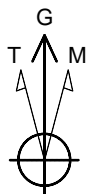


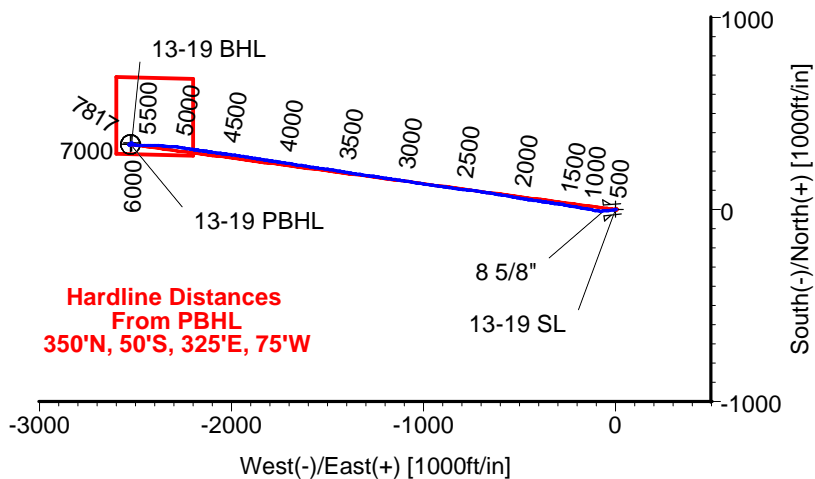
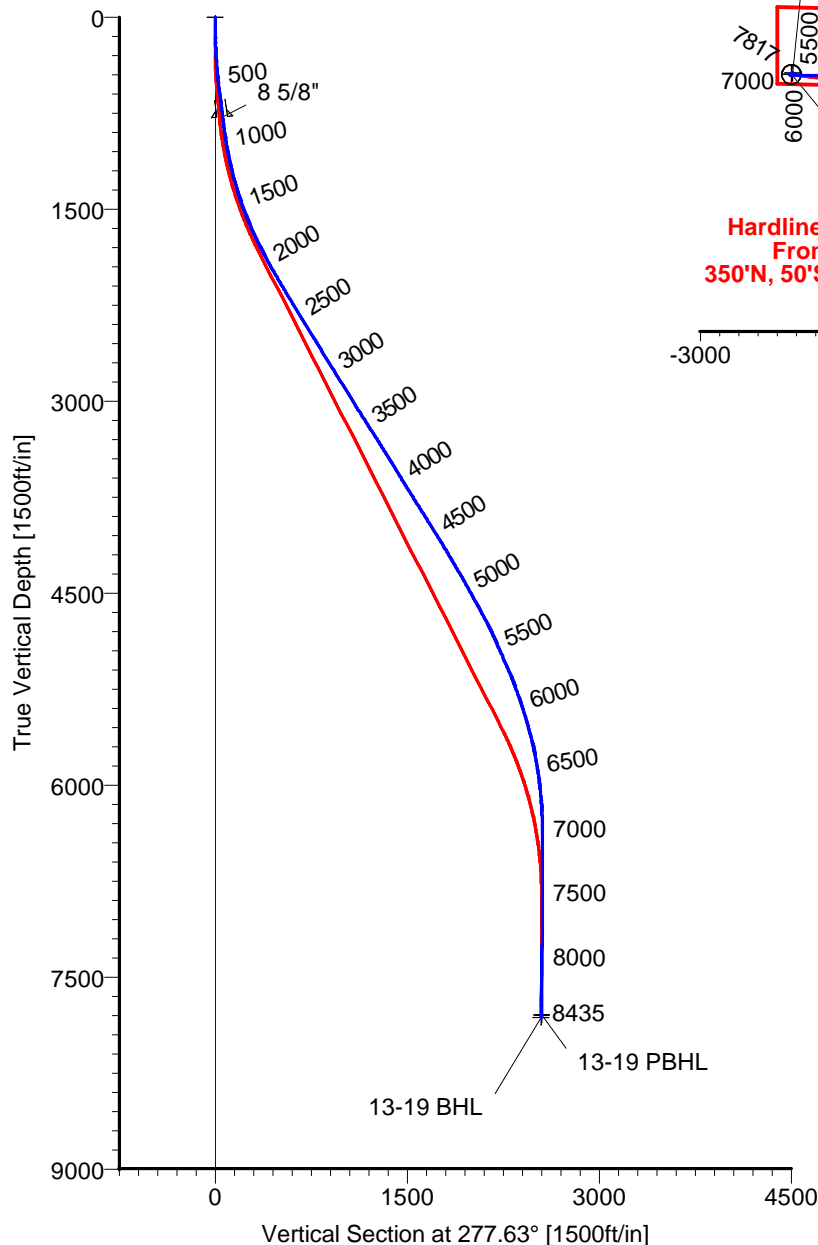
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Sekich 15-19 Pad  
Well: 13-19  
Wellpath: Original Hole



Azimuths to Grid North  
True North:  $-0.37^{\circ}$   
Magnetic North:  $8.59^{\circ}$

Magnetic Field  
Strength: 53067nT  
Dip Angle:  $66.87^{\circ}$   
Date: 04/18/2011  
Model: IGRF2010



## LEGEND

- 13-19, Original Hole, Plan #2
- Original Hole

## CASING DETAILS

No.	TVD	MD	Name	Size
1	781.83	785.00	8 5/8"	8.625

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
13-19 SL	0.00	0.00	0.00	40°12'17.863N	104°55'51.258W	Point
13-19 PBHL	7796.00	338.45	-2526.45	40°12'21.367N	104°56'23.793W	Circle (Radius: 50)
13-19 BHL	7816.67	347.28	-2520.92	40°12'21.453N	104°56'23.721W	Point

Wellpath: (13-19/Original Hole)

Created By: Ivonne Gonzalez

Date: 04/18/2011

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> Sekich 15-19 Pad <b>Well:</b> 13-19 <b>Wellpath:</b> Original Hole	<b>Date:</b> 04/18/2011 <b>Co-ordinate(NE) Reference:</b> Well: 13-19, Grid North <b>Vertical (TVD) Reference:</b> 4907'GL+15'KB 4922.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,277.63Azi) <b>Survey Calculation Method:</b> Minimum Curvature	<b>Time:</b> 08:36:29 <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> Sekich 15-19 Pad  <b>Site Position:</b> <b>From:</b> Geographic <b>Position Uncertainty:</b> 0.00 ft <b>Ground Level:</b> 4907.00 ft	<b>Northing:</b> 1318022.72 ft <b>Easting:</b> 3158960.06 ft  <b>Latitude:</b> 40 12 17.863 N <b>Longitude:</b> 104 55 51.258 W <b>North Reference:</b> Grid <b>Grid Convergence:</b> 0.37 deg
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<b>Well:</b> 13-19  <b>Well Position:</b> +N/-S 0.00 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Slot Name:</b> 13-19  <b>Well Position:</b> +N/-S 0.00 ft <b>Position Uncertainty:</b> 0.00 ft
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<b>Wellpath:</b> Original Hole  <b>Current Datum:</b> 4907'GL+15'KB <b>Magnetic Data:</b> 04/18/2011 <b>Field Strength:</b> 53067 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> 8.96 deg <b>Mag Dip Angle:</b> 66.87 deg <b>Direction:</b> deg
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<b>Survey Program for Definitive Wellpath</b> <b>Date:</b> 04/18/2011 <b>Actual From</b> ft <b>To</b> ft	<b>Validated:</b> No <b>Survey</b>	<b>Version:</b> 0 <b>Toolcode</b>	<b>Tool Name</b>
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49.00	8390.00	Survey #1 (49.00-8390.00)	MWD	Std MWD
8435.00	8435.00	Survey #2 (8435.00-8435.00)	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	0.20	221.30	49.00	-0.06	-0.06	0.05	0.41	0.41	0.00	MWD
140.00	0.40	269.10	140.00	-0.19	-0.48	0.45	0.33	0.22	52.53	MWD
229.00	2.30	250.50	228.97	-0.79	-2.47	2.35	2.16	2.13	-20.90	MWD
349.00	4.60	258.20	348.75	-2.58	-9.45	9.03	1.95	1.92	6.42	MWD
426.00	4.90	263.20	425.48	-3.60	-15.74	15.12	0.66	0.39	6.49	MWD
516.00	6.70	264.90	515.02	-4.52	-24.79	23.97	2.01	2.00	1.89	MWD
607.00	7.40	264.90	605.33	-5.51	-35.91	34.86	0.77	0.77	0.00	MWD
698.00	7.60	266.00	695.55	-6.45	-47.75	46.47	0.27	0.22	1.21	MWD
833.00	6.90	263.90	829.47	-7.94	-64.72	63.10	0.55	-0.52	-1.56	MWD
923.00	8.30	270.20	918.68	-8.49	-76.59	74.79	1.81	1.56	7.00	MWD
1014.00	9.90	276.20	1008.53	-7.62	-90.94	89.12	2.04	1.76	6.59	MWD
1105.00	11.80	280.70	1097.90	-5.05	-107.86	106.24	2.28	2.09	4.95	MWD
1196.00	13.90	281.40	1186.62	-1.16	-127.72	126.44	2.31	2.31	0.77	MWD
1287.00	15.50	279.70	1274.64	3.05	-150.42	149.50	1.82	1.76	-1.87	MWD
1377.00	16.90	280.70	1361.06	7.50	-175.13	174.58	1.59	1.56	1.11	MWD
1468.00	19.20	280.00	1447.58	12.56	-202.87	202.74	2.54	2.53	-0.77	MWD
1558.00	20.80	281.40	1532.15	18.29	-233.11	233.48	1.86	1.78	1.56	MWD
1649.00	23.80	279.30	1616.33	24.45	-267.08	267.96	3.41	3.30	-2.31	MWD
1740.00	25.00	276.90	1699.21	29.73	-304.29	305.54	1.71	1.32	-2.64	MWD
1831.00	25.90	279.00	1781.38	35.15	-343.01	344.64	1.40	0.99	2.31	MWD
1921.00	28.20	278.60	1861.53	41.40	-383.46	385.56	2.56	2.56	-0.44	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 04/18/2011	<b>Time:</b> 08:36:29	<b>Page:</b> 2
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b> Well: 13-19, Grid North		
<b>Site:</b> Sekich 15-19 Pad	<b>Vertical (TVD) Reference:</b> 4907'GL+15'KB 4922.0		
<b>Well:</b> 13-19	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,277.63Azi)		
<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
2012.00	29.20	277.60	1941.35	47.55	-426.72	429.26	1.22	1.10	-1.10	MWD
2103.00	30.40	279.00	2020.31	54.09	-471.47	474.47	1.52	1.32	1.54	MWD
2194.00	31.00	280.70	2098.56	62.04	-517.24	520.89	1.16	0.66	1.87	MWD
2284.00	31.10	279.70	2175.67	70.26	-562.92	567.27	0.58	0.11	-1.11	MWD
2375.00	31.30	279.00	2253.50	77.92	-609.43	614.38	0.46	0.22	-0.77	MWD
2466.00	31.30	278.60	2331.26	85.15	-656.15	661.65	0.23	0.00	-0.44	MWD
2557.00	31.70	277.90	2408.85	91.98	-703.21	709.19	0.60	0.44	-0.77	MWD
2648.00	32.00	277.90	2486.15	98.58	-750.77	757.21	0.33	0.33	0.00	MWD
2738.00	30.80	277.60	2562.97	104.90	-797.23	804.10	1.34	-1.33	-0.33	MWD
2829.00	31.80	277.60	2640.72	111.15	-844.10	851.38	1.10	1.10	0.00	MWD
2920.00	31.80	276.90	2718.06	117.20	-891.66	899.33	0.41	0.00	-0.77	MWD
3011.00	32.00	278.30	2795.32	123.57	-939.33	947.42	0.84	0.22	1.54	MWD
3101.00	31.70	278.60	2871.77	130.54	-986.30	994.90	0.38	-0.33	0.33	MWD
3192.00	31.70	279.00	2949.19	137.86	-1033.56	1042.71	0.23	0.00	0.44	MWD
3283.00	31.80	279.00	3026.57	145.35	-1080.85	1090.58	0.11	0.11	0.00	MWD
3374.00	32.40	277.90	3103.66	152.45	-1128.69	1138.93	0.92	0.66	-1.21	MWD
3465.00	32.60	279.30	3180.41	159.76	-1177.03	1187.82	0.86	0.22	1.54	MWD
3555.00	33.00	278.60	3256.06	167.35	-1225.19	1236.56	0.61	0.44	-0.78	MWD
3646.00	31.80	277.90	3332.90	174.35	-1273.44	1285.31	1.38	-1.32	-0.77	MWD
3737.00	32.40	277.90	3409.98	181.00	-1321.34	1333.67	0.66	0.66	0.00	MWD
3827.00	31.50	279.70	3486.35	188.27	-1368.40	1381.28	1.46	-1.00	2.00	MWD
3918.00	31.10	279.30	3564.11	196.08	-1415.03	1428.53	0.50	-0.44	-0.44	MWD
4009.00	31.70	279.00	3641.78	203.61	-1461.83	1475.93	0.68	0.66	-0.33	MWD
4100.00	32.00	277.20	3719.08	210.38	-1509.37	1523.94	1.09	0.33	-1.98	MWD
4191.00	32.20	278.30	3796.17	216.90	-1557.29	1572.30	0.68	0.22	1.21	MWD
4281.00	32.60	279.00	3872.16	224.15	-1604.96	1620.51	0.61	0.44	0.78	MWD
4372.00	32.00	278.60	3949.08	231.59	-1653.01	1669.13	0.70	-0.66	-0.44	MWD
4462.00	31.80	279.00	4025.48	238.87	-1700.01	1716.68	0.32	-0.22	0.44	MWD
4553.00	31.70	278.30	4102.87	246.07	-1747.35	1764.55	0.42	-0.11	-0.77	MWD
4644.00	30.10	277.90	4180.95	252.66	-1793.62	1811.28	1.77	-1.76	-0.44	MWD
4735.00	31.00	280.00	4259.32	259.86	-1839.30	1857.52	1.53	0.99	2.31	MWD
4826.00	30.30	278.30	4337.60	267.25	-1885.09	1903.89	1.22	-0.77	-1.87	MWD
4916.00	29.60	279.30	4415.59	274.12	-1929.50	1948.81	0.96	-0.78	1.11	MWD
5007.00	29.00	278.60	4494.94	281.05	-1973.49	1993.33	0.76	-0.66	-0.77	MWD
5098.00	29.40	277.20	4574.38	287.15	-2017.46	2037.72	0.87	0.44	-1.54	MWD
5189.00	27.80	276.90	4654.28	292.50	-2060.69	2081.28	1.77	-1.76	-0.33	MWD
5280.00	27.40	278.60	4734.92	298.18	-2102.46	2123.43	0.97	-0.44	1.87	MWD
5370.00	25.50	278.30	4815.50	304.07	-2142.11	2163.52	2.12	-2.11	-0.33	MWD
5461.00	23.40	277.20	4898.33	309.16	-2179.42	2201.18	2.36	-2.31	-1.21	MWD
5552.00	24.30	279.30	4981.56	314.45	-2215.83	2237.96	1.36	0.99	2.31	MWD
5643.00	23.60	279.00	5064.73	320.33	-2252.30	2274.89	0.78	-0.77	-0.33	MWD
5733.00	22.50	276.50	5147.54	325.10	-2287.21	2310.12	1.64	-1.22	-2.78	MWD
5824.00	20.10	274.00	5232.32	328.16	-2320.11	2343.14	2.82	-2.64	-2.75	MWD
5915.00	19.40	275.10	5317.97	330.59	-2350.76	2373.84	0.87	-0.77	1.21	MWD
6006.00	17.60	273.00	5404.26	332.66	-2379.56	2402.66	2.11	-1.98	-2.31	MWD
6097.00	16.50	271.60	5491.26	333.74	-2406.22	2429.22	1.29	-1.21	-1.54	MWD
6188.00	15.10	270.50	5578.82	334.20	-2430.99	2453.84	1.57	-1.54	-1.21	MWD
6278.00	13.90	269.50	5665.95	334.21	-2453.52	2476.17	1.36	-1.33	-1.11	MWD
6369.00	10.90	271.20	5754.82	334.30	-2473.06	2495.55	3.32	-3.30	1.87	MWD
6460.00	9.70	272.30	5844.35	334.78	-2489.32	2511.73	1.34	-1.32	1.21	MWD
6551.00	8.10	273.70	5934.25	335.50	-2503.38	2525.76	1.77	-1.76	1.54	MWD
6641.00	6.00	269.80	6023.57	335.90	-2514.41	2536.75	2.39	-2.33	-4.33	MWD
6732.00	4.80	275.50	6114.16	336.25	-2522.96	2545.26	1.44	-1.32	6.26	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

**Company:** ANADARKO PETROLEUM  
**Field:** Weld County, CO  
**Site:** Sekich 15-19 Pad  
**Well:** 13-19  
**Wellpath:** Original Hole

<b>Date:</b> 04/18/2011	<b>Time:</b> 08:36:29	<b>Page:</b> 3
<b>Co-ordinate(NE) Reference:</b>	Well: 13-19, Grid North	
<b>Vertical (TVD) Reference:</b>	4907'GL+15'KB 4922.0	
<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,277.63Azi)	
<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
6823.00	2.60	281.80	6204.97	337.03	-2528.77	2551.13	2.45	-2.42	6.92	MWD
6914.00	1.60	241.00	6295.91	336.84	-2531.90	2554.21	1.91	-1.10	-44.84	MWD
7005.00	0.20	94.00	6386.90	336.21	-2532.85	2555.07	1.95	-1.54	-161.54	MWD
7095.00	0.70	165.80	6476.90	335.67	-2532.56	2554.71	0.74	0.56	79.78	MWD
7186.00	1.20	21.30	6567.89	336.02	-2532.08	2554.27	2.00	0.55	-158.79	MWD
7277.00	0.90	356.30	6658.88	337.62	-2531.78	2554.19	0.59	-0.33	-27.47	MWD
7368.00	0.40	282.50	6749.87	338.40	-2532.13	2554.65	0.96	-0.55	-81.10	MWD
7459.00	0.70	211.10	6840.87	337.99	-2532.73	2555.18	0.75	0.33	-78.46	MWD
7549.00	1.10	206.50	6930.86	336.75	-2533.40	2555.68	0.45	0.44	-5.11	MWD
7640.00	0.70	52.20	7021.85	336.31	-2533.35	2555.58	1.93	-0.44	-169.56	MWD
7731.00	1.20	48.30	7112.84	337.28	-2532.20	2554.56	0.55	0.55	-4.29	MWD
7822.00	1.60	51.20	7203.81	338.71	-2530.50	2553.07	0.45	0.44	3.19	MWD
7913.00	1.60	44.50	7294.78	340.41	-2528.62	2551.43	0.21	0.00	-7.36	MWD
8095.00	1.10	59.60	7476.73	343.11	-2525.33	2548.53	0.33	-0.27	8.30	MWD
8277.00	1.10	47.30	7658.69	345.18	-2522.54	2546.04	0.13	0.00	-6.76	MWD
8390.00	0.90	31.10	7771.68	346.68	-2521.29	2544.99	0.30	-0.18	-14.34	MWD
8414.33	0.90	31.10	7796.00	347.00	-2521.09	2544.84	0.00	0.00	0.00	13-19 PBHL
8435.00	0.90	31.10	7816.67	347.28	-2520.92	2544.71	0.00	0.00	0.00	13-19 BHL

## 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
13-19 SL			0.00	0.00	0.00	1318022.72	3158960.06	40	12	17.863 N	104	55	51.258 W
13-19 PBHL			7796.00	338.45	-2526.45	1318361.16	3156433.61	40	12	21.367 N	104	56	23.793 W
-Circle (Radius: 50)													
13-19 BHL			7816.67	347.28	-2520.92	1318370.00	3156439.14	40	12	21.453 N	104	56	23.721 W