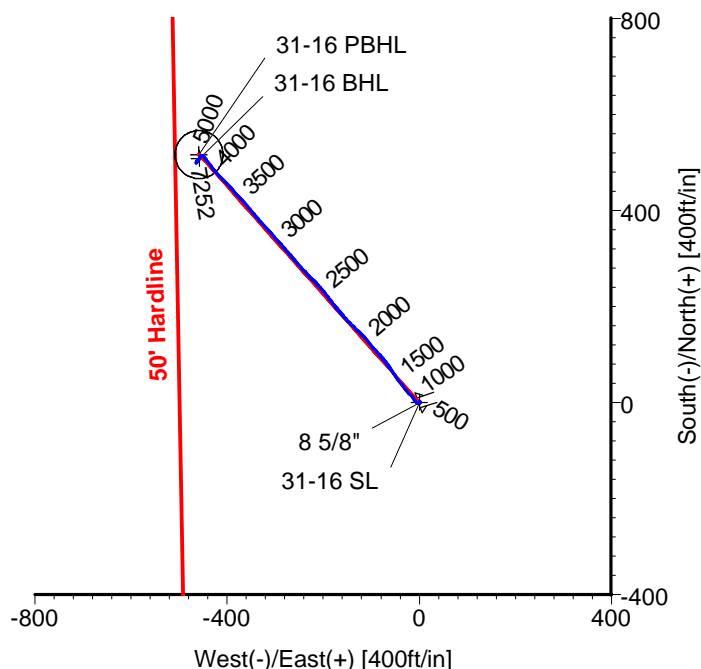
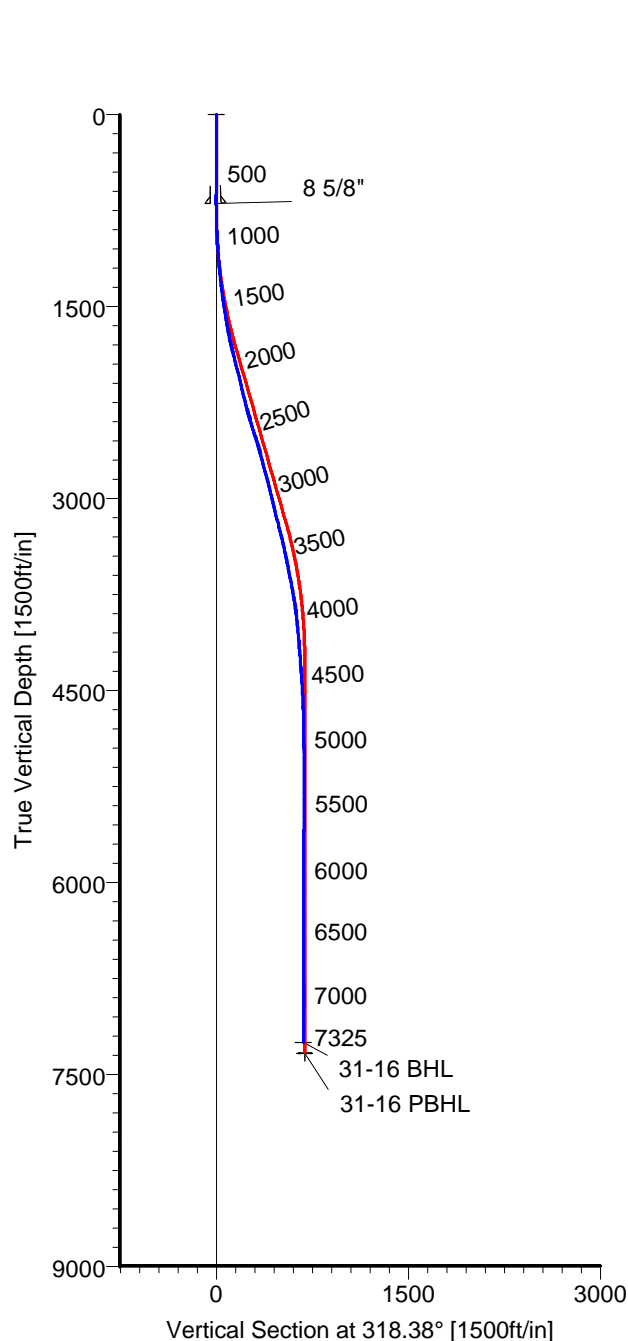


ANADARKO PETROLEUM

Field: Weld County, CO
Site: Houston State 5-16 Pad
Well: 31-16
Wellpath: Original Hole



Azimuths to Grid North
True North: -0.39°
Magnetic North: 8.66°

Magnetic Field
Strength: 53158nT
Dip Angle: 66.92°
Date: 07/31/2010
Model: IGRF2010

CASING DETAILS

No.	TVD	MD	Name	Size
1	694.98	695.00	8 5/8"	8.625

LEGEND

— 31-16,Original Hole,Plan #1
— Original Hole

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
31-16 SL	0.00	0.00	0.00	40°13'41.664N	104°54'10.368W	Point
31-16 BHL	7251.80	507.48	-457.45	40°13'46.709N	104°54'16.222W	Point
31-16 PBHL	7334.00	516.46	-458.85	40°13'46.798N	104°54'16.239W	Circle (Radius: 50)

Wellpath: (31-16/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**

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM		Date: 08/06/2010	Time: 08:28:40	Page: 1
Field: Weld County, CO		Co-ordinate(NE) Reference: Well: 31-16, Grid North		
Site: Houston State 5-16 Pad		Vertical (TVD) Reference: 4773'GL+13'KB 4786.0		
Well: 31-16		Section (VS) Reference: Well (0.00N,0.00E,318.38Azi)		
Wellpath: Original Hole		Survey Calculation Method: Minimum Curvature Db: Adapti		

Field: Weld County, CO	
Map System: US State Plane Coordinate System 1983	Map Zone: Colorado, Northern Zone
Geo Datum: GRS 1980	Coordinate System: Well Centre
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010

Site: Houston State 5-16 Pad	
Centered on 31-16	
Site Position:	Northing: 1326553.84 ft Latitude: 40 13 41.664 N
From: Geographic	Longitude: 104 54 10.368 W
Position Uncertainty: 0.00 ft	North Reference: Grid
Ground Level: 4773.00 ft	Grid Convergence: 0.39 deg

Well: 31-16	Slot Name: 31-16
Well Position: +N/-S 0.00 ft Northing: 1326553.84 ft Latitude: 40 13 41.664 N	Longitude: 104 54 10.368 W
+E/-W 0.00 ft Easting: 3166730.52 ft	
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole		Drilled From: Surface
Current Datum: 4773'GL+13'KB	Height: 4786.00 ft	Tie-on Depth: 0.00 ft
Magnetic Data: 07/31/2010		Above System Datum: Mean Sea Level
Field Strength: 53158 nT		Declination: 9.04 deg
Vertical Section: Depth From (TVD)	+N/-S	Mag Dip Angle: 66.92 deg
ft	ft	Direction
		deg
0.00	0.00	0.00 318.38

Survey Program for Definitive Wellpath			Version: 0	
Date: 08/06/2010	Validated: No	Survey	Toolcode	Tool Name
Actual From	To			
ft	ft			
46.00	7280.00	Survey #1 (46.00-7280.00)	MWD	Std MWD
7325.00	7325.00	Survey #2 (7325.00-7325.00)	Project	Projection

Survey										
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS	DLS	Build	Turn	Tool/Comment
ft	deg	deg	ft	ft	ft	ft	deg/100ft	deg/100ft	deg/100ft	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
46.00	0.50	31.90	46.00	0.17	0.11	0.06	1.09	1.09	0.00	MWD
167.00	0.30	40.30	167.00	0.86	0.59	0.25	0.17	-0.17	6.94	MWD
288.00	0.20	325.50	288.00	1.28	0.68	0.51	0.26	-0.08	-61.82	MWD
413.00	0.30	199.60	412.99	1.15	0.44	0.56	0.36	0.08	-100.72	MWD
549.00	0.50	213.30	548.99	0.32	0.00	0.24	0.16	0.15	10.07	MWD
640.00	0.70	195.70	639.99	-0.55	-0.37	-0.17	0.30	0.22	-19.34	MWD
695.00	1.20	251.60	694.98	-1.06	-1.01	-0.12	1.81	0.91	101.64	8 5/8"
786.00	1.80	279.40	785.95	-1.12	-3.32	1.37	1.02	0.66	30.55	MWD
877.00	1.80	311.40	876.91	0.05	-5.81	3.90	1.09	0.00	35.16	MWD
967.00	2.80	326.20	966.83	2.82	-8.09	7.48	1.28	1.11	16.44	MWD
1058.00	4.20	323.00	1057.66	7.33	-11.33	13.00	1.55	1.54	-3.52	MWD
1149.00	4.80	317.70	1148.38	12.80	-15.90	20.13	0.80	0.66	-5.82	MWD
1240.00	5.80	316.30	1238.99	18.94	-21.64	28.53	1.11	1.10	-1.54	MWD
1331.00	6.70	322.30	1329.45	26.47	-28.06	38.42	1.22	0.99	6.59	MWD
1422.00	7.60	322.30	1419.74	35.43	-34.99	49.72	0.99	0.99	0.00	MWD
1512.00	9.30	323.00	1508.76	45.95	-43.00	62.91	1.89	1.89	0.78	MWD
1603.00	9.20	324.10	1598.58	57.71	-51.69	77.48	0.22	-0.11	1.21	MWD
1686.00	10.40	326.50	1680.37	69.33	-59.72	91.50	1.53	1.45	2.89	MWD
1785.00	12.30	321.90	1777.43	85.09	-71.16	110.87	2.12	1.92	-4.65	MWD
1875.00	14.30	317.70	1865.01	100.85	-84.56	131.56	2.47	2.22	-4.67	MWD
1966.00	13.70	320.90	1953.31	117.53	-98.92	153.56	1.08	-0.66	3.52	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM
Field: Weld County, CO
Site: Houston State 5-16 Pad
Well: 31-16
Wellpath: Original Hole

Date: 08/06/2010 **Time:** 08:28:40 **Page:** 2
Co-ordinate(NE) Reference: Well: 31-16, Grid North
Vertical (TVD) Reference: 4773'GL+13'KB 4786.0
Section (VS) Reference: Well (0.00N,0.00E,318.38Azi)
Survey Calculation Method: Minimum Curvature **Db:** 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
2057.00	13.70	319.10	2041.72	134.04	-112.77	175.10	0.47	0.00	-1.98	MWD
2148.00	13.70	312.10	2130.14	149.41	-127.82	196.59	1.82	0.00	-7.69	MWD
2238.00	14.40	314.90	2217.45	164.45	-143.66	218.35	1.08	0.78	3.11	MWD
2329.00	14.60	318.80	2305.55	181.07	-159.23	241.12	1.10	0.22	4.29	MWD
2420.00	17.10	321.90	2393.08	200.23	-175.04	265.94	2.90	2.75	3.41	MWD
2511.00	18.00	322.30	2479.85	221.88	-191.89	293.33	1.00	0.99	0.44	MWD
2601.00	17.10	317.40	2565.66	242.63	-209.36	320.43	1.92	-1.00	-5.44	MWD
2692.00	14.80	314.60	2653.15	260.64	-226.69	345.41	2.66	-2.53	-3.08	MWD
2783.00	15.30	318.10	2741.03	277.74	-242.98	369.01	1.14	0.55	3.85	MWD
2874.00	15.10	319.50	2828.85	295.69	-258.70	392.87	0.46	-0.22	1.54	MWD
2966.00	13.70	318.10	2917.96	312.91	-273.76	415.75	1.57	-1.52	-1.52	MWD
3057.00	13.10	319.10	3006.48	328.72	-287.71	436.84	0.71	-0.66	1.10	MWD
3148.00	14.10	318.40	3094.93	344.81	-301.82	458.23	1.11	1.10	-0.77	MWD
3239.00	14.40	317.70	3183.13	361.47	-316.79	480.63	0.38	0.33	-0.77	MWD
3330.00	13.90	317.70	3271.37	377.92	-331.77	502.88	0.55	-0.55	0.00	MWD
3421.00	12.80	320.90	3359.91	393.83	-345.48	523.88	1.46	-1.21	3.52	MWD
3512.00	12.00	319.50	3448.78	408.85	-357.98	543.41	0.94	-0.88	-1.54	MWD
3603.00	10.60	316.00	3538.02	422.06	-369.94	561.23	1.71	-1.54	-3.85	MWD
3694.00	11.30	319.10	3627.36	434.82	-381.59	578.51	1.00	0.77	3.41	MWD
3785.00	10.60	318.40	3716.71	447.82	-392.99	595.79	0.78	-0.77	-0.77	MWD
3876.00	9.00	316.70	3806.38	459.26	-403.43	611.28	1.79	-1.76	-1.87	MWD
3967.00	6.90	312.10	3896.50	468.10	-412.36	623.83	2.41	-2.31	-5.05	MWD
4058.00	5.50	312.50	3986.96	474.72	-419.64	633.60	1.54	-1.54	0.44	MWD
4149.00	5.10	322.30	4077.57	480.86	-425.32	641.97	1.09	-0.44	10.77	MWD
4240.00	4.70	325.50	4168.24	487.13	-429.91	649.71	0.53	-0.44	3.52	MWD
4330.00	4.40	320.90	4257.96	492.85	-434.18	656.81	0.52	-0.33	-5.11	MWD
4512.00	3.70	327.60	4439.50	503.23	-441.73	669.59	0.46	-0.38	3.68	MWD
4694.00	2.10	311.80	4621.27	510.41	-447.36	678.70	0.97	-0.88	-8.68	MWD
4875.00	0.80	296.30	4802.21	513.18	-450.96	683.16	0.74	-0.72	-8.56	MWD
5057.00	0.70	291.70	4984.19	514.15	-453.14	685.33	0.06	-0.05	-2.53	MWD
5238.00	0.50	261.80	5165.18	514.45	-454.94	686.75	0.20	-0.11	-16.52	MWD
5420.00	0.30	221.80	5347.18	513.98	-456.05	687.14	0.18	-0.11	-21.98	MWD
5602.00	0.90	168.30	5529.17	512.23	-456.08	685.84	0.42	0.33	-29.40	MWD
5783.00	0.50	213.70	5710.15	510.18	-456.23	684.41	0.36	-0.22	25.08	MWD
5964.00	0.80	230.20	5891.14	508.71	-457.63	684.25	0.19	0.17	9.12	MWD
6146.00	1.10	229.10	6073.12	506.76	-459.93	684.31	0.17	0.16	-0.60	MWD
6327.00	1.20	228.80	6254.08	504.37	-462.67	684.35	0.06	0.06	-0.17	MWD
6509.00	0.80	190.50	6436.06	501.87	-464.34	683.58	0.42	-0.22	-21.04	MWD
6691.00	0.30	143.40	6618.05	500.23	-464.28	682.33	0.35	-0.27	-25.88	MWD
6872.00	1.00	202.80	6799.04	498.40	-464.61	681.17	0.49	0.39	32.82	MWD
7054.00	3.20	23.10	6980.96	501.61	-463.23	682.66	2.31	1.21	-98.74	MWD
7236.00	1.20	67.10	7162.83	507.02	-459.49	684.22	1.36	-1.10	24.18	MWD
7280.00	1.40	80.10	7206.82	507.29	-458.53	683.79	0.81	0.45	29.55	MWD
7325.00	1.40	80.10	7251.80	507.48	-457.45	683.21	0.00	0.00	0.00	31-16 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		
31-16 SL			0.00	0.00	0.00	1326553.843	166730.52	40	13	41.664	N	104	54	10.368	W
31-16 BHL			7251.80	507.48	-457.45	1327061.323	166273.07	40	13	46.709	N	104	54	16.222	W
31-16 PBHL			7334.00	516.46	-458.85	1327070.303	166271.66	40	13	46.798	N	104	54	16.239	W
-Circle (Radius: 50)															

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM

Field: Weld County, CO

Site: Houston State 5-16 Pad

Well: 31-16

Wellpath: Original Hole

Date: 08/06/2010

Time: 08:28:40

Page: 3

Co-ordinate(NE) Reference: Well: 31-16, Grid North

Vertical (TVD) Reference: 4773'GL+13'KB 4786.0

Section (VS) Reference: Well (0.00N,0.00E,318.38Azi)

Survey Calculation Method: Minimum Curvature **Db:** Adapti

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
695.00	694.98	8.625	9.875	8 5/8"