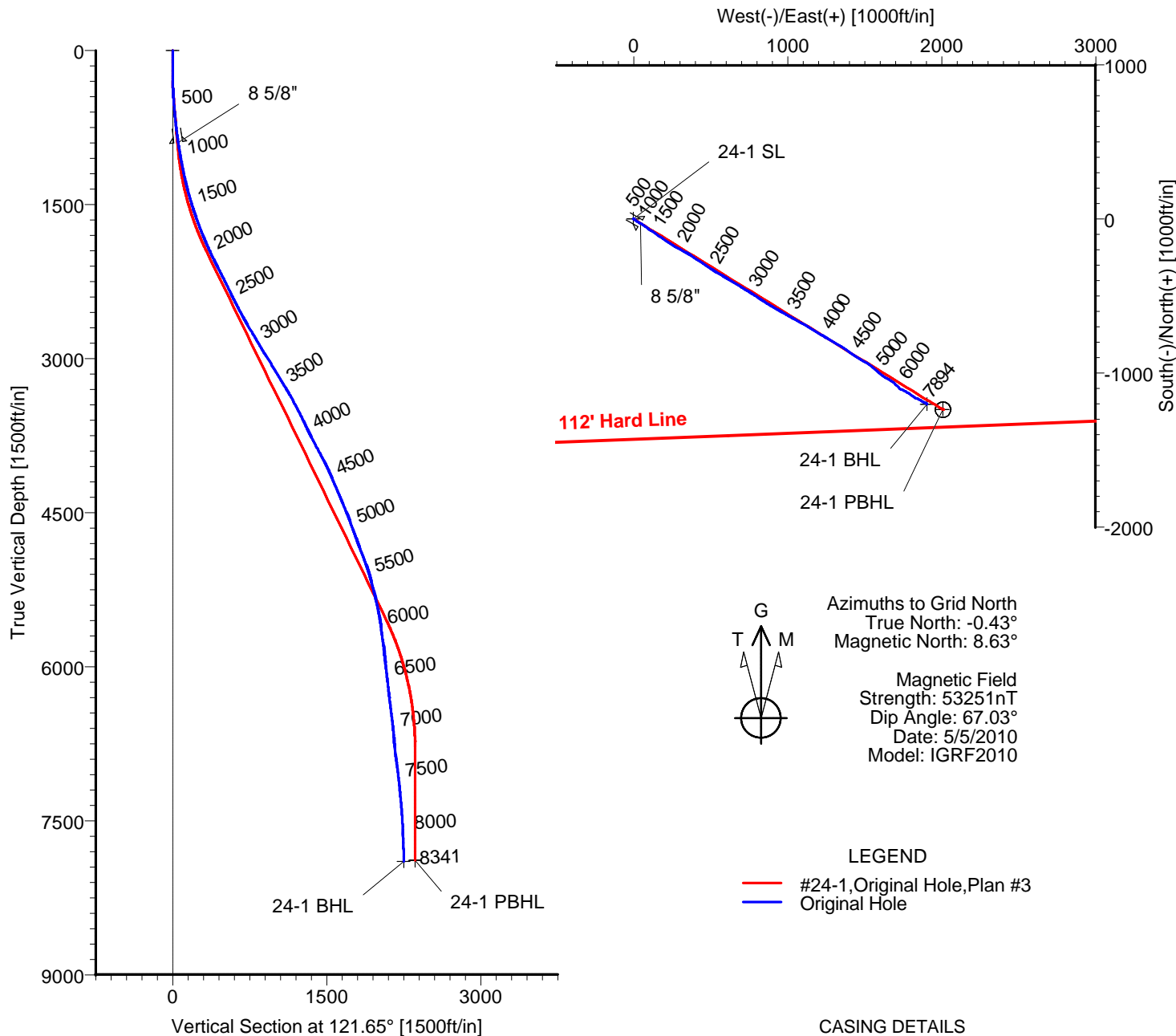


ANADARKO PETROLEUM

Field: Weld County, CO
Site: Bernhardt 3-1 Pad
Well: #24-1
Wellpath: Original Hole



CASING DETAILS

No.	TVD	MD	Name	Size
1	897.27	900.00	8 5/8"	8.625

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
24-1 SL	0.00	0.00	0.00	40°20'41.903N	104°50'28.741W	Point
24-1 PBHL	7887.00	-1238.19	2008.71	40°20'29.519N	104°50'02.918W	Circle (Radius: 50)
24-1 BHL	7893.64	-1201.84	1904.97	40°20'29.886N	104°50'04.255W	Point

Wellpath: (#24-1/Original Hole)

ALLIS-CHALMERS DIRECTIONAL DRILLING SERVICES
911 Regional Park Drive Houston, Texas 77060
Phone: 713-934-9600 Fax: 713-934-9067

Created By: Ivonne Gonzalez

Date: 5/24/2010



DIRECTIONAL
DRILLING SERVICES

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM		Date: 5/24/2010	Time: 09:30:35	Page: 1
Field: Weld County, CO		Co-ordinate(NE) Reference: Well: #24-1, Grid North		
Site: Bernhardt 3-1 Pad		Vertical (TVD) Reference: 4826'GL+13'KB 4839.0		
Well: #24-1		Section (VS) Reference: Well (0.00N,0.00E,121.65Azi)		
Wellpath: Original Hole		Survey Calculation Method: Minimum Curvature Db: Sybase		

Field: Weld County, CO	
Map System: US State Plane Coordinate System 1983	Map Zone: Colorado, Northern Zone
Geo Datum: GRS 1980	Coordinate System: Well Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: Bernhardt 3-1 Pad	
Site Position:	Northing: 1369310.76 ft
From: Geographic	Easting: 3183596.38 ft
Position Uncertainty: 0.00 ft	Latitude: 40 20 43.008 N
Ground Level: 4826.00 ft	Longitude: 104 50 28.824 W
	North Reference: Grid
	Grid Convergence: 0.43 deg

Well: #24-1	Slot Name: 24-1
Well Position: +N/-S -111.76 ft	Latitude: 40 20 41.903 N
+E/-W 7.27 ft	Longitude: 104 50 28.741 W
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole		Drilled From: Surface
Current Datum: 4826'GL+13'KB	Height: 4839.00 ft	Tie-on Depth: 0.00 ft
Magnetic Data: 5/5/2010		Above System Datum: Mean Sea Level
Field Strength: 53251 nT		Declination: 9.05 deg
Vertical Section: Depth From (TVD)	+N/-S	Mag Dip Angle: 67.03 deg
ft	ft	+E/-W
		ft
		Direction
		deg
0.00	0.00	0.00
		121.65

Survey Program for Definitive Wellpath			Version: 0	
Date: 5/24/2010	Validated: No	Survey	Toolcode	Tool Name
Actual From	To			
ft	ft			
47.00	8295.00	Survey #1 (47.00-8295.00)	MWD	Std MWD
8341.00	8341.00	Survey #2 (8341.00-8341.00)	Project	Projection

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
47.00	0.30	170.40	47.00	-0.12	0.02	0.08	0.64	0.64	0.00	MWD
108.00	0.00	102.90	108.00	-0.28	0.05	0.19	0.49	-0.49	0.00	MWD
169.00	0.20	228.40	169.00	-0.35	-0.03	0.16	0.33	0.33	0.00	MWD
229.00	0.00	187.70	229.00	-0.42	-0.11	0.13	0.33	-0.33	0.00	MWD
289.00	0.70	132.80	289.00	-0.67	0.16	0.49	1.17	1.17	0.00	MWD
350.00	1.80	123.30	349.98	-1.45	1.23	1.81	1.83	1.80	-15.57	MWD
428.00	3.20	124.70	427.91	-3.36	4.05	5.21	1.80	1.79	1.79	MWD
518.00	4.40	125.80	517.71	-6.81	8.91	11.16	1.34	1.33	1.22	MWD
608.00	5.10	121.90	607.40	-10.94	15.11	18.60	0.86	0.78	-4.33	MWD
699.00	6.20	121.20	697.95	-15.63	22.75	27.56	1.21	1.21	-0.77	MWD
788.00	7.40	120.50	786.33	-21.02	31.79	38.10	1.35	1.35	-0.79	MWD
850.00	7.90	121.60	847.77	-25.28	38.86	46.35	0.84	0.81	1.77	MWD
900.00	8.32	120.82	897.27	-28.94	44.90	53.40	0.86	0.83	-1.56	8 5/8"
922.00	8.50	120.50	919.04	-30.58	47.66	56.62	0.86	0.83	-1.45	MWD
1012.00	9.30	124.40	1007.95	-38.06	59.40	70.53	1.11	0.89	4.33	MWD
1102.00	11.10	125.80	1096.53	-47.24	72.42	86.44	2.02	2.00	1.56	MWD
1191.00	12.10	125.40	1183.71	-57.65	86.98	104.29	1.13	1.12	-0.45	MWD
1282.00	13.00	124.40	1272.53	-68.96	103.20	124.03	1.02	0.99	-1.10	MWD
1372.00	15.00	123.70	1359.86	-81.14	121.24	145.79	2.23	2.22	-0.78	MWD
1461.00	16.40	121.90	1445.53	-94.17	141.49	169.86	1.67	1.57	-2.02	MWD
1551.00	17.10	125.10	1531.72	-108.50	163.10	195.78	1.29	0.78	3.56	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM	Date: 5/24/2010	Time: 09:30:35	Page: 2
Field: Weld County, CO	Co-ordinate(NE) Reference: Well: #24-1, Grid North		
Site: Bernhardt 3-1 Pad	Vertical (TVD) Reference: 4826'GL+13'KB 4839.0		
Well: #24-1	Section (VS) Reference: Well (0.00N,0.00E,121.65Azi)		
Wellpath: Original Hole	Survey Calculation Method: Minimum Curvature		Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
1641.00	19.50	125.40	1617.16	-124.81	186.18	223.98	2.67	2.67	0.33	MWD
1732.00	20.80	123.70	1702.59	-142.57	212.00	255.28	1.57	1.43	-1.87	MWD
1822.00	21.80	122.60	1786.44	-160.44	239.37	287.96	1.20	1.11	-1.22	MWD
1913.00	23.80	121.60	1870.33	-179.17	269.25	323.22	2.24	2.20	-1.10	MWD
2003.00	24.80	117.70	1952.36	-197.46	301.43	360.21	2.10	1.11	-4.33	MWD
2093.00	25.90	118.00	2033.69	-215.46	335.50	398.66	1.23	1.22	0.33	MWD
2182.00	27.80	122.30	2113.10	-235.68	370.21	438.82	3.05	2.13	4.83	MWD
2272.00	27.30	124.40	2192.89	-258.56	404.98	480.42	1.21	-0.56	2.33	MWD
2362.00	26.00	123.70	2273.33	-281.17	438.43	520.75	1.49	-1.44	-0.78	MWD
2450.00	25.80	123.30	2352.49	-302.38	470.48	559.17	0.30	-0.23	-0.45	MWD
2538.00	27.50	124.00	2431.14	-324.26	503.33	598.62	1.96	1.93	0.80	MWD
2628.00	26.80	120.20	2511.23	-346.09	538.10	639.67	2.08	-0.78	-4.22	MWD
2718.00	28.40	120.20	2590.99	-367.06	574.13	681.35	1.78	1.78	0.00	MWD
2809.00	31.00	121.20	2670.02	-390.09	612.89	726.42	2.91	2.86	1.10	MWD
2899.00	31.30	121.20	2747.05	-414.21	652.71	772.98	0.33	0.33	0.00	MWD
2988.00	30.00	121.20	2823.61	-437.71	691.52	818.35	1.46	-1.46	0.00	MWD
3076.00	31.00	120.50	2899.44	-460.61	729.86	863.00	1.21	1.14	-0.80	MWD
3166.00	31.90	123.00	2976.22	-485.32	769.78	909.95	1.76	1.00	2.78	MWD
3256.00	32.20	123.70	3052.50	-511.58	809.67	957.69	0.53	0.33	0.78	MWD
3347.00	31.00	122.30	3130.01	-537.56	849.65	1005.36	1.55	-1.32	-1.54	MWD
3436.00	31.10	121.20	3206.25	-561.71	888.69	1051.26	0.65	0.11	-1.24	MWD
3526.00	31.30	119.10	3283.24	-585.12	929.00	1097.86	1.23	0.22	-2.33	MWD
3616.00	29.40	120.20	3360.90	-607.61	968.52	1143.30	2.20	-2.11	1.22	MWD
3706.00	28.70	119.10	3439.58	-629.23	1006.50	1186.97	0.98	-0.78	-1.22	MWD
3797.00	27.30	118.80	3519.93	-649.91	1043.88	1229.65	1.55	-1.54	-0.33	MWD
3887.00	26.00	118.40	3600.36	-669.24	1079.32	1269.96	1.46	-1.44	-0.44	MWD
3977.00	24.30	120.90	3681.83	-688.13	1112.56	1308.17	2.23	-1.89	2.78	MWD
4068.00	27.90	120.90	3763.54	-708.69	1146.91	1348.20	3.96	3.96	0.00	MWD
4156.00	28.00	120.90	3841.27	-729.87	1182.30	1389.44	0.11	0.11	0.00	MWD
4247.00	28.70	120.90	3921.36	-752.06	1219.38	1432.65	0.77	0.77	0.00	MWD
4338.00	27.30	121.60	4001.71	-774.22	1255.91	1475.37	1.58	-1.54	0.77	MWD
4428.00	24.80	121.60	4082.56	-794.92	1289.57	1514.89	2.78	-2.78	0.00	MWD
4518.00	22.70	118.40	4164.93	-813.08	1320.92	1551.11	2.74	-2.33	-3.56	MWD
4607.00	23.80	120.50	4246.71	-830.36	1351.50	1586.21	1.55	1.24	2.36	MWD
4695.00	22.90	123.30	4327.50	-848.77	1381.12	1621.08	1.62	-1.02	3.18	MWD
4785.00	22.70	128.20	4410.48	-869.13	1409.40	1655.84	2.12	-0.22	5.44	MWD
4875.00	22.40	125.40	4493.60	-889.80	1437.03	1690.20	1.24	-0.33	-3.11	MWD
4966.00	20.40	118.40	4578.33	-907.39	1465.12	1723.35	3.56	-2.20	-7.69	MWD
5056.00	20.20	116.60	4662.74	-921.81	1492.81	1754.48	0.73	-0.22	-2.00	MWD
5146.00	19.70	122.50	4747.35	-936.92	1519.50	1785.13	2.30	-0.56	6.56	MWD
5237.00	21.00	131.40	4832.69	-955.95	1544.67	1816.55	3.68	1.43	9.78	MWD
5326.00	21.80	130.70	4915.55	-977.27	1569.17	1848.59	0.94	0.90	-0.79	MWD
5417.00	20.30	130.00	5000.48	-998.44	1594.07	1880.89	1.67	-1.65	-0.77	MWD
5507.00	16.60	126.80	5085.84	-1016.18	1616.33	1909.15	4.26	-4.11	-3.56	MWD
5597.00	14.50	117.30	5172.55	-1029.05	1636.64	1933.20	3.66	-2.33	-10.56	MWD
5686.00	15.30	121.60	5258.56	-1040.32	1656.55	1956.05	1.53	0.90	4.83	MWD
5776.00	12.80	125.10	5345.87	-1052.28	1674.82	1977.88	2.93	-2.78	3.89	MWD
5866.00	12.00	129.30	5433.77	-1063.93	1690.22	1997.11	1.34	-0.89	4.67	MWD
5956.00	10.00	133.90	5522.11	-1075.28	1703.09	2014.02	2.43	-2.22	5.11	MWD
6046.00	7.00	140.50	5611.12	-1084.93	1712.21	2026.85	3.50	-3.33	7.33	MWD
6136.00	8.30	134.90	5700.31	-1093.75	1720.30	2038.36	1.66	1.44	-6.22	MWD
6226.00	8.20	127.90	5789.38	-1102.28	1729.97	2051.07	1.12	-0.11	-7.78	MWD
6316.00	5.00	118.40	5878.78	-1108.09	1738.49	2061.37	3.74	-3.56	-10.56	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM
Field: Weld County, CO
Site: Bernhardt 3-1 Pad
Well: #24-1
Wellpath: Original Hole

Date: 5/24/2010 **Time:** 09:30:35 **Page:** 3
Co-ordinate(NE) Reference: Well: #24-1, Grid North
Vertical (TVD) Reference: 4826'GL+13'KB 4839.0
Section (VS) Reference: Well (0.00N,0.00E,121.65Azi)
Survey Calculation Method: Minimum Curvature **Db:** Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
6406.00	7.60	104.70	5968.23	-1111.46	1747.69	2070.98	3.32	2.89	-15.22	MWD
6497.00	6.70	112.40	6058.53	-1115.01	1758.42	2081.97	1.44	-0.99	8.46	MWD
6586.00	6.50	126.50	6146.94	-1119.99	1767.27	2092.12	1.83	-0.22	15.84	MWD
6676.00	5.80	119.80	6236.42	-1125.28	1775.31	2101.74	1.11	-0.78	-7.44	MWD
6764.00	7.70	124.70	6323.81	-1130.85	1784.02	2112.07	2.25	2.16	5.57	MWD
6854.00	7.20	127.20	6413.05	-1137.69	1793.47	2123.70	0.66	-0.56	2.78	MWD
6944.00	6.90	120.90	6502.37	-1143.87	1802.60	2134.72	0.92	-0.33	-7.00	MWD
7034.00	5.80	127.50	6591.82	-1149.42	1810.85	2144.65	1.46	-1.22	7.33	MWD
7124.00	3.90	127.90	6681.49	-1154.07	1816.87	2152.22	2.11	-2.11	0.44	MWD
7213.00	6.50	121.60	6770.12	-1158.57	1823.55	2160.27	2.99	2.92	-7.08	MWD
7307.00	6.50	109.30	6863.52	-1163.12	1833.11	2170.79	1.48	0.00	-13.09	MWD
7394.00	8.30	115.20	6949.79	-1167.42	1843.44	2181.84	2.24	2.07	6.78	MWD
7484.00	7.00	115.60	7038.99	-1172.55	1854.26	2193.75	1.45	-1.44	0.44	MWD
7574.00	6.50	121.60	7128.37	-1177.59	1863.55	2204.30	0.96	-0.56	6.67	MWD
7665.00	4.80	123.70	7218.92	-1182.40	1871.10	2213.25	1.88	-1.87	2.31	MWD
7754.00	5.60	116.60	7307.56	-1186.41	1878.08	2221.30	1.15	0.90	-7.98	MWD
7844.00	4.40	116.60	7397.21	-1189.93	1885.10	2229.11	1.33	-1.33	0.00	MWD
7934.00	3.30	121.20	7487.01	-1192.81	1890.40	2235.14	1.27	-1.22	5.11	MWD
8025.00	2.40	114.90	7577.90	-1194.97	1894.37	2239.65	1.05	-0.99	-6.92	MWD
8115.00	2.10	112.10	7667.83	-1196.39	1897.60	2243.15	0.35	-0.33	-3.11	MWD
8205.00	2.50	128.90	7757.75	-1198.24	1900.66	2246.72	0.87	0.44	18.67	MWD
8295.00	2.30	130.40	7847.67	-1200.64	1903.56	2250.46	0.23	-0.22	1.67	MWD
8334.36	2.30	130.40	7887.00	-1201.67	1904.76	2252.02	0.00	0.00	0.00	24-1 PBHL
8341.00	2.30	130.40	7893.64	-1201.84	1904.97	2252.28	0.00	0.00	0.00	24-1 BHL

Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude --->			<--- Longitude --->		
24-1 SL			0.00	0.00	0.00	1369199.003183603.65	40 20 41.903 N	104 50 28.741 W					
24-1 PBHL			7887.00	-1238.19	2008.71	1367960.813185612.36	40 20 29.519 N	104 50 2.918 W					
-Circle (Radius: 50)													
24-1 BHL			7893.64	-1201.84	1904.97	1367997.163185508.62	40 20 29.886 N	104 50 4.255 W					

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
900.00	897.27	8.625	9.875	8 5/8"