.190720	-104.689793
6,566.00	13.30	6.48	6,561.67	7.68	-159.02	13,362.528780	26,345.195630	40.190738	-104.689790
6,597.00	15.73	5.41	6,591.68	15.41	-158.22	13,370.262994	26,345.923637	40.190759	-104.689787
6,629.00	18.50	3.73	6,622.26	24.79	-157.48	13,379.655317	26,346.577146	40.190785	-104.689785
6,661.00	20.67	2.21	6,652.41	35.50	-156.93	13,390.370455	26,347.027306	40.190814	-104.689783
6,692.00	23.84	359.68	6,681.10	47.24	-156.76	13,402.106291	26,347.096042	40.190847	-104.689782
6,724.00	26.62	358.30	6,710.04	60.87	-157.01	13,415.738486	26,346.722545	40.190884	-104.689783
6,756.00	29.45	357.36	6,738.28	75.90	-157.58	13,430.759344	26,346.010061	40.190925	-104.689785
6,787.00	32.82	357.32	6,764.81	91.91	-158.33	13,446.760343	26,345.119712	40.190969	-104.689788
6,819.00	35.93	357.29	6,791.22	109.96	-159.18	13,464.796267	26,344.105200	40.191019	-104.689791
6,851.00	39.00	357.30	6,816.62	129.40	-160.09	13,484.227071	26,343.009087	40.191072	-104.689794
6,882.00	42.08	356.09	6,840.17	149.51	-161.26	13,504.326909	26,341.657182	40.191127	-104.689798
6,914.00	45.23	355.52	6,863.32	171.54	-162.88	13,526.337935	26,339.837071	40.191188	-104.689804
6,946.00	48.83	356.84	6,885.13	194.89	-164.43	13,549.680183	26,338.071900	40.191252	-104.689810
6,977.00	52.70	0.04	6,904.74	218.89	-165.07	13,573.665083	26,337.217682	40.191318	-104.689812
7,009.00	56.55	2.06	6,923.26	244.97	-164.58	13,599.747781	26,337.468171	40.191389	-104.689810
7,041.00	57.80	2.29	6,940.61	271.84	-163.56	13,626.625463	26,338.243317	40.191463	-104.689806
7,073.00	58.85	0.27	6,957.41	299.06	-162.95	13,653.852688	26,338.599939	40.191538	-104.689804
7,104.00	61.81	359.16	6,972.76	325.99	-163.09	13,680.780795	26,338.215917	40.191612	-104.689805
7,136.00	64.68	358.36	6,987.16	354.56	-163.71	13,709.336719	26,337.334015	40.191690	-104.689807
7,167.00	66.60	357.27	6,999.95	382.78	-164.79	13,737.542101	26,335.997465	40.191768	-104.689811
7,199.00	68.72	357.86	7,012.11	412.35	-166.05	13,767.097815	26,334.470950	40.191849	-104.689815
7,231.00	72.18	357.83	7,022.82	442.47	-167.18	13,797.214191	26,333.061743	40.191932	-104.689819
7,262.00	75.68	358.95	7,031.40	472.25	-168.01	13,826.975837	26,331.955378	40.192013	-104.689822
7,294.00	79.41	359.68	7,038.30	503.49	-168.39	13,858.208737	26,331.297736	40.192099	-104.689824
7,326.00	81.98	359.90	7,043.47	535.06	-168.50	13,889.781069	26,330.893543	40.192186	-104.689824
7,357.00	84.69	0.44	7,047.07	565.85	-168.41	13,920.566679	26,330.703803	40.192270	-104.689824
7,379.00	85.46	0.77	7,048.96	587.77	-168.18	13,942.484302	26,330.734874	40.192330	-104.689823
7,416.00	88.31	0.58	7,050.97	624.71	-167.74	13,979.424151	26,330.830695	40.192432	-104.689821
<b>7" Intermediate Casing</b>									
7,417.00	88.39	0.57	7,051.00	625.70	-167.73	13,980.423695	26,330.831545	40.192434	-104.689821
7,449.00	88.39	0.11	7,051.89	657.69	-167.54	14,012.409448	26,330.728897	40.192522	-104.689821
7,512.00	89.13	359.88	7,053.26	720.68	-167.55	14,075.388848	26,330.147529	40.192695	-104.689821
7,607.00	91.73	1.90	7,052.54	815.65	-166.08	14,170.367118	26,330.754177	40.192956	-104.689815
7,702.00	91.85	1.95	7,049.58	910.55	-162.89	14,265.288305	26,333.075870	40.193216	-104.689804

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
7,797.00	92.04	2.15	7,046.35	1,005.43	-159.49	14,360.195758	26,335.604411	40.193477	-104.689792
7,892.00	91.05	1.66	7,043.79	1,100.35	-156.33	14,455.128119	26,337.893127	40.193737	-104.689781
7,988.00	90.80	1.25	7,042.24	1,196.30	-153.90	14,551.098564	26,339.452893	40.194001	-104.689772
8,083.00	90.00	0.08	7,041.58	1,291.29	-152.79	14,646.089491	26,339.686824	40.194262	-104.689768
8,178.00	89.26	358.97	7,042.19	1,386.28	-153.58	14,741.066882	26,338.030897	40.194522	-104.689771
8,273.00	88.33	358.69	7,044.19	1,481.24	-155.52	14,835.999189	26,335.223575	40.194783	-104.689778
8,368.00	89.51	359.85	7,045.98	1,576.21	-156.73	14,930.952226	26,333.145460	40.195044	-104.689782
8,462.00	90.00	0.32	7,046.38	1,670.21	-156.59	15,024.944054	26,332.425499	40.195302	-104.689782
8,557.00	90.80	0.59	7,045.72	1,765.21	-155.84	15,119.936763	26,332.311303	40.195562	-104.689779
8,651.00	90.37	359.69	7,044.76	1,859.20	-155.61	15,213.924562	26,331.681564	40.195820	-104.689778
8,746.00	90.49	0.02	7,044.05	1,954.20	-155.85	15,308.911217	26,330.572637	40.196081	-104.689779
8,840.00	91.36	359.77	7,042.53	2,048.18	-156.02	15,402.888325	26,329.541139	40.196339	-104.689779
8,935.00	89.81	0.24	7,041.56	2,143.17	-156.01	15,497.872268	26,328.680993	40.196600	-104.689779
9,030.00	89.63	0.23	7,042.02	2,238.17	-155.62	15,592.865839	26,328.202055	40.196861	-104.689778
9,125.00	87.53	0.10	7,044.38	2,333.14	-155.35	15,687.825420	26,327.607318	40.197121	-104.689777
9,219.00	86.84	359.70	7,048.99	2,427.02	-155.51	15,781.701668	26,326.585192	40.197379	-104.689778
9,314.00	86.73	0.36	7,054.32	2,521.87	-155.46	15,876.544041	26,325.767632	40.197639	-104.689778
9,409.00	87.90	0.45	7,058.77	2,616.76	-154.79	15,971.433842	26,325.570799	40.197900	-104.689775
9,503.00	87.34	0.57	7,062.68	2,710.68	-153.95	16,065.348361	26,325.548042	40.198158	-104.689772
9,598.00	88.21	0.38	7,066.36	2,805.60	-153.17	16,160.271703	26,325.467029	40.198418	-104.689769
9,693.00	88.58	0.45	7,069.02	2,900.56	-152.48	16,255.230043	26,325.286598	40.198679	-104.689767
9,787.00	88.40	0.31	7,071.50	2,994.53	-151.86	16,349.193039	26,325.050658	40.198937	-104.689765
9,882.00	87.90	0.07	7,074.57	3,089.48	-151.54	16,444.137494	26,324.497424	40.199198	-104.689763
9,977.00	87.90	0.26	7,078.05	3,184.41	-151.27	16,539.067740	26,323.902822	40.199458	-104.689763
10,072.00	88.58	359.63	7,080.97	3,279.37	-151.36	16,634.012994	26,322.943442	40.199719	-104.689763
10,167.00	88.89	359.45	7,083.06	3,374.34	-152.12	16,728.971637	26,321.312662	40.199980	-104.689766
10,262.00	89.26	0.01	7,084.60	3,469.33	-152.57	16,823.945550	26,319.996675	40.200240	-104.689767
10,356.00	89.13	359.35	7,085.92	3,563.32	-153.09	16,917.921534	26,318.612474	40.200498	-104.689769
10,451.00	89.07	358.79	7,087.41	3,658.29	-154.64	17,012.874806	26,316.202536	40.200759	-104.689775
10,546.00	89.81	359.04	7,088.34	3,753.27	-156.43	17,107.828039	26,313.535551	40.201020	-104.689781
10,641.00	89.75	359.10	7,088.70	3,848.26	-157.98	17,202.792701	26,311.125320	40.201280	-104.689787
10,736.00	89.26	359.62	7,089.53	3,943.25	-159.04	17,297.764894	26,309.195832	40.201541	-104.689790
10,831.00	89.81	357.89	7,090.30	4,038.22	-161.10	17,392.708478	26,306.263686	40.201802	-104.689798
10,926.00	91.17	357.54	7,089.48	4,133.14	-164.89	17,487.584456	26,301.608781	40.202062	-104.689811
11,021.00	90.86	356.50	7,087.80	4,227.99	-169.83	17,582.386531	26,295.803966	40.202323	-104.689829
11,116.00	90.62	356.78	7,086.57	4,322.82	-175.39	17,677.156246	26,289.370023	40.202583	-104.689849
11,211.00	90.87	357.01	7,085.34	4,417.67	-180.54	17,771.953574	26,283.357916	40.202843	-104.689867
11,306.00	90.12	355.73	7,084.52	4,512.48	-186.55	17,866.693796	26,276.477250	40.203104	-104.689889
11,401.00	90.74	353.52	7,083.80	4,607.05	-195.45	17,961.177757	26,266.715238	40.203363	-104.689921
11,495.00	92.29	350.79	7,081.32	4,700.12	-208.28	18,054.128810	26,253.041828	40.203619	-104.689967
11,590.00	91.11	349.52	7,078.50	4,793.68	-224.51	18,147.528669	26,235.951867	40.203876	-104.690025
11,684.00	91.42	349.68	7,076.43	4,886.11	-241.48	18,239.798804	26,218.143559	40.204129	-104.690085
11,779.00	90.31	348.73	7,074.99	4,979.42	-259.27	18,332.933930	26,199.501305	40.204385	-104.690149
11,873.00	91.91	349.84	7,073.17	5,071.76	-276.74	18,425.105592	26,181.185580	40.204639	-104.690212
11,968.00	92.90	349.41	7,069.18	5,165.12	-293.83	18,518.304528	26,163.240329	40.204895	-104.690273
12,063.00	90.93	349.99	7,066.01	5,258.53	-310.81	18,611.553365	26,145.412176	40.205152	-104.690334
12,095.00	91.73	349.96	7,065.27	5,290.04	-316.38	18,643.002466	26,139.555680	40.205238	-104.690354
12,126.00	91.66	350.56	7,064.35	5,320.58	-321.62	18,673.491604	26,134.034726	40.205322	-104.690372
12,158.00	91.61	351.12	7,063.44	5,352.15	-326.71	18,705.021319	26,128.654389	40.205409	-104.690391
12,252.00	90.99	352.54	7,061.30	5,445.17	-340.07	18,797.910578	26,114.450648	40.205664	-104.690438
12,347.00	90.00	353.61	7,060.48	5,539.48	-351.52	18,892.098807	26,102.136096	40.205923	-104.690479
12,442.00	89.88	355.56	7,060.58	5,634.05	-360.48	18,986.580272	26,092.307596	40.206182	-104.690512
12,536.00	90.00	357.47	7,060.68	5,727.87	-366.20	19,080.341871	26,085.736559	40.206440	-104.690532
12,631.00	89.69	358.84	7,060.94	5,822.82	-369.26	19,175.253918	26,081.810212	40.206701	-104.690543
12,726.00	91.24	358.84	7,060.17	5,917.79	-371.18	19,270.202826	26,079.018945	40.206961	-104.690550



# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
12,820.00	91.36	359.36	7,058.03	6,011.75	-372.66	19,364.145271	26,076.683868	40.207219	-104.690555
12,915.00	91.67	359.29	7,055.52	6,106.71	-373.77	19,459.087107	26,074.696995	40.207480	-104.690559
13,010.00	91.36	359.12	7,053.01	6,201.67	-375.09	19,554.024544	26,072.511267	40.207741	-104.690564
13,105.00	91.17	359.55	7,050.91	6,296.64	-376.19	19,648.976633	26,070.540768	40.208001	-104.690568
13,200.00	91.67	0.00	7,048.56	6,391.61	-376.57	19,743.934754	26,069.299529	40.208262	-104.690569
13,295.00	91.98	0.28	7,045.53	6,486.56	-376.34	19,838.880179	26,068.663382	40.208523	-104.690568
13,389.00	92.23	359.98	7,042.08	6,580.50	-376.12	19,932.810343	26,068.017682	40.208780	-104.690568
13,484.00	92.10	0.00	7,038.49	6,675.43	-376.14	20,027.734344	26,067.133173	40.209041	-104.690568
13,579.00	90.49	359.92	7,036.35	6,770.40	-376.21	20,122.698301	26,066.198542	40.209302	-104.690568
13,674.00	89.88	1.60	7,036.04	6,865.39	-374.95	20,217.689100	26,066.590047	40.209562	-104.690563
13,769.00	89.32	2.37	7,036.70	6,960.33	-371.66	20,312.650758	26,069.012215	40.209823	-104.690552
13,864.00	90.12	3.91	7,037.17	7,055.18	-366.45	20,407.542939	26,073.348055	40.210083	-104.690533
13,959.00	90.06	4.51	7,037.02	7,149.93	-359.48	20,502.341810	26,079.455376	40.210343	-104.690508
14,054.00	90.00	4.50	7,036.97	7,244.63	-352.02	20,597.108517	26,086.050745	40.210603	-104.690481
14,149.00	90.43	4.60	7,036.61	7,339.33	-344.48	20,691.869131	26,092.720478	40.210863	-104.690454
14,244.00	90.25	5.08	7,036.05	7,433.99	-336.46	20,786.593689	26,099.869673	40.211123	-104.690426
14,339.00	90.25	4.91	7,035.63	7,528.63	-328.19	20,881.299608	26,107.275174	40.211383	-104.690396
14,434.00	90.25	4.98	7,035.22	7,623.28	-320.00	20,976.011982	26,114.598028	40.211643	-104.690367
14,528.00	89.63	4.54	7,035.32	7,716.95	-312.20	21,069.750450	26,121.541182	40.211900	-104.690339
14,560.00	90.43	4.22	7,035.30	7,748.86	-309.76	21,101.676338	26,123.693114	40.211988	-104.690330
14,591.00	89.69	5.72	7,035.27	7,779.74	-307.07	21,132.580618	26,126.096101	40.212072	-104.690320
14,623.00	90.00	5.30	7,035.35	7,811.59	-304.00	21,164.457937	26,128.877227	40.212160	-104.690309
14,655.00	90.06	5.66	7,035.34	7,843.45	-300.95	21,196.336877	26,131.641678	40.212247	-104.690299
14,686.00	89.63	7.00	7,035.42	7,874.26	-297.53	21,227.175642	26,134.777495	40.212332	-104.690286
14,718.00	89.69	6.79	7,035.61	7,906.02	-293.69	21,258.976075	26,138.328260	40.212419	-104.690273
14,813.00	88.95	8.38	7,036.74	8,000.18	-281.15	21,353.241228	26,150.004564	40.212677	-104.690228
14,908.00	89.75	7.71	7,037.82	8,094.24	-267.85	21,447.412542	26,162.437739	40.212936	-104.690180
15,003.00	89.88	8.24	7,038.12	8,188.32	-254.67	21,541.605485	26,174.756750	40.213194	-104.690133
15,098.00	90.37	7.69	7,037.92	8,282.40	-241.51	21,635.800551	26,187.059320	40.213452	-104.690086
15,193.00	90.37	8.11	7,037.30	8,376.50	-228.45	21,730.008212	26,199.254849	40.213710	-104.690039
15,288.00	90.49	8.07	7,036.59	8,470.55	-215.08	21,824.174415	26,211.762648	40.213969	-104.689991
15,383.00	91.11	8.37	7,035.26	8,564.56	-201.50	21,918.304927	26,224.483097	40.214227	-104.689942
15,478.00	90.31	7.60	7,034.09	8,658.64	-188.31	22,012.487868	26,236.817462	40.214485	-104.689895
15,573.00	89.88	6.28	7,033.93	8,752.94	-176.83	22,106.886375	26,247.432853	40.214744	-104.689854
15,667.00	90.87	5.38	7,033.31	8,846.45	-167.28	22,200.475444	26,256.124987	40.215000	-104.689820
15,762.00	91.42	5.56	7,031.41	8,940.99	-158.23	22,295.098352	26,264.313763	40.215260	-104.689788
15,857.00	91.54	5.55	7,028.96	9,035.52	-149.03	22,389.696718	26,272.641839	40.215519	-104.689755
15,952.00	90.86	5.79	7,026.97	9,130.03	-139.65	22,484.288382	26,281.160712	40.215779	-104.689721
16,047.00	90.49	4.44	7,025.85	9,224.64	-131.18	22,578.970596	26,288.763864	40.216039	-104.689691
16,141.00	90.06	4.18	7,025.40	9,318.38	-124.12	22,672.760062	26,294.970544	40.216296	-104.689665
16,236.00	90.00	4.58	7,025.35	9,413.10	-116.86	22,767.540740	26,301.359135	40.216556	-104.689639
16,297.00	90.25	3.98	7,025.22	9,473.93	-112.31	22,828.406642	26,305.355037	40.216723	-104.689623
<b>Final Sperry MWD Survey @ 16297.00ft</b>									
16,343.00	90.25	3.98	7,025.02	9,519.82	-109.12	22,874.320586	26,308.127968	40.216849	-104.689612
<b>Straight Line Projection to TD @ 16343.00ft</b>									

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Land Spacing Unit	0.00	0.00	0.00	0.00	0.00	313,356.305127	226,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	10,009.10	41.12	1,323,364.94	3,226,453.88		
Point 2			0.00	4,718.95	54.44	1,318,075.35	3,226,515.56		
Wardell 3N-20HZ_PE	0.00	0.00	7,049.00	7,650.00	-330.00	321,002.642310	226,104.358232	40.211716	-104.690403
- actual wellpath misses target center by 18.50ft at 14459.82ft MD (7035.14 TVD, 7649.00 N, -317.79 E)									
- Point									
Wardell 3N-20HZ_PE	0.00	0.00	7,049.00	6,750.00	-380.00	320,102.261137	226,062.590940	40.209246	-104.690582
- actual wellpath misses target center by 12.99ft at 13558.32ft MD (7036.59 TVD, 6749.72 N, -376.18 E)									
- Point									
Wardell 3N-20HZ_Set	0.00	0.00	0.00	0.00	0.00	313,356.305127	226,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	-556.81	-2,094.51	1,312,780.39	3,224,415.03		
Point 2			0.00	-562.07	532.12	1,312,799.15	3,227,041.49		
Point 3			0.00	-565.99	3,159.26	1,312,819.25	3,229,668.44		
Point 4			0.00	2,077.83	3,158.91	1,315,462.84	3,229,643.92		
Point 5			0.00	4,733.99	3,159.59	1,318,118.78	3,229,620.31		
Point 6			0.00	4,733.99	3,159.59	1,318,118.78	3,229,620.31		
Point 7			0.00	7,367.66	3,168.90	1,320,752.32	3,229,605.54		
Point 8			0.00	10,001.20	3,201.71	1,323,385.93	3,229,614.27		
Point 9			0.00	10,004.54	538.27	1,323,364.92	3,226,951.03		
Point 10			0.00	10,008.19	-2,125.07	1,323,344.22	3,224,287.88		
Point 11			0.00	7,351.82	-2,128.68	1,320,688.04	3,224,308.56		
Point 12			0.00	4,695.15	-2,111.96	1,318,031.75	3,224,349.56		
Point 13			0.00	4,695.15	-2,111.96	1,318,031.75	3,224,349.56		
Point 14			0.00	2,057.36	-2,103.21	1,315,394.26	3,224,382.43		
Wardell 3N-20HZ_Set	0.00	0.00	0.00	0.00	0.00	313,356.305127	226,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	4,695.15	-2,111.96	1,318,031.75	3,224,349.56		
Point 2			0.00	4,714.65	523.82	1,318,075.35	3,226,984.94		
Point 3			0.00	4,733.99	3,159.59	1,318,118.78	3,229,620.31		
Wardell 3N-20HZ_PE	0.00	0.00	7,049.00	4,050.00	-154.00	317,404.555298	226,313.257329	40.201834	-104.689772
- actual wellpath misses target center by 42.00ft at 10842.84ft MD (7090.32 TVD, 4050.05 N, -161.54 E)									
- Point									
Wardell 3N-20HZ_PE	0.00	0.00	7,049.00	8,650.00	-195.00	322,003.792177	226,230.204073	40.214461	-104.689919
- actual wellpath misses target center by 15.84ft at 15468.33ft MD (7034.15 TVD, 8649.06 N, -189.59 E)									
- Point									
Wardell 3N-20HZ_BH	0.00	0.00	7,049.00	9,545.38	-110.57	322,899.868525	226,306.440698	40.216919	-104.689617
- actual wellpath misses target center by 35.08ft at 16343.00ft MD (7025.02 TVD, 9519.82 N, -109.12 E)									
- Point									
Wardell 3N-20HZ_Set	0.00	0.00	0.00	0.00	0.00	313,356.305127	226,504.272526	40.190717	-104.689221
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	-97.71	-1,636.02	1,313,243.65	3,224,869.28		
Point 2			0.00	-102.05	532.92	1,313,259.14	3,227,038.08		
Point 3			0.00	-105.29	2,699.18	1,313,275.70	3,229,204.19		
Point 4			0.00	2,077.86	2,698.89	1,315,458.67	3,229,183.94		
Point 5			0.00	4,270.58	2,699.45	1,317,651.21	3,229,164.45		
Point 6			0.00	5,190.66	2,701.18	1,318,571.22	3,229,157.77		
Point 7			0.00	7,371.34	2,708.89	1,320,751.79	3,229,145.54		
Point 8			0.00	9,541.76	2,735.93	1,322,922.27	3,229,152.73		
Point 9			0.00	9,544.52	537.67	1,322,904.94	3,226,954.63		

# Halliburton Company

## Survey Report - Geographic

<b>Company:</b>	Anadarko Petroleum Corp.	<b>Local Co-ordinate Reference:</b>	Well Wardell 3N-20HZ
<b>Project:</b>	Weld County, CO (NAD 83)	<b>TVD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Site:</b>	Sec. 29 T3N-R65W	<b>MD Reference:</b>	RKB=25ft @ 4904.00ft (HP 308)
<b>Well:</b>	Wardell 3N-20HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan E Rev 0	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual Field Surveys	<b>Database:</b>	EDM 2003.16 Single User Db

Point 10	0.00	9,547.54	-1,665.68	1,322,887.81	3,224,751.44		
Point 11	0.00	7,352.96	-1,668.66	1,320,693.39	3,224,768.53		
Point 12	0.00	5,158.56	-1,654.85	1,318,499.30	3,224,802.40		
Point 13	0.00	4,238.53	-1,650.42	1,317,579.39	3,224,815.24		
Point 14	0.00	2,058.89	-1,643.19	1,315,400.00	3,224,842.40		
Wardell 3N-20HZ_PE	0.00	0.00	7,049.00	5,110.00	-300.00	318,463.130984	226,157.578322
- actual wellpath misses target center by 27.74ft at 11915.78ft MD (7071.58 TVD, 5113.83 N, -284.35 E)							
- Point							
Wardell 3N-20HZ_SH	0.00	0.00	0.00	0.00	0.00	313,356.305127	226,504.272526
- actual wellpath hits target center							
- Point							

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,416.00	7,050.97	7" Intermediate Casing	7	8-3/4	

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
125.00	125.00	0.14	0.09	First Gyro Survey @ 125.00ft	
1,013.00	1,013.00	0.46	-0.89	Final Gyro Survey @ 1013.00ft	
1,013.00	1,013.00	0.46	-0.89	Tie-On to Gyro Surveys @ 1013.00ft	
1,102.00	1,102.00	0.30	-1.27	First Sperry MWD Survey @ 1102.00ft	
16,297.00	7,025.22	9,473.93	-112.31	Final Sperry MWD Survey @ 16297.00ft	
16,343.00	7,025.02	9,519.82	-109.12	Straight Line Projection to TD @ 16343.00ft	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_