

Azimuths to True North  
 Magnetic North: 8.57°  
 Magnetic Field  
 Strength: 52829.0snT  
 Dip Angle: 66.78°  
 Date: 12/10/2012  
 Model: IGRF2010

Anadarko  
 Petroleum Corporation

Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD SPARBOE 4 PAD  
 Well: SPARBOE 7C-3HZ  
 Wellbore: Wellbore #1  
 Design: ACTUAL  
 Latitude: 40.101501  
 Longitude: -104.646028  
 GL: 4977.00  
 KB: 16'RKB+4977'GL @ 4993.00ft (XTREME 23)

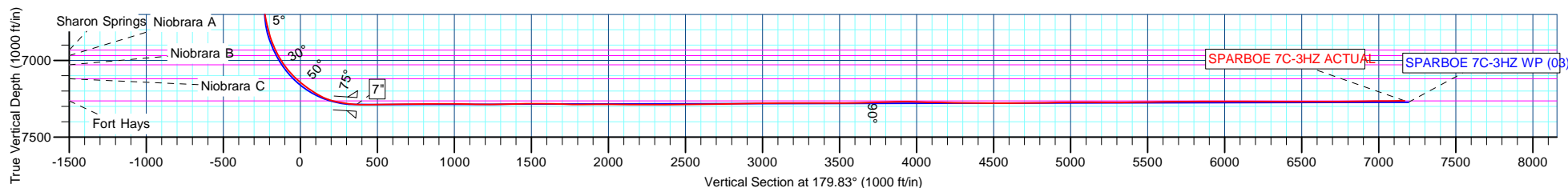
WELL DETAILS: SPARBOE 7C-3HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4977.00 Latitude	Longitude	Slot
0.00	0.00	1280971.47	3238883.55	40.101501	-104.646028	

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation	
1775.98	1776.00	0.27	340.35	1.40	-1.93	-1.41	8.49	TIE ON	
1884.98	1885.00	0.44	351.60	2.06	-2.08	-2.07	9.17	FIRST MWD SURVEY	
7287.76	7685.00	86.28	179.21	-368.68	-760.80	366.42	1403.39	7 IN. CASING	
7264.48	14432.00	90.80	177.59	-7113.86	-730.49	7111.66	8149.51	LAST MWD SURVEY	
7263.70	14488.00	90.80	177.59	-7169.80	-728.13	7167.61	8205.50	PROJECTION TO TD	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
SPARBOE 7C-3HZ PBHL	7273.00	-7195.21	-738.72	40.081749	-104.648668	Point	

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	
746.00	746.01	Fox Hills	
4992.00	5044.77	Sussex	
6933.00	7015.31	Sharon Springs	
6969.00	7055.78	Niobrara A	
7029.00	7126.56	Niobrara B	
7120.00	7246.64	Niobrara C	
7264.00	7527.37	Fort Hays	

CASING DETAILS			
TVD	MD	Name	Size
7287.76	7685.00	7"	7"



# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_SPARBOE 4 PAD**

**SPARBOE 7C-3HZ**

**Wellbore #1**

**Design: ACTUAL**

## **Standard Survey Report**

**30 January, 2013**

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		WELD_SPARBOE 4 PAD			
Site Position:		Northing:	1,280,971.47 usft	Latitude:	40.101501
From:	Lat/Long	Easting:	3,238,883.56 usft	Longitude:	-104.646028
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.55 °

Well		SPARBOE 7C-3HZ				
Well Position	+N/-S	0.00 ft	Northing:	1,280,971.47 usft	Latitude:	40.101501
	+E/-W	0.00 ft	Easting:	3,238,883.56 usft	Longitude:	-104.646028
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,977.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
			(°)	(°)	(nT)
	IGRF2010	12/10/2012	8.57	66.78	52,829

<b>Design</b>	ACTUAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	286.99	

<b>Survey Program</b>	<b>Date</b>	1/30/2013			
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
(ft)	(ft)				
16.00	1,776.00	Survey #1 (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
1,885.00	14,488.00	Survey #2 (Wellbore #1)	MWD	MWD - STANDARD	

<b>Survey</b>										
<b>Measured</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Vertical</b>	<b>Dogleg</b>	<b>Build</b>	<b>Turn</b>	
<b>Depth</b>	<b>(°)</b>	<b>(°)</b>	<b>Depth</b>	<b>(ft)</b>	<b>(ft)</b>	<b>Section</b>	<b>Rate</b>	<b>Rate</b>	<b>Rate</b>	
<b>(ft)</b>			<b>(ft)</b>			<b>(ft)</b>	<b>(°/100usft)</b>	<b>(°/100usft)</b>	<b>(°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	
116.00	0.40	110.90	116.00	-0.12	0.33	-0.35	0.40	0.40	0.00	
216.00	0.33	29.13	216.00	0.00	0.79	-0.76	0.48	-0.07	-81.77	
316.00	0.31	96.48	316.00	0.22	1.20	-1.08	0.36	-0.02	67.35	
416.00	0.23	143.64	416.00	0.03	1.59	-1.51	0.23	-0.08	47.16	
516.00	0.28	299.99	516.00	-0.01	1.50	-1.43	0.50	0.05	156.35	
616.00	0.32	318.35	615.99	0.32	1.10	-0.96	0.10	0.04	18.36	
716.00	0.40	321.83	715.99	0.81	0.70	-0.43	0.08	0.08	3.48	
816.00	0.06	181.13	815.99	1.03	0.48	-0.16	0.45	-0.34	-140.70	

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
916.00	0.18	262.21	915.99	0.95	0.32	-0.03	0.18	0.12	81.08
1,016.00	0.24	255.25	1,015.99	0.88	-0.03	0.29	0.07	0.06	-6.96
1,116.00	0.30	268.12	1,115.99	0.82	-0.50	0.72	0.08	0.06	12.87
1,216.00	0.22	154.85	1,215.99	0.64	-0.68	0.83	0.44	-0.08	-113.27
1,316.00	0.24	240.20	1,315.99	0.36	-0.78	0.85	0.31	0.02	85.35
1,416.00	0.28	232.09	1,415.99	0.10	-1.15	1.13	0.05	0.04	-8.11
1,516.00	0.44	345.23	1,515.99	0.32	-1.44	1.47	0.61	0.16	113.14
1,616.00	0.46	336.98	1,615.98	1.07	-1.70	1.94	0.07	0.02	-8.25
1,716.00	0.12	190.51	1,715.98	1.33	-1.87	2.18	0.56	-0.34	-146.47
1,776.00	0.27	340.35	1,775.98	1.40	-1.93	2.26	0.63	0.25	249.73
TIE ON									
1,885.00	0.44	351.60	1,884.98	2.06	-2.08	2.59	0.17	0.16	10.32
FIRST MWD SURVEY									
1,977.00	2.36	307.07	1,976.95	3.55	-3.64	4.52	2.25	2.09	-48.40
2,071.00	4.72	298.50	2,070.76	6.56	-8.59	10.13	2.57	2.51	-9.12
2,165.00	6.76	297.25	2,164.29	10.94	-16.91	19.37	2.17	2.17	-1.33
2,258.00	8.07	293.63	2,256.51	16.06	-27.75	31.24	1.49	1.41	-3.89
2,351.00	8.87	288.15	2,348.49	20.91	-40.55	44.89	1.22	0.86	-5.89
2,445.00	10.05	286.09	2,441.22	25.45	-55.31	60.34	1.31	1.26	-2.19
2,538.00	11.63	282.19	2,532.55	29.67	-72.28	77.79	1.87	1.70	-4.19
2,631.00	10.56	280.72	2,623.81	33.24	-89.81	95.60	1.19	-1.15	-1.58
2,725.00	10.71	292.23	2,716.21	38.15	-106.36	112.87	2.26	0.16	12.24
2,818.00	11.55	293.86	2,807.46	45.18	-122.88	130.72	0.96	0.90	1.75
2,903.00	11.49	287.50	2,890.75	51.17	-138.73	147.63	1.50	-0.07	-7.48
2,989.00	10.78	284.85	2,975.13	55.81	-154.68	164.23	1.02	-0.83	-3.08
3,074.00	11.20	285.57	3,058.57	60.06	-170.31	180.43	0.52	0.49	0.85
3,159.00	11.86	285.89	3,141.86	64.67	-186.66	197.41	0.78	0.78	0.38
3,245.00	10.66	286.12	3,226.20	69.30	-202.81	214.20	1.40	-1.40	0.27
3,330.00	10.82	285.50	3,309.71	73.61	-218.05	230.04	0.23	0.19	-0.73
3,415.00	11.53	285.78	3,393.10	78.05	-233.91	246.51	0.84	0.84	0.33
3,501.00	10.25	285.08	3,477.55	82.38	-249.57	262.75	1.50	-1.49	-0.81
3,586.00	9.43	284.14	3,561.30	86.05	-263.62	277.26	0.98	-0.96	-1.11
3,672.00	10.35	283.75	3,646.02	89.61	-277.96	292.01	1.07	1.07	-0.45
3,757.00	12.16	287.36	3,729.38	94.09	-293.92	308.59	2.28	2.13	4.25
3,843.00	12.36	287.88	3,813.42	99.62	-311.33	326.85	0.27	0.23	0.60
3,928.00	10.85	288.05	3,896.68	104.89	-327.59	343.95	1.78	-1.78	0.20
4,014.00	10.94	283.39	3,981.13	109.29	-343.23	360.18	1.03	0.10	-5.42
4,099.00	10.57	284.38	4,064.64	113.10	-358.63	376.02	0.49	-0.44	1.16
4,184.00	12.54	282.47	4,147.91	117.02	-375.19	393.01	2.36	2.32	-2.25
4,270.00	12.32	282.63	4,231.90	121.05	-393.26	411.47	0.26	-0.26	0.19
4,355.00	11.52	285.99	4,315.06	125.37	-410.27	429.00	1.25	-0.94	3.95
4,441.00	10.51	286.07	4,399.48	129.90	-426.06	445.42	1.17	-1.17	0.09
4,526.00	11.05	290.84	4,482.98	134.95	-441.12	461.30	1.23	0.64	5.61

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## Survey Report

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<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,612.00	11.77	290.40	4,567.28	140.94	-457.05	478.28	0.84	0.84	-0.51
4,697.00	11.34	289.68	4,650.56	146.77	-473.04	495.28	0.53	-0.51	-0.85
4,782.00	10.69	289.56	4,733.99	152.23	-488.34	511.51	0.77	-0.76	-0.14
4,868.00	10.77	285.38	4,818.49	157.03	-503.60	527.51	0.91	0.09	-4.86
4,953.00	10.92	282.80	4,901.97	160.92	-519.11	543.48	0.60	0.18	-3.04
5,039.00	11.41	283.66	4,986.34	164.73	-535.32	560.09	0.60	0.57	1.00
5,124.00	12.17	286.84	5,069.55	169.32	-552.07	577.45	1.18	0.89	3.74
5,209.00	10.11	281.93	5,152.95	173.45	-567.94	593.84	2.67	-2.42	-5.78
5,295.00	10.61	281.59	5,237.54	176.60	-583.08	609.24	0.59	0.58	-0.40
5,380.00	11.50	287.41	5,320.97	180.71	-598.84	625.50	1.68	1.05	6.85
5,466.00	11.27	286.05	5,405.28	185.60	-615.09	642.48	0.41	-0.27	-1.58
5,551.00	11.34	286.12	5,488.63	190.22	-631.10	659.14	0.08	0.08	0.08
5,636.00	10.23	287.27	5,572.12	194.78	-646.34	675.04	1.33	-1.31	1.35
5,722.00	9.17	289.37	5,656.89	199.32	-660.10	689.53	1.30	-1.23	2.44
5,807.00	7.73	287.96	5,740.97	203.33	-671.92	702.01	1.71	-1.69	-1.66
5,893.00	7.75	283.81	5,826.19	206.50	-683.06	713.58	0.65	0.02	-4.83
5,978.00	7.91	290.23	5,910.40	209.89	-694.11	725.15	1.05	0.19	7.55
6,063.00	7.79	289.22	5,994.60	213.80	-705.04	736.74	0.22	-0.14	-1.19
6,148.00	8.11	289.29	6,078.78	217.68	-716.14	748.49	0.38	0.38	0.08
6,234.00	7.39	289.25	6,164.00	221.51	-727.08	760.08	0.84	-0.84	-0.05
6,319.00	6.31	287.92	6,248.39	224.75	-736.69	770.21	1.28	-1.27	-1.56
6,404.00	5.56	286.34	6,332.93	227.34	-745.09	779.00	0.90	-0.88	-1.86
6,490.00	4.16	290.97	6,418.62	229.63	-752.00	786.28	1.69	-1.63	5.38
6,575.00	2.51	295.74	6,503.47	231.54	-756.55	791.19	1.97	-1.94	5.61
6,660.00	0.98	229.52	6,588.44	231.88	-758.78	793.42	2.70	-1.80	-77.91
6,708.00	1.29	192.84	6,636.43	231.09	-759.21	793.60	1.61	0.65	-76.42
6,751.00	4.71	180.98	6,679.36	228.85	-759.35	793.08	8.04	7.95	-27.58
6,794.00	9.34	178.58	6,722.03	223.59	-759.30	791.49	10.79	10.77	-5.58
6,836.00	13.82	179.30	6,763.16	215.17	-759.15	788.89	10.67	10.67	1.71
6,879.00	14.49	178.97	6,804.86	204.65	-758.99	785.66	1.57	1.56	-0.77
6,922.00	17.53	175.59	6,846.19	192.81	-758.40	781.64	7.39	7.07	-7.86
6,964.00	21.10	174.48	6,885.82	178.98	-757.18	776.43	8.54	8.50	-2.64
7,007.00	24.47	176.13	6,925.46	162.38	-755.84	770.29	7.98	7.84	3.84
7,050.00	28.51	179.40	6,963.94	143.23	-755.13	764.02	9.99	9.40	7.60
7,092.00	31.89	179.59	7,000.23	122.10	-754.94	757.67	8.05	8.05	0.45
7,135.00	36.22	179.27	7,035.85	98.03	-754.70	750.40	10.08	10.07	-0.74
7,178.00	39.27	180.71	7,069.85	71.71	-754.71	742.72	7.38	7.09	3.35
7,221.00	43.89	181.42	7,102.00	43.19	-755.24	734.89	10.80	10.74	1.65
7,263.00	48.90	182.16	7,130.96	12.80	-756.20	726.93	12.00	11.93	1.76
7,306.00	52.57	182.50	7,158.17	-20.46	-757.56	718.51	8.56	8.53	0.79
7,348.00	55.18	182.80	7,182.93	-54.34	-759.13	710.10	6.24	6.21	0.71
7,391.00	56.87	182.12	7,206.96	-89.97	-760.66	701.15	4.14	3.93	-1.58
7,435.00	60.68	180.78	7,229.76	-127.57	-761.60	691.07	9.04	8.66	-3.05
7,477.00	67.27	180.04	7,248.18	-165.29	-761.86	680.29	15.77	15.69	-1.76

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,520.00	74.88	179.97	7,262.12	-205.94	-761.87	668.42	17.70	17.70	-0.16
7,563.00	78.82	180.03	7,271.90	-247.80	-761.87	656.18	9.16	9.16	0.14
7,605.00	81.45	179.61	7,279.09	-289.18	-761.74	643.97	6.34	6.26	-1.00
7,637.00	83.21	179.28	7,283.37	-320.89	-761.43	634.40	5.59	5.50	-1.03
7,685.00	86.28	179.21	7,287.76	-368.68	-760.80	619.83	6.39	6.39	-0.15
7 IN. CASING									
7,757.00	90.88	179.10	7,289.55	-440.63	-759.73	597.79	6.39	6.39	-0.15
7,850.00	91.05	178.55	7,287.98	-533.59	-757.83	568.80	0.62	0.18	-0.59
7,944.00	91.05	178.24	7,286.26	-627.54	-755.20	538.82	0.33	0.00	-0.33
8,037.00	90.18	178.93	7,285.26	-720.50	-752.90	509.46	1.19	-0.94	0.74
8,130.00	90.35	179.28	7,284.83	-813.49	-751.45	480.89	0.42	0.18	0.38
8,224.00	90.99	179.81	7,283.73	-907.48	-750.70	452.71	0.88	0.68	0.56
8,317.00	88.95	180.61	7,283.78	-1,000.48	-751.04	425.86	2.36	-2.19	0.86
8,410.00	88.46	180.02	7,285.88	-1,093.45	-751.55	399.17	0.82	-0.53	-0.63
8,504.00	90.44	178.22	7,286.78	-1,187.43	-750.11	370.33	2.85	2.11	-1.91
8,597.00	90.00	178.75	7,286.43	-1,280.39	-747.65	340.81	0.74	-0.47	0.57
8,691.00	91.32	179.45	7,285.34	-1,374.37	-746.17	311.93	1.59	1.40	0.74
8,784.00	91.79	181.51	7,282.82	-1,467.33	-746.95	285.51	2.27	0.51	2.22
8,878.00	89.01	181.15	7,282.16	-1,561.29	-749.13	260.13	2.98	-2.96	-0.38
8,971.00	88.77	181.57	7,283.96	-1,654.25	-751.34	235.08	0.52	-0.26	0.45
9,062.00	88.15	181.00	7,286.41	-1,745.19	-753.38	210.45	0.93	-0.68	-0.63
9,153.00	90.86	179.15	7,287.20	-1,836.18	-753.50	183.97	3.61	2.98	-2.03
9,244.00	90.06	179.77	7,286.47	-1,927.17	-752.64	156.56	1.11	-0.88	0.68
9,335.00	89.63	179.39	7,286.71	-2,018.16	-751.97	129.33	0.63	-0.47	-0.42
9,427.00	90.31	179.95	7,286.76	-2,110.16	-751.44	101.93	0.96	0.74	0.61
9,512.00	89.32	179.80	7,287.03	-2,195.16	-751.26	76.91	1.18	-1.16	-0.18
9,596.00	88.27	178.24	7,288.80	-2,279.13	-749.82	51.00	2.24	-1.25	-1.86
9,681.00	89.88	177.19	7,290.17	-2,364.04	-746.43	22.94	2.26	1.89	-1.24
9,767.00	90.49	178.14	7,289.90	-2,449.97	-742.93	-5.52	1.31	0.71	1.10
9,852.00	91.23	178.70	7,288.62	-2,534.93	-740.59	-32.59	1.09	0.87	0.66
9,937.00	91.48	181.30	7,286.61	-2,619.90	-740.59	-57.42	3.07	0.29	3.06
10,023.00	91.36	181.26	7,284.48	-2,705.85	-742.51	-80.71	0.15	-0.14	-0.05
10,108.00	91.15	181.22	7,282.62	-2,790.81	-744.35	-103.78	0.25	-0.25	-0.05
10,194.00	90.74	180.98	7,281.20	-2,876.78	-746.00	-127.32	0.55	-0.48	-0.28
10,279.00	90.62	181.05	7,280.19	-2,961.76	-747.50	-150.72	0.16	-0.14	0.08
10,365.00	90.37	180.77	7,279.45	-3,047.75	-748.87	-174.54	0.44	-0.29	-0.33
10,450.00	90.49	180.52	7,278.81	-3,132.74	-749.83	-198.47	0.33	0.14	-0.29
10,536.00	90.06	180.22	7,278.40	-3,218.74	-750.38	-223.07	0.61	-0.50	-0.35
10,621.00	90.06	180.38	7,278.31	-3,303.73	-750.83	-247.48	0.19	0.00	0.19
10,706.00	90.00	179.68	7,278.26	-3,388.73	-750.87	-272.28	0.83	-0.07	-0.82
10,792.00	89.94	179.59	7,278.31	-3,474.73	-750.32	-297.94	0.13	-0.07	-0.10
10,877.00	90.37	179.36	7,278.08	-3,559.73	-749.54	-323.53	0.57	0.51	-0.27
10,962.00	91.48	179.66	7,276.71	-3,644.71	-748.82	-349.06	1.35	1.31	0.35

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,048.00	91.54	180.33	7,274.44	-3,730.68	-748.81	-374.19	0.78	0.07	0.78
11,133.00	91.79	179.81	7,271.97	-3,815.65	-748.91	-398.92	0.68	0.29	-0.61
11,218.00	91.42	180.60	7,269.59	-3,900.61	-749.22	-423.46	1.03	-0.44	0.93
11,304.00	87.66	180.64	7,270.28	-3,986.59	-750.15	-447.70	4.37	-4.37	0.05
11,389.00	88.58	179.92	7,273.07	-4,071.54	-750.56	-472.13	1.37	1.08	-0.85
11,475.00	89.01	179.98	7,274.88	-4,157.52	-750.49	-497.33	0.50	0.50	0.07
11,560.00	89.14	180.25	7,276.25	-4,242.51	-750.66	-522.01	0.35	0.15	0.32
11,646.00	89.26	180.05	7,277.45	-4,328.50	-750.88	-546.92	0.27	0.14	-0.23
11,731.00	88.89	179.76	7,278.82	-4,413.49	-750.74	-571.90	0.55	-0.44	-0.34
11,817.00	89.69	180.29	7,279.89	-4,499.48	-750.78	-596.99	1.12	0.93	0.62
11,902.00	90.55	180.05	7,279.71	-4,584.48	-751.03	-621.59	1.05	1.01	-0.28
11,987.00	90.74	180.00	7,278.75	-4,669.47	-751.07	-646.40	0.23	0.22	-0.06
12,073.00	90.86	179.35	7,277.55	-4,755.46	-750.58	-671.99	0.77	0.14	-0.76
12,158.00	90.80	179.13	7,276.32	-4,840.45	-749.45	-697.91	0.27	-0.07	-0.26
12,244.00	91.11	178.69	7,274.89	-4,926.42	-747.82	-724.60	0.63	0.36	-0.51
12,329.00	90.62	178.01	7,273.60	-5,011.37	-745.37	-751.77	0.99	-0.58	-0.80
12,415.00	89.94	178.73	7,273.18	-5,097.34	-742.93	-779.23	1.15	-0.79	0.84
12,500.00	89.69	179.29	7,273.46	-5,182.32	-741.46	-805.47	0.72	-0.29	0.66
12,586.00	89.38	180.32	7,274.16	-5,268.32	-741.16	-830.88	1.25	-0.36	1.20
12,671.00	90.79	181.04	7,274.03	-5,353.31	-742.17	-854.76	1.86	1.66	0.85
12,756.00	91.36	180.42	7,272.43	-5,438.29	-743.26	-878.56	0.99	0.67	-0.73
12,841.00	90.37	180.19	7,271.15	-5,523.28	-743.71	-902.96	1.20	-1.16	-0.27
12,927.00	90.86	180.64	7,270.23	-5,609.27	-744.33	-927.50	0.77	0.57	0.52
13,012.00	90.37	181.18	7,269.32	-5,694.25	-745.68	-951.04	0.86	-0.58	0.64
13,098.00	89.81	180.48	7,269.18	-5,780.24	-746.93	-974.98	1.04	-0.65	-0.81
13,183.00	90.31	180.84	7,269.09	-5,865.24	-747.91	-998.89	0.72	0.59	0.42
13,269.00	90.37	180.59	7,268.58	-5,951.23	-748.98	-1,022.99	0.30	0.07	-0.29
13,354.00	90.74	180.49	7,267.76	-6,036.22	-749.78	-1,047.07	0.45	0.44	-0.12
13,439.00	90.31	180.31	7,266.98	-6,121.21	-750.37	-1,071.34	0.55	-0.51	-0.21
13,525.00	89.63	180.64	7,267.02	-6,207.21	-751.09	-1,095.79	0.88	-0.79	0.38
13,610.00	89.51	179.92	7,267.66	-6,292.21	-751.50	-1,120.23	0.86	-0.14	-0.85
13,695.00	89.32	179.20	7,268.53	-6,377.20	-750.85	-1,145.70	0.88	-0.22	-0.85
13,781.00	89.57	178.88	7,269.36	-6,463.18	-749.41	-1,172.20	0.47	0.29	-0.37
13,866.00	89.51	178.36	7,270.05	-6,548.15	-747.36	-1,198.99	0.62	-0.07	-0.61
13,952.00	90.99	178.64	7,269.67	-6,634.12	-745.11	-1,226.27	1.75	1.72	0.33
14,037.00	90.18	178.59	7,268.80	-6,719.09	-743.06	-1,253.07	0.95	-0.95	-0.06
14,122.00	91.42	178.57	7,267.62	-6,804.06	-740.95	-1,279.91	1.46	1.46	-0.02
14,208.00	90.43	178.18	7,266.23	-6,890.01	-738.51	-1,307.37	1.24	-1.15	-0.45
14,293.00	90.31	177.95	7,265.68	-6,974.96	-735.64	-1,334.94	0.31	-0.14	-0.27
14,378.00	90.49	177.94	7,265.09	-7,059.90	-732.59	-1,362.68	0.21	0.21	-0.01
14,432.00	90.80	177.59	7,264.48	-7,113.86	-730.49	-1,380.46	0.87	0.57	-0.65
LAST MWD SURVEY									
14,488.00	90.80	177.59	7,263.70	-7,169.80	-728.13	-1,399.06	0.00	0.00	0.00
PROJECTION TO TD									

# Anadarko Petroleum Corp

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,776.00	1,775.98	1.40	-1.93	TIE ON
1,885.00	1,884.98	2.06	-2.08	FIRST MWD SURVEY
7,685.00	7,287.76	-368.68	-760.80	7 IN. CASING
14,432.00	7,264.48	-7,113.86	-730.49	LAST MWD SURVEY
14,488.00	7,263.70	-7,169.80	-728.13	PROJECTION TO TD

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



# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_SPARBOE 4 PAD**

**SPARBOE 7C-3HZ**

**Wellbore #1**

**Design: ACTUAL**

## **Survey Report - Geographic**

**30 January, 2013**

# Anadarko Petroleum Corp

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site	WELD_SPARBOE 4 PAD				
Site Position:		Northing:	1,280,971.47 usft	Latitude:	40.101501
From:	Lat/Long	Easting:	3,238,883.56 usft	Longitude:	-104.646028
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.55 °

Well	SPARBOE 7C-3HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,280,971.47 usft	Latitude:	40.101501
	+E/-W	0.00 ft	Easting:	3,238,883.56 usft	Longitude:	-104.646028
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,977.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	12/10/2012	8.57	66.78	52,829

<b>Design</b>	ACTUAL				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	286.99	

<b>Survey Program</b>	<b>Date</b>	1/30/2013			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
16.00	1,776.00	Survey #1 (Wellbore #1)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
1,885.00	14,488.00	Survey #2 (Wellbore #1)	MWD	MWD - STANDARD	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>
0.00	0.00	0.00	0.00	0.00	0.00	1,280,971.47	3,238,883.56	40.101501	-104.646028
16.00	0.00	0.00	16.00	0.00	0.00	1,280,971.47	3,238,883.56	40.101501	-104.646028
116.00	0.40	110.90	116.00	-0.12	0.33	1,280,971.35	3,238,883.88	40.101501	-104.646027
216.00	0.33	29.13	216.00	0.00	0.79	1,280,971.48	3,238,884.35	40.101501	-104.646025
316.00	0.31	96.48	316.00	0.22	1.20	1,280,971.71	3,238,884.75	40.101502	-104.646024
416.00	0.23	143.64	416.00	0.03	1.59	1,280,971.52	3,238,885.14	40.101501	-104.646023
516.00	0.28	299.99	516.00	-0.01	1.50	1,280,971.48	3,238,885.05	40.101501	-104.646023
616.00	0.32	318.35	615.99	0.32	1.10	1,280,971.80	3,238,884.65	40.101502	-104.646024
716.00	0.40	321.83	715.99	0.81	0.70	1,280,972.28	3,238,884.25	40.101503	-104.646026
816.00	0.06	181.13	815.99	1.03	0.48	1,280,972.50	3,238,884.03	40.101504	-104.646027
916.00	0.18	262.21	915.99	0.95	0.32	1,280,972.43	3,238,883.87	40.101504	-104.646027

# Anadarko Petroleum Corp

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,016.00	0.24	255.25	1,015.99	0.88	-0.03	1,280,972.35	3,238,883.51	40.101504	-104.646028
1,116.00	0.30	268.12	1,115.99	0.82	-0.50	1,280,972.28	3,238,883.05	40.101503	-104.646030
1,216.00	0.22	154.85	1,215.99	0.64	-0.68	1,280,972.10	3,238,882.87	40.101503	-104.646031
1,316.00	0.24	240.20	1,315.99	0.36	-0.78	1,280,971.82	3,238,882.77	40.101502	-104.646031
1,416.00	0.28	232.09	1,415.99	0.10	-1.15	1,280,971.56	3,238,882.40	40.101501	-104.646032
1,516.00	0.44	345.23	1,515.99	0.32	-1.44	1,280,971.78	3,238,882.11	40.101502	-104.646033
1,616.00	0.46	336.98	1,615.98	1.07	-1.70	1,280,972.52	3,238,881.85	40.101504	-104.646034
1,716.00	0.12	190.51	1,715.98	1.33	-1.87	1,280,972.79	3,238,881.67	40.101505	-104.646035
1,776.00	0.27	340.35	1,775.98	1.40	-1.93	1,280,972.86	3,238,881.61	40.101505	-104.646035
TIE ON									
1,885.00	0.44	351.60	1,884.98	2.06	-2.08	1,280,973.51	3,238,881.46	40.101507	-104.646036
FIRST MWD SURVEY									
1,977.00	2.36	307.07	1,976.95	3.55	-3.64	1,280,974.99	3,238,879.88	40.101511	-104.646041
2,071.00	4.72	298.50	2,070.76	6.56	-8.59	1,280,977.95	3,238,874.91	40.101519	-104.646059
2,165.00	6.76	297.25	2,164.29	10.94	-16.91	1,280,982.25	3,238,866.55	40.101531	-104.646089
2,258.00	8.07	293.63	2,256.51	16.06	-27.75	1,280,987.27	3,238,855.65	40.101545	-104.646127
2,351.00	8.87	288.15	2,348.49	20.91	-40.55	1,280,991.99	3,238,842.81	40.101559	-104.646173
2,445.00	10.05	286.09	2,441.22	25.45	-55.31	1,280,996.38	3,238,828.00	40.101571	-104.646226
2,538.00	11.63	282.19	2,532.55	29.67	-72.28	1,281,000.45	3,238,811.00	40.101583	-104.646287
2,631.00	10.56	280.72	2,623.81	33.24	-89.81	1,281,003.84	3,238,793.43	40.101592	-104.646349
2,725.00	10.71	292.23	2,716.21	38.15	-106.36	1,281,008.59	3,238,776.83	40.101606	-104.646408
2,818.00	11.55	293.86	2,807.46	45.18	-122.88	1,281,015.47	3,238,760.25	40.101625	-104.646468
2,903.00	11.49	287.50	2,890.75	51.17	-138.73	1,281,021.30	3,238,744.34	40.101642	-104.646524
2,989.00	10.78	284.85	2,975.13	55.81	-154.68	1,281,025.79	3,238,728.35	40.101654	-104.646581
3,074.00	11.20	285.57	3,058.57	60.06	-170.31	1,281,029.89	3,238,712.67	40.101666	-104.646637
3,159.00	11.86	285.89	3,141.86	64.67	-186.66	1,281,034.34	3,238,696.28	40.101679	-104.646696
3,245.00	10.66	286.12	3,226.20	69.30	-202.81	1,281,038.81	3,238,680.09	40.101691	-104.646753
3,330.00	10.82	285.50	3,309.71	73.61	-218.05	1,281,042.98	3,238,664.81	40.101703	-104.646808
3,415.00	11.53	285.78	3,393.10	78.05	-233.91	1,281,047.27	3,238,648.90	40.101715	-104.646864
3,501.00	10.25	285.08	3,477.55	82.38	-249.57	1,281,051.44	3,238,633.20	40.101727	-104.646920
3,586.00	9.43	284.14	3,561.30	86.05	-263.62	1,281,054.98	3,238,619.11	40.101737	-104.646971
3,672.00	10.35	283.75	3,646.02	89.61	-277.96	1,281,058.40	3,238,604.74	40.101747	-104.647022
3,757.00	12.16	287.36	3,729.38	94.09	-293.92	1,281,062.73	3,238,588.74	40.101759	-104.647079
3,843.00	12.36	287.88	3,813.42	99.62	-311.33	1,281,068.09	3,238,571.28	40.101775	-104.647141
3,928.00	10.85	288.05	3,896.68	104.89	-327.59	1,281,073.21	3,238,554.97	40.101789	-104.647199
4,014.00	10.94	283.39	3,981.13	109.29	-343.23	1,281,077.45	3,238,539.29	40.101801	-104.647255
4,099.00	10.57	284.38	4,064.64	113.10	-358.63	1,281,081.11	3,238,523.86	40.101812	-104.647310
4,184.00	12.54	282.47	4,147.91	117.02	-375.19	1,281,084.88	3,238,507.26	40.101822	-104.647369
4,270.00	12.32	282.63	4,231.90	121.05	-393.26	1,281,088.73	3,238,489.15	40.101833	-104.647434
4,355.00	11.52	285.99	4,315.06	125.37	-410.27	1,281,092.88	3,238,472.10	40.101845	-104.647495
4,441.00	10.51	286.07	4,399.48	129.90	-426.06	1,281,097.27	3,238,456.26	40.101858	-104.647551
4,526.00	11.05	290.84	4,482.98	134.95	-441.12	1,281,102.17	3,238,441.15	40.101872	-104.647605
4,612.00	11.77	290.40	4,567.28	140.94	-457.05	1,281,108.00	3,238,425.17	40.101888	-104.647662
4,697.00	11.34	289.68	4,650.56	146.77	-473.04	1,281,113.68	3,238,409.12	40.101904	-104.647719
4,782.00	10.69	289.56	4,733.99	152.23	-488.34	1,281,118.99	3,238,393.77	40.101919	-104.647774
4,868.00	10.77	285.38	4,818.49	157.03	-503.60	1,281,123.64	3,238,378.46	40.101932	-104.647829
4,953.00	10.92	282.80	4,901.97	160.92	-519.11	1,281,127.38	3,238,362.92	40.101943	-104.647884
5,039.00	11.41	283.66	4,986.34	164.73	-535.32	1,281,131.04	3,238,346.67	40.101953	-104.647942
5,124.00	12.17	286.84	5,069.55	169.32	-552.07	1,281,135.46	3,238,329.89	40.101966	-104.648002
5,209.00	10.11	281.93	5,152.95	173.45	-567.94	1,281,139.45	3,238,313.97	40.101977	-104.648059
5,295.00	10.61	281.59	5,237.54	176.60	-583.08	1,281,142.45	3,238,298.80	40.101986	-104.648113
5,380.00	11.50	287.41	5,320.97	180.71	-598.84	1,281,146.41	3,238,283.01	40.101997	-104.648169
5,466.00	11.27	286.05	5,405.28	185.60	-615.09	1,281,151.14	3,238,266.71	40.102011	-104.648227
5,551.00	11.34	286.12	5,488.63	190.22	-631.10	1,281,155.60	3,238,250.65	40.102023	-104.648284
5,636.00	10.23	287.27	5,572.12	194.78	-646.34	1,281,160.02	3,238,235.37	40.102036	-104.648339

# Anadarko Petroleum Corp

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,722.00	9.17	289.37	5,656.89	199.32	-660.10	1,281,164.42	3,238,221.57	40.102048	-104.648388
5,807.00	7.73	287.96	5,740.97	203.33	-671.92	1,281,168.32	3,238,209.71	40.102059	-104.648430
5,893.00	7.75	283.81	5,826.19	206.50	-683.06	1,281,171.38	3,238,198.54	40.102068	-104.648470
5,978.00	7.91	290.23	5,910.40	209.89	-694.11	1,281,174.66	3,238,187.46	40.102077	-104.648510
6,063.00	7.79	289.22	5,994.60	213.80	-705.04	1,281,178.48	3,238,176.49	40.102088	-104.648549
6,148.00	8.11	289.29	6,078.78	217.68	-716.14	1,281,182.25	3,238,165.36	40.102099	-104.648588
6,234.00	7.39	289.25	6,164.00	221.51	-727.08	1,281,185.97	3,238,154.37	40.102109	-104.648627
6,319.00	6.31	287.92	6,248.39	224.75	-736.69	1,281,189.11	3,238,144.74	40.102118	-104.648662
6,404.00	5.56	286.34	6,332.93	227.34	-745.09	1,281,191.63	3,238,136.32	40.102125	-104.648692
6,490.00	4.16	290.97	6,418.62	229.63	-752.00	1,281,193.85	3,238,129.38	40.102131	-104.648717
6,575.00	2.51	295.74	6,503.47	231.54	-756.55	1,281,195.72	3,238,124.81	40.102137	-104.648733
6,660.00	0.98	229.52	6,588.44	231.88	-758.78	1,281,196.03	3,238,122.58	40.102138	-104.648741
6,708.00	1.29	192.84	6,636.43	231.09	-759.21	1,281,195.24	3,238,122.15	40.102135	-104.648742
6,751.00	4.71	180.98	6,679.36	228.85	-759.35	1,281,193.00	3,238,122.04	40.102129	-104.648743
6,794.00	9.34	178.58	6,722.03	223.59	-759.30	1,281,187.74	3,238,122.14	40.102115	-104.648743
6,836.00	13.82	179.30	6,763.16	215.17	-759.15	1,281,179.32	3,238,122.37	40.102092	-104.648742
6,879.00	14.49	178.97	6,804.86	204.65	-758.99	1,281,168.80	3,238,122.63	40.102063	-104.648742
6,922.00	17.53	175.59	6,846.19	192.81	-758.40	1,281,156.97	3,238,123.34	40.102030	-104.648739
6,964.00	21.10	174.48	6,885.82	178.98	-757.18	1,281,143.15	3,238,124.69	40.101992	-104.648735
7,007.00	24.47	176.13	6,925.46	162.38	-755.84	1,281,126.57	3,238,126.19	40.101947	-104.648730
7,050.00	28.51	179.40	6,963.94	143.23	-755.13	1,281,107.42	3,238,127.09	40.101894	-104.648728
7,092.00	31.89	179.59	7,000.23	122.10	-754.94	1,281,086.30	3,238,127.47	40.101836	-104.648727
7,135.00	36.22	179.27	7,035.85	98.03	-754.70	1,281,062.23	3,238,127.95	40.101770	-104.648726
7,178.00	39.27	180.71	7,069.85	71.71	-754.71	1,281,035.91	3,238,128.19	40.101698	-104.648726
7,221.00	43.89	181.42	7,102.00	43.19	-755.24	1,281,007.39	3,238,127.93	40.101620	-104.648728
7,263.00	48.90	182.16	7,130.96	12.80	-756.20	1,280,976.99	3,238,127.27	40.101536	-104.648732
7,306.00	52.57	182.50	7,158.17	-20.46	-757.56	1,280,943.72	3,238,126.23	40.101445	-104.648736
7,348.00	55.18	182.80	7,182.93	-54.34	-759.13	1,280,909.82	3,238,124.99	40.101352	-104.648742
7,391.00	56.87	182.12	7,206.96	-89.97	-760.66	1,280,874.18	3,238,123.80	40.101254	-104.648747
7,435.00	60.68	180.78	7,229.76	-127.57	-761.60	1,280,836.57	3,238,123.22	40.101151	-104.648751
7,477.00	67.27	180.04	7,248.18	-165.29	-761.86	1,280,798.85	3,238,123.32	40.101047	-104.648752
7,520.00	74.88	179.97	7,262.12	-205.94	-761.87	1,280,758.21	3,238,123.71	40.100936	-104.648752
7,563.00	78.82	180.03	7,271.90	-247.80	-761.87	1,280,716.35	3,238,124.11	40.100821	-104.648752
7,605.00	81.45	179.61	7,279.09	-289.18	-761.74	1,280,674.97	3,238,124.64	40.100707	-104.648751
7,637.00	83.21	179.28	7,283.37	-320.89	-761.43	1,280,643.27	3,238,125.25	40.100620	-104.648750
7,685.00	86.28	179.21	7,287.76	-368.68	-760.80	1,280,595.49	3,238,126.35	40.100489	-104.648748
7 IN. CASING									
7,757.00	90.88	179.10	7,289.55	-440.63	-759.73	1,280,523.55	3,238,128.10	40.100291	-104.648744
7,850.00	91.05	178.55	7,287.98	-533.59	-757.83	1,280,430.61	3,238,130.90	40.100036	-104.648737
7,944.00	91.05	178.24	7,286.26	-627.54	-755.20	1,280,336.69	3,238,134.44	40.099778	-104.648728
8,037.00	90.18	178.93	7,285.26	-720.50	-752.90	1,280,243.75	3,238,137.63	40.099523	-104.648720
8,130.00	90.35	179.28	7,284.83	-813.49	-751.45	1,280,150.78	3,238,139.98	40.099268	-104.648714
8,224.00	90.99	179.81	7,283.73	-907.48	-750.70	1,280,056.80	3,238,141.63	40.099010	-104.648712
8,317.00	88.95	180.61	7,283.78	-1,000.48	-751.04	1,279,963.81	3,238,142.19	40.098755	-104.648713
8,410.00	88.46	180.02	7,285.88	-1,093.45	-751.55	1,279,870.84	3,238,142.57	40.098499	-104.648715
8,504.00	90.44	178.22	7,286.78	-1,187.43	-750.11	1,279,776.88	3,238,144.92	40.098241	-104.648710
8,597.00	90.00	178.75	7,286.43	-1,280.39	-747.65	1,279,683.94	3,238,148.27	40.097986	-104.648701
8,691.00	91.32	179.45	7,285.34	-1,374.37	-746.17	1,279,589.98	3,238,150.65	40.097728	-104.648696
8,784.00	91.79	181.51	7,282.82	-1,467.33	-746.95	1,279,497.02	3,238,150.77	40.097473	-104.648698
8,878.00	89.01	181.15	7,282.16	-1,561.29	-749.13	1,279,403.04	3,238,149.49	40.097215	-104.648706
8,971.00	88.77	181.57	7,283.96	-1,654.25	-751.34	1,279,310.07	3,238,148.18	40.096960	-104.648714
9,062.00	88.15	181.00	7,286.41	-1,745.19	-753.38	1,279,219.11	3,238,147.02	40.096710	-104.648721
9,153.00	90.86	179.15	7,287.20	-1,836.18	-753.50	1,279,128.13	3,238,147.78	40.096460	-104.648722
9,244.00	90.06	179.77	7,286.47	-1,927.17	-752.64	1,279,037.15	3,238,149.51	40.096211	-104.648719
9,335.00	89.63	179.39	7,286.71	-2,018.16	-751.97	1,278,946.16	3,238,151.05	40.095961	-104.648716

# Anadarko Petroleum Corp

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,427.00	90.31	179.95	7,286.76	-2,110.16	-751.44	1,278,854.18	3,238,152.47	40.095708	-104.648714
9,512.00	89.32	179.80	7,287.03	-2,195.16	-751.26	1,278,769.18	3,238,153.47	40.095475	-104.648714
9,596.00	88.27	178.24	7,288.80	-2,279.13	-749.82	1,278,685.24	3,238,155.72	40.095245	-104.648708
9,681.00	89.88	177.19	7,290.17	-2,364.04	-746.43	1,278,600.35	3,238,159.92	40.095011	-104.648696
9,767.00	90.49	178.14	7,289.90	-2,449.97	-742.93	1,278,514.47	3,238,164.25	40.094776	-104.648684
9,852.00	91.23	178.70	7,288.62	-2,534.93	-740.59	1,278,429.54	3,238,167.42	40.094542	-104.648675
9,937.00	91.48	181.30	7,286.61	-2,619.90	-740.59	1,278,344.57	3,238,168.23	40.094309	-104.648675
10,023.00	91.36	181.26	7,284.48	-2,705.85	-742.51	1,278,258.60	3,238,167.14	40.094073	-104.648682
10,108.00	91.15	181.22	7,282.62	-2,790.81	-744.35	1,278,173.63	3,238,166.12	40.093840	-104.648689
10,194.00	90.74	180.98	7,281.20	-2,876.78	-746.00	1,278,087.65	3,238,165.30	40.093604	-104.648695
10,279.00	90.62	181.05	7,280.19	-2,961.76	-747.50	1,278,002.66	3,238,164.61	40.093371	-104.648700
10,365.00	90.37	180.77	7,279.45	-3,047.75	-748.87	1,277,916.66	3,238,164.07	40.093135	-104.648705
10,450.00	90.49	180.52	7,278.81	-3,132.74	-749.83	1,277,831.66	3,238,163.94	40.092901	-104.648708
10,536.00	90.06	180.22	7,278.40	-3,218.74	-750.38	1,277,745.67	3,238,164.21	40.092665	-104.648710
10,621.00	90.06	180.38	7,278.31	-3,303.73	-750.83	1,277,660.67	3,238,164.58	40.092432	-104.648712
10,706.00	90.00	179.68	7,278.26	-3,388.73	-750.87	1,277,575.67	3,238,165.36	40.092198	-104.648712
10,792.00	89.94	179.59	7,278.31	-3,474.73	-750.32	1,277,489.68	3,238,166.73	40.091962	-104.648710
10,877.00	90.37	179.36	7,278.08	-3,559.73	-749.54	1,277,404.70	3,238,168.33	40.091729	-104.648707
10,962.00	91.48	179.66	7,276.71	-3,644.71	-748.82	1,277,319.72	3,238,169.87	40.091496	-104.648705
11,048.00	91.54	180.33	7,274.44	-3,730.68	-748.81	1,277,233.76	3,238,170.71	40.091260	-104.648705
11,133.00	91.79	179.81	7,271.97	-3,815.65	-748.91	1,277,148.80	3,238,171.42	40.091027	-104.648705
11,218.00	91.42	180.60	7,269.59	-3,900.61	-749.22	1,277,063.83	3,238,171.94	40.090793	-104.648706
11,304.00	87.66	180.64	7,270.28	-3,986.59	-750.15	1,276,977.85	3,238,171.84	40.090557	-104.648709
11,389.00	88.58	179.92	7,273.07	-4,071.54	-750.56	1,276,892.90	3,238,172.24	40.090324	-104.648711
11,475.00	89.01	179.98	7,274.88	-4,157.52	-750.49	1,276,806.93	3,238,173.14	40.090088	-104.648711
11,560.00	89.14	180.25	7,276.25	-4,242.51	-750.66	1,276,721.94	3,238,173.79	40.089855	-104.648711
11,646.00	89.26	180.05	7,277.45	-4,328.50	-750.88	1,276,635.95	3,238,174.39	40.089619	-104.648712
11,731.00	88.89	179.76	7,278.82	-4,413.49	-750.74	1,276,550.97	3,238,175.35	40.089385	-104.648712
11,817.00	89.69	180.29	7,279.89	-4,499.48	-750.78	1,276,464.98	3,238,176.14	40.089149	-104.648712
11,902.00	90.55	180.05	7,279.71	-4,584.48	-751.03	1,276,379.98	3,238,176.71	40.088916	-104.648713
11,987.00	90.74	180.00	7,278.75	-4,669.47	-751.07	1,276,294.99	3,238,177.49	40.088683	-104.648713
12,073.00	90.86	179.35	7,277.55	-4,755.46	-750.58	1,276,209.01	3,238,178.81	40.088447	-104.648711
12,158.00	90.80	179.13	7,276.32	-4,840.45	-749.45	1,276,124.04	3,238,180.75	40.088213	-104.648707
12,244.00	91.11	178.69	7,274.89	-4,926.42	-747.82	1,276,038.09	3,238,183.22	40.087977	-104.648701
12,329.00	90.62	178.01	7,273.60	-5,011.37	-745.37	1,275,953.16	3,238,186.48	40.087744	-104.648692
12,415.00	89.94	178.73	7,273.18	-5,097.34	-742.93	1,275,867.23	3,238,189.75	40.087508	-104.648684
12,500.00	89.69	179.29	7,273.46	-5,182.32	-741.46	1,275,782.26	3,238,192.04	40.087275	-104.648678
12,586.00	89.38	180.32	7,274.16	-5,268.32	-741.16	1,275,696.27	3,238,193.16	40.087039	-104.648677
12,671.00	90.79	181.04	7,274.03	-5,353.31	-742.17	1,275,611.27	3,238,192.97	40.086805	-104.648681
12,756.00	91.36	180.42	7,272.43	-5,438.29	-743.26	1,275,526.29	3,238,192.71	40.086572	-104.648685
12,841.00	90.37	180.19	7,271.15	-5,523.28	-743.71	1,275,441.30	3,238,193.07	40.086339	-104.648686
12,927.00	90.86	180.64	7,270.23	-5,609.27	-744.33	1,275,355.31	3,238,193.28	40.086103	-104.648688
13,012.00	90.37	181.18	7,269.32	-5,694.25	-745.68	1,275,270.31	3,238,192.75	40.085869	-104.648693
13,098.00	89.81	180.48	7,269.18	-5,780.24	-746.93	1,275,184.32	3,238,192.33	40.085633	-104.648698
13,183.00	90.31	180.84	7,269.09	-5,865.24	-747.91	1,275,099.32	3,238,192.17	40.085400	-104.648701
13,269.00	90.37	180.59	7,268.58	-5,951.23	-748.98	1,275,013.32	3,238,191.92	40.085164	-104.648705
13,354.00	90.74	180.49	7,267.76	-6,036.22	-749.78	1,274,928.32	3,238,191.94	40.084931	-104.648708
13,439.00	90.31	180.31	7,266.98	-6,121.21	-750.37	1,274,843.33	3,238,192.17	40.084697	-104.648710
13,525.00	89.63	180.64	7,267.02	-6,207.21	-751.09	1,274,757.33	3,238,192.28	40.084461	-104.648713
13,610.00	89.51	179.92	7,267.66	-6,292.21	-751.50	1,274,672.33	3,238,192.69	40.084228	-104.648714
13,695.00	89.32	179.20	7,268.53	-6,377.20	-750.85	1,274,587.35	3,238,194.16	40.083995	-104.648712
13,781.00	89.57	178.88	7,269.36	-6,463.18	-749.41	1,274,501.39	3,238,196.43	40.083759	-104.648707
13,866.00	89.51	178.36	7,270.05	-6,548.15	-747.36	1,274,416.44	3,238,199.29	40.083525	-104.648699
13,952.00	90.99	178.64	7,269.67	-6,634.12	-745.11	1,274,330.50	3,238,202.37	40.083289	-104.648691
14,037.00	90.18	178.59	7,268.80	-6,719.09	-743.06	1,274,245.55	3,238,205.24	40.083056	-104.648684

# Anadarko Petroleum Corp

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well SPARBOE 7C-3HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Site:</b>	WELD_SPARBOE 4 PAD	<b>MD Reference:</b>	16'RKB+4977'GL @ 4993.00ft (XTREME 23)
<b>Well:</b>	SPARBOE 7C-3HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ACTUAL	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,122.00	91.42	178.57	7,267.62	-6,804.06	-740.95	1,274,160.61	3,238,208.17	40.082823	-104.648676
14,208.00	90.43	178.18	7,266.23	-6,890.01	-738.51	1,274,074.68	3,238,211.43	40.082587	-104.648668
14,293.00	90.31	177.95	7,265.68	-6,974.96	-735.64	1,273,989.77	3,238,215.12	40.082354	-104.648657
14,378.00	90.49	177.94	7,265.09	-7,059.90	-732.59	1,273,904.86	3,238,218.99	40.082121	-104.648646
14,432.00	90.80	177.59	7,264.48	-7,113.86	-730.49	1,273,850.92	3,238,221.61	40.081972	-104.648639
LAST MWD SURVEY									
14,488.00	90.80	177.59	7,263.70	-7,169.80	-728.13	1,273,795.00	3,238,224.51	40.081819	-104.648630
PROJECTION TO TD									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,776.00	1,775.98	1.40	-1.93	TIE ON	
1,885.00	1,884.98	2.06	-2.08	FIRST MWD SURVEY	
7,685.00	7,287.76	-368.68	-760.80	7 IN. CASING	
14,432.00	7,264.48	-7,113.86	-730.49	LAST MWD SURVEY	
14,488.00	7,263.70	-7,169.80	-728.13	PROJECTION TO TD	

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