

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 34-T2N-R65W

Sparboe 8C-3HZ

Plan C Rev 0

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

27 February, 2013

Well Coordinates: 1,281,026.35 N, 3,239,662.69 E (40° 06' 05.87" N, 104° 38' 35.67" W)

Ground Level: 4,970.00 ft

Local Coordinate Origin:

Centered on Well Sparboe 8C-3HZ

Viewing Datum:

RKB=25 @ 4995.00ft (HP 308)

TVDs to System:

N

North Reference:

True

Unit System:

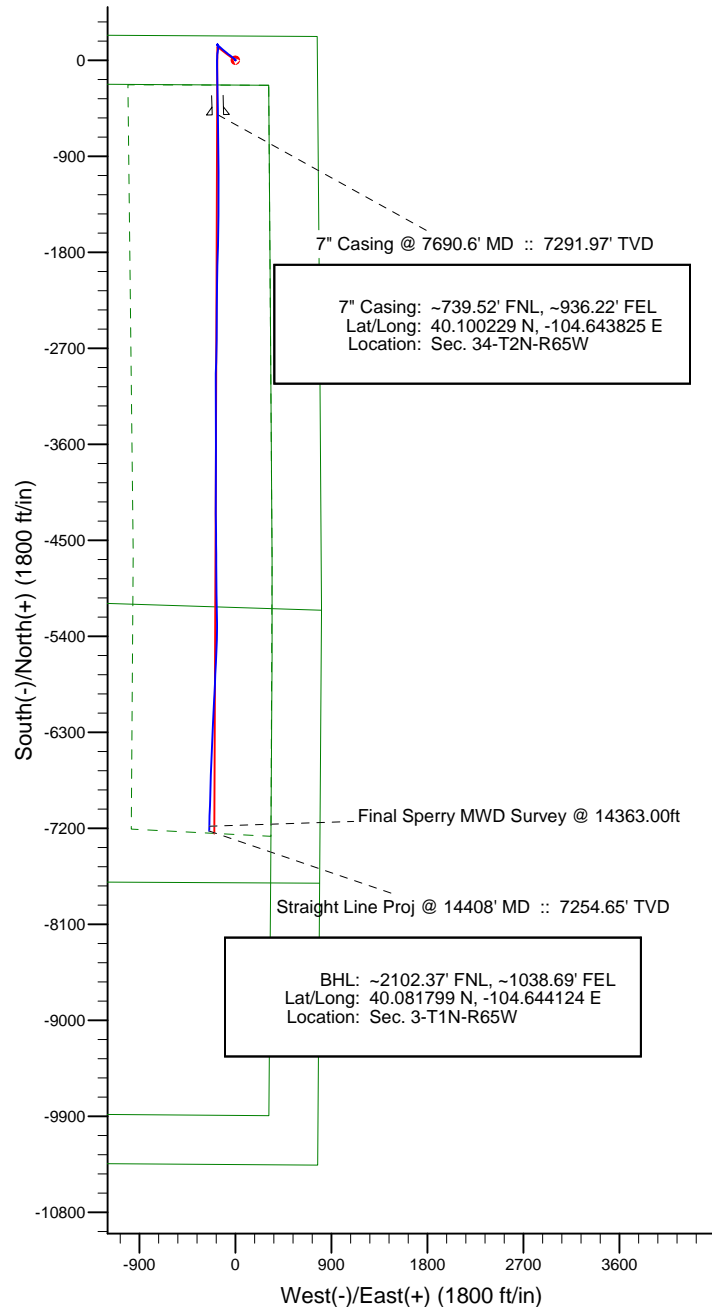
API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

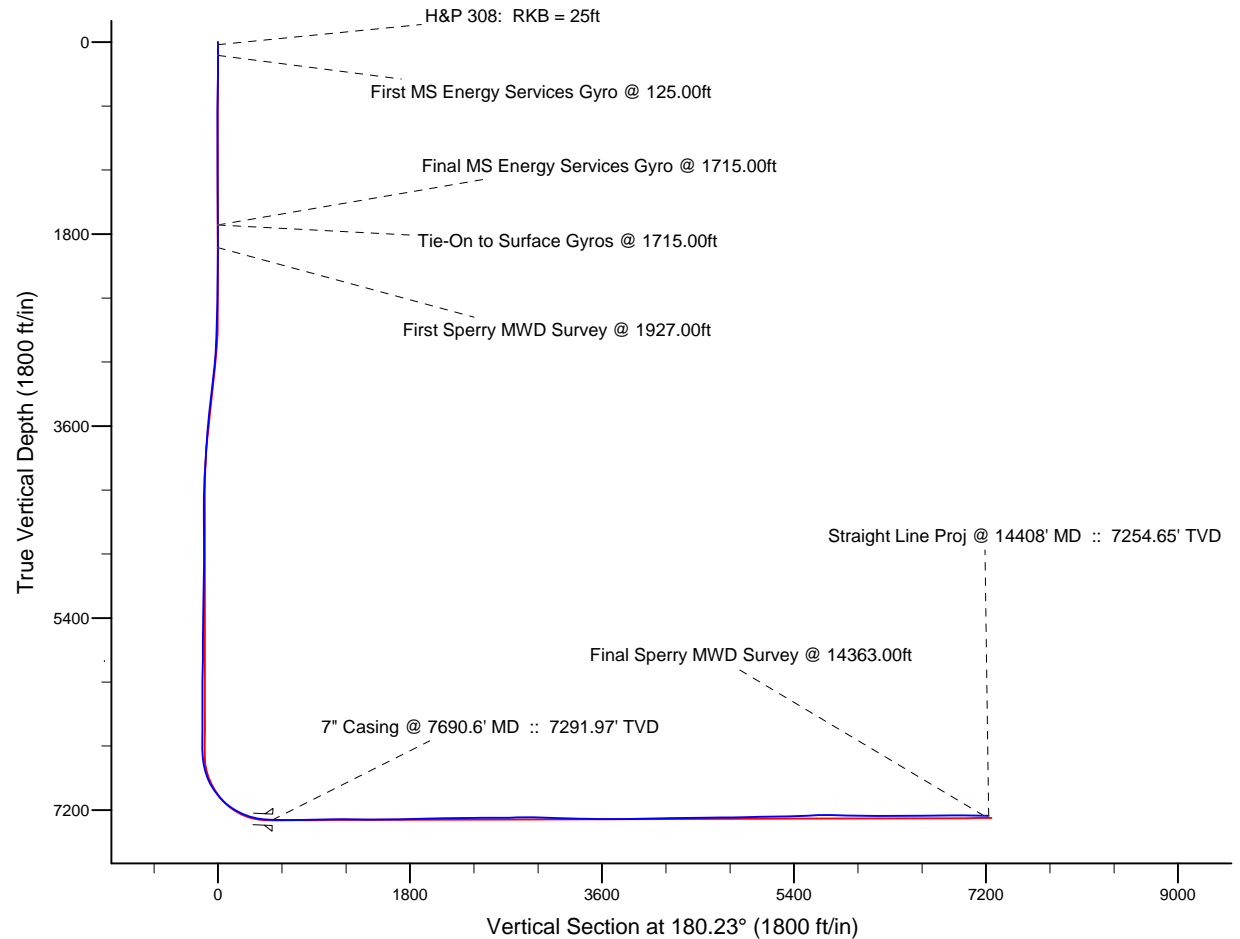
HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 34-T2N-R65W
 Well: Sparboe 8C-3HZ
 Wellbore: Plan C Rev 0
 Design: Actual Field Surveys



LEGEND

- ◆ Sparboe 8C-3HZ, Plan C Rev 0, Plan C Rev 0 Proposal V0
- Actual Field Surveys



WELL DETAILS: Sparboe 8C-3HZ	
Ground Level:	4970.00
RKB=25 @ 4995.00ft (HP 308)	
Design: Actual Field Surveys (Sparboe 8C-3HZ/Plan C Rev 0)	
Created By: Fred Hartmann	Date: 02/27/2013
Reviewed: _____	Date: _____

Design Report for Sparboe 8C-3HZ - 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
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
H&P 308: RKB = 25ft							
125.00	0.24	279.88	125.00	0.04	-0.21	-0.04	0.24
First MS Energy Services Gyro @ 125.00ft							
225.00	0.34	268.54	225.00	0.06	-0.71	-0.06	0.11
325.00	0.56	305.56	325.00	0.34	-1.40	-0.34	0.35
425.00	0.64	324.99	424.99	1.08	-2.12	-1.07	0.22
525.00	0.67	327.98	524.98	2.04	-2.75	-2.02	0.05
625.00	0.19	266.37	624.98	2.52	-3.23	-2.51	0.60
725.00	0.40	18.65	724.98	2.84	-3.28	-2.83	0.50
825.00	0.31	233.17	824.98	3.01	-3.39	-3.00	0.68
925.00	0.30	32.93	924.98	3.07	-3.46	-3.05	0.60
1,025.00	0.28	26.91	1,024.98	3.50	-3.21	-3.49	0.04
1,125.00	0.28	98.41	1,124.98	3.69	-2.86	-3.68	0.33
1,225.00	0.30	0.09	1,224.98	3.91	-2.61	-3.90	0.44
1,325.00	0.30	182.32	1,324.98	3.91	-2.62	-3.90	0.60
1,425.00	0.23	70.50	1,424.97	3.72	-2.44	-3.71	0.44
1,525.00	0.34	288.67	1,524.97	3.88	-2.54	-3.87	0.54
1,625.00	0.29	26.41	1,624.97	4.20	-2.70	-4.19	0.48
1,715.00	0.29	166.81	1,714.97	4.18	-2.55	-4.17	0.61
Final MS Energy Services Gyro @ 1715.00ft - Tie-On to Surface Gyros @ 1715.00ft							
1,927.00	0.69	120.78	1,926.97	3.01	-1.33	-3.00	0.25
First Sperry MWD Survey @ 1927.00ft							
2,018.00	0.09	328.97	2,017.96	2.79	-0.90	-2.79	0.85
2,110.00	0.51	98.29	2,109.96	2.79	-0.53	-2.79	0.62
2,205.00	0.31	57.64	2,204.96	2.87	0.10	-2.87	0.36
2,300.00	0.29	34.93	2,299.96	3.20	0.46	-3.21	0.13
2,395.00	0.40	332.94	2,394.96	3.70	0.45	-3.70	0.39
2,489.00	2.68	323.77	2,488.92	5.76	-1.00	-5.76	2.43
2,584.00	2.63	313.88	2,583.82	9.06	-3.89	-9.05	0.48
2,678.00	2.44	296.92	2,677.72	11.46	-7.22	-11.44	0.82
2,773.00	3.81	309.78	2,772.58	14.40	-11.45	-14.35	1.61
2,868.00	5.51	312.43	2,867.26	19.50	-17.25	-19.43	1.80
3,057.00	9.73	304.97	3,054.56	34.78	-37.04	-34.63	2.29
3,152.00	11.03	308.78	3,148.00	45.07	-50.70	-44.87	1.55
3,247.00	9.66	307.14	3,241.46	55.58	-64.14	-55.32	1.47
3,342.00	10.08	313.23	3,335.05	66.09	-76.55	-65.78	1.18
3,437.00	10.86	307.16	3,428.47	77.19	-89.74	-76.83	1.42
3,531.00	9.39	309.41	3,521.01	87.40	-102.73	-86.99	1.62
3,626.00	7.84	308.32	3,614.93	96.34	-113.80	-95.88	1.64
3,721.00	7.07	309.51	3,709.13	104.08	-123.39	-103.58	0.83
3,816.00	5.42	311.79	3,803.56	110.79	-131.25	-110.26	1.76
3,911.00	4.92	310.74	3,898.17	116.44	-137.68	-115.88	0.54
4,006.00	4.39	310.26	3,992.86	121.45	-143.54	-120.87	0.56
4,101.00	3.89	314.63	4,087.61	126.06	-148.61	-125.46	0.62
4,195.00	3.93	317.73	4,181.39	130.68	-153.05	-130.07	0.23
4,290.00	2.58	295.53	4,276.24	134.01	-157.17	-133.38	1.92
4,385.00	1.75	266.27	4,371.18	134.84	-160.54	-134.20	1.43
4,480.00	1.07	235.30	4,466.15	134.24	-162.72	-133.59	1.05

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,671.00	0.66	222.21	4,657.13	132.41	-164.93	-131.75	0.24
4,860.00	0.47	289.96	4,846.12	131.87	-166.39	-131.20	0.34
5,049.00	1.23	340.13	5,035.10	134.04	-167.80	-133.37	0.53
5,240.00	0.92	337.29	5,226.07	137.39	-169.09	-136.71	0.16
5,429.00	0.80	10.15	5,415.04	140.08	-169.45	-139.40	0.26
5,618.00	0.46	1.23	5,604.03	142.14	-169.20	-141.46	0.19
5,808.00	0.50	354.65	5,794.03	143.73	-169.26	-143.05	0.04
5,997.00	1.31	2.08	5,983.00	146.71	-169.26	-146.03	0.43
6,092.00	0.52	210.34	6,077.99	147.42	-169.43	-146.74	1.88
6,187.00	0.78	212.75	6,172.99	146.51	-170.00	-145.82	0.28
6,282.00	0.96	311.81	6,267.98	146.49	-170.94	-145.81	1.40
6,472.00	0.85	100.55	6,457.97	147.30	-170.75	-146.61	0.92
6,567.00	1.34	74.90	6,552.96	147.46	-168.98	-146.78	0.72
6,661.00	2.29	100.98	6,646.91	147.39	-166.08	-146.72	1.31
6,693.00	4.13	154.72	6,678.86	146.22	-164.96	-145.56	10.42
6,725.00	6.48	171.28	6,710.73	143.39	-164.19	-142.73	8.69
6,756.00	8.27	175.52	6,741.47	139.44	-163.75	-138.78	6.03
6,788.00	10.34	172.53	6,773.05	134.30	-163.20	-133.64	6.64
6,819.00	13.26	172.32	6,803.39	128.02	-162.36	-127.36	9.42
6,851.00	15.80	179.76	6,834.36	120.02	-161.85	-119.37	9.84
6,882.00	17.89	187.13	6,864.04	111.07	-162.42	-110.42	9.63
6,914.00	21.05	189.53	6,894.20	100.53	-163.99	-99.87	10.18
6,946.00	24.45	189.25	6,923.71	88.32	-166.00	-87.65	10.63
6,977.00	28.17	187.11	6,951.49	74.72	-167.94	-74.05	12.38
7,009.00	31.44	184.62	6,979.26	58.90	-169.55	-58.22	10.92
7,041.00	34.40	183.83	7,006.12	41.56	-170.82	-40.87	9.35
7,072.00	36.32	182.91	7,031.40	23.65	-171.88	-22.96	6.43
7,104.00	38.12	182.47	7,056.88	4.32	-172.78	-3.62	5.69
7,136.00	40.86	181.10	7,081.57	-16.02	-173.41	16.71	8.98
7,167.00	43.72	179.85	7,104.50	-36.87	-173.58	37.57	9.62
7,199.00	47.18	177.52	7,126.95	-59.67	-173.04	60.36	11.99
7,230.00	50.66	178.00	7,147.32	-83.01	-172.13	83.70	11.29
7,262.00	54.15	179.41	7,166.84	-108.36	-171.56	109.04	11.45
7,293.00	57.39	180.05	7,184.27	-133.98	-171.45	134.67	10.59
7,325.00	59.52	180.49	7,201.01	-161.25	-171.57	161.94	6.76
7,357.00	62.28	179.36	7,216.57	-189.21	-171.53	189.90	9.16
7,388.00	65.65	179.47	7,230.18	-217.06	-171.25	217.74	10.88
7,420.00	68.09	179.10	7,242.75	-246.48	-170.88	247.16	7.70
7,452.00	69.84	178.99	7,254.23	-276.34	-170.38	277.02	5.48
7,483.00	73.07	179.20	7,264.09	-305.73	-169.92	306.41	10.44
7,515.00	76.58	178.71	7,272.47	-336.60	-169.36	337.28	11.07
7,546.00	79.87	178.28	7,278.79	-366.93	-168.56	367.61	10.70
7,578.00	82.81	178.19	7,283.61	-398.55	-167.58	399.22	9.19
7,609.00	84.90	177.76	7,286.93	-429.35	-166.50	430.02	6.88
7,653.00	86.80	177.64	7,290.11	-473.20	-164.73	473.86	4.33
7,690.60	87.55	178.36	7,291.97	-510.73	-163.42	511.38	2.76
7" Casing @ 7690.6' MD :: 7291.97' TVD							
7,727.00	88.27	179.06	7,293.30	-547.09	-162.61	547.74	2.76
7,819.00	89.88	179.18	7,294.78	-639.07	-161.19	639.71	1.75
7,911.00	90.80	179.65	7,294.23	-731.06	-160.25	731.70	1.12
8,003.00	91.23	180.31	7,292.61	-823.05	-160.22	823.68	0.86

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,095.00	91.67	180.16	7,290.28	-915.02	-160.60	915.65	0.51
8,187.00	91.29	180.22	7,287.90	-1,006.98	-160.90	1,007.62	0.42
8,278.00	90.80	179.82	7,286.24	-1,097.97	-160.94	1,098.61	0.70
8,370.00	89.32	178.87	7,286.14	-1,189.96	-159.88	1,190.59	1.91
8,462.00	89.94	179.69	7,286.74	-1,281.95	-158.73	1,282.58	1.12
8,553.00	89.14	180.20	7,287.47	-1,372.94	-158.64	1,373.57	1.04
8,645.00	89.69	180.54	7,288.41	-1,464.94	-159.23	1,465.56	0.70
8,737.00	90.74	181.38	7,288.06	-1,556.92	-160.78	1,557.55	1.46
8,829.00	90.80	181.38	7,286.83	-1,648.89	-162.99	1,649.53	0.07
8,921.00	90.31	181.09	7,285.94	-1,740.86	-164.97	1,741.51	0.62
9,012.00	91.98	181.92	7,284.12	-1,831.81	-167.36	1,832.46	2.05
9,104.00	91.92	181.48	7,280.99	-1,923.71	-170.09	1,924.38	0.48
9,196.00	91.05	180.49	7,278.60	-2,015.67	-171.67	2,016.34	1.43
9,288.00	90.99	180.99	7,276.97	-2,107.64	-172.86	2,108.32	0.55
9,380.00	90.43	180.43	7,275.83	-2,199.63	-174.00	2,200.31	0.86
9,472.00	90.62	180.74	7,274.98	-2,291.62	-174.94	2,292.30	0.40
9,564.00	90.49	180.45	7,274.09	-2,383.61	-175.89	2,384.30	0.35
9,656.00	90.31	180.24	7,273.45	-2,475.61	-176.45	2,476.30	0.30
9,748.00	89.88	180.42	7,273.30	-2,567.60	-176.98	2,568.29	0.51
9,840.00	89.94	179.88	7,273.44	-2,659.60	-177.22	2,660.29	0.59
9,932.00	92.35	182.33	7,271.60	-2,751.55	-178.99	2,752.25	3.73
10,024.00	91.92	182.39	7,268.17	-2,843.41	-182.78	2,844.12	0.47
10,116.00	89.20	180.85	7,267.28	-2,935.36	-185.38	2,936.08	3.40
10,208.00	87.96	179.40	7,269.56	-3,027.33	-185.58	3,028.05	2.07
10,300.00	87.28	180.41	7,273.38	-3,119.25	-185.43	3,119.97	1.32
10,392.00	88.64	180.63	7,276.65	-3,211.18	-186.26	3,211.90	1.50
10,483.00	88.15	179.55	7,279.20	-3,302.14	-186.40	3,302.87	1.30
10,575.00	89.38	179.49	7,281.18	-3,394.12	-185.63	3,394.84	1.34
10,670.00	88.33	179.25	7,283.08	-3,489.09	-184.59	3,489.81	1.13
10,765.00	89.69	179.22	7,284.72	-3,584.07	-183.32	3,584.77	1.43
10,860.00	89.75	180.05	7,285.19	-3,679.06	-182.72	3,679.77	0.88
10,955.00	91.24	180.47	7,284.37	-3,774.06	-183.15	3,774.76	1.63
11,050.00	90.74	180.64	7,282.72	-3,869.04	-184.07	3,869.74	0.56
11,145.00	90.80	180.42	7,281.45	-3,964.02	-184.95	3,964.73	0.24
11,240.00	91.05	180.32	7,279.91	-4,059.01	-185.56	4,059.72	0.28
11,335.00	90.93	180.36	7,278.27	-4,153.99	-186.12	4,154.71	0.13
11,430.00	90.87	179.27	7,276.78	-4,248.98	-185.82	4,249.69	1.15
11,525.00	90.99	179.11	7,275.24	-4,343.96	-184.47	4,344.66	0.21
11,620.00	91.11	179.11	7,273.50	-4,438.93	-183.00	4,439.63	0.13
11,715.00	90.74	179.39	7,271.96	-4,533.91	-181.75	4,534.60	0.49
11,810.00	90.68	179.47	7,270.79	-4,628.90	-180.81	4,629.59	0.11
11,905.00	90.80	179.76	7,269.56	-4,723.89	-180.17	4,724.57	0.33
12,000.00	90.31	179.24	7,268.64	-4,818.88	-179.34	4,819.56	0.75
12,080.00	90.71	179.56	7,267.93	-4,898.87	-178.50	4,899.55	0.64
12,175.00	91.29	179.39	7,266.27	-4,993.85	-177.63	4,994.53	0.64
12,270.00	92.03	179.00	7,263.52	-5,088.80	-176.30	5,089.47	0.88
12,365.00	90.65	179.41	7,261.30	-5,183.76	-174.98	5,184.43	1.52
12,460.00	90.74	178.80	7,260.14	-5,278.75	-173.50	5,279.40	0.65
12,555.00	91.95	181.57	7,257.91	-5,373.71	-173.80	5,374.36	3.18
12,650.00	92.91	181.92	7,253.89	-5,468.58	-176.69	5,469.24	1.08
12,745.00	92.04	182.24	7,249.78	-5,563.43	-180.14	5,564.10	0.98

Design Report for Sparboe 8C-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
12,840.00	90.00	182.91	7,248.09	-5,658.31	-184.41	5,659.00	2.26
12,935.00	89.88	182.13	7,248.19	-5,753.22	-188.58	5,753.93	0.83
13,030.00	89.44	182.96	7,248.76	-5,848.12	-192.80	5,848.85	0.99
13,125.00	88.53	182.28	7,250.44	-5,943.00	-197.14	5,943.75	1.20
13,220.00	88.58	183.40	7,252.83	-6,037.86	-201.85	6,038.62	1.18
13,315.00	88.70	182.33	7,255.09	-6,132.71	-206.60	6,133.49	1.13
13,410.00	89.14	182.55	7,256.88	-6,227.61	-210.64	6,228.40	0.52
13,505.00	90.89	183.72	7,256.85	-6,322.46	-215.84	6,323.27	2.22
13,600.00	90.68	182.14	7,255.55	-6,417.32	-220.69	6,418.16	1.68
13,695.00	91.42	182.42	7,253.81	-6,512.23	-224.47	6,513.08	0.83
13,790.00	90.90	181.90	7,251.89	-6,607.14	-228.05	6,608.00	0.77
13,885.00	90.43	181.40	7,250.79	-6,702.10	-230.78	6,702.97	0.72
13,980.00	90.22	181.26	7,250.25	-6,797.07	-232.99	6,797.95	0.27
14,075.00	90.55	182.90	7,249.61	-6,892.00	-236.44	6,892.89	1.76
14,170.00	89.35	181.65	7,249.69	-6,986.92	-240.21	6,987.83	1.82
14,265.00	88.70	181.46	7,251.31	-7,081.87	-242.79	7,082.79	0.71
14,363.00	88.64	181.81	7,253.58	-7,179.81	-245.58	7,180.73	0.36
Final Sperry MWD Survey @ 14363.00ft							
14,408.00	88.64	181.81	7,254.65	-7,224.77	-247.00	7,225.70	0.00
Straight Line Proj @ 14408' MD :: 7254.65' TVD							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.00	0.00	H&P 308: RKB = 25ft
125.00	125.00	0.04	-0.21	First MS Energy Services Gyro @ 125.00ft
1,715.00	1,714.97	4.18	-2.55	Final MS Energy Services Gyro @ 1715.00ft
1,715.00	1,714.97	4.18	-2.55	Tie-On to Surface Gyros @ 1715.00ft
1,927.00	1,926.97	3.01	-1.33	First Sperry MWD Survey @ 1927.00ft
14,363.00	7,253.58	-7,179.81	-245.58	Final Sperry MWD Survey @ 14363.00ft
14,408.00	7,254.65	-7,224.77	-247.00	Straight Line Proj @ 14408' MD :: 7254.65' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	180.23	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	1,715.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,927.00	7,653.00	Sperry MWD Surveys - Vert/Build	MWD+IFR1+SC
7,727.00	14,363.00	Sperry MWD Surveys - Lateral	MWD+IFR1+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,690.60	7,291.97	7" Casing @ 7690.6' MD :: 7291.97' TVD	7	8-3/4

Design Report for Sparboe 8C-3HZ - 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
Sparboe 8C-3HZ_BI - actual wellpath misses target center by 57.93ft at 14408.00ft MD (7254.65 TVD, -7224.77 N, -247.00 E) - Point	0.00	0.00	7,275.00	-7,249.41	-198.68	1,273,775.64	3,239,534.06	40.081731	-104.643951
Sparboe 8C-3HZ_1I - actual wellpath hits target center - Polygon Point 1 Point 2	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,508.10 788.23	-7,687.41 -7,714.31	1,273,296.05 1,273,320.32	3,235,229.25 3,240,525.38		
Sparboe 8C-3HZ_34 - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,474.82 -1,835.22 806.24	-4,995.44 -5,072.57 -5,154.06	1,275,988.11 1,275,936.49 1,275,880.52	3,235,236.51 3,237,876.63 3,240,518.65		
Sparboe 8C-3HZ_St - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 11 Point 12 Point 13 Point 14	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,019.34 -4,018.28 -4,015.40 -4,020.63 -4,048.10 -4,067.70 -1,885.36 312.52 328.22 343.08 342.86 327.20 310.74 -1,854.29	-209.94 -2,376.79 -4,548.65 -5,468.93 -7,692.32 -9,862.57 -9,878.32 -9,893.11 -7,712.01 -5,600.28 -4,679.78 -2,457.51 -233.97 -221.12	1,280,777.59 1,278,610.94 1,276,439.30 1,275,519.05 1,273,295.58 1,271,125.33 1,271,130.67 1,271,137.11 1,273,318.17 1,275,429.87 1,276,350.28 1,278,572.21 1,280,795.40 1,280,787.33	3,235,645.72 3,235,667.72 3,235,691.58 3,235,695.24 3,235,689.25 3,235,690.62 3,237,872.93 3,240,070.76 3,240,065.38 3,240,059.84 3,240,050.73 3,240,013.60 3,239,975.66 3,237,810.69		
Sparboe 8C-3HZ_St - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Sparboe 8C-3HZ_LL - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				310.74 -1,008.14 -959.76 -978.01 332.44 342.86	-233.97 -229.30 -4,620.77 -7,206.03 -7,274.99 -4,679.78	1,280,795.40 1,280,787.33 1,276,396.70 1,273,811.49 1,273,755.20 1,276,350.28	3,239,975.66 3,238,656.85 3,238,747.65 3,238,754.38 3,240,065.38 3,240,050.73		
Sparboe 8C-3HZ_Sc - actual wellpath hits target center - Polygon Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 11 Point 12	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
				-4,479.58 -4,478.30 -4,474.82 -4,508.10 -4,531.87 -1,888.63 769.22 788.23 806.24 787.29 767.39 -1,856.11	252.45 -2,368.25 -4,995.44 -7,687.41 -10,319.43 -10,338.32 -10,356.20 -7,714.31 -5,154.38 -2,466.06 223.35 238.92	1,281,235.50 1,278,615.04 1,275,988.11 1,273,296.05 1,270,664.03 1,270,670.67 1,270,678.47 1,273,320.32 1,275,880.20 1,278,568.11 1,281,257.09 1,281,247.31	3,235,181.05 3,235,207.65 3,235,236.51 3,235,229.25 3,235,230.91 3,237,874.10 3,240,531.89 3,240,525.38 3,240,518.65 3,240,473.73 3,240,427.85 3,237,804.43		

North Reference Sheet for Sec. 34-T2N-R65W - Sparboe 8C-3HZ - Plan C 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=25 @ 4995.00ft (HP 308). Northing and Easting are relative to Sparboe 8C-3HZ

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996022

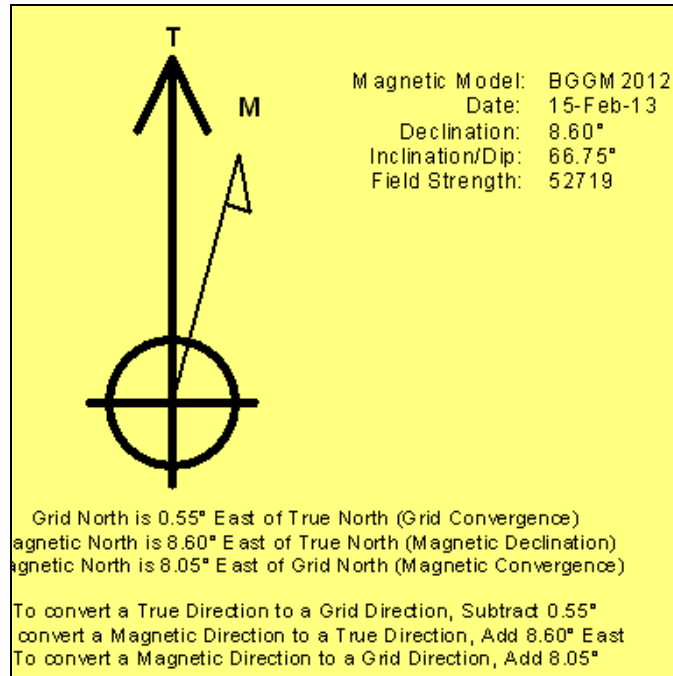
Grid Coordinates of Well: 1,281,026.35 ft N, 3,239,662.69 ft E

Geographical Coordinates of Well: 40° 06' 05.87" N, 104° 38' 35.67" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,408.00ft
the Bottom Hole Displacement is 7,228.99ft in the Direction of 181.96° (True).

Magnetic Convergence at surface is: -8.05° (15 February 2013, , BGGM2012)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 34-T2N-R65W

Sparboe 8C-3HZ

Plan C Rev 0

Design: Actual Field Surveys

Survey Report - Geographic

27 February, 2013

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

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

Site	Sec. 34-T2N-R65W				
Site Position:		Northing:	1,281,025.39ft	Latitude:	40.101626
From:	Lat/Long	Easting:	3,239,752.49ft	Longitude:	-104.642920
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.55 °

Well	Sparboe 8C-3HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,281,026.35 ft	Latitude:	40.101631
	+E/-W	0.00 ft	Easting:	3,239,662.69 ft	Longitude:	-104.643241
Position Uncertainty		3.28 ft	Wellhead Elevation:	ft	Ground Level:	4,970.00 ft

Wellbore	Plan C Rev 0				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	02-15-2013	8.60	66.75	52,719

Design	Actual Field Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	180.23	

Survey Program	Date	02-27-2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	1,715.00	MS Energy Services - Surface Gyros (Plar	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,927.00	7,653.00	Sperry MWD Surveys - Vert/Build (Plan C	MWD+IFR1+SC	Fixed:v2:crustal field dec & axial correction	
7,727.00	14,363.00	Sperry MWD Surveys - Lateral (Plan C Re	MWD+IFR1+SC	Fixed:v2:crustal field dec & axial correction	

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	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	1,281,026.35	3,239,662.69	40.101631	-104.643241
25.00	0.00	0.00	25.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
H&P 308: RKB = 25ft									
125.00	0.24	279.88	125.00	0.04	-0.21	1,281,026.38	3,239,662.48	40.101631	-104.643242
First MS Energy Services Gyro @ 125.00ft									
225.00	0.34	268.54	225.00	0.06	-0.71	1,281,026.40	3,239,661.98	40.101631	-104.643244
325.00	0.56	305.56	325.00	0.34	-1.40	1,281,026.67	3,239,661.28	40.101632	-104.643246
425.00	0.64	324.99	424.99	1.08	-2.12	1,281,027.41	3,239,660.55	40.101634	-104.643249
525.00	0.67	327.98	524.98	2.04	-2.75	1,281,028.36	3,239,659.91	40.101637	-104.643251
625.00	0.19	266.37	624.98	2.52	-3.23	1,281,028.84	3,239,659.43	40.101638	-104.643253
725.00	0.40	18.65	724.98	2.84	-3.28	1,281,029.16	3,239,659.38	40.101639	-104.643253
825.00	0.31	233.17	824.98	3.01	-3.39	1,281,029.32	3,239,659.27	40.101639	-104.643253
925.00	0.30	32.93	924.98	3.07	-3.46	1,281,029.38	3,239,659.20	40.101639	-104.643253
1,025.00	0.28	26.91	1,024.98	3.50	-3.21	1,281,029.82	3,239,659.44	40.101641	-104.643252
1,125.00	0.28	98.41	1,124.98	3.69	-2.86	1,281,030.01	3,239,659.79	40.101641	-104.643251
1,225.00	0.30	0.09	1,224.98	3.91	-2.61	1,281,030.23	3,239,660.03	40.101642	-104.643250
1,325.00	0.30	182.32	1,324.98	3.91	-2.62	1,281,030.23	3,239,660.02	40.101642	-104.643250
1,425.00	0.23	70.50	1,424.97	3.72	-2.44	1,281,030.04	3,239,660.20	40.101641	-104.643250
1,525.00	0.34	288.67	1,524.97	3.88	-2.54	1,281,030.20	3,239,660.11	40.101642	-104.643250
1,625.00	0.29	26.41	1,624.97	4.20	-2.70	1,281,030.52	3,239,659.94	40.101643	-104.643251
1,715.00	0.29	166.81	1,714.97	4.18	-2.55	1,281,030.51	3,239,660.09	40.101642	-104.643250
Final MS Energy Services Gyro @ 1715.00ft - Tie-On to Surface Gyros @ 1715.00ft									
1,927.00	0.69	120.78	1,926.97	3.01	-1.33	1,281,029.34	3,239,661.32	40.101639	-104.643246
First Sperry MWD Survey @ 1927.00ft									
2,018.00	0.09	328.97	2,017.96	2.79	-0.90	1,281,029.13	3,239,661.76	40.101639	-104.643244
2,110.00	0.51	98.29	2,109.96	2.79	-0.53	1,281,029.13	3,239,662.13	40.101639	-104.643243
2,205.00	0.31	57.64	2,204.96	2.87	0.10	1,281,029.22	3,239,662.76	40.101639	-104.643241
2,300.00	0.29	34.93	2,299.96	3.20	0.46	1,281,029.56	3,239,663.11	40.101640	-104.643239
2,395.00	0.40	332.94	2,394.96	3.70	0.45	1,281,030.05	3,239,663.10	40.101641	-104.643239
2,489.00	2.68	323.77	2,488.92	5.76	-1.00	1,281,032.10	3,239,661.63	40.101647	-104.643245
2,584.00	2.63	313.88	2,583.82	9.06	-3.89	1,281,035.37	3,239,658.71	40.101656	-104.643255
2,678.00	2.44	296.92	2,677.72	11.46	-7.22	1,281,037.74	3,239,655.35	40.101662	-104.643267
2,773.00	3.81	309.78	2,772.58	14.40	-11.45	1,281,040.64	3,239,651.09	40.101671	-104.643282
2,868.00	5.51	312.43	2,867.26	19.50	-17.25	1,281,045.68	3,239,645.25	40.101685	-104.643303
3,057.00	9.73	304.97	3,054.56	34.78	-37.04	1,281,060.77	3,239,625.31	40.101726	-104.643373
3,152.00	11.03	308.78	3,148.00	45.07	-50.70	1,281,070.93	3,239,611.55	40.101755	-104.643422
3,247.00	9.66	307.14	3,241.46	55.58	-64.14	1,281,081.30	3,239,598.01	40.101784	-104.643470
3,342.00	10.08	313.23	3,335.05	66.09	-76.55	1,281,091.69	3,239,585.50	40.101812	-104.643515
3,437.00	10.86	307.16	3,428.47	77.19	-89.74	1,281,102.66	3,239,572.20	40.101843	-104.643562
3,531.00	9.39	309.41	3,521.01	87.40	-102.73	1,281,112.75	3,239,559.12	40.101871	-104.643608
3,626.00	7.84	308.32	3,614.93	96.34	-113.80	1,281,121.58	3,239,547.97	40.101895	-104.643648
3,721.00	7.07	309.51	3,709.13	104.08	-123.39	1,281,129.23	3,239,538.30	40.101917	-104.643682
3,816.00	5.42	311.79	3,803.56	110.79	-131.25	1,281,135.86	3,239,530.38	40.101935	-104.643710
3,911.00	4.92	310.74	3,898.17	116.44	-137.68	1,281,141.44	3,239,523.89	40.101951	-104.643733
4,006.00	4.39	310.26	3,992.86	121.45	-143.54	1,281,146.40	3,239,517.98	40.101964	-104.643754
4,101.00	3.89	314.63	4,087.61	126.06	-148.61	1,281,150.96	3,239,512.87	40.101977	-104.643772
4,195.00	3.93	317.73	4,181.39	130.68	-153.05	1,281,155.54	3,239,508.39	40.101990	-104.643788
4,290.00	2.58	295.53	4,276.24	134.01	-157.17	1,281,158.83	3,239,504.24	40.101999	-104.643803
4,385.00	1.75	266.27	4,371.18	134.84	-160.54	1,281,159.63	3,239,500.85	40.102001	-104.643815
4,480.00	1.07	235.30	4,466.15	134.24	-162.72	1,281,159.01	3,239,498.68	40.101999	-104.643823
4,671.00	0.66	222.21	4,657.13	132.41	-164.93	1,281,157.15	3,239,496.50	40.101994	-104.643831
4,860.00	0.47	289.96	4,846.12	131.87	-166.39	1,281,156.60	3,239,495.04	40.101993	-104.643836
5,049.00	1.23	340.13	5,035.10	134.04	-167.80	1,281,158.76	3,239,493.60	40.101999	-104.643841
5,240.00	0.92	337.29	5,226.07	137.39	-169.09	1,281,162.09	3,239,492.28	40.102008	-104.643845
5,429.00	0.80	10.15	5,415.04	140.08	-169.45	1,281,164.78	3,239,491.90	40.102016	-104.643847

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	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
5,618.00	0.46	1.23	5,604.03	142.14	-169.20	1,281,166.84	3,239,492.13	40.102021	-104.643846
5,808.00	0.50	354.65	5,794.03	143.73	-169.26	1,281,168.43	3,239,492.05	40.102026	-104.643846
5,997.00	1.31	2.08	5,983.00	146.71	-169.26	1,281,171.41	3,239,492.03	40.102034	-104.643846
6,092.00	0.52	210.34	6,077.99	147.42	-169.43	1,281,172.12	3,239,491.84	40.102036	-104.643847
6,187.00	0.78	212.75	6,172.99	146.51	-170.00	1,281,171.20	3,239,491.28	40.102033	-104.643849
6,282.00	0.96	311.81	6,267.98	146.49	-170.94	1,281,171.18	3,239,490.34	40.102033	-104.643852
6,472.00	0.85	100.55	6,457.97	147.30	-170.75	1,281,171.98	3,239,490.53	40.102035	-104.643851
6,567.00	1.34	74.90	6,552.96	147.46	-168.98	1,281,172.16	3,239,492.29	40.102036	-104.643845
6,661.00	2.29	100.98	6,646.91	147.39	-166.08	1,281,172.12	3,239,495.20	40.102036	-104.643835
6,693.00	4.13	154.72	6,678.86	146.22	-164.96	1,281,170.96	3,239,496.33	40.102032	-104.643831
6,725.00	6.48	171.28	6,710.73	143.39	-164.19	1,281,168.14	3,239,497.12	40.102025	-104.643828
6,756.00	8.27	175.52	6,741.47	139.44	-163.75	1,281,164.20	3,239,497.60	40.102014	-104.643826
6,788.00	10.34	172.53	6,773.05	134.30	-163.20	1,281,159.06	3,239,498.20	40.102000	-104.643824
6,819.00	13.26	172.32	6,803.39	128.02	-162.36	1,281,152.78	3,239,499.10	40.101982	-104.643821
6,851.00	15.80	179.76	6,834.36	120.02	-161.85	1,281,144.79	3,239,499.69	40.101960	-104.643820
6,882.00	17.89	187.13	6,864.04	111.07	-162.42	1,281,135.84	3,239,499.20	40.101936	-104.643822
6,914.00	21.05	189.53	6,894.20	100.53	-163.99	1,281,125.28	3,239,497.74	40.101907	-104.643827
6,946.00	24.45	189.25	6,923.71	88.32	-166.00	1,281,113.05	3,239,495.84	40.101873	-104.643834
6,977.00	28.17	187.11	6,951.49	74.72	-167.94	1,281,099.44	3,239,494.04	40.101836	-104.643841
7,009.00	31.44	184.62	6,979.26	58.90	-169.55	1,281,083.61	3,239,492.58	40.101793	-104.643847
7,041.00	34.40	183.83	7,006.12	41.56	-170.82	1,281,066.25	3,239,491.47	40.101745	-104.643852
7,072.00	36.32	182.91	7,031.40	23.65	-171.88	1,281,048.34	3,239,490.60	40.101696	-104.643855
7,104.00	38.12	182.47	7,056.88	4.32	-172.78	1,281,029.00	3,239,489.88	40.101643	-104.643859
7,136.00	40.86	181.10	7,081.57	-16.02	-173.41	1,281,008.65	3,239,489.45	40.101587	-104.643861
7,167.00	43.72	179.85	7,104.50	-36.87	-173.58	1,280,987.80	3,239,489.48	40.101530	-104.643861
7,199.00	47.18	177.52	7,126.95	-59.67	-173.04	1,280,965.01	3,239,490.24	40.101467	-104.643860
7,230.00	50.66	178.00	7,147.32	-83.01	-172.13	1,280,941.68	3,239,491.37	40.101403	-104.643856
7,262.00	54.15	179.41	7,166.84	-108.36	-171.56	1,280,916.34	3,239,492.18	40.101334	-104.643854
7,293.00	57.39	180.05	7,184.27	-133.98	-171.45	1,280,890.72	3,239,492.55	40.101263	-104.643854
7,325.00	59.52	180.49	7,201.01	-161.25	-171.57	1,280,863.45	3,239,492.68	40.101188	-104.643854
7,357.00	62.28	179.36	7,216.57	-189.21	-171.53	1,280,835.50	3,239,492.99	40.101112	-104.643854
7,388.00	65.65	179.47	7,230.18	-217.06	-171.25	1,280,807.65	3,239,493.55	40.101035	-104.643853
7,420.00	68.09	179.10	7,242.75	-246.48	-170.88	1,280,778.24	3,239,494.20	40.100954	-104.643852
7,452.00	69.84	178.99	7,254.23	-276.34	-170.38	1,280,748.38	3,239,494.99	40.100872	-104.643850
7,483.00	73.07	179.20	7,264.09	-305.73	-169.92	1,280,719.01	3,239,495.73	40.100792	-104.643848
7,515.00	76.58	178.71	7,272.47	-336.60	-169.36	1,280,688.14	3,239,496.60	40.100707	-104.643846
7,546.00	79.87	178.28	7,278.79	-366.93	-168.56	1,280,657.82	3,239,497.69	40.100624	-104.643844
7,578.00	82.81	178.19	7,283.61	-398.55	-167.58	1,280,626.21	3,239,498.97	40.100537	-104.643840
7,609.00	84.90	177.76	7,286.93	-429.35	-166.50	1,280,595.43	3,239,500.35	40.100452	-104.643836
7,653.00	86.80	177.64	7,290.11	-473.20	-164.73	1,280,551.60	3,239,502.54	40.100332	-104.643830
7,690.60	87.55	178.36	7,291.97	-510.73	-163.42	1,280,514.08	3,239,504.21	40.100229	-104.643825
7" Casing @ 7690.6' MD :: 7291.97' TVD									
7,727.00	88.27	179.06	7,293.30	-547.09	-162.61	1,280,477.73	3,239,505.38	40.100129	-104.643822
7,819.00	89.88	179.18	7,294.78	-639.07	-161.19	1,280,385.78	3,239,507.68	40.099877	-104.643817
7,911.00	90.80	179.65	7,294.23	-731.06	-160.25	1,280,293.80	3,239,509.51	40.099624	-104.643814
8,003.00	91.23	180.31	7,292.61	-823.05	-160.22	1,280,201.82	3,239,510.43	40.099372	-104.643814
8,095.00	91.67	180.16	7,290.28	-915.02	-160.60	1,280,109.86	3,239,510.94	40.099119	-104.643815
8,187.00	91.29	180.22	7,287.90	-1,006.98	-160.90	1,280,017.90	3,239,511.52	40.098867	-104.643816
8,278.00	90.80	179.82	7,286.24	-1,097.97	-160.94	1,279,926.92	3,239,512.37	40.098617	-104.643816
8,370.00	89.32	178.87	7,286.14	-1,189.96	-159.88	1,279,834.95	3,239,514.31	40.098364	-104.643813
8,462.00	89.94	179.69	7,286.74	-1,281.95	-158.73	1,279,742.98	3,239,516.36	40.098112	-104.643808
8,553.00	89.14	180.20	7,287.47	-1,372.94	-158.64	1,279,651.99	3,239,517.32	40.097862	-104.643808
8,645.00	89.69	180.54	7,288.41	-1,464.94	-159.23	1,279,560.00	3,239,517.62	40.097610	-104.643810
8,737.00	90.74	181.38	7,288.06	-1,556.92	-160.78	1,279,468.01	3,239,516.96	40.097357	-104.643816
8,829.00	90.80	181.38	7,286.83	-1,648.89	-162.99	1,279,376.03	3,239,515.64	40.097105	-104.643824

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	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
8,921.00	90.31	181.09	7,285.94	-1,740.86	-164.97	1,279,284.04	3,239,514.54	40.096852	-104.643831
9,012.00	91.98	181.92	7,284.12	-1,831.81	-167.36	1,279,193.08	3,239,513.03	40.096603	-104.643839
9,104.00	91.92	181.48	7,280.99	-1,923.71	-170.09	1,279,101.16	3,239,511.19	40.096350	-104.643849
9,196.00	91.05	180.49	7,278.60	-2,015.67	-171.67	1,279,009.20	3,239,510.50	40.096098	-104.643855
9,288.00	90.99	180.99	7,276.97	-2,107.64	-172.86	1,278,917.22	3,239,510.20	40.095845	-104.643859
9,380.00	90.43	180.43	7,275.83	-2,199.63	-174.00	1,278,825.23	3,239,509.95	40.095593	-104.643863
9,472.00	90.62	180.74	7,274.98	-2,291.62	-174.94	1,278,733.23	3,239,509.90	40.095340	-104.643866
9,564.00	90.49	180.45	7,274.09	-2,383.61	-175.89	1,278,641.24	3,239,509.83	40.095088	-104.643870
9,656.00	90.31	180.24	7,273.45	-2,475.61	-176.45	1,278,549.25	3,239,510.17	40.094835	-104.643872
9,748.00	89.88	180.42	7,273.30	-2,567.60	-176.98	1,278,457.25	3,239,510.53	40.094583	-104.643874
9,840.00	89.94	179.88	7,273.44	-2,659.60	-177.22	1,278,365.26	3,239,511.18	40.094330	-104.643874
9,932.00	92.35	182.33	7,271.60	-2,751.55	-178.99	1,278,273.30	3,239,510.29	40.094078	-104.643881
10,024.00	91.92	182.39	7,268.17	-2,843.41	-182.78	1,278,181.41	3,239,507.39	40.093826	-104.643894
10,116.00	89.20	180.85	7,267.28	-2,935.36	-185.38	1,278,089.45	3,239,505.68	40.093573	-104.643904
10,208.00	87.96	179.40	7,269.56	-3,027.33	-185.58	1,277,997.49	3,239,506.37	40.093321	-104.643904
10,300.00	87.28	180.41	7,273.38	-3,119.25	-185.43	1,277,905.58	3,239,507.41	40.093069	-104.643904
10,392.00	88.64	180.63	7,276.65	-3,211.18	-186.26	1,277,813.64	3,239,507.46	40.092816	-104.643907
10,483.00	88.15	179.55	7,279.20	-3,302.14	-186.40	1,277,722.69	3,239,508.20	40.092566	-104.643907
10,575.00	89.38	179.49	7,281.18	-3,394.12	-185.63	1,277,630.73	3,239,509.86	40.092314	-104.643904
10,670.00	88.33	179.25	7,283.08	-3,489.09	-184.59	1,277,535.77	3,239,511.82	40.092053	-104.643901
10,765.00	89.69	179.22	7,284.72	-3,584.07	-183.32	1,277,440.82	3,239,514.01	40.091793	-104.643896
10,860.00	89.75	180.05	7,285.19	-3,679.06	-182.72	1,277,345.84	3,239,515.53	40.091532	-104.643894
10,955.00	91.24	180.47	7,284.37	-3,774.06	-183.15	1,277,250.85	3,239,516.02	40.091271	-104.643896
11,050.00	90.74	180.64	7,282.72	-3,869.04	-184.07	1,277,155.87	3,239,516.01	40.091010	-104.643899
11,145.00	90.80	180.42	7,281.45	-3,964.02	-184.95	1,277,060.88	3,239,516.05	40.090750	-104.643902
11,240.00	91.05	180.32	7,279.91	-4,059.01	-185.56	1,276,965.90	3,239,516.36	40.090489	-104.643904
11,335.00	90.93	180.36	7,278.27	-4,153.99	-186.12	1,276,870.91	3,239,516.71	40.090228	-104.643906
11,430.00	90.87	179.27	7,276.78	-4,248.98	-185.82	1,276,775.94	3,239,517.94	40.089967	-104.643905
11,525.00	90.99	179.11	7,275.24	-4,343.96	-184.47	1,276,680.98	3,239,520.20	40.089707	-104.643900
11,620.00	91.11	179.11	7,273.50	-4,438.93	-183.00	1,276,586.03	3,239,522.59	40.089446	-104.643895
11,715.00	90.74	179.39	7,271.96	-4,533.91	-181.75	1,276,491.07	3,239,524.75	40.089185	-104.643891
11,810.00	90.68	179.47	7,270.79	-4,628.90	-180.81	1,276,396.10	3,239,526.61	40.088924	-104.643887
11,905.00	90.80	179.76	7,269.56	-4,723.89	-180.17	1,276,301.13	3,239,528.17	40.088664	-104.643885
12,000.00	90.31	179.24	7,268.64	-4,818.88	-179.34	1,276,206.15	3,239,529.92	40.088403	-104.643882
12,080.00	90.71	179.56	7,267.93	-4,898.87	-178.50	1,276,126.17	3,239,531.53	40.088183	-104.643879
12,175.00	91.29	179.39	7,266.27	-4,993.85	-177.63	1,276,031.21	3,239,533.31	40.087923	-104.643876
12,270.00	92.03	179.00	7,263.52	-5,088.80	-176.30	1,275,936.28	3,239,535.56	40.087662	-104.643871
12,365.00	90.65	179.41	7,261.30	-5,183.76	-174.98	1,275,841.34	3,239,537.80	40.087401	-104.643866
12,460.00	90.74	178.80	7,260.14	-5,278.75	-173.50	1,275,746.38	3,239,540.20	40.087141	-104.643861
12,555.00	91.95	181.57	7,257.91	-5,373.71	-173.80	1,275,651.42	3,239,540.81	40.086880	-104.643862
12,650.00	92.91	181.92	7,253.89	-5,468.58	-176.69	1,275,556.54	3,239,538.84	40.086619	-104.643872
12,745.00	92.04	182.24	7,249.78	-5,563.43	-180.14	1,275,461.66	3,239,536.31	40.086359	-104.643885
12,840.00	90.00	182.91	7,248.09	-5,658.31	-184.41	1,275,366.75	3,239,532.96	40.086099	-104.643900
12,935.00	89.88	182.13	7,248.19	-5,753.22	-188.58	1,275,271.81	3,239,529.70	40.085838	-104.643915
13,030.00	89.44	182.96	7,248.76	-5,848.12	-192.80	1,275,176.87	3,239,526.40	40.085578	-104.643930
13,125.00	88.53	182.28	7,250.44	-5,943.00	-197.14	1,275,081.95	3,239,522.98	40.085317	-104.643946
13,220.00	88.58	183.40	7,252.83	-6,037.86	-201.85	1,274,987.06	3,239,519.19	40.085057	-104.643962
13,315.00	88.70	182.33	7,255.09	-6,132.71	-206.60	1,274,892.17	3,239,515.36	40.084796	-104.643979
13,410.00	89.14	182.55	7,256.88	-6,227.61	-210.64	1,274,797.25	3,239,512.23	40.084536	-104.643994
13,505.00	90.89	183.72	7,256.85	-6,322.46	-215.84	1,274,702.35	3,239,507.95	40.084276	-104.644012
13,600.00	90.68	182.14	7,255.55	-6,417.32	-220.69	1,274,607.45	3,239,504.01	40.084015	-104.644030
13,695.00	91.42	182.42	7,253.81	-6,512.23	-224.47	1,274,512.51	3,239,501.15	40.083755	-104.644043
13,790.00	90.90	181.90	7,251.89	-6,607.14	-228.05	1,274,417.57	3,239,498.49	40.083494	-104.644056
13,885.00	90.43	181.40	7,250.79	-6,702.10	-230.78	1,274,322.60	3,239,496.67	40.083233	-104.644066
13,980.00	90.22	181.26	7,250.25	-6,797.07	-232.99	1,274,227.62	3,239,495.38	40.082973	-104.644074

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	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
14,075.00	90.55	182.90	7,249.61	-6,892.00	-236.44	1,274,132.66	3,239,492.85	40.082712	-104.644086
14,170.00	89.35	181.65	7,249.69	-6,986.92	-240.21	1,274,037.71	3,239,490.00	40.082452	-104.644099
14,265.00	88.70	181.46	7,251.31	-7,081.87	-242.79	1,273,942.74	3,239,488.34	40.082191	-104.644109
14,363.00	88.64	181.81	7,253.58	-7,179.81	-245.58	1,273,844.79	3,239,486.49	40.081922	-104.644119
Final Sperry MWD Survey @ 14363.00ft									
14,408.00	88.64	181.81	7,254.65	-7,224.77	-247.00	1,273,799.81	3,239,485.51	40.081799	-104.644124
Straight Line Proj @ 14408' MD :: 7254.65' TVD									

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

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
Sparboe 8C-3HZ_BHI - actual wellpath misses target center by 57.93ft at 14408.00ft MD (7254.65 TVD, -7224.77 N, -247.00 E) - Point	0.00	0.00	7,275.00	-7,249.41	-198.68	1,273,775.64	3,239,534.06	40.081731	-104.643951
Sparboe 8C-3HZ_1/2- - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Point 1			0.00	-7,687.41	-4,508.10	1,273,296.05	3,235,229.25		
Point 2			0.00	-7,714.31	788.23	1,273,320.32	3,240,525.38		
Sparboe 8C-3HZ_34/ - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Point 1			0.00	-4,995.44	-4,474.82	1,275,988.11	3,235,236.51		
Point 2			0.00	-5,072.57	-1,835.22	1,275,936.49	3,237,876.63		
Point 3			0.00	-5,154.06	806.24	1,275,880.52	3,240,518.65		
Sparboe 8C-3HZ_SB - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Point 1			0.00	-209.94	-4,019.34	1,280,777.59	3,235,645.72		
Point 2			0.00	-2,376.79	-4,018.28	1,278,610.94	3,235,667.72		
Point 3			0.00	-4,548.65	-4,015.40	1,276,439.30	3,235,691.58		
Point 4			0.00	-5,468.93	-4,020.63	1,275,519.05	3,235,695.24		
Point 5			0.00	-7,692.32	-4,048.10	1,273,295.58	3,235,689.25		
Point 6			0.00	-9,862.57	-4,067.70	1,271,125.33	3,235,690.62		
Point 7			0.00	-9,878.32	-1,885.36	1,271,130.67	3,237,872.93		
Point 8			0.00	-9,893.11	312.52	1,271,137.11	3,240,070.76		
Point 9			0.00	-7,712.01	328.22	1,273,318.17	3,240,065.38		
Point 10			0.00	-5,600.28	343.08	1,275,429.87	3,240,059.84		
Point 11			0.00	-4,679.78	342.86	1,276,350.28	3,240,050.73		
Point 12			0.00	-2,457.51	327.20	1,278,572.21	3,240,013.60		
Point 13			0.00	-233.97	310.74	1,280,795.40	3,239,975.66		
Point 14			0.00	-221.12	-1,854.29	1,280,787.33	3,237,810.69		
Sparboe 8C-3HZ_SHI - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Sparboe 8C-3HZ_LD - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Point 1			0.00	-233.97	310.74	1,280,795.40	3,239,975.66		
Point 2			0.00	-229.30	-1,008.14	1,280,787.33	3,238,656.85		
Point 3			0.00	-4,620.77	-959.76	1,276,396.70	3,238,747.65		
Point 4			0.00	-7,206.03	-978.01	1,273,811.49	3,238,754.38		
Point 5			0.00	-7,274.99	332.44	1,273,755.20	3,240,065.38		
Point 6			0.00	-4,679.78	342.86	1,276,350.28	3,240,050.73		
Sparboe 8C-3HZ_Sec - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,281,026.35	3,239,662.69	40.101631	-104.643241
Point 1			0.00	252.45	-4,479.58	1,281,235.50	3,235,181.05		
Point 2			0.00	-2,368.25	-4,478.30	1,278,615.04	3,235,207.65		
Point 3			0.00	-4,995.44	-4,474.82	1,275,988.11	3,235,236.51		
Point 4			0.00	-7,687.41	-4,508.10	1,273,296.05	3,235,229.25		
Point 5			0.00	-10,319.43	-4,531.87	1,270,664.03	3,235,230.91		
Point 6			0.00	-10,338.32	-1,888.63	1,270,670.67	3,237,874.10		
Point 7			0.00	-10,356.20	769.22	1,270,678.47	3,240,531.89		
Point 8			0.00	-7,714.31	788.23	1,273,320.32	3,240,525.38		
Point 9			0.00	-5,154.38	806.24	1,275,880.20	3,240,518.65		
Point 10			0.00	-2,466.06	787.29	1,278,568.11	3,240,473.73		

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 8C-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25 @ 4995.00ft (HP 308)
Site:	Sec. 34-T2N-R65W	MD Reference:	RKB=25 @ 4995.00ft (HP 308)
Well:	Sparboe 8C-3HZ	North Reference:	True
Wellbore:	Plan C Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Point 11	0.00	223.35	767.39	1,281,257.09	3,240,427.85
Point 12	0.00	238.92	-1,856.11	1,281,247.31	3,237,804.43

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,690.60	7,291.97	7" Casing @ 7690.6' MD :: 7291.97' TVD	7	8-3/4

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
25.00	25.00	0.00	0.00	H&P 308: RKB = 25ft
125.00	125.00	0.04	-0.21	First MS Energy Services Gyro @ 125.00ft
1,715.00	1,714.97	4.18	-2.55	Final MS Energy Services Gyro @ 1715.00ft
1,715.00	1,714.97	4.18	-2.55	Tie-On to Surface Gyros @ 1715.00ft
1,927.00	1,926.97	3.01	-1.33	First Sperry MWD Survey @ 1927.00ft
14,363.00	7,253.58	-7,179.81	-245.58	Final Sperry MWD Survey @ 14363.00ft
14,408.00	7,254.65	-7,224.77	-247.00	Straight Line Proj @ 14408' MD :: 7254.65' TVD

Checked By: _____ Approved By: _____ Date: _____