

Company: Apache

Lease/Well: North Mcelroy Unit /#2804BH

Location: 6.6 mi NW dir from Crane

Rig Name: Capstar #127

State/County: Texas/Crane

Latitude: 31.49, Longitude: -102.37

GRID North is 1.05 Degrees West of True North

VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = 11 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...mcelroy unit #2804bh-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/21/2014 / 08:23

VES Surey International

West Texas

(432) 563-5444


Chris Bankson

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.10	351.63	100.00	0.08	-0.01	0.08	0.08	351.63	0.10
200.00	0.13	292.28	200.00	0.21	-0.13	0.21	0.25	328.22	0.12
300.00	0.28	294.07	300.00	0.35	-0.46	0.35	0.58	307.57	0.15
400.00	0.16	276.79	400.00	0.47	-0.82	0.47	0.94	299.78	0.14
500.00	0.42	213.35	500.00	0.17	-1.16	0.17	1.17	278.58	0.38
600.00	0.65	186.08	599.99	-0.70	-1.42	-0.70	1.59	243.70	0.34
700.00	0.82	183.63	699.98	-1.99	-1.53	-1.99	2.50	217.56	0.17
800.00	0.81	170.81	799.97	-3.39	-1.46	-3.39	3.70	203.27	0.18
900.00	0.62	172.53	899.97	-4.63	-1.28	-4.63	4.80	195.42	0.18
1000.00	0.73	155.24	999.96	-5.75	-0.94	-5.75	5.83	189.26	0.23
1100.00	0.59	141.21	1099.95	-6.73	-0.35	-6.73	6.74	182.94	0.21
1200.00	0.81	139.25	1199.95	-7.67	0.44	-7.67	7.69	176.72	0.22
1300.00	0.54	135.55	1299.94	-8.54	1.23	-8.54	8.63	171.81	0.27
1400.00	0.34	109.44	1399.94	-8.98	1.84	-8.98	9.17	168.42	0.28
1500.00	0.15	95.35	1499.93	-9.09	2.25	-9.09	9.36	166.10	0.20
1600.00	0.23	88.02	1599.93	-9.10	2.58	-9.10	9.45	164.18	0.08
1700.00	0.70	58.20	1699.93	-8.77	3.29	-8.77	9.37	159.41	0.51
1800.00	1.25	53.94	1799.92	-7.80	4.69	-7.80	9.11	148.97	0.56
1900.00	1.66	38.01	1899.88	-6.02	6.47	-6.02	8.84	132.97	0.57
2000.00	2.05	29.74	1999.83	-3.33	8.24	-3.33	8.89	112.00	0.48
2040.00	1.82	24.06	2039.81	-2.13	8.86	-2.13	9.11	103.52	0.75

HORIZONTAL DISPLACEMENT IS
9.11 FEET AT 103.52 DEGREES

Company:		Apache Corporation									
Well Name:		North McElroy Unit 2804BH									
Location:		Crane County, TX									
Rig:		Capstar 127				Magnetic Declination:		7.65		REFERENCED TO GRID NORTH ▼	
Job Number:		DDMO-140953									
API #:		42-103-36387									
Vertical Section Azimuth:				165.39		Proposed Direction:		165.39			
Survey Calculation Method:				Minimum Curvature							
PTB:	MD		INC		AZM	TVD	N/S	E/W		VS	
	9,368		90.9		164.6						
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'
TIE IN	2,040	1.82	24.06				#VALUE!	0.00			
1	2,081	2.00	27.80	40.98	1.23	0.60	-1.04	1.37	26.02	0.53	0.44
2	2,124	1.90	39.80	83.95	2.44	1.41	-2.01	2.81	29.95	0.98	-0.23
3	2,167	1.50	99.80	126.94	2.89	2.42	-2.19	3.77	39.89	4.03	-0.93
4	2,210	2.90	145.30	169.91	1.90	3.59	-0.93	4.06	62.11	4.97	3.26
5	2,252	4.70	168.00	211.81	-0.66	4.55	1.78	4.60	98.20	5.51	4.29
6	2,295	7.20	173.10	254.58	-5.06	5.24	6.21	7.28	133.96	5.94	5.81
7	2,338	10.10	169.00	297.09	-11.43	6.29	12.65	13.05	151.20	6.89	6.74
8	2,381	13.40	167.40	339.18	-20.00	8.09	21.39	21.57	157.97	7.71	7.67
9	2,424	17.20	167.60	380.65	-31.08	10.55	32.73	32.82	161.25	8.84	8.84
10	2,467	20.70	166.90	421.31	-44.69	13.64	46.69	46.72	163.03	8.16	8.14
11	2,510	23.00	166.40	461.22	-60.26	17.33	62.68	62.70	163.95	5.37	5.35
12	2,553	25.20	166.40	500.47	-77.32	21.46	80.24	80.25	164.49	5.12	5.12
13	2,595	27.50	166.10	538.10	-95.43	25.89	98.88	98.88	164.82	5.49	5.48
14	2,638	29.80	166.30	575.84	-115.45	30.81	119.49	119.49	165.06	5.35	5.35
15	2,681	32.10	167.30	612.71	-136.98	35.85	141.60	141.60	165.33	5.48	5.35
16	2,723	34.40	168.00	647.83	-159.48	40.77	164.60	164.61	165.66	5.55	5.48
17	2,766	36.40	168.10	682.88	-183.84	45.93	189.48	189.49	165.97	4.65	4.65
18	2,809	38.90	167.60	716.92	-209.52	51.46	215.72	215.75	166.20	5.86	5.81
19	2,852	41.10	167.60	749.86	-236.51	57.40	243.34	243.38	166.36	5.12	5.12
20	2,895	42.70	166.70	781.87	-264.51	63.79	272.04	272.09	166.44	3.97	3.72
21	2,938	44.80	166.50	812.93	-293.43	70.68	301.77	301.82	166.46	4.89	4.88
22	2,980	47.10	165.80	842.13	-322.74	77.91	331.95	332.01	166.43	5.61	5.48
23	3,023	50.20	165.40	870.53	-354.00	85.94	364.23	364.28	166.35	7.24	7.21
24	3,066	53.70	165.30	897.03	-386.75	94.50	398.08	398.13	166.27	8.14	8.14
25	3,109	56.40	165.60	921.66	-420.86	103.35	433.33	433.37	166.20	6.31	6.28
26	3,152	59.10	165.90	944.61	-456.11	112.30	469.69	469.73	166.17	6.31	6.28
27	3,195	62.60	165.70	965.55	-492.51	121.51	507.23	507.28	166.14	8.15	8.14
28	3,238	66.10	165.50	984.16	-530.05	131.15	545.99	546.03	166.10	8.15	8.14
29	3,280	69.20	165.30	1000.13	-567.63	140.94	584.83	584.87	166.06	7.39	7.38
30	3,323	72.00	165.30	1014.41	-606.86	151.23	625.39	625.42	166.01	6.51	6.51
31	3,366	74.20	165.40	1026.91	-646.66	161.64	666.53	666.56	165.97	5.12	5.12

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#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance		Azm	DLS/ 100	BUR/ 100'
32	3,409	76.40	165.20	1037.82	-686.89	172.19	708.12	708.15	165.93	5.14	5.12	
33	3,452	78.90	165.10	1047.02	-727.49	182.96	750.12	750.14	165.88	5.82	5.81	
34	3,467	79.50	164.80	1049.83	-741.72	186.78	764.85	764.88	165.87	4.46	4.00	
35	3,562	82.90	165.20	1064.36	-832.39	211.08	858.72	858.74	165.77	3.60	3.58	
36	3,605	85.10	165.60	1068.85	-873.77	221.86	901.48	901.50	165.75	5.20	5.12	
37	3,648	87.50	166.70	1071.63	-915.43	232.13	944.38	944.40	165.77	6.14	5.58	
38	3,691	88.80	167.20	1073.01	-957.30	241.83	987.34	987.37	165.82	3.24	3.02	
39	3,733	90.30	167.00	1073.34	-998.23	251.21	1029.32	1029.36	165.87	3.60	3.57	
40	3,775	90.50	167.10	1073.05	-1039.16	260.62	1071.30	1071.35	165.92	0.53	0.48	
41	3,860	90.60	165.80	1072.24	-1121.79	280.53	1156.28	1156.34	165.96	1.53	0.12	
42	3,946	90.30	165.50	1071.56	-1205.11	301.85	1242.28	1242.33	165.94	0.49	-0.35	
43	4,032	90.10	165.40	1071.26	-1288.35	323.45	1328.28	1328.33	165.91	0.26	-0.23	
44	4,117	89.90	165.50	1071.26	-1370.62	344.81	1413.28	1413.33	165.88	0.26	-0.24	
45	4,203	91.30	172.40	1070.36	-1454.97	361.28	1499.05	1499.15	166.06	8.19	1.63	
46	4,289	91.40	172.20	1068.33	-1540.17	372.80	1584.40	1584.65	166.39	0.26	0.12	
47	4,374	90.90	168.30	1066.63	-1623.91	387.19	1669.06	1669.43	166.59	4.62	-0.59	
48	4,460	91.90	166.80	1064.52	-1707.86	405.72	1754.97	1755.39	166.64	2.10	1.16	
49	4,545	92.00	162.20	1061.63	-1789.70	428.42	1839.89	1840.26	166.54	5.41	0.12	
50	4,631	92.20	162.30	1058.48	-1871.55	454.62	1925.70	1925.97	166.35	0.26	0.23	
51	4,716	91.00	163.30	1056.11	-1952.71	479.74	2010.58	2010.78	166.20	1.84	-1.41	
52	4,802	90.90	163.00	1054.68	-2035.01	504.67	2096.50	2096.65	166.07	0.37	-0.12	
53	4,888	91.00	163.20	1053.25	-2117.28	529.66	2182.42	2182.53	165.96	0.26	0.12	
54	4,974	90.40	163.10	1052.20	-2199.59	554.59	2268.35	2268.42	165.85	0.71	-0.70	
55	5,060	90.20	163.30	1051.75	-2281.91	579.45	2354.29	2354.33	165.75	0.33	-0.23	
56	5,145	90.30	165.20	1051.38	-2363.72	602.52	2439.27	2439.30	165.70	2.24	0.12	
57	5,231	90.30	165.10	1050.93	-2446.84	624.56	2525.26	2525.30	165.68	0.12	0.00	
58	5,316	90.10	165.10	1050.63	-2528.99	646.42	2610.26	2610.29	165.66	0.24	-0.24	
59	5,402	91.50	164.40	1049.43	-2611.95	669.03	2696.25	2696.27	165.63	1.82	1.63	
60	5,488	91.30	164.40	1047.33	-2694.75	692.15	2782.21	2782.23	165.59	0.23	-0.23	
61	5,573	90.90	164.50	1045.70	-2776.63	714.94	2867.18	2867.19	165.56	0.49	-0.47	
62	5,658	90.60	164.80	1044.59	-2858.59	737.43	2952.17	2952.18	165.53	0.50	-0.35	
63	5,743	91.00	164.80	1043.40	-2940.61	759.72	3037.15	3037.16	165.51	0.47	0.47	
64	5,829	90.70	165.00	1042.13	-3023.63	782.12	3123.14	3123.15	165.50	0.42	-0.35	

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	9,368		90.9		164.6								
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/ 100	BUR/ 100'		
65	5,915	90.20	165.00	1041.45	-3106.69	804.38	3209.14	3209.14	165.48	0.58	-0.58		
66	6,001	90.00	165.00	1041.30	-3189.76	826.63	3295.13	3295.14	165.47	0.23	-0.23		
67	6,087	89.60	164.80	1041.60	-3272.79	849.04	3381.13	3381.13	165.46	0.52	-0.47		
68	6,173	90.80	166.20	1041.30	-3356.05	870.57	3467.12	3467.13	165.46	2.14	1.40		
69	6,258	92.00	165.90	1039.22	-3438.52	891.05	3552.09	3552.10	165.47	1.46	1.41		
70	6,344	92.10	166.10	1036.15	-3521.91	911.85	3638.03	3638.04	165.48	0.26	0.12		
71	6,430	91.80	166.10	1033.22	-3605.34	932.49	3723.98	3723.98	165.50	0.35	-0.35		
72	6,516	91.90	166.40	1030.44	-3688.83	952.92	3809.92	3809.93	165.52	0.37	0.12		
73	6,602	90.90	165.10	1028.34	-3772.16	974.09	3895.89	3895.90	165.52	1.91	-1.16		
74	6,687	90.70	165.20	1027.16	-3854.31	995.87	3980.88	3980.89	165.51	0.26	-0.24		
75	6,773	90.40	164.80	1026.33	-3937.38	1018.13	4066.88	4066.88	165.50	0.58	-0.35		
76	6,859	90.50	164.40	1025.66	-4020.29	1040.96	4152.86	4152.87	165.48	0.48	0.12		
77	6,945	90.60	164.40	1024.83	-4103.12	1064.09	4238.85	4238.85	165.46	0.12	0.12		
78	7,030	90.10	164.40	1024.31	-4184.98	1086.95	4323.83	4323.83	165.44	0.59	-0.59		
79	7,116	91.20	164.70	1023.34	-4267.87	1109.86	4409.82	4409.82	165.42	1.33	1.28		
80	7,178	91.80	165.20	1021.71	-4327.72	1125.95	4471.79	4471.79	165.42	1.26	0.97		
81	7,240	91.70	165.90	1019.82	-4387.73	1141.41	4533.76	4533.76	165.42	1.14	-0.16		
82	7,302	91.60	165.80	1018.03	-4447.83	1156.56	4595.74	4595.74	165.42	0.23	-0.16		
83	7,363	91.50	165.90	1016.38	-4506.95	1171.47	4656.71	4656.71	165.43	0.23	-0.16		
84	7,424	91.20	166.30	1014.95	-4566.15	1186.12	4717.69	4717.69	165.44	0.82	-0.49		
85	7,483	90.90	166.10	1013.87	-4623.44	1200.19	4776.67	4776.68	165.45	0.61	-0.51		
86	7,546	90.60	166.30	1013.04	-4684.61	1215.22	4839.66	4839.67	165.46	0.57	-0.48		
87	7,607	90.60	166.00	1012.40	-4743.84	1229.82	4900.65	4900.66	165.47	0.49	0.00		
88	7,668	90.20	166.00	1011.98	-4803.02	1244.58	4961.65	4961.65	165.47	0.66	-0.66		
89	7,730	91.60	165.80	1011.00	-4863.15	1259.68	5023.64	5023.64	165.48	2.28	2.26		
90	7,791	92.10	165.70	1009.03	-4922.24	1274.68	5084.60	5084.61	165.48	0.84	0.82		
91	7,852	92.10	165.40	1006.80	-4981.27	1289.90	5145.56	5145.57	165.48	0.49	0.00		
92	7,914	90.90	165.10	1005.17	-5041.20	1305.68	5207.54	5207.55	165.48	2.00	-1.94		
93	7,974	90.80	165.10	1004.28	-5099.18	1321.10	5267.53	5267.54	165.48	0.17	-0.17		
94	8,034	90.50	165.20	1003.60	-5157.17	1336.48	5327.53	5327.53	165.47	0.53	-0.50		
95	8,093	90.30	164.70	1003.19	-5214.15	1351.80	5386.52	5386.53	165.47	0.91	-0.34		
96	8,154	90.00	164.80	1003.03	-5273.00	1367.84	5447.52	5447.52	165.46	0.52	-0.49		

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			TVD Feet
			N/S Feet
			E/W Feet
			Surface Vert Sec
			Closure Distance
			Azm
			DLS/ 100
			BUR/ 100'
97	8,215	89.60	164.40
98	8,275	90.30	165.10
99	8,336	90.40	165.20
100	8,422	90.50	165.10
101	8,506	91.30	166.20
102	8,590	91.20	166.00
103	8,676	91.10	166.10
104	8,762	91.30	166.30
105	8,845	91.30	177.50
106	8,929	90.40	164.40
107	9,015	90.70	164.60
108	9,101	90.60	164.40
109	9,187	90.70	164.60
110	9,272	90.90	164.30
111	9,319	90.90	164.60
112	9,368	90.90	164.60