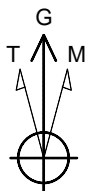


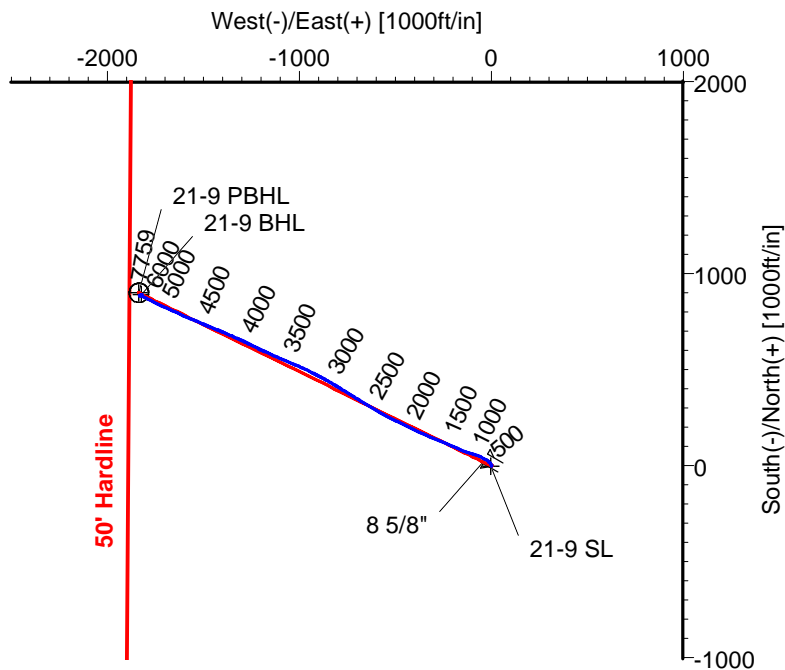
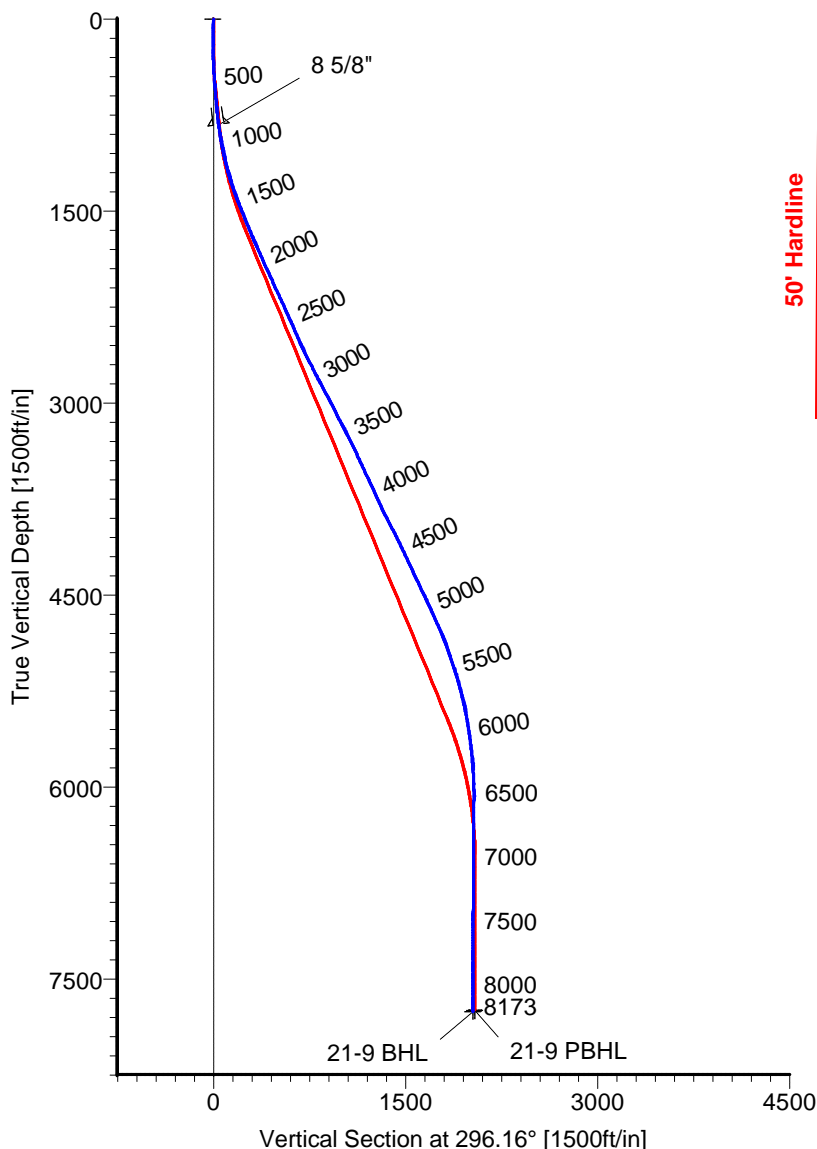
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: REI 8-9 Pad  
Well: 21-9  
Wellpath: Original Hole



Azimuths to Grid North  
True North: -0.54°  
Magnetic North: 8.25°

Magnetic Field  
Strength: 53091nT  
Dip Angle: 66.94°  
Date: 07/13/2011  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	829.92	832.00	8 5/8"	8.625

## LEGEND

- 21-9,Original Hole,Plan #1
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
21-9 SL	0.00	0.00	0.00	40°14'28.253N	104°39'41.865W	Point
21-9 PBHL	7748.00	900.96	-1834.23	40°14'37.327N	104°40'05.408W	Circle (Radius: 50)
21-9 BHL	7758.80	892.04	-1822.85	40°14'37.238N	104°40'05.262W	Point

Wellpath: (21-9/Original Hole)

Created By: Ivonne Gonzalez

Date: 06/08/2011

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

**Archer**

# ARCHER

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> REI 8-9 Pad <b>Well:</b> 21-9 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/08/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 07:57:36 Well: 21-9, Grid North 4816'GL+13'KB 4829.0 Well (0.00N,0.00E,296.16Azi) Minimum Curvature	<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> REI 8-9 Pad  <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4816.00 ft	<b>Northing:</b> 1331813.57 ft <b>Easting:</b> 3234093.02 ft  <b>Latitude:</b> 40 14 28.252 N <b>Longitude:</b> 104 39 41.245 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.54 deg
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<b>Well:</b> 21-9  <b>Well Position:</b> +N/-S -0.36 ft +E/-W -48.04 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 21-9  <b>Latitude:</b> 40 14 28.253 N <b>Longitude:</b> 104 39 41.865 W
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<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> 4816'GL+13'KB <b>Magnetic Data:</b> 07/13/2011 <b>Field Strength:</b> 53091 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> 8.79 deg <b>Mag Dip Angle:</b> 66.94 deg +N/-S ft +E/-W ft Direction deg
0.00	0.00

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 06/08/2011	<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>	
49.00	8128.00	Survey #1 (49.00-8128.00)	MWD	Std MWD	
8173.00	8173.00	Survey #2 (8173.00-8173.00)	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
49.00	1.40	99.50	49.00	-0.10	0.59	-0.57	2.86	2.86	0.00	MWD
140.00	0.90	41.80	139.98	0.25	2.16	-1.83	1.31	-0.55	-63.41	MWD
229.00	0.90	359.60	228.97	1.47	2.62	-1.71	0.73	0.00	-47.42	MWD
319.00	2.10	330.10	318.94	3.61	1.80	-0.02	1.54	1.33	-32.78	MWD
426.00	4.00	330.10	425.78	8.54	-1.04	4.70	1.78	1.78	0.00	MWD
516.00	4.90	318.20	515.51	14.13	-5.17	10.87	1.43	1.00	-13.22	MWD
607.00	4.80	315.40	606.19	19.74	-10.43	18.06	0.28	-0.11	-3.08	MWD
698.00	5.60	309.40	696.81	25.27	-16.54	25.98	1.06	0.88	-6.59	MWD
787.00	6.90	299.50	785.28	30.66	-24.54	35.55	1.89	1.46	-11.12	MWD
832.00	7.66	299.11	829.92	33.44	-29.52	41.24	1.68	1.68	-0.88	8 5/8"
924.00	9.20	298.50	920.92	39.94	-41.33	54.71	1.68	1.68	-0.66	MWD
1014.00	11.40	296.40	1009.47	47.32	-55.63	70.79	2.48	2.44	-2.33	MWD
1105.00	13.50	287.90	1098.33	54.59	-73.79	90.30	3.06	2.31	-9.34	MWD
1196.00	15.10	287.90	1186.51	61.50	-95.18	112.54	1.76	1.76	0.00	MWD
1287.00	17.90	289.70	1273.75	69.86	-119.63	138.17	3.13	3.08	1.98	MWD
1377.00	19.70	291.10	1358.95	79.98	-146.81	167.03	2.06	2.00	1.56	MWD
1468.00	21.50	294.60	1444.13	92.44	-176.28	198.98	2.40	1.98	3.85	MWD
1559.00	22.50	293.20	1528.50	106.25	-207.45	233.04	1.24	1.10	-1.54	MWD
1650.00	22.20	290.00	1612.67	118.99	-239.61	267.52	1.38	-0.33	-3.52	MWD
1741.00	23.10	290.00	1696.65	130.97	-272.54	302.37	0.99	0.99	0.00	MWD
1832.00	24.50	294.50	1779.92	144.90	-306.49	338.98	2.52	1.54	4.95	MWD

# ARCHER

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> REI 8-9 Pad <b>Well:</b> 21-9 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/08/2011 <b>Co-ordinate(NE) Reference:</b> Well: 21-9, Grid North <b>Vertical (TVD) Reference:</b> 4816'GL+13'KB 4829.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,296.16Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 07:57:36 <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
1923.00	24.10	294.30	1862.85	160.37	-340.59	376.41	0.45	-0.44	-0.22	MWD
2013.00	23.90	294.30	1945.07	175.44	-373.96	413.00	0.22	-0.22	0.00	MWD
2104.00	24.80	297.10	2027.98	191.72	-407.75	450.51	1.61	0.99	3.08	MWD
2195.00	24.60	295.30	2110.66	208.51	-441.86	488.53	0.86	-0.22	-1.98	MWD
2285.00	25.00	295.70	2192.36	224.76	-475.93	526.28	0.48	0.44	0.44	MWD
2376.00	24.50	296.00	2275.00	241.37	-510.22	564.37	0.57	-0.55	0.33	MWD
2467.00	24.10	299.50	2357.94	258.79	-543.35	601.79	1.64	-0.44	3.85	MWD
2558.00	23.20	298.50	2441.29	276.49	-575.28	638.25	1.08	-0.99	-1.10	MWD
2649.00	24.30	299.20	2524.59	294.18	-607.37	674.86	1.25	1.21	0.77	MWD
2739.00	26.40	301.30	2605.92	313.61	-640.64	713.28	2.54	2.33	2.33	MWD
2830.00	27.10	302.00	2687.18	335.11	-675.50	754.05	0.84	0.77	0.77	MWD
2921.00	26.70	302.30	2768.33	357.02	-710.36	795.00	0.46	-0.44	0.33	MWD
3012.00	28.50	301.60	2848.97	379.32	-746.14	836.94	2.01	1.98	-0.77	MWD
3102.00	28.20	301.30	2928.18	401.62	-782.60	879.50	0.37	-0.33	-0.33	MWD
3193.00	26.70	300.60	3008.93	423.20	-818.57	921.30	1.69	-1.65	-0.77	MWD
3284.00	27.10	299.20	3090.09	443.72	-854.26	962.38	0.82	0.44	-1.54	MWD
3375.00	28.00	297.80	3170.77	463.79	-891.25	1004.43	1.22	0.99	-1.54	MWD
3465.00	26.00	297.10	3250.95	482.63	-927.50	1045.28	2.25	-2.22	-0.78	MWD
3556.00	26.00	295.70	3332.74	500.37	-963.23	1085.16	0.67	0.00	-1.54	MWD
3647.00	25.90	293.90	3414.57	517.07	-999.37	1124.97	0.87	-0.11	-1.98	MWD
3738.00	25.00	293.20	3496.74	532.70	-1035.22	1164.03	1.04	-0.99	-0.77	MWD
3828.00	25.30	293.20	3578.21	547.77	-1070.37	1202.23	0.33	0.33	0.00	MWD
3919.00	24.50	292.50	3660.75	562.65	-1105.68	1240.48	0.94	-0.88	-0.77	MWD
4010.00	24.80	293.90	3743.46	577.60	-1140.56	1278.38	0.72	0.33	1.54	MWD
4101.00	26.00	294.60	3825.66	593.64	-1176.15	1317.39	1.36	1.32	0.77	MWD
4191.00	27.30	296.40	3906.10	611.02	-1212.57	1357.75	1.70	1.44	2.00	MWD
4282.00	27.10	296.40	3987.03	629.52	-1249.83	1399.35	0.22	-0.22	0.00	MWD
4373.00	25.90	296.00	4068.47	647.45	-1286.26	1439.95	1.33	-1.32	-0.44	MWD
4464.00	25.70	293.20	4150.40	663.94	-1322.26	1479.53	1.36	-0.22	-3.08	MWD
4555.00	25.20	292.90	4232.57	679.25	-1358.24	1518.58	0.57	-0.55	-0.33	MWD
4645.00	25.00	294.60	4314.07	694.62	-1393.18	1556.72	0.83	-0.22	1.89	MWD
4736.00	25.20	291.10	4396.49	709.60	-1428.74	1595.24	1.65	0.22	-3.85	MWD
4828.00	25.90	291.10	4479.49	723.88	-1465.76	1634.77	0.76	0.76	0.00	MWD
4919.00	25.20	295.00	4561.60	739.23	-1501.87	1673.93	2.00	-0.77	4.29	MWD
5009.00	24.50	291.80	4643.27	754.26	-1536.56	1711.70	1.68	-0.78	-3.56	MWD
5100.00	23.90	292.50	4726.27	768.32	-1571.11	1748.91	0.73	-0.66	0.77	MWD
5191.00	23.10	294.30	4809.72	782.72	-1604.41	1785.15	1.18	-0.88	1.98	MWD
5282.00	20.40	294.60	4894.23	796.67	-1635.11	1818.85	2.97	-2.97	0.33	MWD
5373.00	18.70	293.90	4979.99	809.18	-1662.87	1849.29	1.89	-1.87	-0.77	MWD
5464.00	18.30	295.00	5066.28	821.13	-1689.15	1878.15	0.58	-0.44	1.21	MWD
5554.00	16.50	294.60	5152.16	832.42	-1713.58	1905.05	2.00	-2.00	-0.44	MWD
5645.00	14.80	297.00	5239.79	843.08	-1735.69	1929.59	2.00	-1.87	2.64	MWD
5736.00	13.20	292.90	5328.08	852.40	-1755.62	1951.59	2.07	-1.76	-4.51	MWD
5827.00	10.70	298.10	5417.11	860.42	-1772.64	1970.41	2.99	-2.75	5.71	MWD
5918.00	9.50	296.70	5506.69	867.78	-1786.81	1986.36	1.35	-1.32	-1.54	MWD
6008.00	8.10	296.40	5595.63	873.93	-1799.12	2000.13	1.56	-1.56	-0.33	MWD
6099.00	6.90	302.70	5685.85	879.74	-1809.46	2011.97	1.60	-1.32	6.92	MWD
6190.00	5.50	295.30	5776.32	884.56	-1818.01	2021.76	1.77	-1.54	-8.13	MWD
6281.00	3.20	277.70	5867.06	886.76	-1824.47	2028.53	2.89	-2.53	-19.34	MWD
6371.00	2.50	285.80	5956.94	887.63	-1828.85	2032.85	0.90	-0.78	9.00	MWD
6507.00	0.70	164.50	6092.90	887.64	-1831.48	2035.21	2.15	-1.32	-89.19	MWD
6644.00	1.10	165.60	6229.89	885.56	-1830.93	2033.80	0.29	0.29	0.80	MWD
6780.00	0.90	40.80	6365.88	885.10	-1829.90	2032.68	1.31	-0.15	-91.76	MWD

# ARCHER

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> REI 8-9 Pad <b>Well:</b> 21-9 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/08/2011 <b>Co-ordinate(NE) Reference:</b> Well: 21-9, Grid North <b>Vertical (TVD) Reference:</b> 4816'GL+13'KB 4829.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,296.16Azi) <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
6916.00	0.70	116.00	6501.87	885.55	-1828.46	2031.58	0.73	-0.15	55.29	MWD
7052.00	1.20	14.40	6637.85	886.56	-1827.36	2031.04	1.11	0.37	-74.71	MWD
7188.00	0.50	41.10	6773.84	888.39	-1826.61	2031.18	0.58	-0.51	19.63	MWD
7324.00	0.50	101.60	6909.83	888.72	-1825.64	2030.45	0.37	0.00	44.49	MWD
7506.00	0.90	82.60	7091.82	888.74	-1823.45	2028.49	0.25	0.22	-10.44	MWD
7687.00	0.40	16.20	7272.81	889.53	-1821.86	2027.42	0.46	-0.28	-36.69	MWD
7869.00	0.50	10.50	7454.81	890.92	-1821.54	2027.74	0.06	0.05	-3.13	MWD
8050.00	0.40	285.10	7635.80	891.86	-1822.01	2028.57	0.34	-0.06	-47.18	MWD
8128.00	0.40	280.50	7713.80	891.98	-1822.54	2029.10	0.04	0.00	-5.90	MWD
8162.20	0.40	280.50	7748.00	892.03	-1822.77	2029.33	0.00	0.00	0.00	21-9 PBHL
8173.00	0.40	280.50	7758.80	892.04	-1822.85	2029.41	0.00	0.00	0.00	21-9 BHL

### Targets

Name	Description	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->				
								Deg	Min	Sec	Deg	Min	Sec		
21-9 SL			0.00	0.00	0.00	1331813.21	3234044.98	40	14	28.253	N	104	39	41.865	W
21-9 PBHL			7748.00	900.96	-1834.23	1332714.18	3232210.74	40	14	37.327	N	104	40	5.408	W
-Circle (Radius: 50)															
21-9 BHL			7758.80	892.04	-1822.85	1332705.25	3232222.13	40	14	37.238	N	104	40	5.262	W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
832.00	829.92	8.625	9.875	8 5/8"