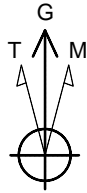


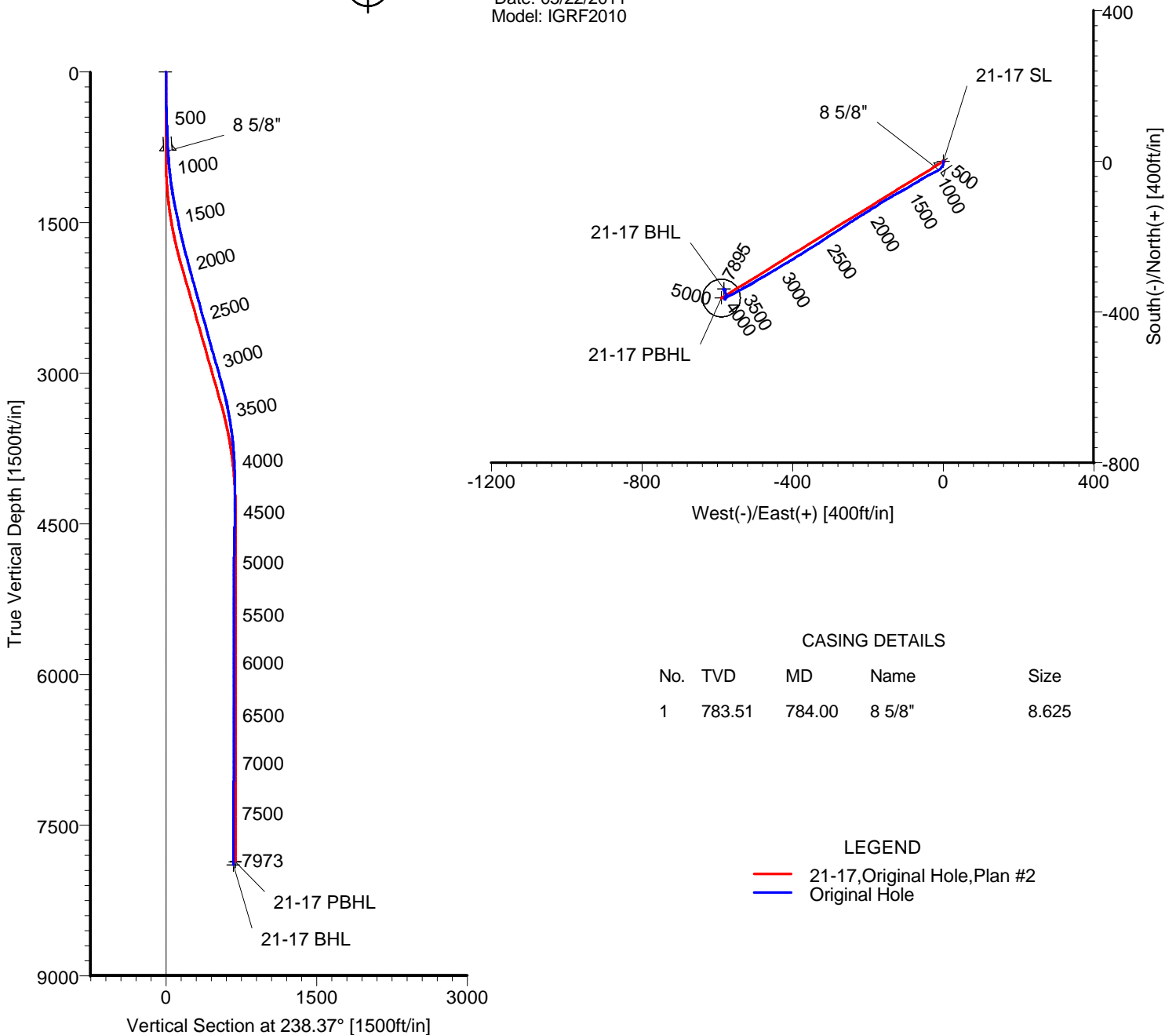
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: REI 17-17 Pad  
Well: 21-17  
Wellpath: Original Hole



Azimuths to Grid North  
True North: -0.53°  
Magnetic North: 8.29°

Magnetic Field  
Strength: 53097nT  
Dip Angle: 66.93°  
Date: 05/22/2011  
Model: IGRF2010



## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
21-17 SL	0.00	0.00	0.00	40°13'46.443N	104°41'01.101W	Point
21-17 PBHL	7863.00	-362.89	-589.18	40°13'42.910N	104°41'08.740W	Circle (Radius: 50)
21-17 BHL	7894.52	-338.71	-582.44	40°13'43.149N	104°41'08.650W	Point

Wellpath: (21-17/Original Hole)

Created By: Ivonne Gonzalez

Date: 06/27/2011

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 17-17 Pad <b>Well:</b> 21-17 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/27/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:04:43 Well: 21-17, Grid North 4898'GL+15'KB 4913.0 Well (0.00N,0.00E,238.37Azi) 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

<b>Site:</b> REI 17-17 Pad  Centered on 27-17 <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4898.00 ft	<b>Northing:</b> 1327540.32 ft <b>Easting:</b> 3227934.36 ft  <b>Latitude:</b> 40 13 46.592 N <b>Longitude:</b> 104 41 1.169 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.53 deg
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<b>Well:</b> 21-17  <b>Well Position:</b> +N/-S    -15.04 ft <b>Northing:</b> 1327525.28 ft +E/-W    5.43 ft <b>Easting :</b> 3227939.79 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 21-17  <b>Latitude:</b> 40 13 46.443 N <b>Longitude:</b> 104 41 1.101 W
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<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> 4898'GL+15'KB <b>Magnetic Data:</b> 05/22/2011 <b>Field Strength:</b> 53097 nT <b>Vertical Section:</b> Depth From (TVD)	<b>Height</b> 4913.00 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> 8.82 deg <b>Mag Dip Angle:</b> 66.93 deg <b>+N/-S</b> ft <b>+E/-W</b> ft <b>Direction</b> deg
0.00	0.00	0.00      238.37

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 06/27/2011	<b>Validated:</b> No	<b>Version:</b> 1		
<b>Actual From</b> ft	<b>To</b> ft	<b>Survey</b>	<b>Toolcode</b>	<b>Tool Name</b>
51.00	7928.00	Survey #1 (51.00-7928.00)	MWD	Std MWD
7973.00	7973.00	Survey #2 (7973.00-7973.00)	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	1.20	177.20	51.00	-0.53	0.03	0.26	2.35	2.35	0.00	MWD
141.00	1.40	178.30	140.97	-2.57	0.10	1.26	0.22	0.22	1.22	MWD
231.00	1.80	179.30	230.94	-5.09	0.15	2.54	0.45	0.44	1.11	MWD
321.00	1.90	188.10	320.89	-7.98	-0.04	4.22	0.33	0.11	9.78	MWD
426.00	1.90	210.60	425.83	-11.20	-1.17	6.87	0.71	0.00	21.43	MWD
518.00	2.10	219.40	517.78	-13.81	-3.02	9.81	0.40	0.22	9.57	MWD
609.00	2.60	221.50	608.70	-16.65	-5.44	13.36	0.56	0.55	2.31	MWD
700.00	2.80	227.50	699.60	-19.70	-8.45	17.52	0.38	0.22	6.59	MWD
739.00	2.80	224.30	738.55	-21.02	-9.82	19.38	0.40	0.00	-8.21	MWD
788.00	2.50	235.90	787.50	-22.48	-11.54	21.61	1.25	-0.61	23.67	MWD
879.00	4.40	243.70	878.33	-25.14	-16.31	27.07	2.15	2.09	8.57	MWD
969.00	5.80	239.80	967.98	-28.95	-23.34	35.05	1.60	1.56	-4.33	MWD
1060.00	6.90	245.10	1058.42	-33.57	-32.27	45.08	1.37	1.21	5.82	MWD
1151.00	8.30	241.20	1148.62	-39.03	-42.98	57.07	1.64	1.54	-4.29	MWD
1242.00	10.40	238.00	1238.40	-46.55	-55.71	71.84	2.38	2.31	-3.52	MWD
1332.00	11.60	238.70	1326.75	-55.56	-70.33	89.02	1.34	1.33	0.78	MWD
1423.00	11.60	239.80	1415.89	-64.91	-86.05	107.31	0.24	0.00	1.21	MWD
1514.00	11.30	240.10	1505.08	-73.96	-101.69	125.37	0.34	-0.33	0.33	MWD
1605.00	12.80	242.30	1594.07	-83.09	-118.34	144.34	1.72	1.65	2.42	MWD
1696.00	13.50	239.80	1682.68	-93.12	-136.45	165.01	0.99	0.77	-2.75	MWD
1786.00	14.60	238.70	1769.99	-104.30	-155.22	186.86	1.26	1.22	-1.22	MWD

# ARCHER

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 06/27/2011	<b>Time:</b> 08:04:43	<b>Page:</b> 2
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b>	Well: 21-17, Grid North	
<b>Site:</b> REI 17-17 Pad	<b>Vertical (TVD) Reference:</b>	4898'GL+15'KB 4913.0	
<b>Well:</b> 21-17	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,238.37Azi)	
<b>Wellpath:</b> Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature	<b>Db:</b> Adapti

### 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
1877.00	15.30	236.60	1857.91	-116.86	-175.04	210.33	0.97	0.77	-2.31	MWD
1968.00	14.40	237.70	1945.87	-129.52	-194.63	233.64	1.04	-0.99	1.21	MWD
2059.00	15.50	239.10	2033.79	-141.81	-214.63	257.12	1.27	1.21	1.54	MWD
2150.00	15.70	238.00	2121.44	-154.58	-235.51	281.59	0.39	0.22	-1.21	MWD
2241.00	15.00	235.20	2209.19	-167.83	-255.62	305.66	1.12	-0.77	-3.08	MWD
2332.00	16.20	238.00	2296.84	-181.27	-276.05	330.11	1.56	1.32	3.08	MWD
2422.00	15.80	238.00	2383.35	-194.42	-297.09	354.92	0.44	-0.44	0.00	MWD
2513.00	15.80	234.90	2470.92	-208.11	-317.73	379.67	0.93	0.00	-3.41	MWD
2604.00	15.00	237.70	2558.65	-221.53	-337.83	403.82	1.20	-0.88	3.08	MWD
2695.00	14.80	238.40	2646.59	-233.91	-357.68	427.22	0.30	-0.22	0.77	MWD
2786.00	15.70	237.70	2734.38	-246.58	-377.99	451.15	1.01	0.99	-0.77	MWD
2876.00	15.80	238.40	2821.01	-259.51	-398.71	475.58	0.24	0.11	0.78	MWD
2967.00	16.40	240.10	2908.44	-272.40	-420.40	500.81	0.84	0.66	1.87	MWD
3058.00	16.00	239.10	2995.82	-285.25	-442.30	526.19	0.54	-0.44	-1.10	MWD
3149.00	15.50	238.70	3083.41	-298.00	-463.45	550.89	0.56	-0.55	-0.44	MWD
3240.00	14.30	241.00	3171.35	-309.77	-483.67	574.28	1.47	-1.32	2.53	MWD
3330.00	13.40	238.00	3258.73	-320.68	-502.24	595.81	1.28	-1.00	-3.33	MWD
3421.00	11.30	242.30	3347.62	-330.42	-519.08	615.25	2.52	-2.31	4.73	MWD
3512.00	9.90	240.50	3437.07	-338.41	-533.78	631.96	1.58	-1.54	-1.98	MWD
3603.00	8.60	240.10	3526.88	-345.66	-546.49	646.58	1.43	-1.43	-0.44	MWD
3694.00	7.00	241.90	3617.04	-351.66	-557.28	658.92	1.78	-1.76	1.98	MWD
3785.00	5.30	248.90	3707.51	-355.79	-566.09	668.59	2.04	-1.87	7.69	MWD
3875.00	3.90	234.90	3797.22	-359.04	-572.47	675.73	1.98	-1.56	-15.56	MWD
3966.00	3.20	230.00	3888.05	-362.46	-576.95	681.33	0.84	-0.77	-5.38	MWD
4057.00	2.10	236.30	3978.95	-365.01	-580.28	685.51	1.25	-1.21	6.92	MWD
4193.00	0.70	98.10	4114.92	-366.51	-581.53	687.36	1.96	-1.03	-101.62	MWD
4329.00	1.10	117.80	4250.90	-367.24	-579.56	686.06	0.37	0.29	14.49	MWD
4466.00	1.40	326.60	4387.89	-366.46	-579.32	685.44	1.77	0.22	-110.36	MWD
4602.00	1.40	342.80	4523.85	-363.48	-580.72	685.08	0.29	0.00	11.91	MWD
4738.00	1.20	25.70	4659.82	-360.61	-580.60	683.47	0.71	-0.15	31.54	MWD
4874.00	1.40	55.60	4795.79	-358.39	-578.61	680.61	0.51	0.15	21.99	MWD
5010.00	0.90	36.90	4931.76	-356.60	-576.59	677.95	0.46	-0.37	-13.75	MWD
5147.00	1.20	357.90	5068.74	-354.30	-576.00	676.25	0.55	0.22	-28.47	MWD
5283.00	1.10	322.80	5204.71	-351.84	-576.84	675.67	0.51	-0.07	-25.81	MWD
5464.00	0.80	327.30	5385.69	-349.39	-578.58	675.86	0.17	-0.17	2.49	MWD
5646.00	1.00	320.70	5567.66	-347.09	-580.27	676.10	0.12	0.11	-3.63	MWD
5827.00	0.80	331.20	5748.64	-344.76	-581.88	676.25	0.14	-0.11	5.80	MWD
6009.00	1.10	338.20	5930.62	-342.03	-583.14	675.89	0.18	0.16	3.85	MWD
6191.00	0.50	337.20	6112.60	-339.68	-584.09	675.47	0.33	-0.33	-0.55	MWD
6372.00	0.40	167.00	6293.60	-339.56	-584.26	675.55	0.50	-0.06	-94.03	MWD
6554.00	0.00	166.30	6475.59	-340.18	-584.12	675.75	0.22	-0.22	0.00	MWD
6736.00	0.20	304.10	6657.59	-340.00	-584.38	675.88	0.11	0.11	0.00	MWD
6917.00	0.20	102.40	6838.59	-339.89	-584.33	675.78	0.22	0.00	87.46	MWD
7099.00	0.70	131.50	7020.59	-340.70	-583.19	675.23	0.29	0.27	15.99	MWD
7280.00	0.90	96.00	7201.57	-341.58	-580.95	673.78	0.29	0.11	-19.61	MWD
7462.00	0.50	120.40	7383.56	-342.13	-578.84	672.28	0.27	-0.22	13.41	MWD
7643.00	0.90	316.10	7564.55	-341.51	-579.14	672.21	0.77	0.22	-90.77	MWD
7825.00	0.70	312.20	7746.53	-339.73	-580.96	672.82	0.11	-0.11	-2.14	MWD
7928.00	0.70	300.30	7849.53	-338.99	-581.97	673.30	0.14	0.00	-11.55	MWD
7941.48	0.70	300.30	7863.00	-338.91	-582.11	673.37	0.00	0.00	0.00	21-17 PBHL
7973.00	0.70	300.30	7894.52	-338.71	-582.44	673.55	0.00	0.00	0.00	21-17 BHL

# ARCHER

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> REI 17-17 Pad <b>Well:</b> 21-17 <b>Wellpath:</b> Original Hole	<b>Date:</b> 06/27/2011 <b>Time:</b> 08:04:43 <b>Page:</b> 3 <b>Co-ordinate(NE) Reference:</b> Well: 21-17, Grid North <b>Vertical (TVD) Reference:</b> 4898'GL+15'KB 4913.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,238.37Azi) <b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Adapti
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### Targets

Name	Description		TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->		
	Dip.	Dir.						Deg	Min	Sec	Deg	Min	Sec
21-17 SL			0.00	0.00	0.00	1327525.28	3227939.79	40	13	46.443 N	104	41	1.101 W
21-17 PBHL			7863.00	-362.89	-589.18	1327162.39	3227350.61	40	13	42.910 N	104	41	8.740 W
-Circle (Radius: 50)													
21-17 BHL			7894.52	-338.71	-582.44	1327186.57	3227357.35	40	13	43.149 N	104	41	8.650 W