

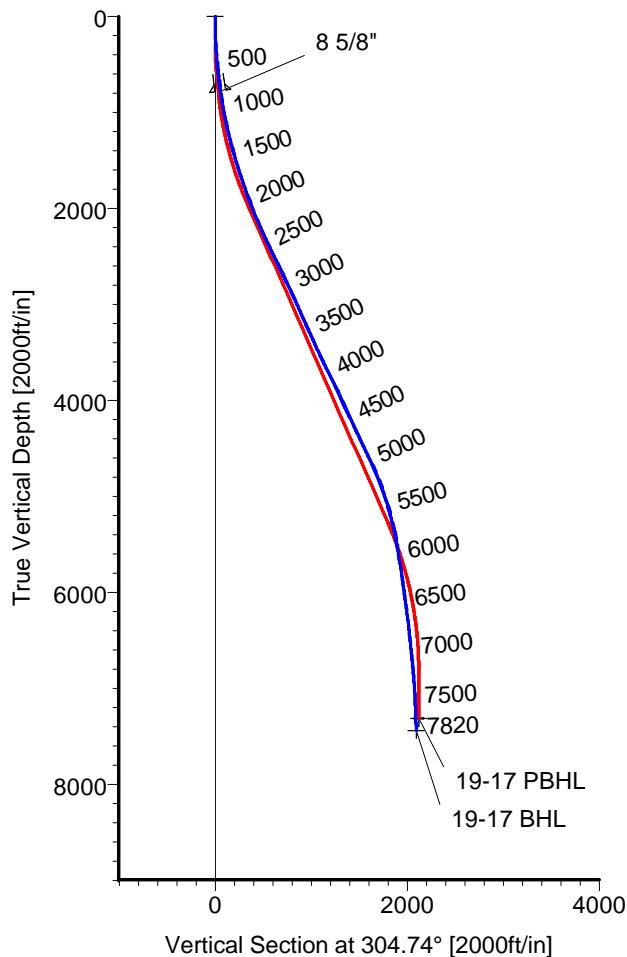
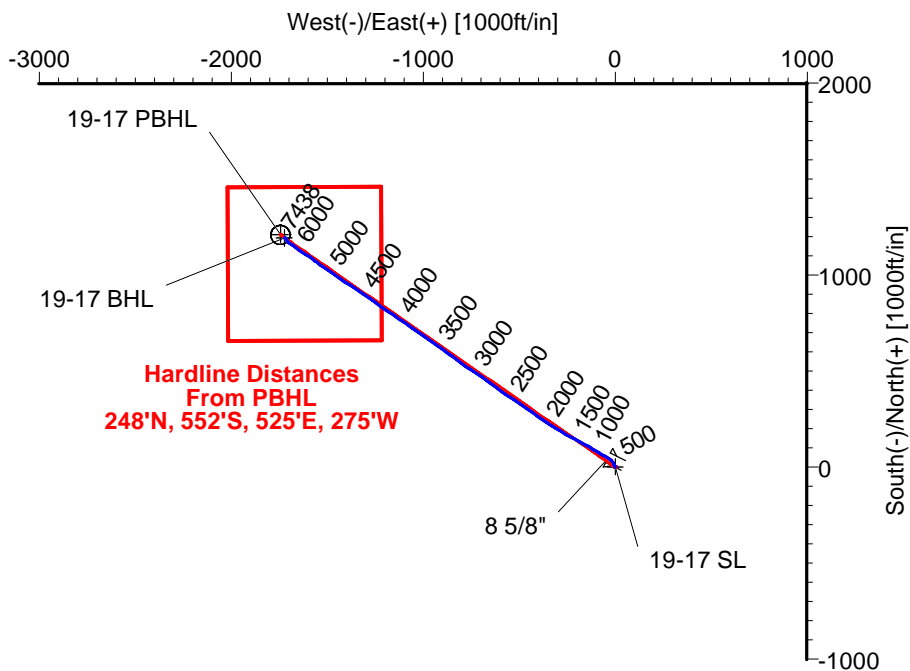
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Sekich 15-17 Pad  
Well: 19-17  
Wellpath: Original Hole



Azimuths to Grid North  
True North: -0.38°  
Magnetic North: 8.59°

Magnetic Field  
Strength: 53092nT  
Dip Angle: 66.89°  
Date: 02/24/2011  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	781.94	785.00	8 5/8"	8.625

## LEGEND

- 19-17, Original Hole, Plan #2
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
19-17 SL	0.00	0.00	0.00	40°13'09.588N	104°54'46.264W	Point
19-17 PBHL	7316.00	1208.76	-1743.07	40°13'21.647N	104°55'08.632W	Circle (Radius: 50)
19-17 BHL	7437.87	1194.55	-1720.59	40°13'21.505N	104°55'08.344W	Point

Wellpath: (19-17/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

Created By: Ivonne Gonzalez

Date: 03/04/2011

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Sekich 15-17 Pad <b>Well:</b> 19-17 <b>Wellpath:</b> Original Hole	<b>Date:</b> 03/04/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 09:09:16 Well: 19-17, Grid North 4865'GL+13'KB 4878.0 Well (0.00N,0.00E,304.74Azi) Minimum Curvature	<b>Page:</b> 1 <b>Db:</b> Adapti
--	---	---	-------------------------------------

<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> Sekich 15-17 Pad  Centered on 19-17 <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4865.00 ft	<b>Northing:</b> 1323289.54 ft <b>Easting:</b> 3163967.97 ft  <b>Latitude:</b> 40 13 9.588 N <b>Longitude:</b> 104 54 46.264 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.38 deg
---	---

<b>Well:</b> 19-17  <b>Well Position:</b> +N/-S 0.00 ft +E/-W 0.00 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 19-17  <b>Latitude:</b> 40 13 9.588 N <b>Longitude:</b> 104 54 46.264 W
--	--

<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> 4865'GL+13'KB <b>Magnetic Data:</b> 02/24/2011 <b>Field Strength:</b> 53092 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> 8.97 deg <b>Mag Dip Angle:</b> 66.89 deg +N/-S ft +E/-W ft Direction deg
0.00	0.00

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 03/04/2011	<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	7775.00	Survey #1 (51.00-7775.00)	MWD	Std MWD
7820.00	7820.00	Survey #2 (7820.00-7820.00)	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	334.50	51.00	0.48	-0.23	0.46	2.35	2.35	0.00	MWD
111.00	2.30	335.60	110.97	2.15	-1.00	2.04	1.83	1.83	1.83	MWD
170.00	2.50	339.80	169.92	4.43	-1.93	4.11	0.45	0.34	7.12	MWD
231.00	2.50	339.10	230.86	6.92	-2.87	6.30	0.05	0.00	-1.15	MWD
291.00	3.20	330.70	290.78	9.61	-4.15	8.89	1.36	1.17	-14.00	MWD
382.00	3.90	338.40	381.61	14.70	-6.53	13.74	0.93	0.77	8.46	MWD
473.00	5.10	334.20	472.33	21.22	-9.43	19.84	1.37	1.32	-4.62	MWD
564.00	6.90	326.40	562.83	29.41	-14.22	28.45	2.17	1.98	-8.57	MWD
655.00	7.40	315.50	653.12	38.15	-21.35	39.28	1.59	0.55	-11.98	MWD
740.00	7.90	300.00	737.37	44.97	-30.25	50.48	2.49	0.59	-18.24	MWD
785.00	8.00	296.42	781.94	47.91	-35.73	56.66	1.12	0.22	-7.96	8 5/8"
820.00	8.10	293.70	816.60	49.99	-40.17	61.49	1.12	0.28	-7.76	MWD
910.00	9.90	297.30	905.49	56.08	-52.85	75.39	2.09	2.00	4.00	MWD
1001.00	10.70	297.60	995.02	63.59	-67.29	91.53	0.88	0.88	0.33	MWD
1091.00	11.60	302.20	1083.32	72.28	-82.35	108.86	1.41	1.00	5.11	MWD
1183.00	13.40	304.30	1173.14	83.22	-98.99	128.76	2.02	1.96	2.28	MWD
1274.00	14.10	301.10	1261.53	94.88	-117.19	150.37	1.14	0.77	-3.52	MWD
1364.00	14.60	297.30	1348.72	105.75	-136.66	172.56	1.18	0.56	-4.22	MWD
1455.00	16.40	297.60	1436.41	116.96	-158.24	196.68	1.98	1.98	0.33	MWD
1546.00	17.40	300.10	1523.48	129.74	-181.39	222.99	1.36	1.10	2.75	MWD
1637.00	17.90	297.60	1610.20	143.04	-205.56	250.43	1.00	0.55	-2.75	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Sekich 15-17 Pad <b>Well:</b> 19-17 <b>Wellpath:</b> Original Hole	<b>Date:</b> 03/04/2011 <b>Co-ordinate(NE) Reference:</b> Well: 19-17, Grid North <b>Vertical (TVD) Reference:</b> 4865'GL+13'KB 4878.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,304.74Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 09:09:16 <b>Page:</b> 2 <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
1728.00	19.00	296.90	1696.52	156.22	-231.16	278.98	1.23	1.21	-0.77	MWD
1819.00	19.20	299.40	1782.51	170.27	-257.41	308.55	0.93	0.22	2.75	MWD
1909.00	19.50	300.10	1867.43	185.07	-283.30	338.26	0.42	0.33	0.78	MWD
2000.00	21.80	303.20	1952.58	201.94	-310.58	370.30	2.80	2.53	3.41	MWD
2091.00	22.90	303.90	2036.74	221.07	-339.42	404.89	1.24	1.21	0.77	MWD
2182.00	22.70	305.00	2120.63	241.01	-368.50	440.15	0.52	-0.22	1.21	MWD
2273.00	23.60	305.30	2204.30	261.61	-397.75	475.93	1.00	0.99	0.33	MWD
2363.00	24.30	305.00	2286.55	282.65	-427.62	512.46	0.79	0.78	-0.33	MWD
2454.00	25.70	305.00	2369.02	304.70	-459.12	550.92	1.54	1.54	0.00	MWD
2545.00	26.40	302.90	2450.78	327.01	-492.27	590.87	1.27	0.77	-2.31	MWD
2636.00	25.30	302.90	2532.67	348.56	-525.59	630.53	1.21	-1.21	0.00	MWD
2726.00	26.40	305.70	2613.67	370.69	-557.98	669.76	1.83	1.22	3.11	MWD
2817.00	24.80	303.60	2695.74	393.05	-590.31	709.07	2.02	-1.76	-2.31	MWD
2907.00	26.00	307.10	2777.04	415.40	-621.77	747.66	2.13	1.33	3.89	MWD
2998.00	25.90	307.40	2858.86	439.50	-653.47	787.44	0.18	-0.11	0.33	MWD
3089.00	24.70	305.70	2941.14	462.67	-684.70	826.30	1.54	-1.32	-1.87	MWD
3180.00	23.90	304.30	3024.07	484.15	-715.37	863.75	1.08	-0.88	-1.54	MWD
3271.00	24.50	303.20	3107.08	504.87	-746.38	901.04	0.82	0.66	-1.21	MWD
3361.00	23.80	302.90	3189.20	524.96	-777.25	937.85	0.79	-0.78	-0.33	MWD
3452.00	24.60	306.40	3272.21	546.17	-807.91	975.14	1.80	0.88	3.85	MWD
3543.00	25.30	306.70	3354.71	569.03	-838.75	1013.50	0.78	0.77	0.33	MWD
3634.00	24.10	306.00	3437.39	591.57	-869.37	1051.51	1.36	-1.32	-0.77	MWD
3725.00	24.60	306.00	3520.29	613.63	-899.72	1089.02	0.55	0.55	0.00	MWD
3815.00	25.90	306.40	3601.69	636.30	-930.70	1127.40	1.46	1.44	0.44	MWD
3907.00	26.60	305.00	3684.20	660.04	-963.75	1168.08	1.02	0.76	-1.52	MWD
3997.00	26.40	304.60	3764.75	682.96	-996.72	1208.24	0.30	-0.22	-0.44	MWD
4088.00	26.40	304.60	3846.26	705.94	-1030.03	1248.70	0.00	0.00	0.00	MWD
4179.00	24.80	304.60	3928.32	728.26	-1062.39	1288.02	1.76	-1.76	0.00	MWD
4270.00	23.40	303.60	4011.39	749.10	-1093.15	1325.17	1.60	-1.54	-1.10	MWD
4360.00	25.90	306.40	4093.18	770.66	-1123.87	1362.70	3.07	2.78	3.11	MWD
4452.00	25.20	303.20	4176.19	793.31	-1156.43	1402.36	1.68	-0.76	-3.48	MWD
4542.00	25.20	303.60	4257.62	814.40	-1188.42	1440.67	0.19	0.00	0.44	MWD
4633.00	25.90	306.40	4339.73	836.92	-1220.56	1479.91	1.53	0.77	3.08	MWD
4723.00	25.00	305.30	4420.99	859.57	-1251.90	1518.57	1.13	-1.00	-1.22	MWD
4815.00	25.90	305.00	4504.06	882.33	-1284.22	1558.11	0.99	0.98	-0.33	MWD
4905.00	25.50	303.60	4585.16	904.33	-1316.46	1597.13	0.81	-0.44	-1.56	MWD
4996.00	25.00	303.90	4667.47	925.89	-1348.74	1635.95	0.57	-0.55	0.33	MWD
5087.00	22.90	301.50	4750.63	945.87	-1379.80	1672.85	2.54	-2.31	-2.64	MWD
5177.00	22.20	303.90	4833.75	964.51	-1408.84	1707.34	1.28	-0.78	2.67	MWD
5269.00	19.20	303.60	4919.80	982.58	-1435.88	1739.85	3.26	-3.26	-0.33	MWD
5359.00	18.10	306.00	5005.07	998.98	-1459.51	1768.62	1.49	-1.22	2.67	MWD
5450.00	17.40	304.60	5091.74	1015.02	-1482.15	1796.36	0.90	-0.77	-1.54	MWD
5541.00	14.30	305.00	5179.27	1029.19	-1502.56	1821.21	3.41	-3.41	0.44	MWD
5632.00	14.60	303.90	5267.39	1042.04	-1521.29	1843.92	0.45	0.33	-1.21	MWD
5723.00	12.80	307.10	5355.80	1054.52	-1538.85	1865.46	2.15	-1.98	3.52	MWD
5813.00	10.20	307.10	5443.99	1065.34	-1553.16	1883.39	2.89	-2.89	0.00	MWD
5904.00	8.80	309.20	5533.74	1074.60	-1564.98	1898.38	1.58	-1.54	2.31	MWD
5995.00	9.20	307.40	5623.62	1083.42	-1576.15	1912.59	0.54	0.44	-1.98	MWD
6085.00	9.00	304.60	5712.48	1091.78	-1587.66	1926.81	0.54	-0.22	-3.11	MWD
6176.00	9.00	305.30	5802.36	1099.94	-1599.33	1941.05	0.12	0.00	0.77	MWD
6267.00	8.10	302.20	5892.35	1107.47	-1610.57	1954.57	1.11	-0.99	-3.41	MWD
6358.00	7.70	302.50	5982.49	1114.16	-1621.13	1967.07	0.44	-0.44	0.33	MWD
6449.00	8.10	303.60	6072.62	1120.98	-1631.61	1979.57	0.47	0.44	1.21	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Sekich 15-17 Pad <b>Well:</b> 19-17 <b>Wellpath:</b> Original Hole	<b>Date:</b> 03/04/2011 <b>Co-ordinate(NE) Reference:</b> Well: 19-17, Grid North <b>Vertical (TVD) Reference:</b> 4865'GL+13'KB 4878.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,304.74Azi) <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
6539.00	7.40	307.10	6161.80	1127.99	-1641.52	1991.70	0.94	-0.78	3.89	MWD
6630.00	6.90	303.20	6252.10	1134.52	-1650.77	2003.02	0.77	-0.55	-4.29	MWD
6721.00	6.90	305.70	6342.44	1140.70	-1659.78	2013.95	0.33	0.00	2.75	MWD
6812.00	5.80	308.90	6432.88	1146.78	-1667.80	2024.00	1.27	-1.21	3.52	MWD
6902.00	6.20	307.10	6522.38	1152.56	-1675.21	2033.39	0.49	0.44	-2.00	MWD
6993.00	6.00	300.40	6612.87	1157.94	-1683.23	2043.04	0.81	-0.22	-7.36	MWD
7084.00	5.60	300.40	6703.40	1162.59	-1691.16	2052.21	0.44	-0.44	0.00	MWD
7175.00	5.50	315.90	6793.98	1167.97	-1698.03	2060.92	1.65	-0.11	17.03	MWD
7265.00	4.60	310.30	6883.63	1173.40	-1703.78	2068.74	1.14	-1.00	-6.22	MWD
7356.00	4.20	321.50	6974.37	1178.37	-1708.64	2075.57	1.04	-0.44	12.31	MWD
7447.00	3.50	321.50	7065.16	1183.15	-1712.44	2081.42	0.77	-0.77	0.00	MWD
7538.00	2.60	328.50	7156.03	1187.08	-1715.25	2085.97	1.07	-0.99	7.69	MWD
7628.00	2.10	325.00	7245.95	1190.17	-1717.26	2089.38	0.58	-0.56	-3.89	MWD
7698.08	1.72	325.50	7316.00	1192.09	-1718.60	2091.57	0.54	-0.54	0.71	19-17 PBHL
7720.00	1.60	325.70	7337.91	1192.62	-1718.96	2092.16	0.54	-0.54	0.93	MWD
7775.00	1.40	317.30	7392.89	1193.74	-1719.84	2093.54	0.54	-0.36	-15.27	MWD
7820.00	1.40	317.30	7437.87	1194.55	-1720.59	2094.61	0.00	0.00	0.00	19-17 BHL

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->		
19-17 SL			0.00	0.00	0.00	1323289.54	3163967.97	40	13	9.588 N	104	54	46.264 W
19-17 PBHL			7316.00	1208.76	-1743.07	1324498.30	3162224.90	40	13	21.647 N	104	55	8.632 W
-Circle (Radius: 50)													
19-17 BHL			7437.87	1194.55	-1720.59	1324484.09	3162247.38	40	13	21.505 N	104	55	8.344 W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
785.00	781.94	8.625	9.875	8 5/8"