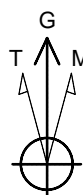
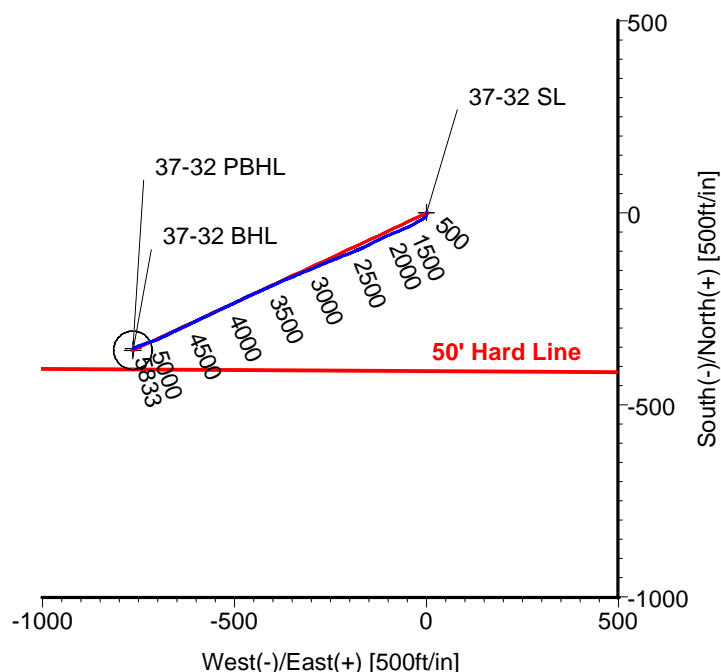
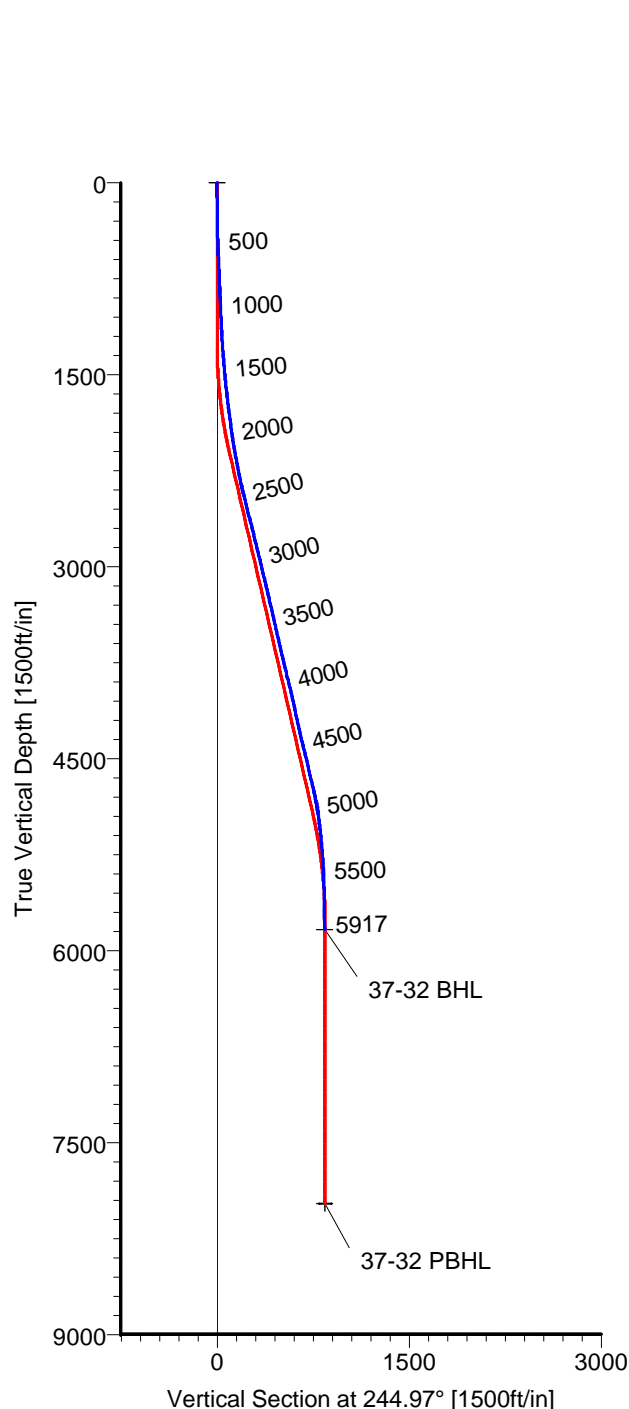


# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Varra 16-32 Pad  
Well: 37-32  
Wellpath: Original Hole



Azimuths to Grid North  
True North: -0.38°  
Magnetic North: 8.60°  
  
Magnetic Field  
Strength: 53082nT  
Dip Angle: 66.86°  
Date: 01/13/2011  
Model: IGRF2010

## LEGEND

- 37-32, Original Hole, Plan #2
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
37-32 SL	0.00	0.00	0.00	40°10'34.608N	104°54'21.996W	Point
37-32 BHL	5833.39	-352.27	-762.70	40°10'31.177N	104°54'31.852W	Point
37-32 PBHL	7975.00	-357.12	-764.87	40°10'31.129N	104°54'31.881W	Circle (Radius: 50)

Wellpath: (37-32/Original Hole)

Created By: Ivonne Gonzalez

Date: 02/06/2011

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 16-32 Pad <b>Well:</b> 37-32 <b>Wellpath:</b> Original Hole	<b>Date:</b> 02/06/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:34:38 Well: 37-32, Grid North SITE 4848.0 Well (0.00N,0.00E,244.97Azi) Minimum Curvature	<b>Page:</b> 1 <b>Db:</b> Sybase
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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

<b>Site:</b> Varra 16-32 Pad Currently centered on 37-32	
<b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4835.00 ft	<b>Northing:</b> 1307620.01 ft <b>Easting:</b> 3165955.44 ft <b>Latitude:</b> 40 10 34.608 N <b>Longitude:</b> 104 54 21.996 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.38 deg

<b>Well:</b> 37-32	<b>Slot Name:</b> 37-32
<b>Well Position:</b> +N/-S 0.00 ft +E/-W 0.00 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Latitude:</b> 40 10 34.608 N <b>Longitude:</b> 104 54 21.996 W <b>Easting :</b> 3165955.44 ft

<b>Wellpath:</b> Original Hole <b>Current Datum:</b> SITE <b>Magnetic Data:</b> 01/13/2011 <b>Field Strength:</b> 53082 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> 66.86 deg <b>Direction:</b> deg
Height 4848.00 ft	+N/-S ft +E/-W ft 0.00 0.00 244.97

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 01/29/2011 <b>Actual From</b> ft 81.00 5917.00	<b>To</b> ft 5825.00 5917.00	<b>Validated:</b> No <b>Survey</b> Survey #1 (81.00-5825.00) Survey #2 (5917.00-5917.00)	<b>Version:</b> 0 <b>Toolcode</b> MWD Project	<b>Tool Name</b> Std MWD 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
81.00	0.90	152.40	81.00	-0.56	0.29	-0.03	1.11	1.11	0.00	MWD
170.00	1.10	170.30	169.98	-2.03	0.76	0.17	0.41	0.22	20.11	MWD
261.00	1.40	185.10	260.96	-3.99	0.81	0.95	0.48	0.33	16.26	MWD
350.00	1.80	213.60	349.93	-6.24	-0.06	2.69	0.99	0.45	32.02	MWD
427.00	1.90	225.90	426.89	-8.14	-1.65	4.93	0.53	0.13	15.97	MWD
518.00	2.30	222.40	517.83	-10.53	-3.96	8.05	0.46	0.44	-3.85	MWD
609.00	2.60	228.20	608.74	-13.26	-6.73	11.71	0.43	0.33	6.37	MWD
699.00	2.50	242.20	698.66	-15.53	-9.99	15.62	0.70	-0.11	15.56	MWD
790.00	2.50	244.20	789.57	-17.32	-13.53	19.59	0.10	0.00	2.20	MWD
881.00	2.30	241.40	880.49	-19.06	-16.92	23.40	0.25	-0.22	-3.08	MWD
972.00	2.30	238.90	971.42	-20.88	-20.09	27.03	0.11	0.00	-2.75	MWD
1063.00	2.50	238.20	1062.34	-22.87	-23.34	30.82	0.22	0.22	-0.77	MWD
1140.00	2.80	237.50	1139.25	-24.76	-26.35	34.35	0.39	0.39	-0.91	MWD
1194.00	3.20	237.80	1193.18	-26.28	-28.74	37.16	0.74	0.74	0.56	MWD
1285.00	4.00	243.50	1284.00	-29.05	-33.73	42.85	0.96	0.88	6.26	MWD
1376.00	5.10	244.20	1374.71	-32.22	-40.21	50.07	1.21	1.21	0.77	MWD
1467.00	4.80	245.60	1465.37	-35.56	-47.32	57.92	0.36	-0.33	1.54	MWD
1558.00	6.00	245.90	1555.97	-39.07	-55.13	66.48	1.32	1.32	0.33	MWD
1649.00	6.20	247.00	1646.45	-42.93	-63.99	76.15	0.25	0.22	1.21	MWD
1739.00	6.70	248.70	1735.88	-46.74	-73.36	86.24	0.59	0.56	1.89	MWD
1830.00	7.60	245.20	1826.17	-51.19	-83.77	97.56	1.10	0.99	-3.85	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM  
**Field:** Weld County, CO  
**Site:** Varra 16-32 Pad  
**Well:** 37-32  
**Wellpath:** Original Hole

<b>Date:</b> 02/06/2011	<b>Time:</b> 08:34:38	<b>Page:</b> 2
<b>Co-ordinate(NE) Reference:</b>	Well: 37-32, Grid North	
<b>Vertical (TVD) Reference:</b>	SITE 4848.0	
<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,244.97Azi)	
<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> 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
1921.00	7.90	245.20	1916.34	-56.34	-94.91	109.83	0.33	0.33	0.00	MWD
2012.00	8.60	247.30	2006.40	-61.59	-106.86	122.88	0.84	0.77	2.31	MWD
2103.00	10.00	245.20	2096.20	-67.53	-120.31	137.58	1.58	1.54	-2.31	MWD
2194.00	10.60	241.70	2185.74	-74.81	-134.85	153.84	0.95	0.66	-3.85	MWD
2284.00	11.40	244.20	2274.08	-82.61	-150.15	171.00	1.03	0.89	2.78	MWD
2375.00	12.50	245.60	2363.11	-90.59	-167.22	189.84	1.25	1.21	1.54	MWD
2465.00	14.30	248.40	2450.66	-98.70	-186.42	210.68	2.13	2.00	3.11	MWD
2556.00	14.30	248.00	2538.84	-107.05	-207.29	233.12	0.11	0.00	-0.44	MWD
2647.00	14.10	247.00	2627.06	-115.59	-227.91	255.42	0.35	-0.22	-1.10	MWD
2738.00	14.30	249.10	2715.28	-123.93	-248.62	277.70	0.61	0.22	2.31	MWD
2829.00	13.50	247.70	2803.61	-131.97	-268.94	299.52	0.95	-0.88	-1.54	MWD
2920.00	14.10	247.00	2891.98	-140.33	-288.97	321.21	0.68	0.66	-0.77	MWD
3010.00	13.50	247.00	2979.39	-148.72	-308.74	342.66	0.67	-0.67	0.00	MWD
3101.00	13.20	246.30	3067.93	-157.05	-328.03	363.67	0.37	-0.33	-0.77	MWD
3192.00	13.40	248.70	3156.49	-165.06	-347.37	384.58	0.65	0.22	2.64	MWD
3283.00	13.00	246.30	3245.08	-173.00	-366.56	405.33	0.75	-0.44	-2.64	MWD
3374.00	12.50	246.30	3333.84	-181.07	-384.95	425.41	0.55	-0.55	0.00	MWD
3465.00	13.20	244.90	3422.56	-189.44	-403.38	445.65	0.84	0.77	-1.54	MWD
3555.00	12.70	245.20	3510.27	-197.95	-421.66	465.81	0.56	-0.56	0.33	MWD
3646.00	13.50	247.30	3598.90	-206.24	-440.54	486.43	1.02	0.88	2.31	MWD
3737.00	12.80	246.60	3687.51	-214.34	-459.59	507.12	0.79	-0.77	-0.77	MWD
3827.00	13.50	242.80	3775.16	-223.11	-478.09	527.58	1.24	0.78	-4.22	MWD
3918.00	13.90	243.50	3863.57	-232.84	-497.32	549.12	0.48	0.44	0.77	MWD
4009.00	13.70	245.90	3951.94	-242.12	-516.94	570.83	0.67	-0.22	2.64	MWD
4100.00	12.80	245.20	4040.52	-250.74	-535.92	591.68	1.00	-0.99	-0.77	MWD
4191.00	11.80	245.90	4129.43	-258.77	-553.57	611.07	1.11	-1.10	0.77	MWD
4282.00	12.10	244.20	4218.46	-266.72	-570.65	629.91	0.51	0.33	-1.87	MWD
4372.00	13.00	243.50	4306.30	-275.35	-588.20	649.46	1.01	1.00	-0.78	MWD
4463.00	14.10	243.80	4394.77	-284.81	-607.31	670.77	1.21	1.21	0.33	MWD
4554.00	13.90	245.90	4483.07	-294.16	-627.23	692.78	0.60	-0.22	2.31	MWD
4644.00	13.20	245.20	4570.56	-302.89	-646.43	713.87	0.80	-0.78	-0.78	MWD
4736.00	13.20	242.40	4660.13	-312.16	-665.27	734.87	0.69	0.00	-3.04	MWD
4826.00	12.30	243.50	4747.91	-321.20	-682.96	754.72	1.04	-1.00	1.22	MWD
4917.00	10.90	250.20	4837.05	-328.44	-699.73	772.98	2.13	-1.54	7.36	MWD
5008.00	8.60	251.90	4926.73	-333.47	-714.29	788.30	2.55	-2.53	1.87	MWD
5099.00	7.20	249.80	5016.87	-337.55	-726.11	800.74	1.57	-1.54	-2.31	MWD
5189.00	5.60	253.00	5106.31	-340.78	-735.61	810.71	1.82	-1.78	3.56	MWD
5280.00	4.90	246.30	5196.92	-343.64	-743.41	818.99	1.02	-0.77	-7.36	MWD
5371.00	4.00	248.00	5287.65	-346.39	-749.91	826.04	1.00	-0.99	1.87	MWD
5462.00	2.80	247.70	5378.49	-348.43	-754.91	831.43	1.32	-1.32	-0.33	MWD
5553.00	1.10	234.30	5469.43	-349.78	-757.68	834.51	1.92	-1.87	-14.73	MWD
5643.00	0.70	234.70	5559.42	-350.60	-758.83	835.90	0.44	-0.44	0.44	MWD
5734.00	0.70	230.10	5650.41	-351.28	-759.71	836.99	0.06	0.00	-5.05	MWD
5825.00	1.10	256.10	5741.40	-351.85	-760.98	838.38	0.62	0.44	28.57	MWD
5917.00	1.10	256.10	5833.39	-352.27	-762.70	840.11	0.00	0.00	0.00	37-32 BHL

## Targets

[illegible]