

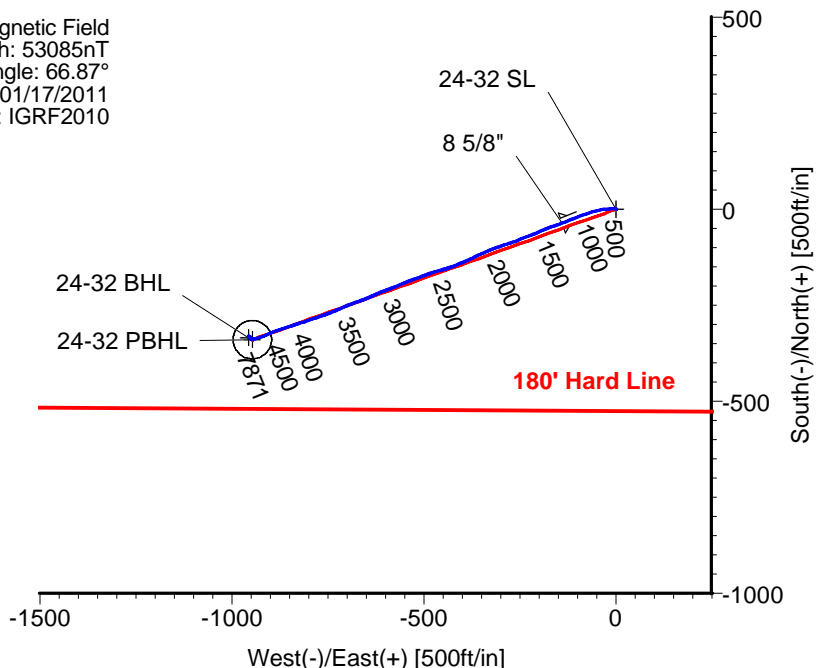
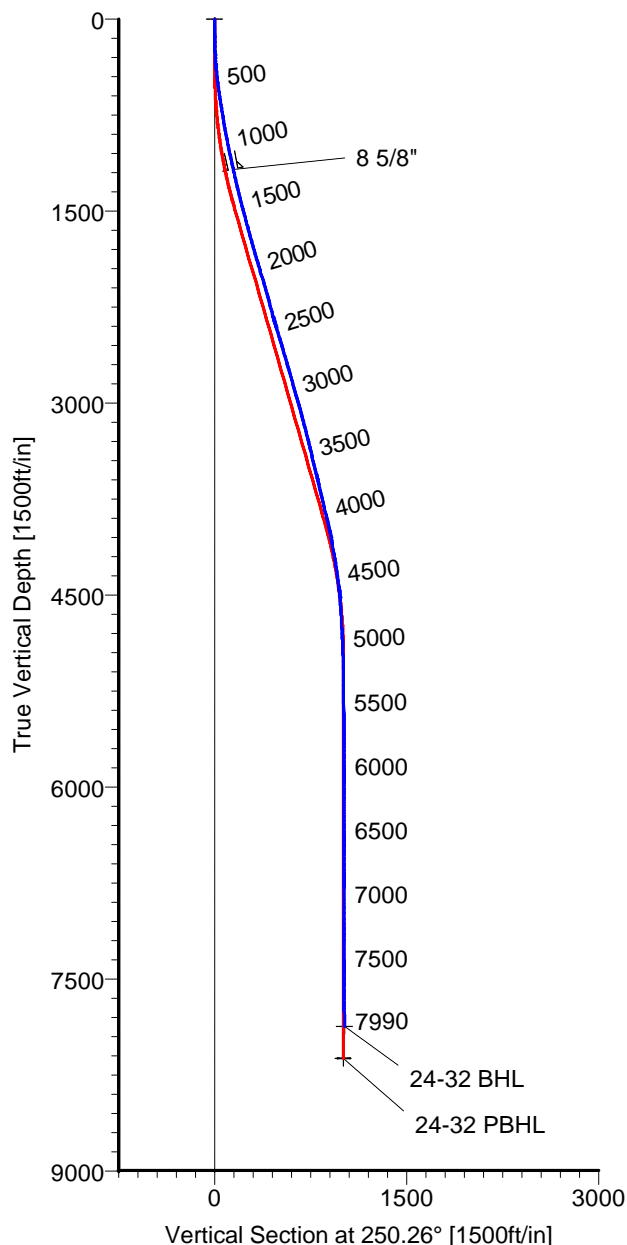
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Varra 8-32 Pad  
Well: 24-32  
Wellpath: Original Hole



Azimuths to Grid North  
True North:  $-0.38^{\circ}$   
Magnetic North:  $8.59^{\circ}$

Magnetic Field  
Strength: 53085nT  
Dip Angle:  $66.87^{\circ}$   
Date: 01/17/2011  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	1172.69	1185.00	8 5/8"	8.625

## LEGEND

- 24-32, Original Hole, Plan #3
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
24-32 SL	0.00	0.00	0.00	40°11'01.708N	104°54'21.335W	Point
24-32 BHL	7870.65	-334.48	-956.88	40°10'58.466N	104°54'33.692W	Point
24-32 PBHL	8118.00	-339.72	-946.98	40°10'58.414N	104°54'33.565W	Circle (Radius: 50)

Wellpath: (24-32/Original Hole)

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



DIRECTIONAL  
DRILLING SERVICES

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Varra 8-32 Pad <b>Well:</b> 24-32 <b>Wellpath:</b> Original Hole	<b>Date:</b> 02/09/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:39:51 <b>Well:</b> 24-32, Grid North <b>SITE</b> 0.0 <b>Well (0.00N,0.00E,250.26Azi)</b> <b>Minimum Curvature</b>	<b>Page:</b> 1 <b>Db:</b> Adapti
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<b>Field:</b> Weld County, CO  <b>Map System:</b> US State Plane Coordinate System 1983 <b>Geo Datum:</b> GRS 1980 <b>Sys Datum:</b> Mean Sea Level	<b>Map Zone:</b> Colorado, Northern Zone <b>Coordinate System:</b> Well Centre <b>Geomagnetic Model:</b> IGRF2010
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<b>Site:</b> Varra 8-32 Pad Currently centered on 41-32  <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4801.00 ft	<b>Northing:</b> 1310377.94 ft <b>Easting:</b> 3165992.85 ft  <b>Latitude:</b> 40 11 1.860 N <b>Longitude:</b> 104 54 21.276 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.38 deg
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<b>Well:</b> 24-32  <b>Well Position:</b> +N/-S -15.36 ft +E/-W -4.44 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 24-32  <b>Latitude:</b> 40 11 1.708 N <b>Longitude:</b> 104 54 21.335 W
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<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> SITE <b>Magnetic Data:</b> 01/17/2011 <b>Field Strength:</b> 53085 nT <b>Vertical Section:</b> Depth From (TVD) ft	<b>Drilled From:</b> Surface <b>Tie-on Depth:</b> 0.00 ft <b>Above System Datum:</b> Mean Sea Level <b>Declination:</b> 8.98 deg <b>Mag Dip Angle:</b> 66.87 deg <b>+N/-S</b> ft <b>+E/-W</b> ft <b>Direction</b> deg
0.00	0.00

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 02/09/2011	<b>Validated:</b> No	<b>Version:</b> 0		
<b>Actual From</b> ft	<b>To</b> ft	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
51.00	7945.00	Survey #1 (51.00-7945.00)	MWD	Std MWD
7990.00	7990.00	Survey #2 (7990.00-7990.00)	Project	Projection

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
51.00	0.20	34.60	51.00	0.07	0.05	-0.07	0.39	0.39	0.00	MWD
111.00	0.40	107.70	111.00	0.10	0.31	-0.32	0.65	0.33	121.83	MWD
200.00	1.60	289.80	199.99	0.42	-0.56	0.39	2.25	1.35	-199.89	MWD
291.00	3.50	274.00	290.90	1.05	-4.53	3.91	2.21	2.09	-17.36	MWD
382.00	5.60	269.10	381.60	1.17	-11.74	10.66	2.34	2.31	-5.38	MWD
472.00	7.20	265.60	471.04	0.67	-21.76	20.25	1.83	1.78	-3.89	MWD
563.00	8.30	262.10	561.21	-0.67	-33.95	32.18	1.31	1.21	-3.85	MWD
654.00	9.00	258.20	651.17	-3.03	-47.42	45.66	1.00	0.77	-4.29	MWD
744.00	9.30	252.60	740.03	-6.64	-61.25	59.90	1.04	0.33	-6.22	MWD
835.00	9.70	251.50	829.78	-11.28	-75.54	74.91	0.48	0.44	-1.21	MWD
926.00	10.90	249.40	919.32	-16.74	-90.86	91.18	1.38	1.32	-2.31	MWD
1017.00	11.60	249.10	1008.57	-23.03	-107.46	108.93	0.77	0.77	-0.33	MWD
1108.00	12.60	246.90	1097.54	-30.18	-125.14	127.98	1.21	1.10	-2.42	MWD
1140.00	12.70	247.70	1128.77	-32.89	-131.61	134.98	0.63	0.31	2.50	MWD
1197.00	12.30	249.40	1184.42	-37.40	-143.09	147.31	0.95	-0.70	2.98	MWD
1288.00	13.00	252.60	1273.21	-43.87	-161.93	167.23	1.09	0.77	3.52	MWD
1378.00	13.70	248.00	1360.78	-50.89	-181.47	188.00	1.41	0.78	-5.11	MWD
1469.00	14.60	245.90	1449.02	-59.61	-201.93	210.20	1.14	0.99	-2.31	MWD
1560.00	15.50	248.70	1536.90	-68.71	-223.73	233.79	1.27	0.99	3.08	MWD
1651.00	15.10	248.70	1624.67	-77.44	-246.10	257.79	0.44	-0.44	0.00	MWD
1741.00	15.30	250.50	1711.52	-85.66	-268.22	281.39	0.57	0.22	2.00	MWD

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## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Varra 8-32 Pad <b>Well:</b> 24-32 <b>Wellpath:</b> Original Hole	<b>Date:</b> 02/09/2011 <b>Co-ordinate(NE) Reference:</b> Well: 24-32, Grid North <b>Vertical (TVD) Reference:</b> SITE 0.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,250.26Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 08:39:51 <b>Page:</b> 2 <b>Db:</b> Adapti
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### 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
1832.00	15.70	252.60	1799.21	-93.35	-291.28	305.70	0.76	0.44	2.31	MWD
1923.00	16.70	250.10	1886.60	-101.48	-315.33	331.07	1.34	1.10	-2.75	MWD
2014.00	16.90	246.20	1973.72	-111.27	-339.73	357.34	1.26	0.22	-4.29	MWD
2105.00	16.50	244.80	2060.88	-122.11	-363.52	383.40	0.62	-0.44	-1.54	MWD
2196.00	15.80	245.50	2148.29	-132.75	-386.49	408.61	0.80	-0.77	0.77	MWD
2286.00	14.80	247.70	2235.10	-142.19	-408.27	432.31	1.28	-1.11	2.44	MWD
2377.00	14.60	249.80	2323.12	-150.56	-429.79	455.39	0.63	-0.22	2.31	MWD
2468.00	17.60	255.00	2410.55	-158.09	-453.85	480.57	3.65	3.30	5.71	MWD
2559.00	17.40	252.20	2497.34	-165.81	-480.09	507.88	0.95	-0.22	-3.08	MWD
2650.00	16.00	248.70	2584.50	-174.52	-504.74	534.02	1.89	-1.54	-3.85	MWD
2741.00	16.40	251.20	2671.88	-183.22	-528.58	559.40	0.88	0.44	2.75	MWD
2831.00	15.50	246.60	2758.42	-192.09	-551.65	584.11	1.72	-1.00	-5.11	MWD
2922.00	15.50	247.70	2846.11	-201.53	-574.06	608.39	0.32	0.00	1.21	MWD
3013.00	16.70	250.80	2933.54	-210.45	-597.66	633.61	1.62	1.32	3.41	MWD
3104.00	16.00	246.00	3020.87	-219.85	-621.46	659.20	1.67	-0.77	-5.27	MWD
3195.00	14.30	245.90	3108.70	-229.54	-643.18	682.91	1.87	-1.87	-0.11	MWD
3286.00	15.00	251.20	3196.75	-237.92	-664.59	705.89	1.66	0.77	5.82	MWD
3376.00	14.10	249.80	3283.86	-245.46	-685.90	728.50	1.07	-1.00	-1.56	MWD
3467.00	13.00	245.50	3372.33	-253.54	-705.62	749.79	1.64	-1.21	-4.73	MWD
3558.00	13.20	247.30	3460.96	-261.79	-724.52	770.36	0.50	0.22	1.98	MWD
3649.00	14.40	249.40	3549.33	-269.78	-744.70	792.05	1.43	1.32	2.31	MWD
3739.00	12.50	250.00	3636.86	-277.05	-764.33	812.98	2.12	-2.11	0.67	MWD
3830.00	13.50	251.20	3725.53	-283.84	-783.64	833.45	1.14	1.10	1.32	MWD
3921.00	13.70	252.20	3813.97	-290.56	-803.95	854.84	0.34	0.22	1.10	MWD
4011.00	13.90	252.90	3901.38	-297.00	-824.43	876.29	0.29	0.22	0.78	MWD
4102.00	12.30	251.50	3990.01	-303.29	-844.07	896.91	1.79	-1.76	-1.54	MWD
4193.00	10.00	251.20	4079.28	-308.91	-860.75	914.50	2.53	-2.53	-0.33	MWD
4284.00	9.90	250.80	4168.91	-314.03	-875.61	930.22	0.13	-0.11	-0.44	MWD
4374.00	8.80	249.40	4257.72	-318.99	-889.36	944.84	1.25	-1.22	-1.56	MWD
4465.00	7.70	247.30	4347.77	-323.80	-901.50	957.89	1.25	-1.21	-2.31	MWD
4556.00	7.20	245.50	4438.01	-328.51	-912.32	969.66	0.61	-0.55	-1.98	MWD
4647.00	4.40	251.90	4528.53	-331.96	-920.83	978.84	3.15	-3.08	7.03	MWD
4737.00	3.70	255.00	4618.31	-333.79	-926.91	985.18	0.81	-0.78	3.44	MWD
4828.00	3.00	257.80	4709.15	-335.05	-932.08	990.47	0.79	-0.77	3.08	MWD
4919.00	3.20	256.80	4800.02	-336.13	-936.88	995.35	0.23	0.22	-1.10	MWD
5010.00	2.10	242.40	4890.92	-337.49	-940.83	999.53	1.40	-1.21	-15.82	MWD
5100.00	1.90	250.10	4980.86	-338.76	-943.69	1002.65	0.37	-0.22	8.56	MWD
5191.00	0.40	276.80	5071.84	-339.23	-945.43	1004.44	1.71	-1.65	29.34	MWD
5282.00	0.40	282.10	5162.84	-339.13	-946.05	1005.00	0.04	0.00	5.82	MWD
5373.00	0.50	293.40	5253.84	-338.91	-946.73	1005.56	0.15	0.11	12.42	MWD
5463.00	0.90	281.10	5343.83	-338.61	-947.78	1006.45	0.47	0.44	-13.67	MWD
5554.00	0.90	274.70	5434.82	-338.42	-949.19	1007.72	0.11	0.00	-7.03	MWD
5690.00	0.00	12.50	5570.82	-338.33	-950.26	1008.69	0.66	-0.66	0.00	MWD
5826.00	0.40	42.70	5706.81	-337.98	-949.94	1008.27	0.29	0.29	0.00	MWD
5962.00	0.20	128.10	5842.81	-337.78	-949.43	1007.72	0.32	-0.15	62.79	MWD
6099.00	0.20	252.20	5979.81	-338.00	-949.47	1007.83	0.26	0.00	90.58	MWD
6235.00	0.40	5.10	6115.81	-337.60	-949.65	1007.87	0.38	0.15	83.01	MWD
6371.00	0.70	294.40	6251.81	-336.78	-950.37	1008.27	0.50	0.22	-51.99	MWD
6507.00	0.50	328.90	6387.80	-335.93	-951.43	1008.98	0.30	-0.15	25.37	MWD
6643.00	0.70	307.80	6523.79	-334.91	-952.39	1009.54	0.22	0.15	-15.51	MWD
6779.00	1.20	317.30	6659.77	-333.36	-954.01	1010.54	0.38	0.37	6.99	MWD
6915.00	1.20	313.70	6795.74	-331.33	-956.01	1011.74	0.06	0.00	-2.65	MWD
7051.00	0.20	189.30	6931.73	-330.58	-957.08	1012.49	0.97	-0.74	-91.47	MWD

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### 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
7187.00	1.10	94.00	7067.73	-330.90	-955.81	1011.41	0.84	0.66	-70.07	MWD
7324.00	1.40	117.60	7204.69	-331.77	-953.02	1009.07	0.43	0.22	17.23	MWD
7460.00	0.40	244.80	7340.68	-332.74	-951.98	1008.42	1.23	-0.74	93.53	MWD
7596.00	0.40	238.20	7476.68	-333.19	-952.81	1009.35	0.03	0.00	-4.85	MWD
7733.00	0.50	270.20	7613.67	-333.44	-953.81	1010.38	0.19	0.07	23.36	MWD
7868.00	0.90	246.90	7748.66	-333.86	-955.38	1012.00	0.36	0.30	-17.26	MWD
7945.00	0.70	247.70	7825.66	-334.27	-956.37	1013.07	0.26	-0.26	1.04	MWD
7990.00	0.70	247.70	7870.65	-334.48	-956.88	1013.62	0.00	0.00	0.00	PROJECTED to TD