

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 34-T2N-R65W

Sparboe 40N-3HZ

Plan D Rev 0

Design: Actual Field Surveys

Sperry Drilling Services Standard Report

06 February, 2013

Well Coordinates: 1,281,025.83 N, 3,239,722.56 E (40° 06' 05.86" N, 104° 38' 34.90" W)

Ground Level: 4,970.00 ft

Local Coordinate Origin:

Centered on Well Sparboe 40N-3HZ

Viewing Datum:

RKB=25 @ 4995.00ft (HP 308)

TVDs to System:

N

North Reference:

True

Unit System:

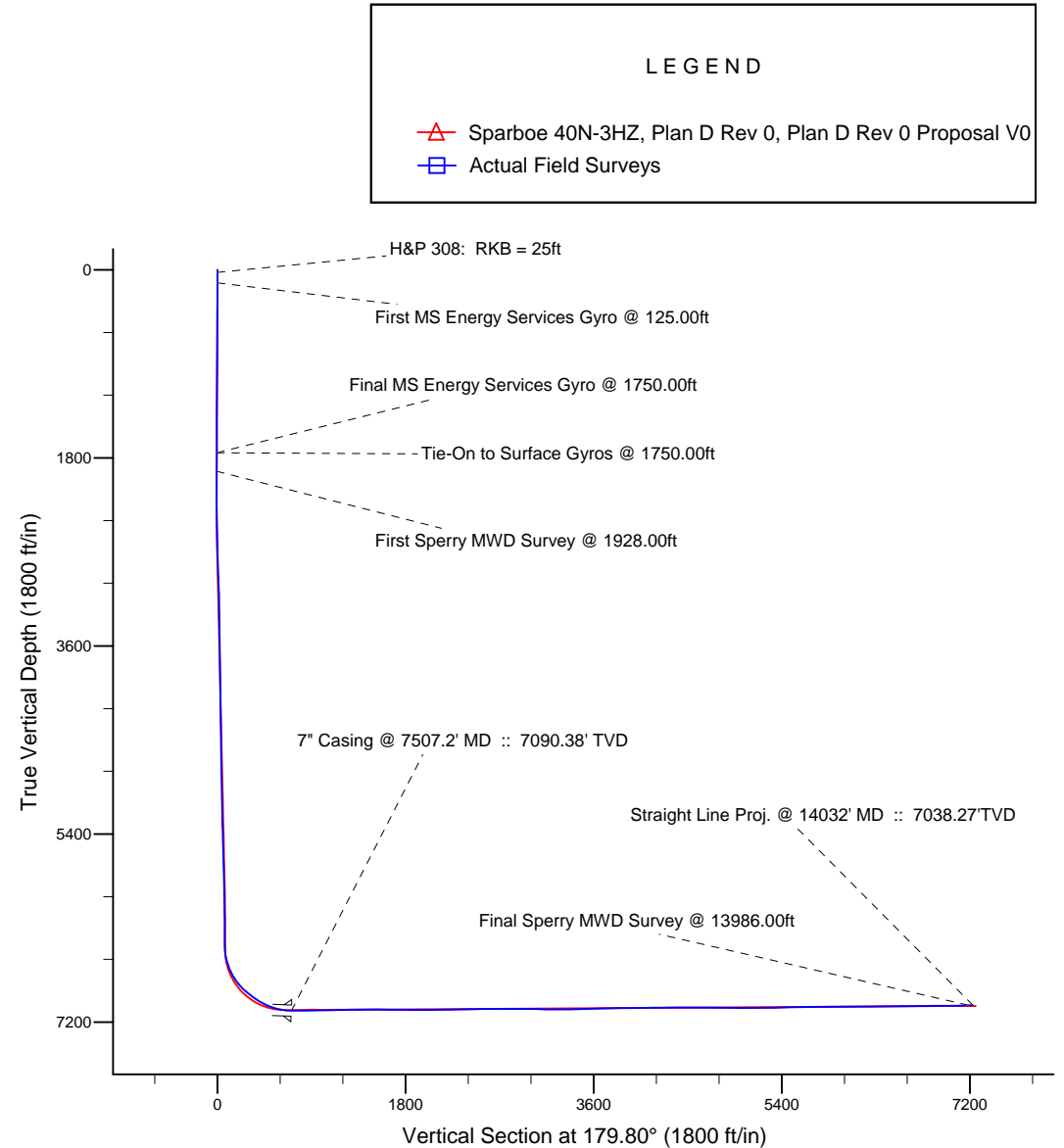
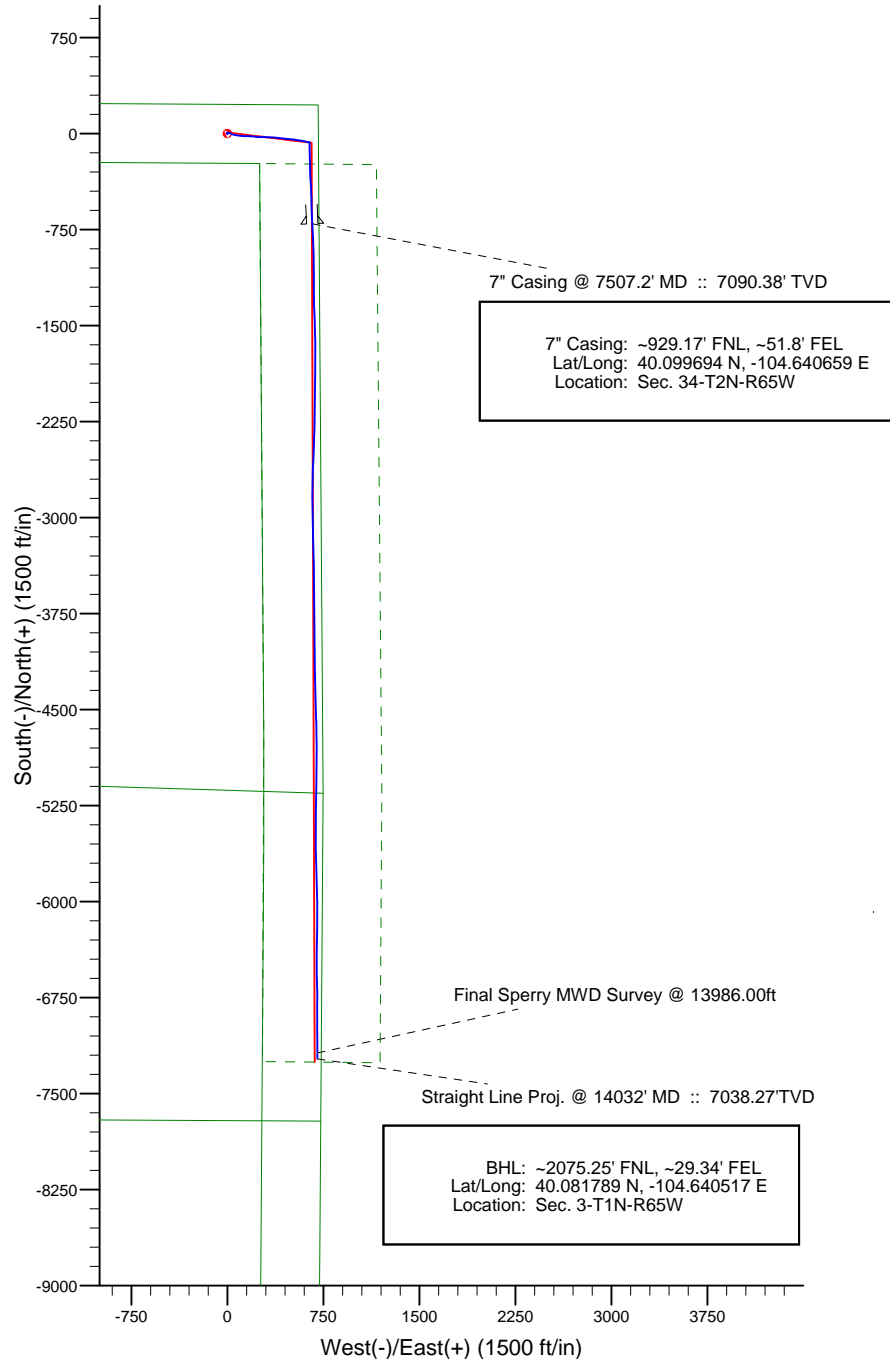
API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 34-T2N-R65W
 Well: Sparboe 40N-3HZ
 Wellbore: Plan D Rev 0
 Design: Actual Field Surveys



WELL DETAILS: Sparboe 40N-3HZ	
Ground Level:	4970.00
RKB=25 @ 4995.00ft (HP 308)	
Design: Actual Field Surveys (Sparboe 40N-3HZ/Plan D Rev 0)	
Created By: Fred Hartmann	Date: 02/06/2013
Reviewed: _____	Date: _____

Design Report for Sparboe 40N-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	0.29	96.68	125.00	-0.03	0.25	0.03	0.29
First MS Energy Services Gyro @ 125.00ft							
225.00	0.29	315.61	225.00	0.12	0.33	-0.12	0.55
325.00	0.58	21.70	325.00	0.77	0.34	-0.77	0.53
425.00	0.26	51.57	424.99	1.38	0.70	-1.38	0.38
525.00	0.14	327.73	524.99	1.63	0.81	-1.63	0.28
625.00	0.49	34.44	624.99	2.08	0.99	-2.08	0.45
725.00	0.50	317.62	724.99	2.76	0.94	-2.76	0.62
825.00	0.46	2.04	824.99	3.48	0.66	-3.48	0.36
925.00	0.23	39.35	924.98	4.04	0.80	-4.04	0.31
1,025.00	0.46	359.76	1,024.98	4.60	0.92	-4.59	0.32
1,125.00	0.39	283.77	1,124.98	5.08	0.59	-5.08	0.53
1,225.00	0.45	266.64	1,224.98	5.14	-0.13	-5.14	0.14
1,325.00	0.26	261.35	1,324.98	5.08	-0.75	-5.08	0.19
1,425.00	0.20	127.51	1,424.98	4.94	-0.83	-4.94	0.42
1,525.00	0.29	64.80	1,524.97	4.94	-0.46	-4.94	0.27
1,625.00	0.49	344.52	1,624.97	5.46	-0.35	-5.46	0.53
1,725.00	0.43	333.82	1,724.97	6.21	-0.63	-6.21	0.10
1,750.00	0.34	331.71	1,749.97	6.36	-0.71	-6.36	0.36
Final MS Energy Services Gyro @ 1750.00ft - Tie-On to Surface Gyros @ 1750.00ft							
1,928.00	0.26	23.09	1,927.97	7.20	-0.80	-7.20	0.15
First Sperry MWD Survey @ 1928.00ft							
2,020.00	0.26	272.76	2,019.97	7.40	-0.92	-7.40	0.46
2,111.00	0.18	353.41	2,110.97	7.55	-1.15	-7.55	0.32
2,205.00	1.05	93.67	2,204.96	7.64	-0.30	-7.64	1.17
2,300.00	2.83	107.16	2,299.90	6.89	2.80	-6.88	1.92
2,394.00	2.35	99.38	2,393.81	5.89	6.92	-5.87	0.63
2,489.00	3.43	97.43	2,488.68	5.21	11.66	-5.17	1.14
2,584.00	5.35	102.40	2,583.40	3.89	18.81	-3.83	2.06
2,678.00	4.85	122.97	2,677.04	0.79	26.42	-0.69	2.00
2,773.00	5.66	113.36	2,771.64	-3.26	34.09	3.38	1.26
2,868.00	6.40	104.37	2,866.11	-6.43	43.52	6.58	1.26
2,963.00	7.89	102.62	2,960.37	-9.17	55.02	9.36	1.58
3,057.00	9.26	100.01	3,053.32	-11.89	68.76	12.13	1.51
3,152.00	10.77	97.98	3,146.87	-14.45	85.08	14.75	1.63
3,247.00	12.11	95.83	3,239.98	-16.70	103.78	17.06	1.48
3,342.00	12.39	92.50	3,332.82	-18.15	123.88	18.59	0.80
3,437.00	13.47	91.16	3,425.41	-18.82	145.12	19.33	1.18
3,531.00	11.57	90.03	3,517.17	-19.05	165.50	19.63	2.04
3,626.00	10.95	93.82	3,610.34	-19.65	184.03	20.30	1.02
3,721.00	11.57	99.69	3,703.52	-21.86	202.42	22.57	1.37
3,816.00	12.73	96.76	3,796.39	-24.70	222.21	25.47	1.38
3,911.00	12.51	91.88	3,889.10	-26.26	242.89	27.11	1.15
4,006.00	13.78	89.96	3,981.61	-26.59	264.48	27.52	1.41
4,101.00	14.28	90.22	4,073.77	-26.63	287.52	27.64	0.53
4,195.00	14.30	91.85	4,164.86	-27.05	310.71	28.14	0.43
4,290.00	12.55	93.41	4,257.26	-28.04	332.74	29.21	1.88

Design Report for Sparboe 40N-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,385.00	11.35	94.78	4,350.20	-29.44	352.36	30.67	1.30
4,480.00	11.23	95.29	4,443.37	-31.07	370.89	32.36	0.16
4,575.00	10.83	94.92	4,536.61	-32.69	388.99	34.04	0.43
4,670.00	10.46	95.96	4,629.98	-34.35	406.46	35.77	0.44
4,765.00	10.40	95.61	4,723.41	-36.08	423.57	37.56	0.09
4,860.00	10.33	96.38	4,816.86	-37.87	440.57	39.40	0.16
4,955.00	9.06	95.24	4,910.50	-39.50	456.48	41.09	1.35
5,049.00	8.22	93.41	5,003.43	-40.57	470.56	42.21	0.94
5,144.00	8.93	99.34	5,097.37	-42.17	484.62	43.86	1.19
5,239.00	9.57	92.99	5,191.14	-43.78	499.78	45.52	1.27
5,334.00	10.92	97.99	5,284.62	-45.44	516.58	47.25	1.70
5,429.00	9.65	99.63	5,378.09	-48.03	533.34	49.89	1.37
5,523.00	9.86	101.13	5,470.73	-50.90	549.01	52.81	0.35
5,618.00	8.31	97.18	5,564.54	-53.33	563.80	55.29	1.76
5,713.00	8.92	96.90	5,658.47	-55.07	577.92	57.09	0.64
5,808.00	8.93	101.80	5,752.32	-57.46	592.45	59.53	0.80
5,902.00	6.95	103.89	5,845.41	-60.32	605.11	62.43	2.13
5,997.00	5.77	103.73	5,939.83	-62.83	615.33	64.98	1.24
6,092.00	4.67	102.52	6,034.43	-64.80	623.75	66.98	1.16
6,187.00	4.24	101.62	6,129.14	-66.35	630.96	68.55	0.46
6,282.00	2.33	85.94	6,223.99	-66.92	636.33	69.14	2.20
6,377.00	1.59	65.57	6,318.93	-66.24	639.46	68.47	1.06
6,471.00	0.44	266.21	6,412.92	-65.72	640.28	67.96	2.14
6,503.00	0.18	241.45	6,444.92	-65.76	640.12	67.99	0.90
6,535.00	1.98	181.00	6,476.91	-66.33	640.06	68.57	5.93
6,566.00	4.85	178.86	6,507.85	-68.18	640.08	70.41	9.27
6,598.00	7.70	182.63	6,539.66	-71.67	640.01	73.91	8.99
6,630.00	11.58	181.04	6,571.20	-77.03	639.85	79.26	12.15
6,661.00	14.09	180.62	6,601.43	-83.91	639.75	86.15	8.10
6,693.00	16.74	178.91	6,632.27	-92.42	639.80	94.65	8.40
6,724.00	19.82	176.94	6,661.70	-102.13	640.17	104.37	10.13
6,756.00	22.51	176.36	6,691.54	-113.66	640.84	115.90	8.43
6,787.00	25.62	177.09	6,719.84	-126.28	641.56	128.52	10.08
6,819.00	28.73	177.29	6,748.31	-140.88	642.28	143.12	9.72
6,851.00	31.60	177.67	6,775.97	-156.94	642.98	159.18	8.99
6,882.00	34.94	178.55	6,801.89	-173.94	643.54	176.18	10.89
6,914.00	38.59	179.37	6,827.52	-193.08	643.88	195.33	11.51
6,945.00	41.83	179.83	6,851.19	-213.09	644.01	215.34	10.50
6,977.00	45.00	179.94	6,874.43	-235.08	644.06	237.33	9.91
7,009.00	47.61	178.96	6,896.54	-258.21	644.28	260.46	8.45
7,040.00	49.98	178.56	6,916.96	-281.53	644.79	283.78	7.71
7,072.00	52.40	177.82	6,937.01	-306.45	645.58	308.70	7.77
7,104.00	54.41	175.93	6,956.09	-332.10	646.99	334.36	7.87
7,135.00	55.82	176.29	6,973.82	-357.47	648.71	359.73	4.65
7,167.00	56.82	176.80	6,991.56	-384.05	650.32	386.32	3.39
7,199.00	59.19	176.98	7,008.52	-411.15	651.79	413.42	7.42
7,230.00	62.98	177.46	7,023.50	-438.25	653.10	440.52	12.30
7,262.00	66.04	178.36	7,037.27	-467.11	654.15	469.39	9.89
7,293.00	68.35	179.09	7,049.29	-495.68	654.79	497.96	7.76
7,325.00	71.22	179.27	7,060.34	-525.70	655.22	527.98	8.98
7,357.00	74.75	178.19	7,069.71	-556.29	655.90	558.57	11.49

Design Report for Sparboe 40N-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,388.00	77.99	177.21	7,077.01	-586.38	657.11	588.67	10.89
7,420.00	81.40	176.92	7,082.73	-617.82	658.72	620.12	10.69
7,467.00	85.46	177.73	7,088.11	-664.45	660.90	666.76	8.81
7,507.20	88.07	177.45	7,090.38	-704.55	662.59	706.86	6.54
7" Casing @ 7507.2' MD :: 7090.38' TVD							
7,535.00	89.88	177.25	7,090.87	-732.31	663.87	734.63	6.54
7,630.00	90.49	177.51	7,090.57	-827.21	668.21	829.54	0.70
7,726.00	90.87	178.00	7,089.43	-923.13	671.97	925.47	0.65
7,817.00	91.73	179.73	7,087.36	-1,014.09	673.78	1,016.43	2.12
7,909.00	92.04	179.85	7,084.34	-1,106.04	674.11	1,108.38	0.36
8,001.00	91.17	179.40	7,081.76	-1,198.00	674.72	1,200.35	1.06
8,093.00	90.37	179.14	7,080.52	-1,289.98	675.89	1,292.33	0.91
8,185.00	90.12	177.95	7,080.13	-1,381.95	678.22	1,384.31	1.32
8,277.00	90.06	177.91	7,079.99	-1,473.89	681.55	1,476.26	0.08
8,369.00	89.38	178.65	7,080.44	-1,565.84	684.31	1,568.22	1.09
8,460.00	89.20	180.18	7,081.56	-1,656.83	685.24	1,659.21	1.69
8,552.00	89.38	180.22	7,082.70	-1,748.82	684.92	1,751.20	0.20
8,644.00	89.63	180.07	7,083.50	-1,840.82	684.68	1,843.20	0.32
8,736.00	89.75	180.20	7,084.00	-1,932.82	684.47	1,935.19	0.19
8,828.00	91.61	181.10	7,082.90	-2,024.80	683.42	2,027.17	2.25
8,919.00	90.25	180.86	7,081.43	-2,115.77	681.87	2,118.14	1.52
9,011.00	91.30	180.92	7,080.18	-2,207.75	680.44	2,210.11	1.14
9,103.00	90.62	181.49	7,078.64	-2,299.72	678.50	2,302.07	0.96
9,195.00	90.68	180.69	7,077.60	-2,391.69	676.75	2,394.04	0.87
9,286.00	91.30	183.28	7,076.03	-2,482.62	673.60	2,484.95	2.93
9,378.00	90.43	182.24	7,074.64	-2,574.50	669.17	2,576.82	1.47
9,470.00	91.11	182.55	7,073.40	-2,666.41	665.33	2,668.71	0.81
9,562.00	89.38	179.91	7,073.01	-2,758.37	663.35	2,760.67	3.43
9,654.00	89.44	179.83	7,073.95	-2,850.37	663.56	2,852.67	0.11
9,746.00	89.75	179.54	7,074.60	-2,942.37	664.07	2,944.67	0.46
9,838.00	89.38	178.84	7,075.30	-3,034.35	665.37	3,036.66	0.86
9,930.00	88.95	178.38	7,076.64	-3,126.32	667.60	3,128.63	0.68
10,022.00	89.63	178.66	7,077.78	-3,218.28	669.98	3,220.60	0.80
10,114.00	88.95	177.91	7,078.92	-3,310.23	672.73	3,312.56	1.10
10,206.00	92.04	179.21	7,078.13	-3,402.18	675.04	3,404.52	3.64
10,298.00	91.67	179.57	7,075.15	-3,494.13	676.02	3,496.47	0.56
10,390.00	92.29	179.31	7,071.97	-3,586.07	676.92	3,588.41	0.73
10,482.00	91.67	179.52	7,068.79	-3,678.01	677.86	3,680.35	0.71
10,574.00	90.25	180.27	7,067.25	-3,769.99	678.03	3,772.34	1.75
10,669.00	90.37	179.72	7,066.74	-3,864.99	678.03	3,867.33	0.59
10,763.00	90.74	179.24	7,065.83	-3,958.98	678.89	3,961.33	0.64
10,858.00	91.36	178.92	7,064.09	-4,053.95	680.41	4,056.30	0.73
10,954.00	90.19	179.11	7,062.79	-4,149.93	682.06	4,152.28	1.23
11,049.00	90.56	178.88	7,062.17	-4,244.91	683.73	4,247.27	0.46
11,144.00	91.11	178.14	7,060.78	-4,339.87	686.20	4,342.24	0.97
11,239.00	90.12	179.21	7,059.76	-4,434.84	688.40	4,437.21	1.53
11,334.00	89.75	178.19	7,059.87	-4,529.81	690.55	4,532.19	1.14
11,429.00	89.63	178.25	7,060.38	-4,624.76	693.50	4,627.15	0.14
11,523.00	89.51	179.27	7,061.09	-4,718.74	695.54	4,721.14	1.09
11,618.00	88.52	179.54	7,062.72	-4,813.72	696.52	4,816.12	1.08
11,713.00	89.44	180.82	7,064.41	-4,908.70	696.22	4,911.10	1.66

Design Report for Sparboe 40N-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,808.00	89.38	180.46	7,065.39	-5,003.69	695.16	5,006.08	0.38
11,903.00	90.80	181.22	7,065.24	-5,098.67	693.77	5,101.06	1.70
11,998.00	91.05	181.16	7,063.71	-5,193.64	691.80	5,196.02	0.27
12,093.00	91.42	180.62	7,061.66	-5,288.61	690.32	5,290.98	0.69
12,188.00	90.68	180.10	7,059.92	-5,383.59	689.72	5,385.96	0.95
12,284.00	90.87	179.51	7,058.62	-5,479.58	690.05	5,481.95	0.65
12,378.00	91.36	178.77	7,056.79	-5,573.55	691.46	5,575.93	0.94
12,473.00	90.68	179.75	7,055.10	-5,668.52	692.69	5,670.91	1.26
12,568.00	91.55	178.40	7,053.25	-5,763.49	694.22	5,765.88	1.69
12,663.00	90.74	177.70	7,051.36	-5,858.41	697.45	5,860.81	1.13
12,758.00	90.12	179.34	7,050.64	-5,953.38	699.91	5,955.78	1.85
12,853.00	89.94	179.84	7,050.59	-6,048.37	700.59	6,050.78	0.56
12,948.00	89.13	179.82	7,051.36	-6,143.37	700.87	6,145.78	0.85
13,043.00	90.06	180.59	7,052.04	-6,238.36	700.53	6,240.77	1.27
13,138.00	91.73	181.19	7,050.55	-6,333.34	699.05	6,335.74	1.87
13,233.00	90.56	180.56	7,048.65	-6,428.31	697.60	6,430.70	1.40
13,328.00	90.31	179.47	7,047.93	-6,523.30	697.58	6,525.70	1.18
13,423.00	91.11	178.77	7,046.75	-6,618.28	699.04	6,620.68	1.12
13,518.00	90.31	180.09	7,045.58	-6,713.27	699.98	6,715.67	1.62
13,613.00	91.11	179.52	7,044.40	-6,808.26	700.31	6,810.66	1.03
13,708.00	89.63	179.80	7,043.79	-6,903.25	700.87	6,905.66	1.59
13,803.00	90.62	180.05	7,043.58	-6,998.25	700.99	7,000.65	1.07
13,898.00	91.42	179.81	7,041.89	-7,093.23	701.11	7,095.64	0.88
13,986.00	91.61	179.32	7,039.56	-7,181.20	701.78	7,183.61	0.60
Final Sperry MWD Survey @ 13986.00ft							
14,032.00	91.61	179.32	7,038.27	-7,227.18	702.32	7,229.59	0.00
Straight Line Proj. @ 14032' MD :: 7038.27'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	-0.03	0.25	First MS Energy Services Gyro @ 125.00ft
1,750.00	1,749.97	6.36	-0.71	Final MS Energy Services Gyro @ 1750.00ft
1,750.00	1,749.97	6.36	-0.71	Tie-On to Surface Gyros @ 1750.00ft
1,928.00	1,927.97	7.20	-0.80	First Sperry MWD Survey @ 1928.00ft
13,986.00	7,039.56	-7,181.20	701.78	Final Sperry MWD Survey @ 13986.00ft
14,032.00	7,038.27	-7,227.18	702.32	Straight Line Proj. @ 14032' MD :: 7038.27'TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	179.80	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	1,750.00	MS Energy Services - Surface Gyros	NS-GYRO-MS
1,928.00	7,467.00	Sperry MWD Surveys - Vert/Build	MWD+SC
7,535.00	13,986.00	Sperry MWD Surveys - Lateral	MWD+SC

Design Report for Sparboe 40N-3HZ - Actual Field Surveys

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,507.20	7,090.38	7" Casing @ 7507.2' MD :: 7090.38' TVD	7	8-3/4

Design Report for Sparboe 40N-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 40N-3HZ_1	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Polygon									
Point 1				-4,567.98	-7,686.30	1,273,296.05	3,235,229.25		
Point 2				728.35	-7,713.22	1,273,320.32	3,240,525.38		
Sparboe 40N-3HZ_5	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Polygon									
Point 1				-4,079.21	-208.84	1,280,777.59	3,235,645.72		
Point 2				-4,078.15	-2,375.69	1,278,610.94	3,235,667.72		
Point 3				-4,075.27	-4,547.54	1,276,439.30	3,235,691.58		
Point 4				-4,080.51	-5,467.82	1,275,519.05	3,235,695.24		
Point 5				-4,107.99	-7,691.22	1,273,295.58	3,235,689.25		
Point 6				-4,127.59	-9,861.47	1,271,125.33	3,235,690.62		
Point 7				-1,945.25	-9,877.22	1,271,130.67	3,237,872.93		
Point 8				252.63	-9,892.02	1,271,137.11	3,240,070.76		
Point 9				268.33	-7,710.92	1,273,318.17	3,240,065.38		
Point 10				283.20	-5,599.18	1,275,429.87	3,240,059.84		
Point 11				282.98	-4,678.69	1,276,350.28	3,240,050.73		
Point 12				267.33	-2,456.42	1,278,572.21	3,240,013.60		
Point 13				250.87	-232.88	1,280,795.40	3,239,975.66		
Point 14				-1,914.16	-220.02	1,280,787.33	3,237,810.69		
Sparboe 40N-3HZ_E	0.00	0.00	7,028.00	-7,253.05	711.61	1,273,780.29	3,240,504.19	40.081718	-104.640484
- actual wellpath misses target center by 29.34ft at 14032.00ft MD (7038.27 TVD, -7227.18 N, 702.32 E)									
- Point									
Sparboe 40N-3HZ_5	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Polygon									
Point 1				-4,539.45	253.56	1,281,235.50	3,235,181.05		
Point 2				-4,538.17	-2,367.14	1,278,615.04	3,235,207.65		
Point 3				-4,534.70	-4,994.33	1,275,988.11	3,235,236.51		
Point 4				-4,567.98	-7,686.30	1,273,296.05	3,235,229.25		
Point 5				-4,591.76	-10,318.32	1,270,664.03	3,235,230.91		
Point 6				-1,948.52	-10,337.23	1,270,670.67	3,237,874.10		
Point 7				709.33	-10,355.11	1,270,678.47	3,240,531.89		
Point 8				728.35	-7,713.22	1,273,320.32	3,240,525.38		
Point 9				746.36	-5,153.29	1,275,880.20	3,240,518.65		
Point 10				727.42	-2,464.97	1,278,568.11	3,240,473.73		
Point 11				707.52	224.44	1,281,257.09	3,240,427.85		
Point 12				-1,915.97	240.01	1,281,247.31	3,237,804.43		
Sparboe 40N-3HZ_5	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Point									
Sparboe 40N-3HZ_3	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Polygon									
Point 1				-4,534.70	-4,994.33	1,275,988.11	3,235,236.51		
Point 2				-1,895.10	-5,071.47	1,275,936.49	3,237,876.63		
Point 3				746.36	-5,152.97	1,275,880.52	3,240,518.65		
Sparboe 40N-3HZ_E	0.00	0.00	7,045.00	-7,253.05	681.61	1,273,780.00	3,240,474.20	40.081718	-104.640591
- actual wellpath misses target center by 33.82ft at 14032.00ft MD (7038.27 TVD, -7227.18 N, 702.32 E)									
- Point									
Sparboe 40N-3HZ_L	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- actual wellpath hits target center									
- Polygon									
Point 1				250.87	-232.88	1,280,795.40	3,239,975.66		
Point 2				282.98	-4,678.69	1,276,350.28	3,240,050.73		
Point 3				272.80	-7,248.90	1,273,780.20	3,240,065.38		
Point 4				1,192.79	-7,257.79	1,273,780.20	3,240,985.38		
Point 5				1,206.36	-5,157.74	1,275,880.20	3,240,978.65		
Point 6				1,163.06	-241.69	1,280,795.40	3,240,887.85		

Design Report for Sparboe 40N-3HZ - Actual Field Surveys

North Reference Sheet for Sec. 34-T2N-R65W - Sparboe 40N-3HZ - Plan D 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 40N-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

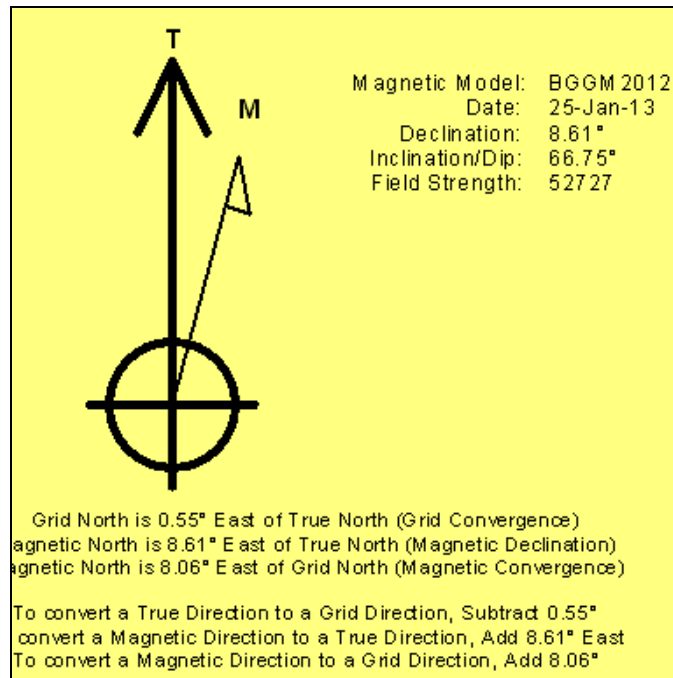
Grid Coordinates of Well: 1,281,025.83 ft N, 3,239,722.56 ft E

Geographical Coordinates of Well: 40° 06' 05.86" N, 104° 38' 34.90" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,032.00ft
the Bottom Hole Displacement is 7,261.22ft in the Direction of 174.45° (True).

Magnetic Convergence at surface is: -8.06° (25 January 2013, , BGGM2012)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 34-T2N-R65W

Sparboe 40N-3HZ

Plan D Rev 0

Design: Actual Field Surveys

Survey Report - Geographic

06 February, 2013

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D 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 40N-3HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,281,025.83 ft	Latitude:	40.101628
	+E/-W	0.00 ft	Easting:	3,239,722.56 ft	Longitude:	-104.643027
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,970.00 ft

Wellbore	Plan D Rev 0				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	01-25-2013	8.61	66.75	52,727

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	179.80	

Survey Program	Date	02-06-2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	1,750.00	MS Energy Services - Surface Gyros (Plar	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,928.00	7,467.00	Sperry MWD Surveys - Vert/Build (Plan D	MWD+SC	Fixed:v2:standard dec & axial correction	
7,535.00	13,986.00	Sperry MWD Surveys - Lateral (Plan D Re	MWD+SC	Fixed:v2:standard dec & axial correction	

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D 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	1,281,025.83	3,239,722.56	40.101628	-104.643027
25.00	0.00	0.00	25.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
H&P 308: RKB = 25ft									
125.00	0.29	96.68	125.00	-0.03	0.25	1,281,025.81	3,239,722.81	40.101628	-104.643026
First MS Energy Services Gyro @ 125.00ft									
225.00	0.29	315.61	225.00	0.12	0.33	1,281,025.96	3,239,722.88	40.101628	-104.643026
325.00	0.58	21.70	325.00	0.77	0.34	1,281,026.61	3,239,722.88	40.101630	-104.643026
425.00	0.26	51.57	424.99	1.38	0.70	1,281,027.22	3,239,723.24	40.101632	-104.643024
525.00	0.14	327.73	524.99	1.63	0.81	1,281,027.47	3,239,723.35	40.101632	-104.643024
625.00	0.49	34.44	624.99	2.08	0.99	1,281,027.93	3,239,723.53	40.101634	-104.643023
725.00	0.50	317.62	724.99	2.76	0.94	1,281,028.60	3,239,723.47	40.101636	-104.643024
825.00	0.46	2.04	824.99	3.48	0.66	1,281,029.32	3,239,723.18	40.101638	-104.643025
925.00	0.23	39.35	924.98	4.04	0.80	1,281,029.88	3,239,723.32	40.101639	-104.643024
1,025.00	0.46	359.76	1,024.98	4.60	0.92	1,281,030.44	3,239,723.44	40.101641	-104.643024
1,125.00	0.39	283.77	1,124.98	5.08	0.59	1,281,030.92	3,239,723.10	40.101642	-104.643025
1,225.00	0.45	266.64	1,224.98	5.14	-0.13	1,281,030.97	3,239,722.38	40.101642	-104.643027
1,325.00	0.26	261.35	1,324.98	5.08	-0.75	1,281,030.90	3,239,721.76	40.101642	-104.643030
1,425.00	0.20	127.51	1,424.98	4.94	-0.83	1,281,030.76	3,239,721.68	40.101642	-104.643030
1,525.00	0.29	64.80	1,524.97	4.94	-0.46	1,281,030.77	3,239,722.04	40.101642	-104.643029
1,625.00	0.49	344.52	1,624.97	5.46	-0.35	1,281,031.29	3,239,722.15	40.101643	-104.643028
1,725.00	0.43	333.82	1,724.97	6.21	-0.63	1,281,032.04	3,239,721.87	40.101645	-104.643029
1,750.00	0.34	331.71	1,749.97	6.36	-0.71	1,281,032.18	3,239,721.79	40.101645	-104.643030
Final MS Energy Services Gyro @ 1750.00ft - Tie-On to Surface Gyros @ 1750.00ft									
1,928.00	0.26	23.09	1,927.97	7.20	-0.80	1,281,033.02	3,239,721.69	40.101648	-104.643030
First Sperry MWD Survey @ 1928.00ft									
2,020.00	0.26	272.76	2,019.97	7.40	-0.92	1,281,033.22	3,239,721.56	40.101648	-104.643030
2,111.00	0.18	353.41	2,110.97	7.55	-1.15	1,281,033.37	3,239,721.34	40.101649	-104.643031
2,205.00	1.05	93.67	2,204.96	7.64	-0.30	1,281,033.47	3,239,722.18	40.101649	-104.643028
2,300.00	2.83	107.16	2,299.90	6.89	2.80	1,281,032.75	3,239,725.29	40.101647	-104.643017
2,394.00	2.35	99.38	2,393.81	5.89	6.92	1,281,031.79	3,239,729.42	40.101644	-104.643002
2,489.00	3.43	97.43	2,488.68	5.21	11.66	1,281,031.15	3,239,734.17	40.101642	-104.642985
2,584.00	5.35	102.40	2,583.40	3.89	18.81	1,281,029.90	3,239,741.32	40.101639	-104.642960
2,678.00	4.85	122.97	2,677.04	0.79	26.42	1,281,026.87	3,239,748.97	40.101630	-104.642933
2,773.00	5.66	113.36	2,771.64	-3.26	34.09	1,281,022.91	3,239,756.68	40.101619	-104.642905
2,868.00	6.40	104.37	2,866.11	-6.43	43.52	1,281,019.83	3,239,766.14	40.101610	-104.642871
2,963.00	7.89	102.62	2,960.37	-9.17	55.02	1,281,017.20	3,239,777.66	40.101603	-104.642830
3,057.00	9.26	100.01	3,053.32	-11.89	68.76	1,281,014.61	3,239,791.43	40.101595	-104.642781
3,152.00	10.77	97.98	3,146.87	-14.45	85.08	1,281,012.20	3,239,807.77	40.101588	-104.642723
3,247.00	12.11	95.83	3,239.98	-16.70	103.78	1,281,010.14	3,239,826.49	40.101582	-104.642656
3,342.00	12.39	92.50	3,332.82	-18.15	123.88	1,281,008.88	3,239,846.60	40.101578	-104.642584
3,437.00	13.47	91.16	3,425.41	-18.82	145.12	1,281,008.41	3,239,867.85	40.101576	-104.642508
3,531.00	11.57	90.03	3,517.17	-19.05	165.50	1,281,008.39	3,239,888.22	40.101576	-104.642435
3,626.00	10.95	93.82	3,610.34	-19.65	184.03	1,281,007.96	3,239,906.76	40.101574	-104.642369
3,721.00	11.57	99.69	3,703.52	-21.86	202.42	1,281,005.93	3,239,925.17	40.101568	-104.642303
3,816.00	12.73	96.76	3,796.39	-24.70	222.21	1,281,003.29	3,239,944.98	40.101560	-104.642233
3,911.00	12.51	91.88	3,889.10	-26.26	242.89	1,281,001.92	3,239,965.68	40.101556	-104.642159
4,006.00	13.78	89.96	3,981.61	-26.59	264.48	1,281,001.80	3,239,987.28	40.101555	-104.642082
4,101.00	14.28	90.22	4,073.77	-26.63	287.52	1,281,001.98	3,240,010.30	40.101555	-104.641999
4,195.00	14.30	91.85	4,164.86	-27.05	310.71	1,281,001.79	3,240,033.50	40.101554	-104.641916
4,290.00	12.55	93.41	4,257.26	-28.04	332.74	1,281,001.01	3,240,055.54	40.101551	-104.641838
4,385.00	11.35	94.78	4,350.20	-29.44	352.36	1,280,999.80	3,240,075.17	40.101547	-104.641767
4,480.00	11.23	95.29	4,443.37	-31.07	370.89	1,280,998.35	3,240,093.71	40.101543	-104.641701
4,575.00	10.83	94.92	4,536.61	-32.69	388.99	1,280,996.91	3,240,111.83	40.101538	-104.641636
4,670.00	10.46	95.96	4,629.98	-34.35	406.46	1,280,995.42	3,240,129.31	40.101534	-104.641574
4,765.00	10.40	95.61	4,723.41	-36.08	423.57	1,280,993.85	3,240,146.44	40.101529	-104.641513

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D 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
4,860.00	10.33	96.38	4,816.86	-37.87	440.57	1,280,992.23	3,240,163.45	40.101524	-104.641452
4,955.00	9.06	95.24	4,910.50	-39.50	456.48	1,280,990.75	3,240,179.38	40.101520	-104.641395
5,049.00	8.22	93.41	5,003.43	-40.57	470.56	1,280,989.81	3,240,193.47	40.101517	-104.641345
5,144.00	8.93	99.34	5,097.37	-42.17	484.62	1,280,988.35	3,240,207.54	40.101512	-104.641295
5,239.00	9.57	92.99	5,191.14	-43.78	499.78	1,280,986.89	3,240,222.72	40.101508	-104.641240
5,334.00	10.92	97.99	5,284.62	-45.44	516.58	1,280,985.39	3,240,239.53	40.101503	-104.641180
5,429.00	9.65	99.63	5,378.09	-48.03	533.34	1,280,982.96	3,240,256.32	40.101496	-104.641120
5,523.00	9.86	101.13	5,470.73	-50.90	549.01	1,280,980.24	3,240,272.01	40.101488	-104.641064
5,618.00	8.31	97.18	5,564.54	-53.33	563.80	1,280,977.96	3,240,286.82	40.101482	-104.641012
5,713.00	8.92	96.90	5,658.47	-55.07	577.92	1,280,976.35	3,240,300.96	40.101477	-104.640961
5,808.00	8.93	101.80	5,752.32	-57.46	592.45	1,280,974.10	3,240,315.51	40.101470	-104.640909
5,902.00	6.95	103.89	5,845.41	-60.32	605.11	1,280,971.37	3,240,328.20	40.101462	-104.640864
5,997.00	5.77	103.73	5,939.83	-62.83	615.33	1,280,968.95	3,240,338.44	40.101455	-104.640827
6,092.00	4.67	102.52	6,034.43	-64.80	623.75	1,280,967.06	3,240,346.88	40.101450	-104.640797
6,187.00	4.24	101.62	6,129.14	-66.35	630.96	1,280,965.59	3,240,354.11	40.101446	-104.640772
6,282.00	2.33	85.94	6,223.99	-66.92	636.33	1,280,965.07	3,240,359.48	40.101444	-104.640752
6,377.00	1.59	65.57	6,318.93	-66.24	639.46	1,280,965.78	3,240,362.60	40.101446	-104.640741
6,471.00	0.44	266.21	6,412.92	-65.72	640.28	1,280,966.30	3,240,363.42	40.101448	-104.640738
6,503.00	0.18	241.45	6,444.92	-65.76	640.12	1,280,966.27	3,240,363.25	40.101447	-104.640739
6,535.00	1.98	181.00	6,476.91	-66.33	640.06	1,280,965.69	3,240,363.21	40.101446	-104.640739
6,566.00	4.85	178.86	6,507.85	-68.18	640.08	1,280,963.85	3,240,363.24	40.101441	-104.640739
6,598.00	7.70	182.63	6,539.66	-71.67	640.01	1,280,960.35	3,240,363.20	40.101431	-104.640739
6,630.00	11.58	181.04	6,571.20	-77.03	639.85	1,280,954.99	3,240,363.10	40.101417	-104.640740
6,661.00	14.09	180.62	6,601.43	-83.91	639.75	1,280,948.11	3,240,363.07	40.101398	-104.640740
6,693.00	16.74	178.91	6,632.27	-92.42	639.80	1,280,939.61	3,240,363.19	40.101374	-104.640740
6,724.00	19.82	176.94	6,661.70	-102.13	640.17	1,280,929.90	3,240,363.65	40.101348	-104.640739
6,756.00	22.51	176.36	6,691.54	-113.66	640.84	1,280,918.37	3,240,364.44	40.101316	-104.640736
6,787.00	25.62	177.09	6,719.84	-126.28	641.56	1,280,905.76	3,240,365.28	40.101281	-104.640734
6,819.00	28.73	177.29	6,748.31	-140.88	642.28	1,280,891.17	3,240,366.14	40.101241	-104.640731
6,851.00	31.60	177.67	6,775.97	-156.94	642.98	1,280,875.12	3,240,367.00	40.101197	-104.640729
6,882.00	34.94	178.55	6,801.89	-173.94	643.54	1,280,858.13	3,240,367.72	40.101151	-104.640727
6,914.00	38.59	179.37	6,827.52	-193.08	643.88	1,280,838.99	3,240,368.24	40.101098	-104.640725
6,945.00	41.83	179.83	6,851.19	-213.09	644.01	1,280,818.98	3,240,368.57	40.101043	-104.640725
6,977.00	45.00	179.94	6,874.43	-235.08	644.06	1,280,797.00	3,240,368.83	40.100983	-104.640725
7,009.00	47.61	178.96	6,896.54	-258.21	644.28	1,280,773.87	3,240,369.28	40.100919	-104.640724
7,040.00	49.98	178.56	6,916.96	-281.53	644.79	1,280,750.56	3,240,370.01	40.100855	-104.640722
7,072.00	52.40	177.82	6,937.01	-306.45	645.58	1,280,725.65	3,240,371.04	40.100787	-104.640719
7,104.00	54.41	175.93	6,956.09	-332.10	646.99	1,280,700.01	3,240,372.70	40.100716	-104.640714
7,135.00	55.82	176.29	6,973.82	-357.47	648.71	1,280,674.66	3,240,374.67	40.100647	-104.640708
7,167.00	56.82	176.80	6,991.56	-384.05	650.32	1,280,648.10	3,240,376.53	40.100574	-104.640702
7,199.00	59.19	176.98	7,008.52	-411.15	651.79	1,280,621.02	3,240,378.26	40.100499	-104.640697
7,230.00	62.98	177.46	7,023.50	-438.25	653.10	1,280,593.93	3,240,379.84	40.100425	-104.640692
7,262.00	66.04	178.36	7,037.27	-467.11	654.15	1,280,565.09	3,240,381.17	40.100346	-104.640689
7,293.00	68.35	179.09	7,049.29	-495.68	654.79	1,280,536.53	3,240,382.08	40.100267	-104.640686
7,325.00	71.22	179.27	7,060.34	-525.70	655.22	1,280,506.51	3,240,382.80	40.100185	-104.640685
7,357.00	74.75	178.19	7,069.71	-556.29	655.90	1,280,475.93	3,240,383.77	40.100101	-104.640682
7,388.00	77.99	177.21	7,077.01	-586.38	657.11	1,280,445.85	3,240,385.27	40.100018	-104.640678
7,420.00	81.40	176.92	7,082.73	-617.82	658.72	1,280,414.43	3,240,387.19	40.099932	-104.640672
7,467.00	85.46	177.73	7,088.11	-664.45	660.90	1,280,367.82	3,240,389.82	40.099804	-104.640665
7,507.20	88.07	177.45	7,090.38	-704.55	662.59	1,280,327.75	3,240,391.89	40.099694	-104.640659
7" Casing @ 7507.2' MD :: 7090.38' TVD									
7,535.00	89.88	177.25	7,090.87	-732.31	663.87	1,280,300.00	3,240,393.45	40.099618	-104.640654
7,630.00	90.49	177.51	7,090.57	-827.21	668.21	1,280,205.15	3,240,398.71	40.099357	-104.640638
7,726.00	90.87	178.00	7,089.43	-923.13	671.97	1,280,109.27	3,240,403.39	40.099094	-104.640625
7,817.00	91.73	179.73	7,087.36	-1,014.09	673.78	1,280,018.34	3,240,406.07	40.098844	-104.640619

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D 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
7,909.00	92.04	179.85	7,084.34	-1,106.04	674.11	1,279,926.41	3,240,407.30	40.098592	-104.640617
8,001.00	91.17	179.40	7,081.76	-1,198.00	674.72	1,279,834.46	3,240,408.79	40.098339	-104.640615
8,093.00	90.37	179.14	7,080.52	-1,289.98	675.89	1,279,742.50	3,240,410.85	40.098087	-104.640611
8,185.00	90.12	177.95	7,080.13	-1,381.95	678.22	1,279,650.56	3,240,414.08	40.097834	-104.640603
8,277.00	90.06	177.91	7,079.99	-1,473.89	681.55	1,279,558.66	3,240,418.29	40.097582	-104.640591
8,369.00	89.38	178.65	7,080.44	-1,565.84	684.31	1,279,466.74	3,240,421.94	40.097330	-104.640581
8,460.00	89.20	180.18	7,081.56	-1,656.83	685.24	1,279,375.77	3,240,423.75	40.097080	-104.640578
8,552.00	89.38	180.22	7,082.70	-1,748.82	684.92	1,279,283.78	3,240,424.31	40.096827	-104.640579
8,644.00	89.63	180.07	7,083.50	-1,840.82	684.68	1,279,191.79	3,240,424.97	40.096575	-104.640580
8,736.00	89.75	180.20	7,084.00	-1,932.82	684.47	1,279,099.80	3,240,425.64	40.096322	-104.640580
8,828.00	91.61	181.10	7,082.90	-2,024.80	683.42	1,279,007.81	3,240,425.49	40.096070	-104.640584
8,919.00	90.25	180.86	7,081.43	-2,115.77	681.87	1,278,916.83	3,240,424.81	40.095820	-104.640590
9,011.00	91.30	180.92	7,080.18	-2,207.75	680.44	1,278,824.85	3,240,424.27	40.095568	-104.640595
9,103.00	90.62	181.49	7,078.64	-2,299.72	678.50	1,278,732.87	3,240,423.22	40.095315	-104.640602
9,195.00	90.68	180.69	7,077.60	-2,391.69	676.75	1,278,640.89	3,240,422.36	40.095063	-104.640608
9,286.00	91.30	183.28	7,076.03	-2,482.62	673.60	1,278,549.94	3,240,420.09	40.094813	-104.640619
9,378.00	90.43	182.24	7,074.64	-2,574.50	669.17	1,278,458.02	3,240,416.55	40.094561	-104.640635
9,470.00	91.11	182.55	7,073.40	-2,666.41	665.33	1,278,366.08	3,240,413.59	40.094309	-104.640649
9,562.00	89.38	179.91	7,073.01	-2,758.37	663.35	1,278,274.11	3,240,412.51	40.094056	-104.640656
9,654.00	89.44	179.83	7,073.95	-2,850.37	663.56	1,278,182.12	3,240,413.61	40.093804	-104.640655
9,746.00	89.75	179.54	7,074.60	-2,942.37	664.07	1,278,090.14	3,240,415.00	40.093551	-104.640653
9,838.00	89.38	178.84	7,075.30	-3,034.35	665.37	1,277,998.17	3,240,417.19	40.093299	-104.640649
9,930.00	88.95	178.38	7,076.64	-3,126.32	667.60	1,277,906.24	3,240,420.31	40.093046	-104.640641
10,022.00	89.63	178.66	7,077.78	-3,218.28	669.98	1,277,814.31	3,240,423.58	40.092794	-104.640632
10,114.00	88.95	177.91	7,078.92	-3,310.23	672.73	1,277,722.39	3,240,427.22	40.092541	-104.640623
10,206.00	92.04	179.21	7,078.13	-3,402.18	675.04	1,277,630.47	3,240,430.42	40.092289	-104.640614
10,298.00	91.67	179.57	7,075.15	-3,494.13	676.02	1,277,538.54	3,240,432.28	40.092036	-104.640611
10,390.00	92.29	179.31	7,071.97	-3,586.07	676.92	1,277,446.62	3,240,434.07	40.091784	-104.640608
10,482.00	91.67	179.52	7,068.79	-3,678.01	677.86	1,277,354.69	3,240,435.90	40.091532	-104.640604
10,574.00	90.25	180.27	7,067.25	-3,769.99	678.03	1,277,262.72	3,240,436.96	40.091279	-104.640604
10,669.00	90.37	179.72	7,066.74	-3,864.99	678.03	1,277,167.73	3,240,437.88	40.091018	-104.640604
10,763.00	90.74	179.24	7,065.83	-3,958.98	678.89	1,277,073.75	3,240,439.64	40.090760	-104.640601
10,858.00	91.36	178.92	7,064.09	-4,053.95	680.41	1,276,978.81	3,240,442.09	40.090500	-104.640595
10,954.00	90.19	179.11	7,062.79	-4,149.93	682.06	1,276,882.85	3,240,444.66	40.090236	-104.640589
11,049.00	90.56	178.88	7,062.17	-4,244.91	683.73	1,276,787.90	3,240,447.25	40.089975	-104.640583
11,144.00	91.11	178.14	7,060.78	-4,339.87	686.20	1,276,692.97	3,240,450.64	40.089715	-104.640575
11,239.00	90.12	179.21	7,059.76	-4,434.84	688.40	1,276,598.03	3,240,453.75	40.089454	-104.640567
11,334.00	89.75	178.19	7,059.87	-4,529.81	690.55	1,276,503.09	3,240,456.82	40.089193	-104.640559
11,429.00	89.63	178.25	7,060.38	-4,624.76	693.50	1,276,408.17	3,240,460.69	40.088933	-104.640548
11,523.00	89.51	179.27	7,061.09	-4,718.74	695.54	1,276,314.23	3,240,463.63	40.088675	-104.640541
11,618.00	88.52	179.54	7,062.72	-4,813.72	696.52	1,276,219.26	3,240,465.54	40.088414	-104.640538
11,713.00	89.44	180.82	7,064.41	-4,908.70	696.22	1,276,124.29	3,240,466.16	40.088153	-104.640539
11,808.00	89.38	180.46	7,065.39	-5,003.69	695.16	1,276,029.30	3,240,466.01	40.087893	-104.640543
11,903.00	90.80	181.22	7,065.24	-5,098.67	693.77	1,275,934.31	3,240,465.54	40.087632	-104.640548
11,998.00	91.05	181.16	7,063.71	-5,193.64	691.80	1,275,839.33	3,240,464.48	40.087371	-104.640555
12,093.00	91.42	180.62	7,061.66	-5,288.61	690.32	1,275,744.36	3,240,463.93	40.087110	-104.640560
12,188.00	90.68	180.10	7,059.92	-5,383.59	689.72	1,275,649.38	3,240,464.25	40.086850	-104.640562
12,284.00	90.87	179.51	7,058.62	-5,479.58	690.05	1,275,553.40	3,240,465.50	40.086586	-104.640561
12,378.00	91.36	178.77	7,056.79	-5,573.55	691.46	1,275,459.45	3,240,467.82	40.086328	-104.640556
12,473.00	90.68	179.75	7,055.10	-5,668.52	692.69	1,275,364.49	3,240,469.96	40.086068	-104.640551
12,568.00	91.55	178.40	7,053.25	-5,763.49	694.22	1,275,269.55	3,240,472.41	40.085807	-104.640546
12,663.00	90.74	177.70	7,051.36	-5,858.41	697.45	1,275,174.67	3,240,476.56	40.085546	-104.640534
12,758.00	90.12	179.34	7,050.64	-5,953.38	699.91	1,275,079.74	3,240,479.93	40.085286	-104.640526
12,853.00	89.94	179.84	7,050.59	-6,048.37	700.59	1,274,984.75	3,240,481.53	40.085025	-104.640523
12,948.00	89.13	179.82	7,051.36	-6,143.37	700.87	1,274,889.77	3,240,482.73	40.084764	-104.640522

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D 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
13,043.00	90.06	180.59	7,052.04	-6,238.36	700.53	1,274,794.78	3,240,483.31	40.084503	-104.640523
13,138.00	91.73	181.19	7,050.55	-6,333.34	699.05	1,274,699.80	3,240,482.75	40.084243	-104.640529
13,233.00	90.56	180.56	7,048.65	-6,428.31	697.60	1,274,604.82	3,240,482.22	40.083982	-104.640534
13,328.00	90.31	179.47	7,047.93	-6,523.30	697.58	1,274,509.84	3,240,483.11	40.083721	-104.640534
13,423.00	91.11	178.77	7,046.75	-6,618.28	699.04	1,274,414.88	3,240,485.49	40.083460	-104.640529
13,518.00	90.31	180.09	7,045.58	-6,713.27	699.98	1,274,319.91	3,240,487.35	40.083200	-104.640525
13,613.00	91.11	179.52	7,044.40	-6,808.26	700.31	1,274,224.93	3,240,488.59	40.082939	-104.640524
13,708.00	89.63	179.80	7,043.79	-6,903.25	700.87	1,274,129.95	3,240,490.08	40.082678	-104.640522
13,803.00	90.62	180.05	7,043.58	-6,998.25	700.99	1,274,034.96	3,240,491.12	40.082417	-104.640522
13,898.00	91.42	179.81	7,041.89	-7,093.23	701.11	1,273,939.99	3,240,492.15	40.082157	-104.640521
13,986.00	91.61	179.32	7,039.56	-7,181.20	701.78	1,273,852.04	3,240,493.67	40.081915	-104.640519
Final Sperry MWD Survey @ 13986.00ft									
14,032.00	91.61	179.32	7,038.27	-7,227.18	702.32	1,273,806.07	3,240,494.66	40.081789	-104.640517
Straight Line Proj. @ 14032' MD :: 7038.27'TVD									

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N-S (ft)	+E-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Sparboe 40N-3HZ_1/	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Polygon										
Point 1				0.00	-7,686.30	-4,567.98	1,273,296.05	3,235,229.25		
Point 2				0.00	-7,713.22	728.35	1,273,320.32	3,240,525.38		
Sparboe 40N-3HZ_SE	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Polygon										
Point 1				0.00	-208.84	-4,079.21	1,280,777.59	3,235,645.72		
Point 2				0.00	-2,375.69	-4,078.15	1,278,610.94	3,235,667.72		
Point 3				0.00	-4,547.54	-4,075.27	1,276,439.30	3,235,691.58		
Point 4				0.00	-5,467.82	-4,080.51	1,275,519.05	3,235,695.24		
Point 5				0.00	-7,691.22	-4,107.99	1,273,295.58	3,235,689.25		
Point 6				0.00	-9,861.47	-4,127.59	1,271,125.33	3,235,690.62		
Point 7				0.00	-9,877.22	-1,945.25	1,271,130.67	3,237,872.93		
Point 8				0.00	-9,892.02	252.63	1,271,137.11	3,240,070.76		
Point 9				0.00	-7,710.92	268.33	1,273,318.17	3,240,065.38		
Point 10				0.00	-5,599.18	283.20	1,275,429.87	3,240,059.84		
Point 11				0.00	-4,678.69	282.98	1,276,350.28	3,240,050.73		
Point 12				0.00	-2,456.42	267.33	1,278,572.21	3,240,013.60		
Point 13				0.00	-232.88	250.87	1,280,795.40	3,239,975.66		
Point 14				0.00	-220.02	-1,914.16	1,280,787.33	3,237,810.69		
Sparboe 40N-3HZ_Bf	- actual wellpath misses target center by 29.34ft at 14032.00ft MD (7038.27 TVD, -7227.18 N, 702.32 E)	0.00	0.00	7,028.00	-7,253.05	711.61	1,273,780.29	3,240,504.19	40.081718	-104.640484
- Point										
Sparboe 40N-3HZ_Se	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Polygon										
Point 1				0.00	253.56	-4,539.45	1,281,235.50	3,235,181.05		
Point 2				0.00	-2,367.14	-4,538.17	1,278,615.04	3,235,207.65		
Point 3				0.00	-4,994.33	-4,534.70	1,275,988.11	3,235,236.51		
Point 4				0.00	-7,686.30	-4,567.98	1,273,296.05	3,235,229.25		
Point 5				0.00	-10,318.32	-4,591.76	1,270,664.03	3,235,230.91		
Point 6				0.00	-10,337.23	-1,948.52	1,270,670.67	3,237,874.10		
Point 7				0.00	-10,355.11	709.33	1,270,678.47	3,240,531.89		
Point 8				0.00	-7,713.22	728.35	1,273,320.32	3,240,525.38		
Point 9				0.00	-5,153.29	746.36	1,275,880.20	3,240,518.65		
Point 10				0.00	-2,464.97	727.42	1,278,568.11	3,240,473.73		
Point 11				0.00	224.44	707.52	1,281,257.09	3,240,427.85		
Point 12				0.00	240.01	-1,915.97	1,281,247.31	3,237,804.43		
Sparboe 40N-3HZ_St	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Point										
Sparboe 40N-3HZ_34	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Polygon										
Point 1				0.00	-4,994.33	-4,534.70	1,275,988.11	3,235,236.51		
Point 2				0.00	-5,071.47	-1,895.10	1,275,936.49	3,237,876.63		
Point 3				0.00	-5,152.97	746.36	1,275,880.52	3,240,518.65		
Sparboe 40N-3HZ_Bf	- actual wellpath misses target center by 33.82ft at 14032.00ft MD (7038.27 TVD, -7227.18 N, 702.32 E)	0.00	0.00	7,045.00	-7,253.05	681.61	1,273,780.00	3,240,474.20	40.081718	-104.640591
- Point										
Sparboe 40N-3HZ_LC	- actual wellpath hits target center	0.00	0.00	0.00	0.00	0.00	1,281,025.83	3,239,722.56	40.101628	-104.643027
- Polygon										

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Sparboe 40N-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 40N-3HZ	North Reference:	True
Wellbore:	Plan D Rev 0	Survey Calculation Method:	Minimum Curvature
Design:	Actual Field Surveys	Database:	EDM 2003.16 Single User Db

Point 1	0.00	-232.88	250.87	1,280,795.40	3,239,975.66
Point 2	0.00	-4,678.69	282.98	1,276,350.28	3,240,050.73
Point 3	0.00	-7,248.90	272.80	1,273,780.20	3,240,065.38
Point 4	0.00	-7,257.79	1,192.79	1,273,780.20	3,240,985.38
Point 5	0.00	-5,157.74	1,206.36	1,275,880.20	3,240,978.65
Point 6	0.00	-241.69	1,163.06	1,280,795.40	3,240,887.85

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,507.20	7,090.38	7" Casing @ 7507.2' MD :: 7090.38' 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	-0.03	0.25	First MS Energy Services Gyro @ 125.00ft
1,750.00	1,749.97	6.36	-0.71	Final MS Energy Services Gyro @ 1750.00ft
1,750.00	1,749.97	6.36	-0.71	Tie-On to Surface Gyros @ 1750.00ft
1,928.00	1,927.97	7.20	-0.80	First Sperry MWD Survey @ 1928.00ft
13,986.00	7,039.56	-7,181.20	701.78	Final Sperry MWD Survey @ 13986.00ft
14,032.00	7,038.27	-7,227.18	702.32	Straight Line Proj. @ 14032' MD :: 7038.27'TVD

Checked By: _____ Approved By: _____ Date: _____