

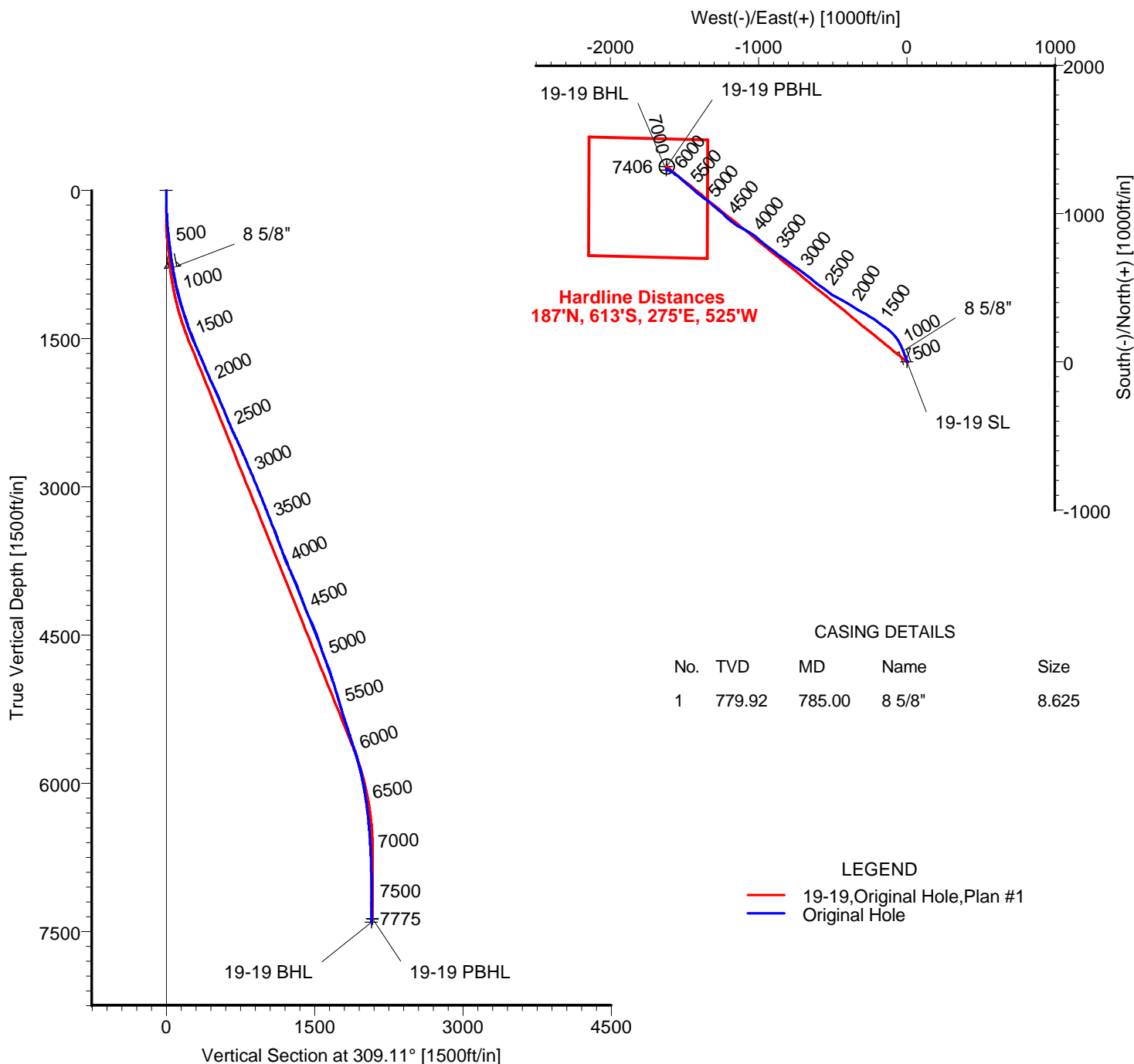
# ANADARKO PETROLEUM

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



Azimuths to Grid North  
True North: -0.37°  
Magnetic North: 8.60°

Magnetic Field  
Strength: 53070nT  
Dip Angle: 66.87°  
Date: 04/06/2011  
Model: IGRF2010



## CASING DETAILS

No.	TVD	MD	Name	Size
1	779.92	785.00	8 5/8"	8.625

## LEGEND

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

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
19-19 SL	0.00	0.00	0.00	40°12'18.106N	104°55'51.481W	Point
19-19 PBHL	7369.00	1316.94	-1619.92	40°12'31.222N	104°56'12.252W	Circle (Radius: 50)
19-19 BHL	7405.77	1294.34	-1623.41	40°12'30.999N	104°56'12.298W	Point

Wellpath: (19-19/Original Hole)

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

Created By: Ivonne Gonzalez

Date: 04/07/2011



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> 19-19 <b>Wellpath:</b> Original Hole	<b>Date:</b> 04/07/2011 <b>Co-ordinate(NE) Reference:</b> <b>Vertical (TVD) Reference:</b> <b>Section (VS) Reference:</b> <b>Survey Calculation Method:</b>	<b>Time:</b> 08:34:20 Well: 19-19, Grid North 4907'GL+15'KB 4922.0 Well (0.00N,0.00E,309.11Azi) 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> 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> 19-19	<b>Slot Name:</b> 19-19
<b>Well Position:</b> +N/-S 24.44 ft +E/-W -17.45 ft <b>Position Uncertainty:</b> 0.00 ft	<b>Northing:</b> 1318047.16 ft <b>Easting :</b> 3158942.61 ft <b>Latitude:</b> 40 12 18.106 N <b>Longitude:</b> 104 55 51.481 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> 04/06/2011 <b>Field Strength:</b> 53070 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 0.00 309.11

<b>Survey Program for Definitive Wellpath</b>				
<b>Date:</b> 04/07/2011	<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	7730.00	Survey #1 (49.00-7730.00)	MWD	Std MWD
7775.00	7775.00	Survey #2 (7775.00-7775.00)	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	1.10	354.90	49.00	0.47	-0.04	0.33	2.24	2.24	0.00	MWD
140.00	1.90	354.90	139.97	2.84	-0.25	1.99	0.88	0.88	0.00	MWD
230.00	3.20	349.60	229.87	6.80	-0.84	4.94	1.47	1.44	-5.89	MWD
319.00	5.10	340.10	318.64	12.96	-2.63	10.22	2.26	2.13	-10.67	MWD
426.00	6.30	334.90	425.11	22.75	-6.74	19.58	1.22	1.12	-4.86	MWD
516.00	8.10	338.00	514.39	33.10	-11.21	29.58	2.05	2.00	3.44	MWD
607.00	9.30	340.50	604.35	45.98	-16.07	41.47	1.38	1.32	2.75	MWD
698.00	9.30	339.40	694.15	59.79	-21.11	54.10	0.20	0.00	-1.21	MWD
740.00	9.50	341.20	735.59	66.25	-23.42	59.97	0.85	0.48	4.29	MWD
785.00	10.24	340.85	779.92	73.54	-25.93	66.51	1.65	1.65	-0.78	8 5/8"
837.00	11.10	340.50	831.02	82.63	-29.12	74.72	1.65	1.65	-0.67	MWD
928.00	12.80	335.60	920.05	100.07	-36.21	91.22	2.17	1.87	-5.38	MWD
1018.00	14.30	332.10	1007.54	118.97	-45.53	110.38	1.90	1.67	-3.89	MWD
1109.00	16.40	328.20	1095.29	139.83	-57.56	132.87	2.57	2.31	-4.29	MWD
1200.00	17.80	322.90	1182.27	161.84	-72.72	158.52	2.30	1.54	-5.82	MWD
1291.00	18.50	318.30	1268.75	183.72	-90.72	186.28	1.75	0.77	-5.05	MWD
1382.00	18.70	310.60	1355.01	203.99	-111.40	215.12	2.71	0.22	-8.46	MWD
1472.00	20.20	307.80	1439.87	222.91	-134.63	245.08	1.96	1.67	-3.11	MWD
1563.00	23.20	305.30	1524.42	242.90	-161.68	278.68	3.45	3.30	-2.75	MWD
1654.00	23.60	307.10	1607.93	264.24	-190.84	314.77	0.90	0.44	1.98	MWD
1744.00	23.10	305.30	1690.56	285.31	-219.62	350.39	0.97	-0.56	-2.00	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 04/07/2011	<b>Time:</b> 08:34:20	<b>Page:</b> 2
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b>	Well: 19-19, Grid North	
<b>Site:</b> Sekich 15-19 Pad	<b>Vertical (TVD) Reference:</b>	4907'GL+15'KB 4922.0	
<b>Well:</b> 19-19	<b>Section (VS) Reference:</b>	Well (0.00N,0.00E,309.11Azi)	
<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
1835.00	22.90	301.80	1774.33	304.96	-249.24	385.76	1.52	-0.22	-3.85	MWD
1926.00	23.90	299.00	1857.85	323.23	-280.41	421.48	1.64	1.10	-3.08	MWD
2016.00	24.60	299.70	1939.91	341.35	-312.63	457.91	0.84	0.78	0.78	MWD
2107.00	25.20	302.90	2022.45	361.26	-345.35	495.85	1.62	0.66	3.52	MWD
2198.00	23.40	301.10	2105.39	381.11	-377.09	533.01	2.14	-1.98	-1.98	MWD
2289.00	23.20	298.00	2188.97	398.86	-408.39	568.49	1.37	-0.22	-3.41	MWD
2379.00	22.90	298.00	2271.78	415.41	-439.50	603.07	0.33	-0.33	0.00	MWD
2470.00	23.20	299.70	2355.52	432.60	-470.71	638.13	0.80	0.33	1.87	MWD
2561.00	24.30	302.20	2438.81	451.46	-502.12	674.40	1.64	1.21	2.75	MWD
2652.00	25.20	305.70	2521.46	472.74	-533.70	712.33	1.89	0.99	3.85	MWD
2743.00	24.50	306.70	2604.03	495.33	-564.56	750.52	0.90	-0.77	1.10	MWD
2833.00	23.60	307.40	2686.22	517.42	-593.84	787.17	1.05	-1.00	0.78	MWD
2924.00	22.90	308.90	2769.83	539.60	-622.09	823.09	1.01	-0.77	1.65	MWD
3015.00	22.70	309.20	2853.72	561.82	-649.47	858.35	0.25	-0.22	0.33	MWD
3106.00	22.30	308.20	2937.79	583.59	-676.65	893.17	0.61	-0.44	-1.10	MWD
3196.00	22.20	307.80	3021.09	604.57	-703.50	927.25	0.20	-0.11	-0.44	MWD
3287.00	22.50	304.60	3105.26	625.00	-731.42	961.79	1.38	0.33	-3.52	MWD
3378.00	21.80	303.60	3189.54	644.24	-759.83	995.97	0.87	-0.77	-1.10	MWD
3469.00	20.90	305.70	3274.30	663.06	-787.08	1028.99	1.30	-0.99	2.31	MWD
3559.00	21.50	306.00	3358.21	682.12	-813.46	1061.49	0.68	0.67	0.33	MWD
3650.00	21.80	306.40	3442.79	701.95	-840.55	1095.02	0.37	0.33	0.44	MWD
3741.00	19.70	307.40	3527.88	721.30	-866.34	1127.23	2.34	-2.31	1.10	MWD
3832.00	20.80	308.90	3613.25	740.76	-891.10	1158.72	1.34	1.21	1.65	MWD
3923.00	20.40	308.50	3698.43	760.78	-916.09	1190.74	0.47	-0.44	-0.44	MWD
4013.00	24.10	307.10	3781.72	781.64	-943.03	1224.80	4.15	4.11	-1.56	MWD
4104.00	23.60	307.40	3864.95	803.91	-972.32	1261.57	0.57	-0.55	0.33	MWD
4195.00	23.20	311.70	3948.47	826.90	-1000.18	1297.69	1.93	-0.44	4.73	MWD
4286.00	21.30	307.10	4032.70	848.79	-1026.75	1332.12	2.83	-2.09	-5.05	MWD
4377.00	20.60	303.20	4117.68	867.53	-1053.33	1364.56	1.71	-0.77	-4.29	MWD
4466.00	21.60	299.40	4200.72	884.15	-1080.70	1396.28	1.90	1.12	-4.27	MWD
4557.00	22.90	298.00	4284.94	900.68	-1110.93	1430.17	1.54	1.43	-1.54	MWD
4648.00	23.40	299.40	4368.62	917.86	-1142.30	1465.35	0.82	0.55	1.54	MWD
4738.00	22.30	306.40	4451.57	936.78	-1171.62	1500.03	3.26	-1.22	7.78	MWD
4829.00	19.90	311.70	4536.47	957.33	-1197.09	1532.76	3.37	-2.64	5.82	MWD
4920.00	19.20	314.50	4622.22	978.12	-1219.33	1563.13	1.29	-0.77	3.08	MWD
5011.00	20.40	313.10	4707.84	999.45	-1241.58	1593.85	1.42	1.32	-1.54	MWD
5105.00	20.60	310.60	4795.89	1021.40	-1266.10	1626.72	0.96	0.21	-2.66	MWD
5192.00	19.00	306.40	4877.75	1039.77	-1289.12	1656.17	2.46	-1.84	-4.83	MWD
5283.00	17.40	310.30	4964.20	1057.36	-1311.42	1684.58	2.21	-1.76	4.29	MWD
5374.00	17.80	310.00	5050.94	1075.10	-1332.46	1712.09	0.45	0.44	-0.33	MWD
5465.00	17.10	307.10	5137.75	1092.11	-1353.78	1739.37	1.23	-0.77	-3.19	MWD
5555.00	15.70	308.40	5224.09	1107.66	-1373.88	1764.77	1.61	-1.56	1.44	MWD
5646.00	17.10	308.20	5311.38	1123.58	-1394.04	1790.46	1.54	1.54	-0.22	MWD
5737.00	18.80	310.60	5397.95	1141.40	-1415.69	1818.50	2.04	1.87	2.64	MWD
5827.00	17.00	311.30	5483.59	1159.52	-1436.59	1846.14	2.01	-2.00	0.78	MWD
5918.00	18.70	312.40	5570.21	1178.14	-1457.36	1874.00	1.90	1.87	1.21	MWD
6009.00	18.30	310.30	5656.51	1197.22	-1479.03	1902.85	0.85	-0.44	-2.31	MWD
6100.00	16.20	307.80	5743.41	1214.24	-1499.96	1929.83	2.45	-2.31	-2.75	MWD
6190.00	14.80	308.50	5830.13	1229.09	-1518.87	1953.87	1.57	-1.56	0.78	MWD
6281.00	12.50	314.80	5918.56	1243.27	-1534.96	1975.30	3.01	-2.53	6.92	MWD
6372.00	11.10	308.20	6007.64	1255.63	-1548.83	1993.86	2.13	-1.54	-7.25	MWD
6463.00	9.20	301.10	6097.22	1264.80	-1561.95	2009.82	2.50	-2.09	-7.80	MWD
6553.00	7.90	305.70	6186.22	1272.13	-1573.13	2023.12	1.63	-1.44	5.11	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> 19-19 <b>Wellpath:</b> Original Hole	<b>Date:</b> 04/07/2011 <b>Co-ordinate(NE) Reference:</b> Well: 19-19, Grid North <b>Vertical (TVD) Reference:</b> 4907'GL+15'KB 4922.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,309.11Azi) <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
6644.00	6.90	302.20	6276.46	1278.69	-1582.84	2034.79	1.20	-1.10	-3.85	MWD
6735.00	6.20	297.60	6366.86	1283.88	-1591.82	2045.03	0.96	-0.77	-5.05	MWD
6826.00	4.60	302.20	6457.46	1288.10	-1599.26	2053.47	1.82	-1.76	5.05	MWD
6917.00	4.00	306.70	6548.20	1291.94	-1604.89	2060.27	0.76	-0.66	4.95	MWD
7007.00	3.00	299.00	6638.03	1294.96	-1609.47	2065.72	1.23	-1.11	-8.56	MWD
7098.00	2.30	295.80	6728.93	1296.91	-1613.20	2069.84	0.79	-0.77	-3.52	MWD
7189.00	1.80	285.30	6819.88	1298.08	-1616.22	2072.93	0.69	-0.55	-11.54	MWD
7280.00	1.60	275.10	6910.84	1298.57	-1618.86	2075.29	0.40	-0.22	-11.21	MWD
7371.00	1.20	256.80	7001.81	1298.47	-1621.06	2076.92	0.65	-0.44	-20.11	MWD
7461.00	0.90	225.90	7091.79	1297.76	-1622.48	2077.58	0.70	-0.33	-34.33	MWD
7552.00	0.70	193.20	7182.79	1296.72	-1623.12	2077.42	0.54	-0.22	-35.93	MWD
7643.00	0.70	190.00	7273.78	1295.63	-1623.34	2076.91	0.04	0.00	-3.52	MWD
7730.00	0.50	178.10	7360.77	1294.73	-1623.42	2076.40	0.27	-0.23	-13.68	MWD
7738.23	0.50	178.10	7369.00	1294.66	-1623.42	2076.36	0.00	0.00	0.00	19-19 PBHL
7775.00	0.50	178.10	7405.77	1294.34	-1623.41	2076.15	0.00	0.00	0.00	19-19 BHL

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude ---> Deg Min Sec			<--- Longitude ---> Deg Min Sec		
19-19 SL			0.00	0.00	0.00	1318047.16	3158942.61	40	12	18.106 N	104	55	51.481 W
19-19 PBHL			7369.00	1316.94	-1619.92	1319364.10	3157322.69	40	12	31.222 N	104	56	12.252 W
-Circle (Radius: 50)													
19-19 BHL			7405.77	1294.34	-1623.41	1319341.50	3157319.20	40	12	30.999 N	104	56	12.298 W

### Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
785.00	779.92	8.625	9.875	8 5/8"