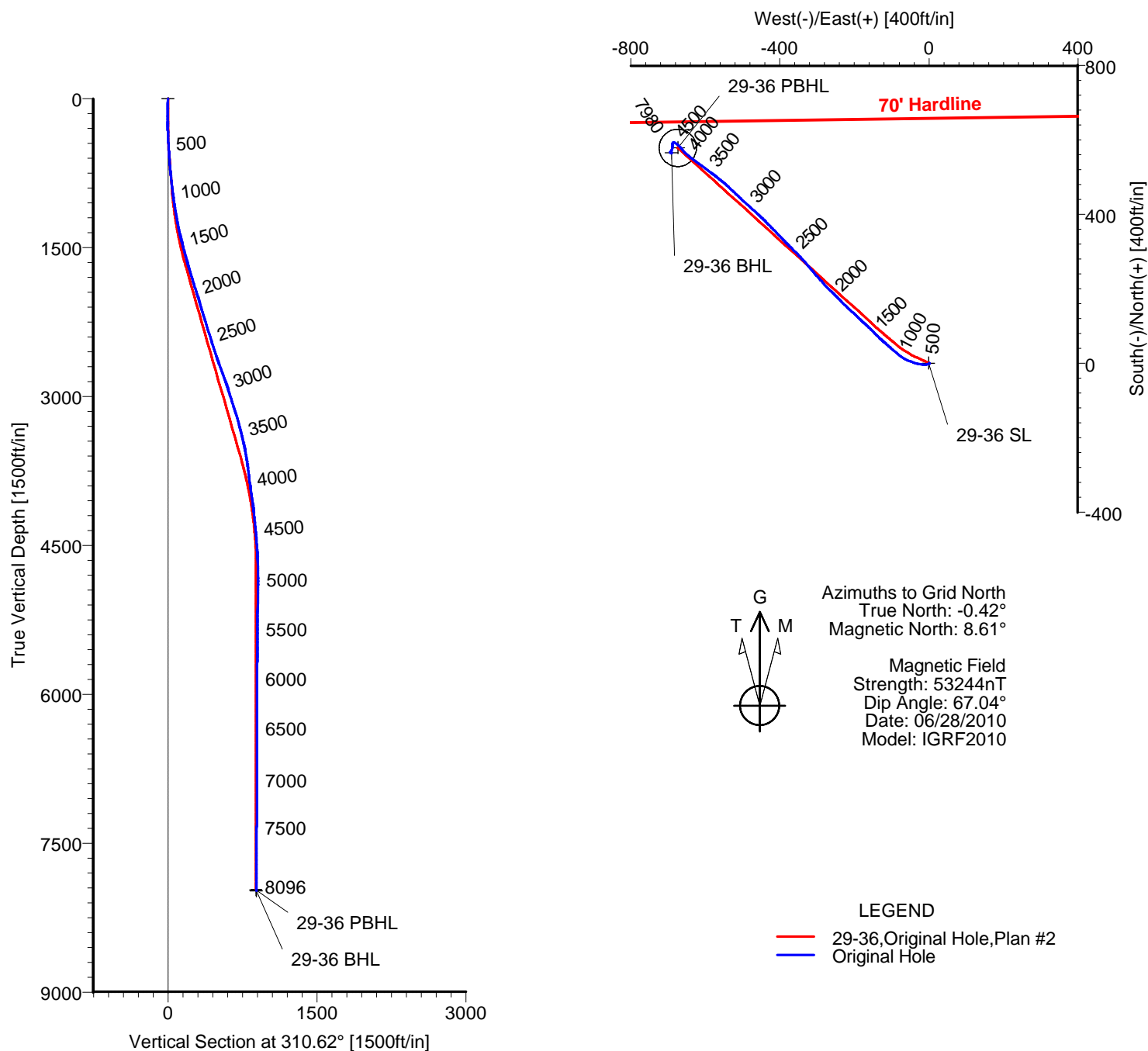


# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Berhardt State 3-36 Pad  
Well: 29-36  
Wellpath: Original Hole



## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
29-36 SL	0.00	0.00	0.00	40°21'41.226N	104°50'37.681W	Point
29-36 PBHL	7969.00	578.49	-674.46	40°21'46.992N	104°50'46.338W	Circle (Radius: 50)
29-36 BHL	7979.75	564.80	-691.37	40°21'46.858N	104°50'46.558W	Point

Wellpath: (29-36/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>Date:</b> 07/12/2010		<b>Time:</b> 09:24:08		<b>Page:</b> 1	
<b>Field:</b> Weld County, CO		<b>Co-ordinate(NE) Reference:</b> Well: 29-36, Grid North					
<b>Site:</b> Berhardt State 3-36 Pad		<b>Vertical (TVD) Reference:</b> 4887'GL+13'KB 4900.0					
<b>Well:</b> 29-36		<b>Section (VS) Reference:</b> Well (0.00N,0.00E,310.62Azi)					
<b>Wellpath:</b> Original Hole		<b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Adapti					

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

<b>Site:</b> Berhardt State 3-36 Pad	
<b>Site Position:</b>	<b>Northing:</b> 1375221.77 ft
<b>From:</b> Geographic	<b>Easting:</b> 3182883.65 ft
<b>Position Uncertainty:</b> 0.00 ft	<b>Latitude:</b> 40 21 41.472 N
<b>Ground Level:</b> 4887.00 ft	<b>Longitude:</b> 104 50 37.464 W
	<b>North Reference:</b> Grid
	<b>Grid Convergence:</b> 0.42 deg

<b>Well:</b> 29-36		<b>Slot Name:</b> 29-36	
<b>Well Position:</b> +N/-S -25.03 ft	<b>Northing:</b> 1375196.74 ft	<b>Latitude:</b> 40 21 41.226 N	
+E/-W -16.58 ft	<b>Easting:</b> 3182867.07 ft	<b>Longitude:</b> 104 50 37.681 W	
<b>Position Uncertainty:</b> 0.00 ft			

<b>Wellpath:</b> Original Hole		<b>Drilled From:</b> Surface	
<b>Current Datum:</b> 4887'GL+13'KB	<b>Height:</b> 4900.00 ft	<b>Tie-on Depth:</b> 0.00 ft	
<b>Magnetic Data:</b> 06/28/2010		<b>Above System Datum:</b> Mean Sea Level	
<b>Field Strength:</b> 53244 nT		<b>Declination:</b> 9.04 deg	
<b>Vertical Section: Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
ft	ft	ft	deg
0.00	0.00	0.00	310.62

<b>Survey Program for Definitive Wellpath</b>			
<b>Date:</b> 07/12/2010		<b>Validated:</b> No	
<b>Actual From</b>		<b>Version:</b> 0	
<b>To</b>	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
ft	ft		
47.00	8051.00	Survey #1 (47.00-8051.00)	MWD
8096.00	8096.00	Survey #2 (8096.00-8096.00)	Project
			Std MWD 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	0.40	128.20	47.00	-0.10	0.13	-0.16	0.85	0.85	0.00	MWD
107.00	0.50	169.70	107.00	-0.49	0.34	-0.58	0.55	0.17	69.17	MWD
168.00	0.50	163.70	168.00	-1.01	0.46	-1.01	0.09	0.00	-9.84	MWD
228.00	0.70	227.30	227.99	-1.51	0.27	-1.18	1.09	0.33	106.00	MWD
289.00	2.30	243.50	288.97	-2.30	-1.10	-0.66	2.69	2.62	26.56	MWD
350.00	3.20	258.60	349.90	-3.19	-3.87	0.86	1.88	1.48	24.75	MWD
430.00	3.90	267.40	429.75	-3.75	-8.77	4.22	1.11	0.87	11.00	MWD
520.00	4.40	275.20	519.51	-3.58	-15.27	9.26	0.84	0.56	8.67	MWD
611.00	4.80	281.50	610.22	-2.50	-22.48	15.43	0.71	0.44	6.92	MWD
702.00	6.00	278.80	700.81	-1.02	-30.91	22.80	1.35	1.32	-2.97	MWD
793.00	6.70	288.20	791.26	1.37	-40.65	31.75	1.37	0.77	10.33	MWD
845.00	7.00	289.90	842.89	3.40	-46.51	37.52	0.70	0.58	3.27	MWD
925.00	6.90	293.10	922.30	6.94	-55.52	46.66	0.50	-0.12	4.00	MWD
1015.00	8.30	298.40	1011.51	12.15	-66.20	58.16	1.74	1.56	5.89	MWD
1106.00	8.80	307.50	1101.50	19.51	-77.50	71.53	1.58	0.55	10.00	MWD
1197.00	10.00	310.00	1191.28	28.83	-89.08	86.39	1.39	1.32	2.75	MWD
1288.00	11.60	313.10	1280.66	40.16	-101.81	103.43	1.87	1.76	3.41	MWD
1378.00	12.70	310.00	1368.65	52.70	-116.00	122.36	1.42	1.22	-3.44	MWD
1469.00	15.00	313.50	1457.00	67.24	-132.21	144.13	2.69	2.53	3.85	MWD
1560.00	15.50	316.30	1544.79	84.14	-149.15	167.99	0.98	0.55	3.08	MWD
1651.00	14.80	311.40	1632.63	100.62	-166.27	191.71	1.60	-0.77	-5.38	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Berhardt State 3-36 Pad <b>Well:</b> 29-36 <b>Wellpath:</b> Original Hole	<b>Date:</b> 07/12/2010 <b>Time:</b> 09:24:08 <b>Page:</b> 2 <b>Co-ordinate(NE) Reference:</b> Well: 29-36, Grid North <b>Vertical (TVD) Reference:</b> 4887'GL+13'KB 4900.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,310.62Azi) <b>Survey Calculation Method:</b> Minimum Curvature <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
1742.00	16.90	314.20	1720.17	117.53	-184.47	216.54	2.46	2.31	3.08	MWD
1833.00	16.90	312.10	1807.24	135.62	-203.77	242.96	0.67	0.00	-2.31	MWD
1924.00	17.60	313.80	1894.15	154.01	-223.52	269.92	0.95	0.77	1.87	MWD
2015.00	18.00	316.60	1980.79	173.74	-243.11	297.64	1.04	0.44	3.08	MWD
2106.00	16.00	314.00	2067.81	192.67	-261.79	324.15	2.35	-2.20	-2.86	MWD
2197.00	17.20	316.30	2155.02	211.12	-280.11	350.06	1.50	1.32	2.53	MWD
2288.00	17.60	320.00	2241.86	231.38	-298.25	377.02	1.29	0.44	4.07	MWD
2379.00	17.60	318.80	2328.60	252.27	-316.15	404.21	0.40	0.00	-1.32	MWD
2470.00	17.40	318.80	2415.39	272.86	-334.18	431.30	0.22	-0.22	0.00	MWD
2561.00	18.00	315.60	2502.08	293.15	-352.98	458.78	1.26	0.66	-3.52	MWD
2652.00	18.00	314.50	2588.63	313.05	-372.84	486.81	0.37	0.00	-1.21	MWD
2743.00	20.10	316.30	2674.64	334.21	-393.68	516.40	2.40	2.31	1.98	MWD
2834.00	20.60	315.90	2759.96	357.01	-415.62	547.90	0.57	0.55	-0.44	MWD
2925.00	19.50	315.20	2845.44	379.28	-437.47	578.99	1.24	-1.21	-0.77	MWD
3016.00	17.10	312.40	2931.84	399.09	-458.05	607.50	2.81	-2.64	-3.08	MWD
3107.00	18.30	312.10	3018.53	417.69	-478.53	635.16	1.32	1.32	-0.33	MWD
3197.00	18.00	312.80	3104.05	436.61	-499.22	663.18	0.41	-0.33	0.78	MWD
3288.00	16.40	313.50	3190.98	455.00	-518.86	690.06	1.77	-1.76	0.77	MWD
3379.00	15.50	313.80	3278.47	472.26	-536.95	715.03	0.99	-0.99	0.33	MWD
3470.00	14.30	308.60	3366.41	487.69	-554.51	738.41	1.97	-1.32	-5.71	MWD
3561.00	12.80	308.00	3454.88	500.91	-571.24	759.71	1.66	-1.65	-0.66	MWD
3652.00	10.60	306.80	3543.98	512.13	-585.89	778.13	2.43	-2.42	-1.32	MWD
3742.00	9.30	306.80	3632.63	521.45	-598.34	793.65	1.44	-1.44	0.00	MWD
3833.00	7.20	304.30	3722.68	529.07	-608.94	806.65	2.34	-2.31	-2.75	MWD
3924.00	7.70	308.20	3812.91	536.05	-618.44	818.41	0.78	0.55	4.29	MWD
4014.00	7.90	308.20	3902.08	543.60	-628.04	830.62	0.22	0.22	0.00	MWD
4105.00	7.60	308.20	3992.25	551.19	-637.68	842.88	0.33	-0.33	0.00	MWD
4196.00	8.10	306.10	4082.40	558.69	-647.59	855.28	0.63	0.55	-2.31	MWD
4287.00	6.30	317.70	4172.68	566.16	-656.13	866.63	2.53	-1.98	12.75	MWD
4378.00	5.50	319.10	4263.20	573.15	-662.35	875.90	0.89	-0.88	1.54	MWD
4468.00	5.30	318.40	4352.80	579.52	-667.93	884.28	0.23	-0.22	-0.78	MWD
4559.00	4.60	315.90	4443.46	585.28	-673.26	892.08	0.80	-0.77	-2.75	MWD
4650.00	3.70	311.40	4534.22	589.85	-678.00	898.65	1.05	-0.99	-4.95	MWD
4741.00	2.10	285.00	4625.10	592.22	-681.82	903.09	2.25	-1.76	-29.01	MWD
4832.00	2.10	272.00	4716.04	592.71	-685.09	905.89	0.52	0.00	-14.29	MWD
4922.00	1.10	269.50	4806.01	592.76	-687.61	907.83	1.11	-1.11	-2.78	MWD
5013.00	1.80	183.40	4896.98	591.33	-688.56	907.63	2.25	0.77	-94.62	MWD
5103.00	0.70	159.50	4986.96	589.40	-688.46	906.29	1.33	-1.22	-26.56	MWD
5194.00	0.70	178.50	5077.96	588.32	-688.25	905.43	0.25	0.00	20.88	MWD
5285.00	0.70	175.70	5168.95	587.21	-688.19	904.67	0.04	0.00	-3.08	MWD
5466.00	0.90	213.30	5349.93	584.92	-688.89	903.70	0.30	0.11	20.77	MWD
5648.00	1.20	163.40	5531.90	581.90	-689.13	901.92	0.51	0.16	-27.42	MWD
5830.00	1.10	199.90	5713.87	578.43	-689.18	899.70	0.40	-0.05	20.05	MWD
6012.00	1.10	196.40	5895.84	575.11	-690.27	898.36	0.04	0.00	-1.92	MWD
6193.00	0.90	201.00	6076.81	572.12	-691.27	897.17	0.12	-0.11	2.54	MWD
6375.00	0.50	179.90	6258.80	569.99	-691.78	896.18	0.26	-0.22	-11.59	MWD
6557.00	0.50	210.50	6440.79	568.51	-692.18	895.52	0.14	0.00	16.81	MWD
6739.00	0.50	264.60	6622.78	567.75	-693.37	895.93	0.25	0.00	29.73	MWD
6921.00	0.30	231.20	6804.78	567.38	-694.53	896.57	0.16	-0.11	-18.35	MWD
7103.00	0.20	232.60	6986.78	566.89	-695.16	896.72	0.06	-0.05	0.77	MWD
7284.00	0.30	163.00	7167.78	566.24	-695.27	896.39	0.16	0.06	-38.45	MWD
7466.00	0.70	142.60	7349.77	564.91	-694.46	894.90	0.24	0.22	-11.21	MWD
7648.00	0.50	126.80	7531.76	563.55	-693.14	893.02	0.14	-0.11	-8.68	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Berhardt State 3-36 Pad <b>Well:</b> 29-36 <b>Wellpath:</b> Original Hole	<b>Date:</b> 07/12/2010 <b>Time:</b> 09:24:08 <b>Page:</b> 3 <b>Co-ordinate(NE) Reference:</b> Well: 29-36, Grid North <b>Vertical (TVD) Reference:</b> 4887'GL+13'KB 4900.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,310.62Azi) <b>Survey Calculation Method:</b> Minimum Curvature <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
7830.00	0.30	5.90	7713.76	563.54	-692.46	892.50	0.39	-0.11	-66.43	MWD
8012.00	0.50	51.60	7895.75	564.51	-691.79	892.62	0.20	0.11	25.11	MWD
8051.00	0.30	56.50	7934.75	564.67	-691.57	892.56	0.52	-0.51	12.56	MWD
8085.25	0.30	56.50	7969.00	564.77	-691.42	892.51	0.00	0.00	0.00	29-36 PBHL
8096.00	0.30	56.50	7979.75	564.80	-691.37	892.49	0.00	0.00	0.00	29-36 BHL

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----><--- Longitude --->		
29-36 SL			0.00	0.00	0.00	1375196.743182867.07	40 21 41.226 N	104 50 37.681 W		
29-36 PBHL			7969.00	578.49	-674.46	1375775.233182192.61	40 21 46.992 N	104 50 46.338 W		
-Circle (Radius: 50)										
29-36 BHL			7979.75	564.80	-691.37	1375761.543182175.70	40 21 46.858 N	104 50 46.558 W		