

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 10-T2N-R65W

Cook 36N-3HZ

Plan D Rev 0

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

29 October, 2012

Well Coordinates: 1,297,730.71 N, 3,237,802.96 E (40° 08' 51.12" N, 104° 38' 57.54" W)

Ground Level: 4,869.00 ft

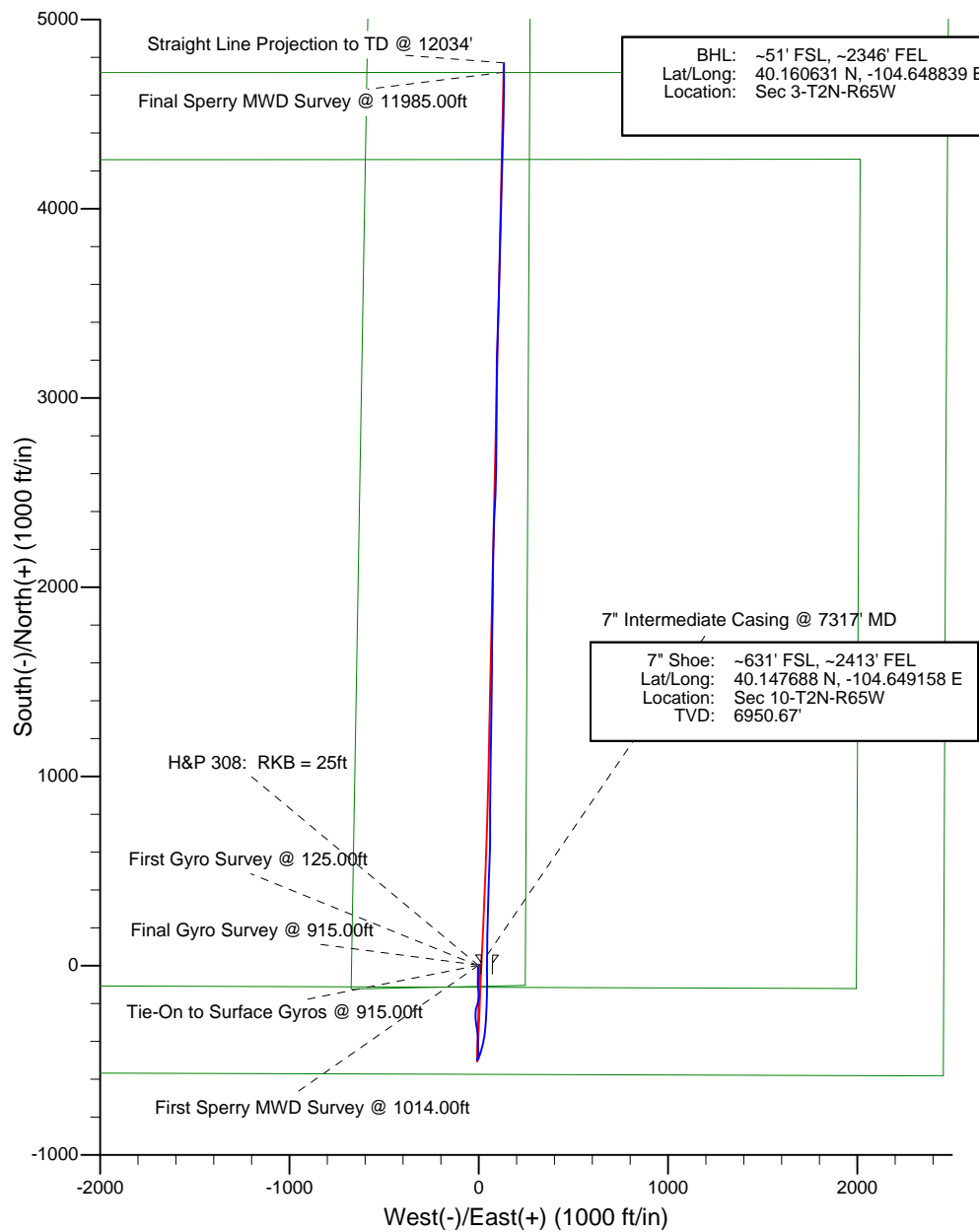
Local Coordinate Origin:	Centered on Well Cook 36N-3HZ
Viewing Datum:	RKB=25ft @ 4894.00ft (HP 308)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

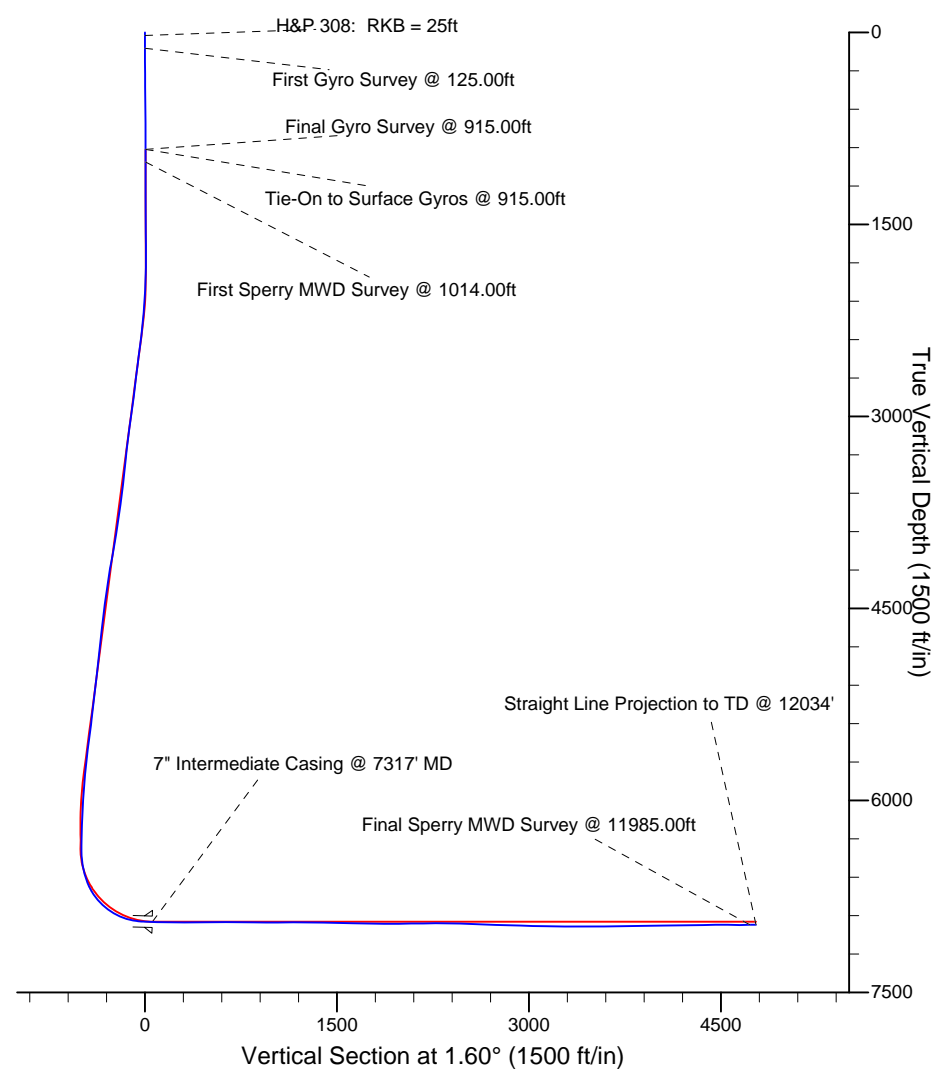
HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 10-T2N-R65W
 Well: Cook 36N-3HZ



LEGEND

- ◇ Cook 36N-3HZ, Plan D Rev 0, Plan D Rev 0 Proposal V0
- Actual Field Surveys



Design Report for Cook 36N-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	0.17	268.53	125.00	0.00	-0.15	-0.01	0.17
First Gyro Survey @ 125.00ft							
225.00	0.13	11.78	225.00	0.10	-0.27	0.10	0.24
325.00	0.39	347.19	325.00	0.55	-0.33	0.54	0.28
425.00	0.52	357.00	425.00	1.33	-0.42	1.32	0.15
525.00	0.54	349.41	524.99	2.25	-0.54	2.23	0.07
625.00	0.38	322.19	624.99	2.97	-0.83	2.95	0.27
725.00	0.13	275.11	724.99	3.25	-1.14	3.21	0.31
825.00	0.27	52.99	824.99	3.40	-1.07	3.37	0.38
915.00	0.27	57.24	914.99	3.64	-0.72	3.62	0.02
Final Gyro Survey @ 915.00ft - Tie-On to Surface Gyros @ 915.00ft							
1,014.00	0.28	93.70	1,013.98	3.75	-0.28	3.74	0.17
First Sperry MWD Survey @ 1014.00ft							
1,106.00	0.46	120.65	1,105.98	3.55	0.26	3.55	0.27
1,199.00	0.36	49.66	1,198.98	3.55	0.80	3.57	0.52
1,291.00	0.39	6.99	1,290.98	4.04	1.06	4.07	0.30
1,383.00	0.34	10.70	1,382.98	4.62	1.15	4.65	0.06
1,475.00	0.56	357.90	1,474.97	5.34	1.19	5.37	0.26
1,567.00	0.49	319.46	1,566.97	6.09	0.91	6.11	0.38
1,660.00	0.28	337.92	1,659.97	6.60	0.57	6.61	0.26
1,752.00	0.44	337.92	1,751.97	7.14	0.35	7.14	0.17
1,845.00	0.93	215.50	1,844.96	6.85	-0.22	6.84	1.32
1,937.00	2.39	194.09	1,936.92	4.39	-1.12	4.35	1.70
2,029.00	3.72	185.50	2,028.79	-0.45	-1.87	-0.50	1.52
2,122.00	3.37	182.78	2,121.61	-6.18	-2.30	-6.24	0.42
2,216.00	4.71	188.95	2,215.38	-12.75	-3.03	-12.83	1.50
2,311.00	6.23	177.99	2,309.94	-21.76	-3.46	-21.85	1.93
2,406.00	7.01	180.39	2,404.31	-32.71	-3.31	-32.79	0.87
2,501.00	8.02	178.66	2,498.49	-45.13	-3.20	-45.20	1.09
2,595.00	6.70	182.22	2,591.72	-57.16	-3.26	-57.23	1.49
2,690.00	7.62	183.15	2,685.98	-68.99	-3.82	-69.07	0.98
2,785.00	6.09	179.82	2,780.29	-80.32	-4.15	-80.40	1.66
2,879.00	8.30	180.22	2,873.55	-92.09	-4.16	-92.17	2.35
2,974.00	7.97	175.21	2,967.59	-105.51	-3.64	-105.57	0.82
3,069.00	7.32	176.66	3,061.75	-118.12	-2.73	-118.15	0.71
3,163.00	7.46	174.85	3,154.97	-130.17	-1.84	-130.17	0.29
3,258.00	5.56	175.34	3,249.35	-140.90	-0.91	-140.87	2.00
3,353.00	7.11	177.04	3,343.77	-151.36	-0.23	-151.31	1.64
3,447.00	6.12	172.05	3,437.14	-162.14	0.76	-162.05	1.22
3,542.00	5.94	192.63	3,531.63	-171.95	0.39	-171.87	2.27
3,637.00	7.59	191.06	3,625.96	-182.90	-1.89	-182.88	1.75
3,731.00	9.35	192.73	3,718.93	-196.45	-4.76	-196.50	1.89
3,826.00	7.76	200.30	3,812.88	-209.99	-8.69	-210.15	2.05
3,921.00	8.29	196.69	3,906.95	-222.56	-12.88	-222.84	0.77
4,015.00	10.81	187.23	3,999.64	-237.80	-15.94	-238.16	3.15
4,110.00	11.27	179.47	4,092.89	-255.93	-16.97	-256.30	1.64
4,205.00	9.20	176.71	4,186.37	-272.79	-16.45	-273.14	2.24

Design Report for Cook 36N-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,299.00	8.38	173.25	4,279.27	-287.10	-15.22	-287.41	1.04
4,394.00	7.95	175.74	4,373.31	-300.52	-13.91	-300.79	0.59
4,489.00	7.29	172.28	4,467.47	-313.05	-12.62	-313.28	0.85
4,585.00	7.21	171.21	4,562.70	-325.04	-10.88	-325.21	0.16
4,678.00	7.09	172.06	4,654.98	-336.49	-9.19	-336.61	0.17
4,773.00	6.62	169.37	4,749.30	-347.68	-7.37	-347.75	0.60
4,867.00	5.66	168.38	4,842.76	-357.54	-5.44	-357.56	1.03
4,962.00	6.68	177.74	4,937.21	-367.65	-4.28	-367.63	1.50
5,057.00	5.93	177.32	5,031.63	-378.08	-3.83	-378.04	0.79
5,151.00	7.83	183.64	5,124.95	-389.32	-4.01	-389.28	2.17
5,246.00	6.99	183.25	5,219.16	-401.55	-4.75	-401.52	0.89
5,341.00	5.54	183.59	5,313.59	-411.90	-5.36	-411.89	1.53
5,436.00	7.06	179.86	5,408.01	-422.31	-5.64	-422.31	1.66
5,531.00	7.33	171.43	5,502.27	-434.14	-4.72	-434.11	1.15
5,626.00	7.75	174.54	5,596.45	-446.51	-3.21	-446.43	0.62
5,721.00	5.74	170.29	5,690.78	-457.57	-1.80	-457.44	2.18
5,816.00	5.70	184.51	5,785.32	-466.96	-1.37	-466.82	1.49
5,911.00	4.79	187.93	5,879.92	-475.59	-2.28	-475.47	1.01
6,006.00	3.60	199.32	5,974.66	-482.33	-3.82	-482.25	1.52
6,101.00	3.23	204.68	6,069.49	-487.58	-5.92	-487.56	0.51
6,196.00	2.02	194.39	6,164.39	-491.63	-7.46	-491.65	1.36
6,291.00	1.41	167.53	6,259.35	-494.40	-7.62	-494.42	1.05
6,323.00	1.71	168.15	6,291.34	-495.25	-7.44	-495.26	0.94
6,386.00	1.58	142.01	6,354.31	-496.85	-6.71	-496.85	1.20
6,418.00	1.72	70.46	6,386.30	-497.04	-5.99	-497.01	6.04
6,450.00	3.59	43.32	6,418.27	-496.15	-4.84	-496.09	6.89
6,482.00	5.51	30.99	6,450.17	-494.10	-3.37	-494.01	6.70
6,513.00	7.85	24.31	6,480.96	-490.90	-1.73	-490.76	7.94
6,545.00	10.42	21.58	6,512.55	-486.22	0.24	-486.02	8.14
6,577.00	13.04	20.27	6,543.88	-480.14	2.55	-479.88	8.23
6,608.00	15.75	19.52	6,573.90	-472.89	5.17	-472.56	8.76
6,640.00	18.39	18.69	6,604.49	-464.01	8.24	-463.60	8.28
6,672.00	21.19	17.11	6,634.59	-453.70	11.56	-453.20	8.91
6,703.00	24.61	16.09	6,663.15	-442.14	15.00	-441.55	11.11
6,735.00	28.43	14.40	6,691.78	-428.36	18.74	-427.67	12.17
6,767.00	31.63	12.45	6,719.48	-412.78	22.44	-411.99	10.45
6,799.00	35.80	10.22	6,746.09	-395.37	25.91	-394.49	13.59
6,830.00	39.67	9.27	6,770.60	-376.67	29.12	-375.71	12.62
6,862.00	42.95	7.12	6,794.64	-355.77	32.12	-354.73	11.17
6,894.00	46.90	5.61	6,817.29	-333.31	34.61	-332.22	12.78
6,925.00	51.00	4.58	6,837.64	-310.03	36.68	-308.89	13.46
6,957.00	54.27	4.22	6,857.06	-284.68	38.63	-283.49	10.26
6,989.00	58.21	2.66	6,874.84	-258.13	40.22	-256.91	12.96
7,021.00	61.58	1.47	6,890.89	-230.47	41.21	-229.23	11.01
7,053.00	65.35	1.50	6,905.18	-201.85	41.95	-200.60	11.78
7,084.00	69.42	2.36	6,917.10	-173.26	42.92	-171.99	13.38
7,116.00	73.53	0.84	6,927.27	-142.94	43.76	-141.66	13.61
7,148.00	77.48	0.15	6,935.28	-111.96	44.03	-110.69	12.52
7,180.00	81.87	359.88	6,941.01	-80.49	44.03	-79.23	13.74
7,257.00	87.26	359.87	6,948.30	-3.86	43.87	-2.64	7.00
7,317.00	88.21	0.65	6,950.67	56.09	44.14	57.30	2.05

Design Report for Cook 36N-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" Intermediate Casing @ 7317' MD							
7,352.00	88.77	1.10	6,951.59	91.07	44.67	92.28	2.05
7,447.00	89.45	1.29	6,953.07	186.04	46.65	187.27	0.74
7,541.00	89.91	1.53	6,953.59	280.01	48.96	281.27	0.55
7,636.00	90.59	1.89	6,953.18	374.97	51.80	376.26	0.81
7,731.00	90.09	1.57	6,952.61	469.92	54.67	471.26	0.62
7,825.00	90.52	2.14	6,952.11	563.87	57.71	565.26	0.76
7,920.00	90.12	1.05	6,951.58	658.83	60.35	660.26	1.22
8,015.00	88.98	359.95	6,952.33	753.82	61.18	755.23	1.67
8,109.00	89.63	0.04	6,953.47	847.81	61.17	849.19	0.70
8,204.00	89.26	0.19	6,954.39	942.81	61.37	944.15	0.42
8,299.00	89.78	0.79	6,955.18	1,037.80	62.18	1,039.13	0.84
8,393.00	90.06	0.90	6,955.32	1,131.79	63.56	1,133.12	0.32
8,488.00	90.37	1.13	6,954.96	1,226.77	65.25	1,228.12	0.41
8,583.00	90.40	1.38	6,954.32	1,321.75	67.33	1,323.11	0.27
8,677.00	88.64	0.29	6,955.11	1,415.73	68.70	1,417.09	2.20
8,772.00	88.55	0.40	6,957.44	1,510.70	69.27	1,512.04	0.15
8,867.00	88.61	0.39	6,959.79	1,605.67	69.92	1,606.99	0.06
8,961.00	88.12	0.87	6,962.47	1,699.62	70.96	1,700.94	0.73
9,056.00	89.17	1.06	6,964.72	1,794.58	72.56	1,795.91	1.12
9,151.00	90.12	0.34	6,965.31	1,889.57	73.72	1,890.89	1.25
9,245.00	90.74	0.64	6,964.60	1,983.57	74.52	1,984.87	0.73
9,340.00	91.57	0.52	6,962.69	2,078.54	75.48	2,079.84	0.88
9,435.00	89.57	1.43	6,961.74	2,173.52	77.10	2,174.82	2.31
9,530.00	90.46	1.35	6,961.72	2,268.49	79.40	2,269.82	0.94
9,625.00	90.06	2.94	6,961.29	2,363.42	82.96	2,364.81	1.73
9,720.00	88.55	2.63	6,962.44	2,458.29	87.57	2,459.78	1.62
9,815.00	87.25	0.84	6,965.92	2,553.18	90.45	2,554.71	2.33
9,910.00	87.32	1.11	6,970.42	2,648.06	92.06	2,649.60	0.29
10,005.00	88.64	0.39	6,973.77	2,742.99	93.31	2,744.53	1.58
10,100.00	88.40	0.24	6,976.22	2,837.96	93.83	2,839.47	0.30
10,195.00	88.49	0.15	6,978.80	2,932.92	94.15	2,934.41	0.13
10,290.00	88.61	0.74	6,981.21	3,027.89	94.89	3,029.36	0.63
10,385.00	88.89	0.18	6,983.28	3,122.86	95.65	3,124.31	0.66
10,480.00	88.98	1.16	6,985.04	3,217.84	96.76	3,219.28	1.04
10,575.00	89.94	1.63	6,985.94	3,312.80	99.08	3,314.28	1.13
10,671.00	90.03	1.95	6,985.96	3,408.76	102.07	3,410.28	0.35
10,766.00	90.25	1.84	6,985.73	3,503.70	105.22	3,505.28	0.26
10,861.00	90.46	1.57	6,985.14	3,598.66	108.04	3,600.27	0.36
10,956.00	90.31	1.50	6,984.51	3,693.62	110.59	3,695.27	0.17
11,051.00	90.95	1.95	6,983.46	3,788.58	113.45	3,790.27	0.82
11,147.00	91.17	1.05	6,981.68	3,884.52	115.96	3,886.25	0.96
11,242.00	91.29	1.24	6,979.65	3,979.48	117.86	3,981.22	0.24
11,337.00	90.68	1.57	6,978.01	4,074.44	120.19	4,076.21	0.73
11,432.00	91.51	1.54	6,976.20	4,169.39	122.76	4,171.19	0.87
11,528.00	90.62	2.13	6,974.41	4,265.32	125.84	4,267.17	1.11
11,623.00	90.28	1.16	6,973.67	4,360.28	128.56	4,362.17	1.08
11,718.00	90.03	1.30	6,973.41	4,455.25	130.60	4,457.16	0.30
11,813.00	89.97	0.86	6,973.41	4,550.24	132.39	4,552.16	0.47
11,908.00	89.91	359.97	6,973.51	4,645.23	133.08	4,647.14	0.94
11,985.00	90.49	0.17	6,973.24	4,722.23	133.18	4,724.11	0.80

Design Report for Cook 36N-3HZ - Actual Field Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Final Sperry MWD Survey @ 11985.00ft							
12,034.00	90.49	0.17	6,972.82	4,771.23	133.32	4,773.09	0.00
Straight Line Projection to TD @ 12034'							

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	0.00	-0.15	First Gyro Survey @ 125.00ft
915.00	914.99	3.64	-0.72	Final Gyro Survey @ 915.00ft
915.00	914.99	3.64	-0.72	Tie-On to Surface Gyros @ 915.00ft
1,014.00	1,013.98	3.75	-0.28	First Sperry MWD Survey @ 1014.00ft
11,985.00	6,973.24	4,722.23	133.18	Final Sperry MWD Survey @ 11985.00ft
12,034.00	6,972.82	4,771.23	133.32	Straight Line Projection to TD @ 12034'

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N_S (ft)	+E-W (ft)	
Target	Cook 36N-3HZ_BHL revised	1.60	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
25.00	915.00	Surface Gyros	NS-GYRO-MS
915.00	7,180.00	Sperry MWD Surveys - Vert/Build	MWD+SC
7,257.00	11,985.00	Sperry MWD Surveys - Lateral	MWD+SC

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,317.00		7" Intermediate Casing @ 7317' MD	7	8-3/4

Design Report for Cook 36N-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
Cook 36N-3HZ_Set1	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1				2,023.26	5,182.33	1,302,931.99	3,239,776.33		
Point 2				2,045.49	7,369.87	1,305,119.55	3,239,777.57		
Point 3				2,080.11	9,391.67	1,307,141.51	3,239,792.79		
Point 4				-104.33	9,405.61	1,307,134.49	3,237,608.41		
Point 5				-2,290.44	9,419.56	1,307,127.47	3,235,422.36		
Point 6				-2,310.40	7,374.47	1,305,082.37	3,235,422.02		
Point 7				-2,331.90	5,179.72	1,302,887.60	3,235,421.57		
Point 8				-153.56	5,181.02	1,302,909.80	3,237,599.71		
Cook 36N-3HZ_BHL	0.00	0.00	6,948.00	5,181.40	133.04	1,302,912.92	3,237,886.28	40.161757	-104.648840
- actual wellpath misses target center by 410.92ft at 12034.00ft MD (6972.82 TVD, 4771.23 N, 133.32 E)									
- Point									
Cook 36N-3HZ_WP1	0.00	0.00	6,948.88	638.41	42.00	1,298,369.46	3,237,838.83	40.149286	-104.649166
- actual wellpath misses target center by 18.14ft at 7899.09ft MD (6951.64 TVD, 637.93 N, 59.93 E)									
- Point									
Cook 36N-3HZ_SHL	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Point									
Cook 36N-3HZ_Lan1	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1				-576.22	5,557.21	1,303,281.90	3,237,173.48		
Point 2				-673.43	-122.54	1,297,601.72	3,237,130.76		
Point 3				246.88	-103.41	1,297,629.67	3,238,050.81		
Point 4				274.87	5,602.81	1,303,335.66	3,238,024.06		
Cook 36N-3HZ_Set2	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1				1,995.32	-120.20	1,297,629.66	3,239,799.25		
Point 2				2,005.64	2,069.23	1,299,818.99	3,239,788.57		
Point 3				2,015.98	4,262.29	1,302,011.96	3,239,777.87		
Point 4				-164.04	4,260.98	1,301,989.74	3,237,598.06		
Point 5				-2,343.31	4,259.67	1,301,967.52	3,235,418.99		
Point 6				-2,376.38	2,064.46	1,299,772.19	3,235,406.98		
Point 7				-2,420.43	-105.79	1,297,601.71	3,235,383.75		
Point 8				-212.70	-112.96	1,297,615.72	3,237,591.36		
Cook 36N-3HZ_Sec1	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1				-2,796.45	4,719.42	1,302,422.89	3,234,961.48		
Point 2				2,478.62	4,722.59	1,302,476.66	3,240,236.06		
Cook 36N-3HZ_Sec2	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1				2,454.48	-581.72	1,297,172.58	3,240,262.80		
Point 2				2,465.67	2,069.73	1,299,823.91	3,240,248.56		
Point 3				2,478.62	4,722.59	1,302,476.66	3,240,236.06		
Point 4				2,505.45	7,369.47	1,305,123.56	3,240,237.49		
Point 5				2,548.00	9,848.79	1,307,603.08	3,240,256.26		
Point 6				-99.08	9,865.77	1,307,594.66	3,237,609.24		
Point 7				-2,746.10	9,882.48	1,307,585.98	3,234,962.30		
Point 8				-2,770.55	7,374.76	1,305,078.24	3,234,961.90		
Point 9				-2,796.45	4,719.42	1,302,422.89	3,234,961.48		
Point 10				-2,836.46	2,063.96	1,299,767.28	3,234,946.94		
Point 11				-2,889.86	-564.29	1,297,138.74	3,234,918.76		
Point 12				-217.82	-572.96	1,297,155.71	3,237,590.65		
Cook 36N-3HZ_BHL	0.00	0.00	6,948.00	4,771.40	133.04	1,302,502.96	3,237,890.21	40.160632	-104.648840
- actual wellpath misses target center by 24.82ft at 12034.00ft MD (6972.82 TVD, 4771.23 N, 133.32 E)									

Design Report for Cook 36N-3HZ - Actual Field Surveys

- Point

North Reference Sheet for Sec. 10-T2N-R65W - Cook 36N-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=25ft @ 4894.00ft (HP 308). Northing and Easting are relative to Cook 36N-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: 0.99995846

Grid Coordinates of Well: 1,297,730.71 ft N, 3,237,802.96 ft E
 Geographical Coordinates of Well: 40° 08' 51.12" N, 104° 38' 57.54" W
 Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,034.00ft
 the Bottom Hole Displacement is 4,773.09ft in the Direction of 1.60° (True).

Magnetic Convergence at surface is: -8.10° (10 October 2012, , BGGM2012)

Magnetic Model: BGGM 2012
 Date: 10-Oct-12
 Declination: 8.65°
 Inclination/Dip: 66.80°
 Field Strength: 52791

Grid North is 0.55° East of True North (Grid Convergence)
 Magnetic North is 8.65° East of True North (Magnetic Declination)
 Magnetic North is 8.10° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.55°
 To convert a Magnetic Direction to a True Direction, Add 8.65° East
 To convert a Magnetic Direction to a Grid Direction, Add 8.10°

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 10-T2N-R65W

Cook 36N-3HZ

Plan D Rev 0

Design: Actual Field Surveys

Survey Report - Geographic

29 October, 2012

Halliburton Company

Survey Report - Geographic

Company: Anadarko Petroleum Corp.	Local Co-ordinate Reference: Well Cook 36N-3HZ
Project: Weld County, CO (NAD 83)	TVD Reference: RKB=25ft @ 4894.00ft (HP 308)
Site: Sec. 10-T2N-R65W	MD Reference: RKB=25ft @ 4894.00ft (HP 308)
Well: Cook 36N-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. 10-T2N-R65W					
Site Position:		Northing:	1,297,730.72ft	Latitude:	40.147534
From:	Lat/Long	Easting:	3,237,802.96ft	Longitude:	-104.649316
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.55 °

Well Cook 36N-3HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,297,730.71 ft	Latitude:
	+E/-W	0.00 ft	Easting:	3,237,802.96 ft	Longitude:
Position Uncertainty		3.28 ft	Wellhead Elevation:	ft	Ground Level:
					4,869.00ft

Wellbore Plan D Rev 0					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	2012-10-10	8.65	66.80	52,791

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	1.60	

Survey Program Date 2012-10-29					
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
25.00	915.00	Surface Gyros (Plan D Rev 0)	NS-GYRO-MS	North sensing gyrocompassing m/s	
915.00	7,180.00	Sperry MWD Surveys - Vert/Build (Plan D	MWD+SC	Fixed:v2:standard dec & axial correction	
7,257.00	11,985.00	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 Cook 36N-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 36N-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	1,297,730.71	3,237,802.96	40.147534	-104.649316	
25.00	0.00	0.00	25.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316	
H&P 308: RKB = 25ft										
125.00	0.17	268.53	125.00	0.00	-0.15	1,297,730.70	3,237,802.81	40.147534	-104.649317	
First Gyro Survey @ 125.00ft										
225.00	0.13	11.78	225.00	0.10	-0.27	1,297,730.81	3,237,802.68	40.147534	-104.649317	
325.00	0.39	347.19	325.00	0.55	-0.33	1,297,731.25	3,237,802.62	40.147535	-104.649317	
425.00	0.52	357.00	425.00	1.33	-0.42	1,297,732.03	3,237,802.52	40.147538	-104.649318	
525.00	0.54	349.41	524.99	2.25	-0.54	1,297,732.95	3,237,802.40	40.147540	-104.649318	
625.00	0.38	322.19	624.99	2.97	-0.83	1,297,733.67	3,237,802.10	40.147542	-104.649319	
725.00	0.13	275.11	724.99	3.25	-1.14	1,297,733.94	3,237,801.78	40.147543	-104.649320	
825.00	0.27	52.99	824.99	3.40	-1.07	1,297,734.09	3,237,801.86	40.147543	-104.649320	
915.00	0.27	57.24	914.99	3.64	-0.72	1,297,734.34	3,237,802.20	40.147544	-104.649319	
Final Gyro Survey @ 915.00ft - Tie-On to Surface Gyros @ 915.00ft										
1,014.00	0.28	93.70	1,013.98	3.75	-0.28	1,297,734.45	3,237,802.64	40.147544	-104.649317	
First Sperry MWD Survey @ 1014.00ft										
1,106.00	0.46	120.65	1,105.98	3.55	0.26	1,297,734.26	3,237,803.18	40.147544	-104.649315	
1,199.00	0.36	49.66	1,198.98	3.55	0.80	1,297,734.26	3,237,803.73	40.147544	-104.649313	
1,291.00	0.39	6.99	1,290.98	4.04	1.06	1,297,734.76	3,237,803.98	40.147545	-104.649312	
1,383.00	0.34	10.70	1,382.98	4.62	1.15	1,297,735.34	3,237,804.06	40.147547	-104.649312	
1,475.00	0.56	357.90	1,474.97	5.34	1.19	1,297,736.06	3,237,804.09	40.147549	-104.649312	
1,567.00	0.49	319.46	1,566.97	6.09	0.91	1,297,736.80	3,237,803.81	40.147551	-104.649313	
1,660.00	0.28	337.92	1,659.97	6.60	0.57	1,297,737.31	3,237,803.46	40.147552	-104.649314	
1,752.00	0.44	337.92	1,751.97	7.14	0.35	1,297,737.85	3,237,803.24	40.147554	-104.649315	
1,845.00	0.93	215.50	1,844.96	6.85	-0.22	1,297,737.56	3,237,802.67	40.147553	-104.649317	
1,937.00	2.39	194.09	1,936.92	4.39	-1.12	1,297,735.08	3,237,801.79	40.147546	-104.649320	
2,029.00	3.72	185.50	2,028.79	-0.45	-1.87	1,297,730.24	3,237,801.09	40.147533	-104.649323	
2,122.00	3.37	182.78	2,121.61	-6.18	-2.30	1,297,724.50	3,237,800.72	40.147517	-104.649324	
2,216.00	4.71	188.95	2,215.38	-12.75	-3.03	1,297,717.93	3,237,800.05	40.147499	-104.649327	
2,311.00	6.23	177.99	2,309.94	-21.76	-3.46	1,297,708.92	3,237,799.71	40.147474	-104.649328	
2,406.00	7.01	180.39	2,404.31	-32.71	-3.31	1,297,697.97	3,237,799.96	40.147444	-104.649328	
2,501.00	8.02	178.66	2,498.49	-45.13	-3.20	1,297,685.55	3,237,800.19	40.147410	-104.649327	
2,595.00	6.70	182.22	2,591.72	-57.16	-3.26	1,297,673.52	3,237,800.25	40.147377	-104.649328	
2,690.00	7.62	183.15	2,685.98	-68.99	-3.82	1,297,661.68	3,237,799.80	40.147345	-104.649330	
2,785.00	6.09	179.82	2,780.29	-80.32	-4.15	1,297,650.35	3,237,799.58	40.147313	-104.649331	
2,879.00	8.30	180.22	2,873.55	-92.09	-4.16	1,297,638.58	3,237,799.68	40.147281	-104.649331	
2,974.00	7.97	175.21	2,967.59	-105.51	-3.64	1,297,625.17	3,237,800.33	40.147244	-104.649329	
3,069.00	7.32	176.66	3,061.75	-118.12	-2.73	1,297,612.57	3,237,801.36	40.147210	-104.649326	
3,163.00	7.46	174.85	3,154.97	-130.17	-1.84	1,297,600.53	3,237,802.37	40.147177	-104.649323	
3,258.00	5.56	175.34	3,249.35	-140.90	-0.91	1,297,589.81	3,237,803.40	40.147147	-104.649319	
3,353.00	7.11	177.04	3,343.77	-151.36	-0.23	1,297,579.35	3,237,804.18	40.147118	-104.649317	
3,447.00	6.12	172.05	3,437.14	-162.14	0.76	1,297,568.59	3,237,805.27	40.147089	-104.649313	
3,542.00	5.94	192.63	3,531.63	-171.95	0.39	1,297,558.78	3,237,804.99	40.147062	-104.649315	
3,637.00	7.59	191.06	3,625.96	-182.90	-1.89	1,297,547.80	3,237,802.82	40.147032	-104.649323	
3,731.00	9.35	192.73	3,718.93	-196.45	-4.76	1,297,534.23	3,237,800.08	40.146995	-104.649333	
3,826.00	7.76	200.30	3,812.88	-209.99	-8.69	1,297,520.65	3,237,796.28	40.146958	-104.649347	
3,921.00	8.29	196.69	3,906.95	-222.56	-12.88	1,297,508.04	3,237,792.21	40.146923	-104.649362	
4,015.00	10.81	187.23	3,999.64	-237.80	-15.94	1,297,492.77	3,237,789.30	40.146881	-104.649373	
4,110.00	11.27	179.47	4,092.89	-255.93	-16.97	1,297,474.64	3,237,788.44	40.146831	-104.649377	
4,205.00	9.20	176.71	4,186.37	-272.79	-16.45	1,297,457.78	3,237,789.12	40.146785	-104.649375	
4,299.00	8.38	173.25	4,279.27	-287.10	-15.22	1,297,443.49	3,237,790.49	40.146746	-104.649370	
4,394.00	7.95	175.74	4,373.31	-300.52	-13.91	1,297,430.08	3,237,791.92	40.146709	-104.649366	
4,489.00	7.29	172.28	4,467.47	-313.05	-12.62	1,297,417.56	3,237,793.34	40.146675	-104.649361	
4,585.00	7.21	171.21	4,562.70	-325.04	-10.88	1,297,405.59	3,237,795.20	40.146642	-104.649355	
4,678.00	7.09	172.06	4,654.98	-336.49	-9.19	1,297,394.16	3,237,796.99	40.146610	-104.649349	

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 36N-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 36N-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
4,773.00	6.62	169.37	4,749.30	-347.68	-7.37	1,297,382.99	3,237,798.92	40.146580	-104.649342
4,867.00	5.66	168.38	4,842.76	-357.54	-5.44	1,297,373.14	3,237,800.95	40.146552	-104.649335
4,962.00	6.68	177.74	4,937.21	-367.65	-4.28	1,297,363.04	3,237,802.20	40.146525	-104.649331
5,057.00	5.93	177.32	5,031.63	-378.08	-3.83	1,297,352.63	3,237,802.75	40.146496	-104.649330
5,151.00	7.83	183.64	5,124.95	-389.32	-4.01	1,297,341.38	3,237,802.68	40.146465	-104.649330
5,246.00	6.99	183.25	5,219.16	-401.55	-4.75	1,297,329.15	3,237,802.06	40.146432	-104.649333
5,341.00	5.54	183.59	5,313.59	-411.90	-5.36	1,297,318.79	3,237,801.54	40.146403	-104.649335
5,436.00	7.06	179.86	5,408.01	-422.31	-5.64	1,297,308.38	3,237,801.37	40.146375	-104.649336
5,531.00	7.33	171.43	5,502.27	-434.14	-4.72	1,297,296.56	3,237,802.40	40.146342	-104.649333
5,626.00	7.75	174.54	5,596.45	-446.51	-3.21	1,297,284.20	3,237,804.03	40.146308	-104.649327
5,721.00	5.74	170.29	5,690.78	-457.57	-1.80	1,297,273.16	3,237,805.55	40.146278	-104.649322
5,816.00	5.70	184.51	5,785.32	-466.96	-1.37	1,297,263.78	3,237,806.07	40.146252	-104.649321
5,911.00	4.79	187.93	5,879.92	-475.59	-2.28	1,297,255.14	3,237,805.23	40.146228	-104.649324
6,006.00	3.60	199.32	5,974.66	-482.33	-3.82	1,297,248.38	3,237,803.76	40.146210	-104.649330
6,101.00	3.23	204.68	6,069.49	-487.58	-5.92	1,297,243.11	3,237,801.71	40.146196	-104.649337
6,196.00	2.02	194.39	6,164.39	-491.63	-7.46	1,297,239.04	3,237,800.22	40.146184	-104.649343
6,291.00	1.41	167.53	6,259.35	-494.40	-7.62	1,297,236.28	3,237,800.08	40.146177	-104.649343
6,323.00	1.71	168.15	6,291.34	-495.25	-7.44	1,297,235.43	3,237,800.27	40.146174	-104.649343
6,386.00	1.58	142.01	6,354.31	-496.85	-6.71	1,297,233.83	3,237,801.01	40.146170	-104.649340
6,418.00	1.72	70.46	6,386.30	-497.04	-5.99	1,297,233.65	3,237,801.74	40.146170	-104.649337
6,450.00	3.59	43.32	6,418.27	-496.15	-4.84	1,297,234.55	3,237,802.87	40.146172	-104.649333
6,482.00	5.51	30.99	6,450.17	-494.10	-3.37	1,297,236.61	3,237,804.33	40.146178	-104.649328
6,513.00	7.85	24.31	6,480.96	-490.90	-1.73	1,297,239.83	3,237,805.94	40.146186	-104.649322
6,545.00	10.42	21.58	6,512.55	-486.22	0.24	1,297,244.54	3,237,807.86	40.146199	-104.649315
6,577.00	13.04	20.27	6,543.88	-480.14	2.55	1,297,250.64	3,237,810.11	40.146216	-104.649307
6,608.00	15.75	19.52	6,573.90	-472.89	5.17	1,297,257.91	3,237,812.66	40.146236	-104.649298
6,640.00	18.39	18.69	6,604.49	-464.01	8.24	1,297,266.81	3,237,815.64	40.146260	-104.649287
6,672.00	21.19	17.11	6,634.59	-453.70	11.56	1,297,277.15	3,237,818.87	40.146289	-104.649275
6,703.00	24.61	16.09	6,663.15	-442.14	15.00	1,297,288.75	3,237,822.19	40.146320	-104.649262
6,735.00	28.43	14.40	6,691.78	-428.36	18.74	1,297,302.57	3,237,825.80	40.146358	-104.649249
6,767.00	31.63	12.45	6,719.48	-412.78	22.44	1,297,318.18	3,237,829.36	40.146401	-104.649236
6,799.00	35.80	10.22	6,746.09	-395.37	25.91	1,297,335.62	3,237,832.66	40.146449	-104.649223
6,830.00	39.67	9.27	6,770.60	-376.67	29.12	1,297,354.35	3,237,835.68	40.146500	-104.649212
6,862.00	42.95	7.12	6,794.64	-355.77	32.12	1,297,375.28	3,237,838.48	40.146557	-104.649201
6,894.00	46.90	5.61	6,817.29	-333.31	34.61	1,297,397.75	3,237,840.76	40.146619	-104.649192
6,925.00	51.00	4.58	6,837.64	-310.03	36.68	1,297,421.05	3,237,842.61	40.146683	-104.649185
6,957.00	54.27	4.22	6,857.06	-284.68	38.63	1,297,446.42	3,237,844.31	40.146752	-104.649178
6,989.00	58.21	2.66	6,874.84	-258.13	40.22	1,297,472.99	3,237,845.64	40.146825	-104.649172
7,021.00	61.58	1.47	6,890.89	-230.47	41.21	1,297,500.65	3,237,846.37	40.146901	-104.649169
7,053.00	65.35	1.50	6,905.18	-201.85	41.95	1,297,529.27	3,237,846.84	40.146980	-104.649166
7,084.00	69.42	2.36	6,917.10	-173.26	42.92	1,297,557.87	3,237,847.53	40.147058	-104.649162
7,116.00	73.53	0.84	6,927.27	-142.94	43.76	1,297,588.20	3,237,848.08	40.147142	-104.649159
7,148.00	77.48	0.15	6,935.28	-111.96	44.03	1,297,619.18	3,237,848.05	40.147227	-104.649159
7,180.00	81.87	359.88	6,941.01	-80.49	44.03	1,297,650.65	3,237,847.76	40.147313	-104.649158
7,257.00	87.26	359.87	6,948.30	-3.86	43.87	1,297,727.26	3,237,846.85	40.147523	-104.649159
7,317.00	88.21	0.65	6,950.67	56.09	44.14	1,297,787.21	3,237,846.55	40.147688	-104.649158
7" Intermediate Casing @ 7317' MD									
7,352.00	88.77	1.10	6,951.59	91.07	44.67	1,297,822.20	3,237,846.75	40.147784	-104.649156
7,447.00	89.45	1.29	6,953.07	186.04	46.65	1,297,917.18	3,237,847.82	40.148045	-104.649149
7,541.00	89.91	1.53	6,953.59	280.01	48.96	1,298,011.16	3,237,849.23	40.148303	-104.649141
7,636.00	90.59	1.89	6,953.18	374.97	51.80	1,298,106.14	3,237,851.15	40.148563	-104.649131
7,731.00	90.09	1.57	6,952.61	469.92	54.67	1,298,201.11	3,237,853.11	40.148824	-104.649120
7,825.00	90.52	2.14	6,952.11	563.87	57.71	1,298,295.08	3,237,855.25	40.149082	-104.649110
7,920.00	90.12	1.05	6,951.58	658.83	60.35	1,298,390.06	3,237,856.98	40.149342	-104.649100
8,015.00	88.98	359.95	6,952.33	753.82	61.18	1,298,485.05	3,237,856.90	40.149603	-104.649097

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 36N-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 36N-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	
8,109.00	89.63	0.04	6,953.47	847.81	61.17	1,298,579.03	3,237,855.99	40.149861	-104.649097	
8,204.00	89.26	0.19	6,954.39	942.81	61.37	1,298,674.02	3,237,855.27	40.150122	-104.649096	
8,299.00	89.78	0.79	6,955.18	1,037.80	62.18	1,298,769.01	3,237,855.17	40.150383	-104.649094	
8,393.00	90.06	0.90	6,955.32	1,131.79	63.56	1,298,863.01	3,237,855.66	40.150641	-104.649089	
8,488.00	90.37	1.13	6,954.96	1,226.77	65.25	1,298,958.00	3,237,856.43	40.150901	-104.649083	
8,583.00	90.40	1.38	6,954.32	1,321.75	67.33	1,299,052.98	3,237,857.60	40.151162	-104.649075	
8,677.00	88.64	0.29	6,955.11	1,415.73	68.70	1,299,146.97	3,237,858.07	40.151420	-104.649070	
8,772.00	88.55	0.40	6,957.44	1,510.70	69.27	1,299,241.94	3,237,857.73	40.151681	-104.649068	
8,867.00	88.61	0.39	6,959.79	1,605.67	69.92	1,299,336.90	3,237,857.47	40.151942	-104.649066	
8,961.00	88.12	0.87	6,962.47	1,699.62	70.96	1,299,430.86	3,237,857.60	40.152199	-104.649062	
9,056.00	89.17	1.06	6,964.72	1,794.58	72.56	1,299,525.83	3,237,858.29	40.152460	-104.649056	
9,151.00	90.12	0.34	6,965.31	1,889.57	73.72	1,299,620.82	3,237,858.54	40.152721	-104.649052	
9,245.00	90.74	0.64	6,964.60	1,983.57	74.52	1,299,714.81	3,237,858.44	40.152979	-104.649049	
9,340.00	91.57	0.52	6,962.69	2,078.54	75.48	1,299,809.79	3,237,858.49	40.153240	-104.649046	
9,435.00	89.57	1.43	6,961.74	2,173.52	77.10	1,299,904.77	3,237,859.20	40.153500	-104.649040	
9,530.00	90.46	1.35	6,961.72	2,268.49	79.40	1,299,999.76	3,237,860.59	40.153761	-104.649032	
9,625.00	90.06	2.94	6,961.29	2,363.42	82.96	1,300,094.71	3,237,863.24	40.154022	-104.649019	
9,720.00	88.55	2.63	6,962.44	2,458.29	87.57	1,300,189.62	3,237,866.94	40.154282	-104.649003	
9,815.00	87.25	0.84	6,965.92	2,553.18	90.45	1,300,284.53	3,237,868.90	40.154542	-104.648992	
9,910.00	87.32	1.11	6,970.42	2,648.06	92.06	1,300,379.42	3,237,869.61	40.154803	-104.648987	
10,005.00	88.64	0.39	6,973.77	2,742.99	93.31	1,300,474.35	3,237,869.94	40.155064	-104.648982	
10,100.00	88.40	0.24	6,976.22	2,837.96	93.83	1,300,569.31	3,237,869.55	40.155324	-104.648980	
10,195.00	88.49	0.15	6,978.80	2,932.92	94.15	1,300,664.27	3,237,868.96	40.155585	-104.648979	
10,290.00	88.61	0.74	6,981.21	3,027.89	94.89	1,300,759.24	3,237,868.79	40.155846	-104.648977	
10,385.00	88.89	0.18	6,983.28	3,122.86	95.65	1,300,854.21	3,237,868.64	40.156106	-104.648974	
10,480.00	88.98	1.16	6,985.04	3,217.84	96.76	1,300,949.19	3,237,868.84	40.156367	-104.648970	
10,575.00	89.94	1.63	6,985.94	3,312.80	99.08	1,301,044.17	3,237,870.24	40.156628	-104.648962	
10,671.00	90.03	1.95	6,985.96	3,408.76	102.07	1,301,140.14	3,237,872.32	40.156891	-104.648951	
10,766.00	90.25	1.84	6,985.73	3,503.70	105.22	1,301,235.11	3,237,874.55	40.157152	-104.648940	
10,861.00	90.46	1.57	6,985.14	3,598.66	108.04	1,301,330.09	3,237,876.47	40.157412	-104.648929	
10,956.00	90.31	1.50	6,984.51	3,693.62	110.59	1,301,425.07	3,237,878.10	40.157673	-104.648920	
11,051.00	90.95	1.95	6,983.46	3,788.58	113.45	1,301,520.04	3,237,880.05	40.157934	-104.648910	
11,147.00	91.17	1.05	6,981.68	3,884.52	115.96	1,301,616.00	3,237,881.64	40.158197	-104.648901	
11,242.00	91.29	1.24	6,979.65	3,979.48	117.86	1,301,710.97	3,237,882.63	40.158458	-104.648894	
11,337.00	90.68	1.57	6,978.01	4,074.44	120.19	1,301,805.94	3,237,884.05	40.158718	-104.648886	
11,432.00	91.51	1.54	6,976.20	4,169.39	122.76	1,301,900.91	3,237,885.71	40.158979	-104.648877	
11,528.00	90.62	2.13	6,974.41	4,265.32	125.84	1,301,996.86	3,237,887.86	40.159242	-104.648866	
11,623.00	90.28	1.16	6,973.67	4,360.28	128.56	1,302,091.83	3,237,889.68	40.159503	-104.648856	
11,718.00	90.03	1.30	6,973.41	4,455.25	130.60	1,302,186.82	3,237,890.81	40.159764	-104.648849	
11,813.00	89.97	0.86	6,973.41	4,550.24	132.39	1,302,281.81	3,237,891.69	40.160024	-104.648842	
11,908.00	89.91	359.97	6,973.51	4,645.23	133.08	1,302,376.81	3,237,891.46	40.160285	-104.648840	
11,985.00	90.49	0.17	6,973.24	4,722.23	133.18	1,302,453.80	3,237,890.82	40.160497	-104.648840	
Final Sperry MWD Survey @ 11985.00ft										
12,034.00	90.49	0.17	6,972.82	4,771.23	133.32	1,302,502.80	3,237,890.50	40.160631	-104.648839	
Straight Line Projection to TD @ 12034'										

Halliburton Company

Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 36N-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 36N-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	Dip Angle	Dip Dir.	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Cook 36N-3HZ_Setba	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	5,182.33	2,023.26	1,302,931.99	3,239,776.33		
Point 2			0.00	7,369.87	2,045.49	1,305,119.55	3,239,777.57		
Point 3			0.00	9,391.67	2,080.11	1,307,141.51	3,239,792.79		
Point 4			0.00	9,405.61	-104.33	1,307,134.49	3,237,608.41		
Point 5			0.00	9,419.56	-2,290.44	1,307,127.47	3,235,422.36		
Point 6			0.00	7,374.47	-2,310.40	1,305,082.37	3,235,422.02		
Point 7			0.00	5,179.72	-2,331.90	1,302,887.60	3,235,421.57		
Point 8			0.00	5,181.02	-153.56	1,302,909.80	3,237,599.71		
Cook 36N-3HZ_BHL	0.00	0.00	6,948.00	5,181.40	133.04	1,302,912.92	3,237,886.28	40.161757	-104.648840
- actual wellpath misses target center by 410.92ft at 12034.00ft MD (6972.82 TVD, 4771.23 N, 133.32 E)									
- Point									
Cook 36N-3HZ_WPtg	0.00	0.00	6,948.88	638.41	42.00	1,298,369.46	3,237,838.83	40.149286	-104.649166
- actual wellpath misses target center by 18.14ft at 7899.09ft MD (6951.64 TVD, 637.93 N, 59.93 E)									
- Point									
Cook 36N-3HZ_SHL	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Point									
Cook 36N-3HZ_Land	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	5,557.21	-576.22	1,303,281.90	3,237,173.48		
Point 2			0.00	-122.54	-673.43	1,297,601.72	3,237,130.76		
Point 3			0.00	-103.41	246.88	1,297,629.67	3,238,050.81		
Point 4			0.00	5,602.81	274.87	1,303,335.66	3,238,024.06		
Cook 36N-3HZ_Setba	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	-120.20	1,995.32	1,297,629.66	3,239,799.25		
Point 2			0.00	2,069.23	2,005.64	1,299,818.99	3,239,788.57		
Point 3			0.00	4,262.29	2,015.98	1,302,011.96	3,239,777.87		
Point 4			0.00	4,260.98	-164.04	1,301,989.74	3,237,598.06		
Point 5			0.00	4,259.67	-2,343.31	1,301,967.52	3,235,418.99		
Point 6			0.00	2,064.46	-2,376.38	1,299,772.19	3,235,406.98		
Point 7			0.00	-105.79	-2,420.43	1,297,601.71	3,235,383.75		
Point 8			0.00	-112.96	-212.70	1,297,615.72	3,237,591.36		
Cook 36N-3HZ_Sec 3	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	4,719.42	-2,796.45	1,302,422.89	3,234,961.48		
Point 2			0.00	4,722.59	2,478.62	1,302,476.66	3,240,236.06		
Cook 36N-3HZ_Sectic	0.00	0.00	0.00	0.00	0.00	1,297,730.71	3,237,802.96	40.147534	-104.649316
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	-581.72	2,454.48	1,297,172.58	3,240,262.80		
Point 2			0.00	2,069.73	2,465.67	1,299,823.91	3,240,248.56		
Point 3			0.00	4,722.59	2,478.62	1,302,476.66	3,240,236.06		
Point 4			0.00	7,369.47	2,505.45	1,305,123.56	3,240,237.49		
Point 5			0.00	9,848.79	2,548.00	1,307,603.08	3,240,256.26		
Point 6			0.00	9,865.77	-99.08	1,307,594.66	3,237,609.24		
Point 7			0.00	9,882.48	-2,746.10	1,307,585.98	3,234,962.30		
Point 8			0.00	7,374.76	-2,770.55	1,305,078.24	3,234,961.90		
Point 9			0.00	4,719.42	-2,796.45	1,302,422.89	3,234,961.48		

Halliburton Company
Survey Report - Geographic

Company:	Anadarko Petroleum Corp.	Local Co-ordinate Reference:	Well Cook 36N-3HZ
Project:	Weld County, CO (NAD 83)	TVD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Site:	Sec. 10-T2N-R65W	MD Reference:	RKB=25ft @ 4894.00ft (HP 308)
Well:	Cook 36N-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 10	0.00	2,063.96	-2,836.46	1,299,767.28	3,234,946.94		
Point 11	0.00	-564.29	-2,889.86	1,297,138.74	3,234,918.76		
Point 12	0.00	-572.96	-217.82	1,297,155.71	3,237,590.65		
Cook 36N-3HZ_BHL r	0.00	0.00	6,948.00	4,771.40	133.04	1,302,502.96	3,237,890.21
- actual wellpath misses target center by 24.82ft at 12034.00ft MD (6972.82 TVD, 4771.23 N, 133.32 E)							
- Point							

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,317.00	6,950.67	7" Intermediate Casing @ 7317' MD	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	0.00	-0.15		First Gyro Survey @ 125.00ft
915.00	914.99	3.64	-0.72		Final Gyro Survey @ 915.00ft
915.00	914.99	3.64	-0.72		Tie-On to Surface Gyros @ 915.00ft
1,014.00	1,013.98	3.75	-0.28		First Sperry MWD Survey @ 1014.00ft
11,985.00	6,973.24	4,722.23	133.18		Final Sperry MWD Survey @ 11985.00ft
12,034.00	6,972.82	4,771.23	133.32		Straight Line Projection to TD @ 12034'

Checked By: _____	Approved By: _____	Date: _____
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