

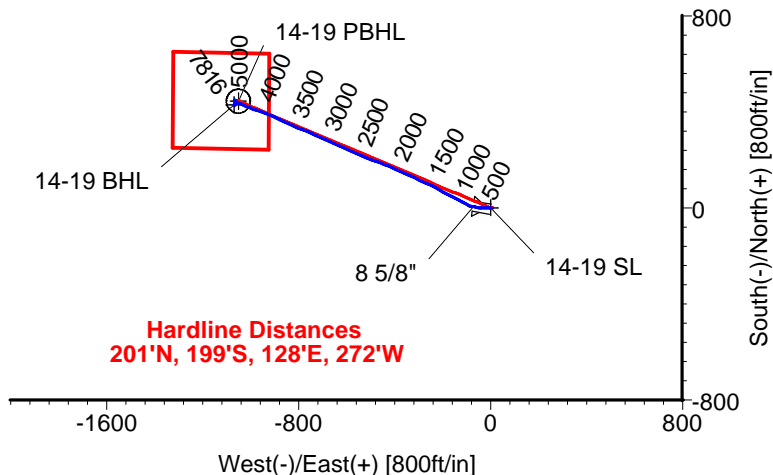
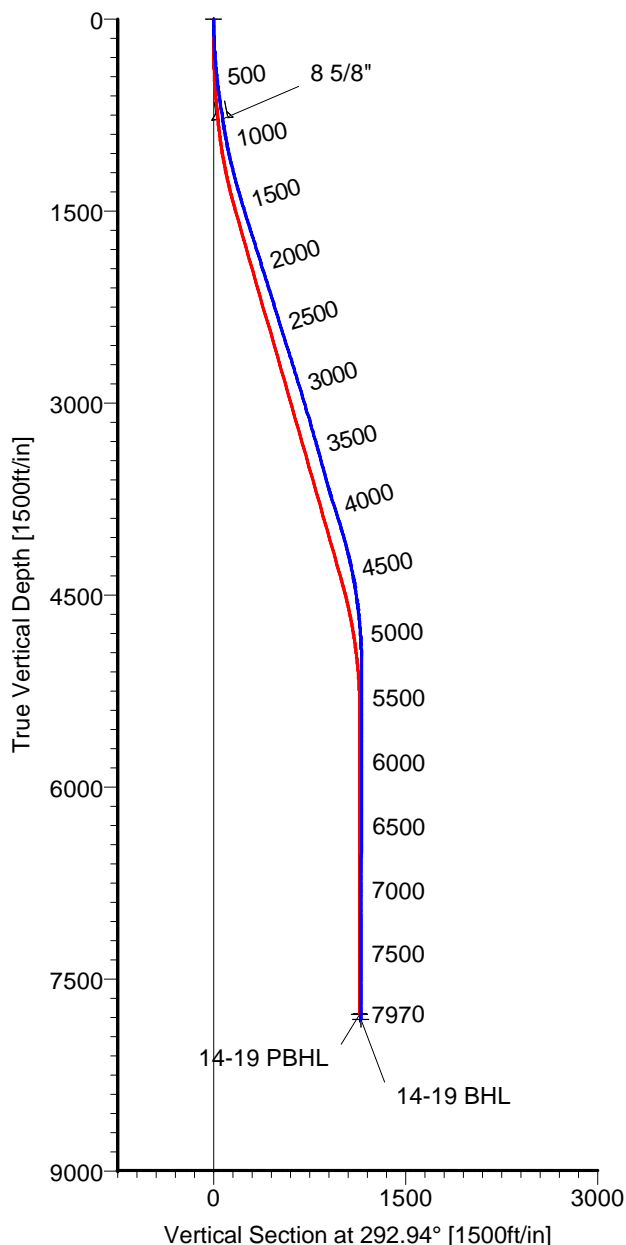
# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Sekich 15-19 Pad  
Well: 14-19  
Wellpath: Original Hole



Azimuths to Grid North  
True North: -0.37°  
Magnetic North: 8.59°

Magnetic Field  
Strength: 53068nT  
Dip Angle: 66.87°  
Date: 04/14/2011  
Model: IGRF2010



**Hardline Distances**  
201°N, 199°S, 128°E, 272°W

## CASING DETAILS

No.	TVD	MD	Name	Size
1	780.57	785.00	8 5/8"	8.625

## LEGEND

- 14-19,Original Hole,Plan #1
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
14-19 SL	0.00	0.00	0.00	40°12'17.944N	104°55'51.332W	Point
14-19 PBHL	7775.00	444.98	-1051.36	40°12'22.408N	104°56'04.846W	Circle (Radius: 50)
14-19 BHL	7815.85	428.10	-1070.27	40°12'22.242N	104°56'05.091W	Point

Wellpath: (14-19/Original Hole)

Created By: Ivonne Gonzalez

Date: 04/14/2011

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> 14-19 <b>Wellpath:</b> Original Hole	<b>Date:</b> 04/14/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:38:15 Well: 14-19, Grid North 4907'GL+15'KB 4922.0 Well (0.00N,0.00E,292.94Azi) 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 15-19 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

<b>Well:</b> 14-19	<b>Slot Name:</b> 14-19
<b>Well Position:</b> +N/-S 8.16 ft +E/-W -5.76 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Northing:</b> 1318030.88 ft <b>Easting :</b> 3158954.30 ft <b>Latitude:</b> 40 12 17.944 N <b>Longitude:</b> 104 55 51.332 W

<b>Wellpath:</b> Original Hole	<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>Current Datum:</b> 4907'GL+15'KB <b>Magnetic Data:</b> 04/14/2011 <b>Field Strength:</b> 53068 nT <b>Vertical Section:</b> Depth From (TVD) ft	<b>Height</b> 4922.00 ft +N/-S ft +E/-W ft <b>Direction</b> deg
0.00	0.00 0.00 292.94

<b>Survey Program for Definitive Wellpath</b>					
<b>Date:</b> 04/14/2011 <b>Actual From</b> ft 49.00 7970.00	<b>To</b> ft 7925.00 7970.00	<b>Validated:</b> No <b>Survey</b> Survey #1 (49.00-7925.00) Survey #2 (7970.00-7970.00)	<b>Version:</b> 0 <b>Toolcode</b> MWD Project	<b>Tool Name</b> Std MWD 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	1.10	324.70	49.00	0.38	-0.27	0.40	2.24	2.24	0.00	MWD
140.00	2.10	272.60	139.96	1.17	-2.44	2.71	1.83	1.10	-57.25	MWD
229.00	3.50	259.60	228.86	0.76	-6.74	6.50	1.72	1.57	-14.61	MWD
319.00	4.90	267.00	318.61	0.06	-13.28	12.26	1.66	1.56	8.22	MWD
426.00	6.30	270.50	425.10	-0.13	-23.72	21.79	1.35	1.31	3.27	MWD
516.00	7.40	270.20	514.46	-0.07	-34.45	31.70	1.22	1.22	-0.33	MWD
607.00	8.40	279.30	604.60	1.03	-46.87	43.57	1.76	1.10	10.00	MWD
698.00	8.60	279.30	694.60	3.20	-60.15	56.64	0.22	0.22	0.00	MWD
740.00	8.80	277.20	736.11	4.11	-66.43	62.78	0.89	0.48	-5.00	MWD
785.00	9.00	280.40	780.57	5.18	-73.31	69.53	1.19	0.44	7.11	8 5/8"
876.00	9.50	291.60	870.39	9.23	-87.30	83.99	2.05	0.55	12.31	MWD
966.00	10.60	297.60	959.02	15.80	-101.54	99.66	1.69	1.22	6.67	MWD
1057.00	12.50	295.80	1048.17	23.96	-117.82	117.84	2.12	2.09	-1.98	MWD
1148.00	14.10	298.00	1136.73	33.45	-136.48	138.72	1.84	1.76	2.42	MWD
1239.00	15.00	297.60	1224.81	44.11	-156.70	161.50	1.00	0.99	-0.44	MWD
1330.00	15.50	297.60	1312.60	55.20	-177.91	185.36	0.55	0.55	0.00	MWD
1420.00	16.50	301.10	1399.12	67.38	-199.51	210.00	1.54	1.11	3.89	MWD
1511.00	16.90	298.30	1486.28	80.32	-222.23	235.96	0.99	0.44	-3.08	MWD
1602.00	17.40	295.50	1573.23	92.45	-246.15	262.72	1.06	0.55	-3.08	MWD
1693.00	18.10	294.80	1659.90	104.24	-271.27	290.44	0.80	0.77	-0.77	MWD
1783.00	17.40	294.40	1745.62	115.66	-296.21	317.87	0.79	-0.78	-0.44	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 04/14/2011	<b>Time:</b> 08:38:15	<b>Page:</b> 2
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b>	Well: 14-19, Grid North	
<b>Site:</b> Sekich 15-19 Pad	<b>Vertical (TVD) Reference:</b>	4907'GL+15'KB 4922.0	
<b>Well:</b> 14-19	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,292.94Azi)	
<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
1874.00	17.60	294.40	1832.41	126.97	-321.13	345.22	0.22	0.22	0.00	MWD
1965.00	17.10	295.50	1919.26	138.41	-345.74	372.34	0.66	-0.55	1.21	MWD
2056.00	17.60	294.80	2006.12	149.94	-370.30	399.46	0.60	0.55	-0.77	MWD
2146.00	17.90	294.10	2091.84	161.30	-395.28	426.89	0.41	0.33	-0.78	MWD
2237.00	17.10	292.30	2178.63	172.08	-420.43	454.25	1.06	-0.88	-1.98	MWD
2328.00	17.40	290.60	2265.54	181.95	-445.54	481.22	0.64	0.33	-1.87	MWD
2510.00	17.20	290.20	2439.30	200.81	-496.27	535.29	0.13	-0.11	-0.22	MWD
2601.00	17.40	291.30	2526.18	210.40	-521.57	562.33	0.42	0.22	1.21	MWD
2691.00	17.40	293.70	2612.07	220.70	-546.43	589.24	0.80	0.00	2.67	MWD
2782.00	17.20	294.80	2698.95	231.81	-571.10	616.29	0.42	-0.22	1.21	MWD
2873.00	16.90	294.40	2785.95	242.92	-595.36	642.96	0.35	-0.33	-0.44	MWD
2963.00	17.10	294.40	2872.02	253.79	-619.33	669.27	0.22	0.22	0.00	MWD
3054.00	16.90	294.40	2959.04	264.78	-643.56	695.86	0.22	-0.22	0.00	MWD
3145.00	16.70	293.70	3046.16	275.50	-667.57	722.16	0.31	-0.22	-0.77	MWD
3235.00	16.20	293.70	3132.47	285.74	-690.91	747.64	0.56	-0.56	0.00	MWD
3326.00	16.40	294.80	3219.82	296.24	-714.20	773.18	0.40	0.22	1.21	MWD
3417.00	16.20	294.10	3307.16	306.81	-737.45	798.71	0.31	-0.22	-0.77	MWD
3508.00	15.10	290.60	3394.79	316.16	-760.13	823.24	1.59	-1.21	-3.85	MWD
3598.00	15.10	291.30	3481.68	324.54	-782.02	846.67	0.20	0.00	0.78	MWD
3689.00	15.80	292.00	3569.39	333.49	-804.55	870.91	0.80	0.77	0.77	MWD
3780.00	15.70	293.70	3656.97	343.08	-827.32	895.61	0.52	-0.11	1.87	MWD
3871.00	17.60	297.30	3744.16	354.34	-850.82	921.64	2.37	2.09	3.96	MWD
3961.00	17.80	295.50	3829.90	366.50	-875.33	948.95	0.65	0.22	-2.00	MWD
4052.00	17.80	293.70	3916.54	378.08	-900.62	976.75	0.60	0.00	-1.98	MWD
4143.00	16.20	292.00	4003.56	388.43	-925.12	1003.36	1.84	-1.76	-1.87	MWD
4233.00	15.10	289.90	4090.23	397.12	-947.79	1027.62	1.37	-1.22	-2.33	MWD
4324.00	13.90	288.10	4178.33	404.55	-969.32	1050.34	1.41	-1.32	-1.98	MWD
4415.00	11.80	290.20	4267.04	411.16	-988.45	1070.53	2.36	-2.31	2.31	MWD
4506.00	11.30	289.90	4356.20	417.41	-1005.56	1088.73	0.55	-0.55	-0.33	MWD
4597.00	9.00	294.10	4445.77	423.35	-1020.45	1104.75	2.65	-2.53	4.62	MWD
4687.00	8.30	293.00	4534.75	428.77	-1032.85	1118.28	0.80	-0.78	-1.22	MWD
4778.00	6.20	295.80	4625.01	433.47	-1043.32	1129.76	2.34	-2.31	3.08	MWD
4869.00	5.60	296.20	4715.53	437.57	-1051.73	1139.10	0.66	-0.66	0.44	MWD
4960.00	4.00	296.50	4806.21	440.95	-1058.56	1146.70	1.76	-1.76	0.33	MWD
5051.00	2.30	311.70	4897.07	443.58	-1062.76	1151.60	2.07	-1.87	16.70	MWD
5142.00	0.70	320.10	4988.04	445.22	-1064.48	1153.83	1.77	-1.76	9.23	MWD
5232.00	0.50	318.30	5078.03	445.93	-1065.09	1154.67	0.22	-0.22	-2.00	MWD
5323.00	0.50	324.70	5169.03	446.55	-1065.59	1155.37	0.06	0.00	7.03	MWD
5459.00	0.40	343.70	5305.02	447.49	-1066.06	1156.17	0.13	-0.07	13.97	MWD
5596.00	0.40	8.30	5442.02	448.43	-1066.13	1156.59	0.12	0.00	17.96	MWD
5732.00	0.00	66.30	5578.02	448.90	-1066.06	1156.71	0.29	-0.29	0.00	MWD
5868.00	0.20	110.20	5714.02	448.81	-1065.84	1156.48	0.15	0.15	0.00	MWD
6049.00	0.50	202.00	5895.02	447.97	-1065.84	1156.15	0.30	0.17	50.72	MWD
6231.00	0.40	175.60	6077.01	446.60	-1066.08	1155.84	0.12	-0.05	-14.51	MWD
6412.00	0.90	165.40	6258.00	444.60	-1065.68	1154.69	0.28	0.28	-5.64	MWD
6594.00	0.70	165.80	6439.98	442.14	-1065.05	1153.14	0.11	-0.11	0.22	MWD
6775.00	1.10	174.60	6620.96	439.34	-1064.61	1151.65	0.23	0.22	4.86	MWD
6957.00	1.40	175.00	6802.91	435.38	-1064.25	1149.78	0.16	0.16	0.22	MWD
7138.00	0.90	217.80	6983.88	432.06	-1064.93	1149.11	0.53	-0.28	23.65	MWD
7320.00	0.50	199.50	7165.87	430.18	-1066.07	1149.43	0.25	-0.22	-10.05	MWD
7502.00	0.40	244.20	7347.86	429.15	-1066.91	1149.80	0.19	-0.05	24.56	MWD
7683.00	0.40	273.70	7528.86	428.92	-1068.11	1150.81	0.11	0.00	16.30	MWD
7865.00	0.40	247.70	7710.85	428.72	-1069.33	1151.86	0.10	0.00	-14.29	MWD

# 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> 14-19 <b>Wellpath:</b> Original Hole	<b>Date:</b> 04/14/2011 <b>Co-ordinate(NE) Reference:</b> Well: 14-19, Grid North <b>Vertical (TVD) Reference:</b> 4907'GL+15'KB 4922.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,292.94Azi) <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
7925.00	0.70	234.30	7770.85	428.42	-1069.82	1152.20	0.54	0.50	-22.33	MWD
7929.15	0.70	234.30	7775.00	428.40	-1069.86	1152.23	0.00	0.00	0.00	14-19 PBHL
7970.00	0.70	234.30	7815.85	428.10	-1070.27	1152.48	0.00	0.00	0.00	14-19 BHL

### Targets

Name	Description	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ---->			<--- Longitude --->				
	Dip.							Deg	Min	Sec	Deg	Min	Sec		
14-19 SL			0.00	0.00	0.00	1318030.88	3158954.30	40	12	17.944	N	104	55	51.332	W
14-19 PBHL			7775.00	444.98	-1051.36	1318475.85	3157902.94	40	12	22.408	N	104	56	4.846	W
-Circle (Radius: 50)															
14-19 BHL			7815.85	428.10	-1070.27	1318458.98	3157884.03	40	12	22.242	N	104	56	5.091	W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
785.00	780.57	8.625	9.875	8 5/8"