

**5D Plan Report**

Anadarko Petroleum

Field Name: *WATTENBURG_NAD83*
Site Name: *BROTEMARKLE 3N-13HZ PAD*
Well Name: *BROTEMARKLE 3C-13HZ*
Plan: *PLAN 1*



Plan Surveys for the BROTEMARKLE 3C-13HZ

Site Name BROTEMARKLE 3N-13HZ PAD	Units : US ft	North Reference : True	Convergence Angle : 0.50
	Position	Northing : 1323520.33 US ft	Latitude : 40.218881
		Easting : 3215741.70 US ft	Longitude : -104.727427
	Elevation above: 5032.00 US ft Comment :		
Slot Name BROTEMARKLE 3C-13HZ	Position (Offsets relative to Site Centre)		
	+N / -S : -18.58 US ft	Northing : 1323501.95 US ft	Latitude : 40.218830
	+E / -W : 23.74 US ft	Easting : 3215765.60 US ft	Longitude : -104.727342
	Slot TVD Reference : Ground Elevation Elevation above : 5032.00 US ft Comment :		
Well Name BROTEMARKLE 3C-13HZ	Type : Main well	UWI :	Plan : PLAN 1
	Rig Height Drill Floor : 17.00 US ft	Comment :	
	Relative to : 5049.00 US ft		
	Closure Distance : 4516.89 US ft	Closure Azimuth : 2.33809°	
	Vertical Section (Position of Origin Relative to Slot)		
	+N / -S : 18.58 US ft	+E / -W : -23.74 US ft	Az : 359.83°
	Magnetic Parameters		
	Model : BGGM	Field Strength : 52750.4nT	Dec : 8.54°
			Dip : 66.82°
			Date : 14/Nov/2013

Target Set**Name :** BROTEMARKLE 3C-13HZ**Number of Targets :** 1**Comment :**

TargetName:	Position (Relative to centre)			
PBHL	+N / -S : 4513.13US ft		Northing : 1328016.51 US ft	
	+E / -W : 184.27 US ft		Easting : 3215910.54US ft	
Shape:	Longitude : -104°43'36.055200"			
Cuboid	TVD (Drill Floor) : 7464.00 US ft			
	Orientation	Azimuth : 0.00°	Inclination : 0.00°	
	Dimensions	Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft

Well path created using minimum curvature

Salient Points (Relative to centre, TVD relative to Drill Floor)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Latitude (°)	Longitude (°)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	40.218830	-104.727342	0.00	0.00	-18.65	
1238.00	0.00	0.00	1238.00	0.00	0.00	40.218830	-104.727342	0.00	0.00	-18.65	FOX HILLS MARKER :
1400.00	0.00	0.00	1400.00	0.00	0.00	40.218830	-104.727342	0.00	0.00	-18.65	
2199.95	16.00	141.62	2189.59	-86.99	68.89	40.218591	-104.727095	2.00	141.62	-105.84	
2551.91	16.00	141.62	2527.92	-163.03	129.12	40.218382	-104.726880	0.00	0.00	-182.07	
3351.86	0.00	0.00	3317.51	-250.02	198.01	40.218144	-104.726633	2.00	180.00	-269.26	
4099.34	0.00	0.00	4065.00	-250.02	198.01	40.218144	-104.726633	0.00	0.00	-269.26	PARKMAN :
4483.34	0.00	0.00	4449.00	-250.02	198.01	40.218144	-104.726633	0.00	0.00	-269.26	SUSSEX :
6925.39	0.00	0.00	6891.04	-250.02	198.01	40.218144	-104.726633	0.00	0.00	-269.26	KOP @ 6925.39' MD
7160.92	23.55	359.83	7120.00	-202.28	197.88	40.218275	-104.726633	10.00	359.83	-221.52	SHARON SPRINGS :
7223.63	29.82	359.83	7176.00	-174.13	197.79	40.218352	-104.726634	10.00	0.00	-193.37	NIOBRARA A :
7285.61	36.02	359.83	7228.00	-140.46	197.70	40.218444	-104.726634	10.00	0.00	-159.70	NIOBRARA B :
7393.81	46.84	359.83	7309.00	-68.97	197.49	40.218641	-104.726635	10.00	0.00	-88.21	NIOBRARA C :
7652.12	72.67	359.83	7438.00	152.30	196.85	40.219248	-104.726637	10.00	0.00	133.06	FORT HAYS :
7749.64	82.43	359.83	7459.00	247.41	196.58	40.219509	-104.726638	10.00	0.00	228.17	CODELL :
7825.39	90.00	359.83	7464.00	322.94	196.36	40.219716	-104.726639	10.00	0.00	303.70	LANDING POINT
12015.59	90.00	359.83	7464.00	4513.13	184.27	40.231219	-104.726682	0.00	0.00	4493.91	TD @ 12015.59' MD

5D Plan Report

Interpolated Points (Relative to centre, TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-18.65	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	-18.65	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	-18.65	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	-18.65	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	-18.65	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	-18.65	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	-18.65	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	-18.65	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	-18.65	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	-18.65	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	-18.65	
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	-18.65	
1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	-18.65	
1238.00	0.00	0.00	1238.00	0.00	0.00	0.00	0.00	-18.65	FOX HILLS MARKER :
1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	-18.65	
1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	-18.65	
1500.00	2.00	141.62	1499.98	-1.37	1.08	2.00	141.62	-20.02	
1600.00	4.00	141.62	1599.84	-5.47	4.33	2.00	0.00	-24.14	
1700.00	6.00	141.62	1699.45	-12.30	9.74	2.00	0.00	-30.98	
1800.00	8.00	141.62	1798.70	-21.86	17.31	2.00	0.00	-40.56	
1900.00	10.00	141.62	1897.47	-34.12	27.02	2.00	0.00	-52.85	
2000.00	12.00	141.62	1995.62	-49.08	38.87	2.00	0.00	-67.84	
2100.00	14.00	141.62	2093.06	-66.71	52.83	2.00	0.00	-85.52	
2199.95	16.00	141.62	2189.59	-86.99	68.89	2.00	0.00	-105.84	
2200.00	16.00	141.62	2189.64	-87.00	68.90	0.00	0.00	-105.85	
2300.00	16.00	141.62	2285.77	-108.60	86.01	0.00	0.00	-127.51	
2400.00	16.00	141.62	2381.90	-130.21	103.13	0.00	0.00	-149.17	
2500.00	16.00	141.62	2478.02	-151.82	120.24	0.00	0.00	-170.83	
2551.91	16.00	141.62	2527.92	-163.03	129.12	0.00	0.00	-182.07	
2600.00	15.04	141.62	2574.26	-173.12	137.11	2.00	180.00	-192.18	
2700.00	13.04	141.62	2671.27	-192.13	152.17	2.00	180.00	-211.23	
2800.00	11.04	141.62	2769.06	-208.48	165.11	2.00	180.00	-227.62	
2900.00	9.04	141.62	2867.53	-222.14	175.93	2.00	180.00	-241.31	
3000.00	7.04	141.62	2966.54	-233.10	184.61	2.00	180.00	-252.30	
3100.00	5.04	141.62	3065.98	-241.34	191.14	2.00	180.00	-260.56	
3200.00	3.04	141.62	3165.73	-246.86	195.52	2.00	180.00	-266.09	
3300.00	1.04	141.62	3265.66	-249.65	197.72	2.00	180.00	-268.89	
3351.86	0.00	0.00	3317.51	-250.02	198.01	2.00	180.00	-269.26	
3400.00	0.00	0.00	3365.66	-250.02	198.01	0.00	0.00	-269.26	
3500.00	0.00	0.00	3465.66	-250.02	198.01	0.00	0.00	-269.26	
3600.00	0.00	0.00	3565.66	-250.02	198.01	0.00	0.00	-269.26	

5D Plan Report

Interpolated Points (Relative to centre, TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
3700.00	0.00	0.00	3665.66	-250.02	198.01	0.00	0.00	-269.26	
3800.00	0.00	0.00	3765.66	-250.02	198.01	0.00	0.00	-269.26	
3900.00	0.00	0.00	3865.66	-250.02	198.01	0.00	0.00	-269.26	
4000.00	0.00	0.00	3965.66	-250.02	198.01	0.00	0.00	-269.26	
4099.34	0.00	0.00	4065.00	-250.02	198.01	0.00	0.00	-269.26	PARKMAN :
4100.00	0.00	0.00	4065.66	-250.02	198.01	0.00	0.00	-269.26	
4200.00	0.00	0.00	4165.66	-250.02	198.01	0.00	0.00	-269.26	
4300.00	0.00	0.00	4265.66	-250.02	198.01	0.00	0.00	-269.26	
4400.00	0.00	0.00	4365.66	-250.02	198.01	0.00	0.00	-269.26	
4483.34	0.00	0.00	4449.00	-250.02	198.01	0.00	0.00	-269.26	SUSSEX :
4500.00	0.00	0.00	4465.66	-250.02	198.01	0.00	0.00	-269.26	
4600.00	0.00	0.00	4565.66	-250.02	198.01	0.00	0.00	-269.26	
4700.00	0.00	0.00	4665.66	-250.02	198.01	0.00	0.00	-269.26	
4800.00	0.00	0.00	4765.66	-250.02	198.01	0.00	0.00	-269.26	
4900.00	0.00	0.00	4865.66	-250.02	198.01	0.00	0.00	-269.26	
5000.00	0.00	0.00	4965.66	-250.02	198.01	0.00	0.00	-269.26	
5100.00	0.00	0.00	5065.66	-250.02	198.01	0.00	0.00	-269.26	
5200.00	0.00	0.00	5165.66	-250.02	198.01	0.00	0.00	-269.26	
5300.00	0.00	0.00	5265.66	-250.02	198.01	0.00	0.00	-269.26	
5400.00	0.00	0.00	5365.66	-250.02	198.01	0.00	0.00	-269.26	
5500.00	0.00	0.00	5465.66	-250.02	198.01	0.00	0.00	-269.26	
5600.00	0.00	0.00	5565.66	-250.02	198.01	0.00	0.00	-269.26	
5700.00	0.00	0.00	5665.66	-250.02	198.01	0.00	0.00	-269.26	
5800.00	0.00	0.00	5765.66	-250.02	198.01	0.00	0.00	-269.26	
5900.00	0.00	0.00	5865.66	-250.02	198.01	0.00	0.00	-269.26	
6000.00	0.00	0.00	5965.66	-250.02	198.01	0.00	0.00	-269.26	
6100.00	0.00	0.00	6065.66	-250.02	198.01	0.00	0.00	-269.26	
6200.00	0.00	0.00	6165.66	-250.02	198.01	0.00	0.00	-269.26	
6300.00	0.00	0.00	6265.66	-250.02	198.01	0.00	0.00	-269.26	
6400.00	0.00	0.00	6365.66	-250.02	198.01	0.00	0.00	-269.26	
6500.00	0.00	0.00	6465.66	-250.02	198.01	0.00	0.00	-269.26	
6600.00	0.00	0.00	6565.66	-250.02	198.01	0.00	0.00	-269.26	
6700.00	0.00	0.00	6665.66	-250.02	198.01	0.00	0.00	-269.26	
6800.00	0.00	0.00	6765.66	-250.02	198.01	0.00	0.00	-269.26	
6900.00	0.00	0.00	6865.66	-250.02	198.01	0.00	0.00	-269.26	
6925.39	0.00	0.00	6891.04	-250.02	198.01	0.00	0.00	-269.26	KOP @ 6925.39' MD
7000.00	7.46	359.83	6965.45	-245.17	198.00	10.00	359.83	-264.41	
7100.00	17.46	359.83	7062.97	-223.61	197.94	10.00	0.00	-242.85	
7160.92	23.55	359.83	7120.00	-202.28	197.88	10.00	0.00	-221.52	SHARON SPRINGS :
7200.00	27.46	359.83	7155.26	-185.46	197.83	10.00	0.00	-204.70	
7223.63	29.82	359.83	7176.00	-174.13	197.79	10.00	0.00	-193.37	NIOBRARA A :

5D Plan Report

Interpolated Points (Relative to centre, TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
7285.61	36.02	359.83	7228.00	-140.46	197.70	10.00	0.00	-159.70	NIOBRARA B :
7300.00	37.46	359.83	7239.53	-131.85	197.67	10.00	0.00	-151.09	
7393.81	46.84	359.83	7309.00	-68.97	197.49	10.00	0.00	-88.21	NIOBRARA C :
7400.00	47.46	359.83	7313.21	-64.43	197.48	10.00	0.00	-83.67	
7500.00	57.46	359.83	7374.06	14.76	197.25	10.00	0.00	-4.47	
7600.00	67.46	359.83	7420.24	103.32	196.99	10.00	0.00	84.08	
7652.12	72.67	359.83	7438.00	152.30	196.85	10.00	0.00	133.06	FORT HAYS :
7700.00	77.46	359.83	7450.34	198.55	196.72	10.00	0.00	179.31	
7749.64	82.43	359.83	7459.00	247.41	196.58	10.00	0.00	228.17	CODELL :
7800.00	87.46	359.83	7463.44	297.56	196.43	10.00	0.00	278.32	
7825.39	90.00	359.83	7464.00	322.94	196.36	10.00	0.00	303.70	LANDING POINT
7900.00	90.00	359.83	7464.00	397.55	196.15	0.00	0.00	378.32	
8000.00	90.00	359.83	7464.00	497.55	195.86	0.00	0.00	478.32	
8100.00	90.00	359.83	7464.00	597.55	195.57	0.00	0.00	578.32	
8200.00	90.00	359.83	7464.00	697.55	195.28	0.00	0.00	678.32	
8300.00	90.00	359.83	7464.00	797.55	194.99	0.00	0.00	778.32	
8400.00	90.00	359.83	7464.00	897.55	194.70	0.00	0.00	878.32	
8500.00	90.00	359.83	7464.00	997.55	194.41	0.00	0.00	978.32	
8600.00	90.00	359.83	7464.00	1097.55	194.13	0.00	0.00	1078.32	
8700.00	90.00	359.83	7464.00	1197.55	193.84	0.00	0.00	1178.32	
8800.00	90.00	359.83	7464.00	1297.55	193.55	0.00	0.00	1278.32	
8900.00	90.00	359.83	7464.00	1397.55	193.26	0.00	0.00	1378.32	
9000.00	90.00	359.83	7464.00	1497.55	192.97	0.00	0.00	1478.32	
9100.00	90.00	359.83	7464.00	1597.55	192.68	0.00	0.00	1578.32	
9200.00	90.00	359.83	7464.00	1697.55	192.39	0.00	0.00	1678.32	
9300.00	90.00	359.83	7464.00	1797.55	192.11	0.00	0.00	1778.32	
9400.00	90.00	359.83	7464.00	1897.55	191.82	0.00	0.00	1878.32	
9500.00	90.00	359.83	7464.00	1997.55	191.53	0.00	0.00	1978.32	
9600.00	90.00	359.83	7464.00	2097.55	191.24	0.00	0.00	2078.32	
9700.00	90.00	359.83	7464.00	2197.55	190.95	0.00	0.00	2178.32	
9800.00	90.00	359.83	7464.00	2297.54	190.66	0.00	0.00	2278.32	
9900.00	90.00	359.83	7464.00	2397.54	190.37	0.00	0.00	2378.32	
10000.00	90.00	359.83	7464.00	2497.54	190.09	0.00	0.00	2478.32	
10100.00	90.00	359.83	7464.00	2597.54	189.80	0.00	0.00	2578.32	
10200.00	90.00	359.83	7464.00	2697.54	189.51	0.00	0.00	2678.32	
10300.00	90.00	359.83	7464.00	2797.54	189.22	0.00	0.00	2778.32	
10400.00	90.00	359.83	7464.00	2897.54	188.93	0.00	0.00	2878.32	
10500.00	90.00	359.83	7464.00	2997.54	188.64	0.00	0.00	2978.32	
10600.00	90.00	359.83	7464.00	3097.54	188.36	0.00	0.00	3078.32	
10700.00	90.00	359.83	7464.00	3197.54	188.07	0.00	0.00	3178.32	
10800.00	90.00	359.83	7464.00	3297.54	187.78	0.00	0.00	3278.32	

5D Plan Report

Interpolated Points (Relative to centre, TVD relative to Drill Floor)									
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100 US ft)	T.Face (°)	VS (US ft)	Comment
10900.00	90.00	359.83	7464.00	3397.54	187.49	0.00	0.00	3378.32	
11000.00	90.00	359.83	7464.00	3497.54	187.20	0.00	0.00	3478.32	
11100.00	90.00	359.83	7464.00	3597.54	186.91	0.00	0.00	3578.32	
11200.00	90.00	359.83	7464.00	3697.54	186.62	0.00	0.00	3678.32	
11300.00	90.00	359.83	7464.00	3797.54	186.34	0.00	0.00	3778.32	
11400.00	90.00	359.83	7464.00	3897.54	186.05	0.00	0.00	3878.32	
11500.00	90.00	359.83	7464.00	3997.54	185.76	0.00	0.00	3978.32	
11600.00	90.00	359.83	7464.00	4097.54	185.47	0.00	0.00	4078.32	
11700.00	90.00	359.83	7464.00	4197.54	185.18	0.00	0.00	4178.32	
11800.00	90.00	359.83	7464.00	4297.54	184.89	0.00	0.00	4278.32	
11900.00	90.00	359.83	7464.00	4397.54	184.60	0.00	0.00	4378.32	
12000.00	90.00	359.83	7464.00	4497.54	184.32	0.00	0.00	4478.32	
12015.59	90.00	359.83	7464.00	4513.13	184.27	0.00	0.00	4493.91	TD @ 12015.59' MD

Formation Points (Relative to centre, TVD relative to Drill Floor)			
Name	MD (US ft)	TVD (US ft)	
FOX HILLS MARKER	1238.00	1238.00	
PARKMAN	4099.34	4065.00	
SUSSEX	4483.34	4449.00	
SHARON SPRINGS	7160.92	7120.00	
NIOBRARA A	7223.63	7176.00	
NIOBRARA B	7285.61	7228.00	
NIOBRARA C	7393.81	7309.00	
FORT HAYS	7652.12	7438.00	
CODELL	7749.64	7459.00	