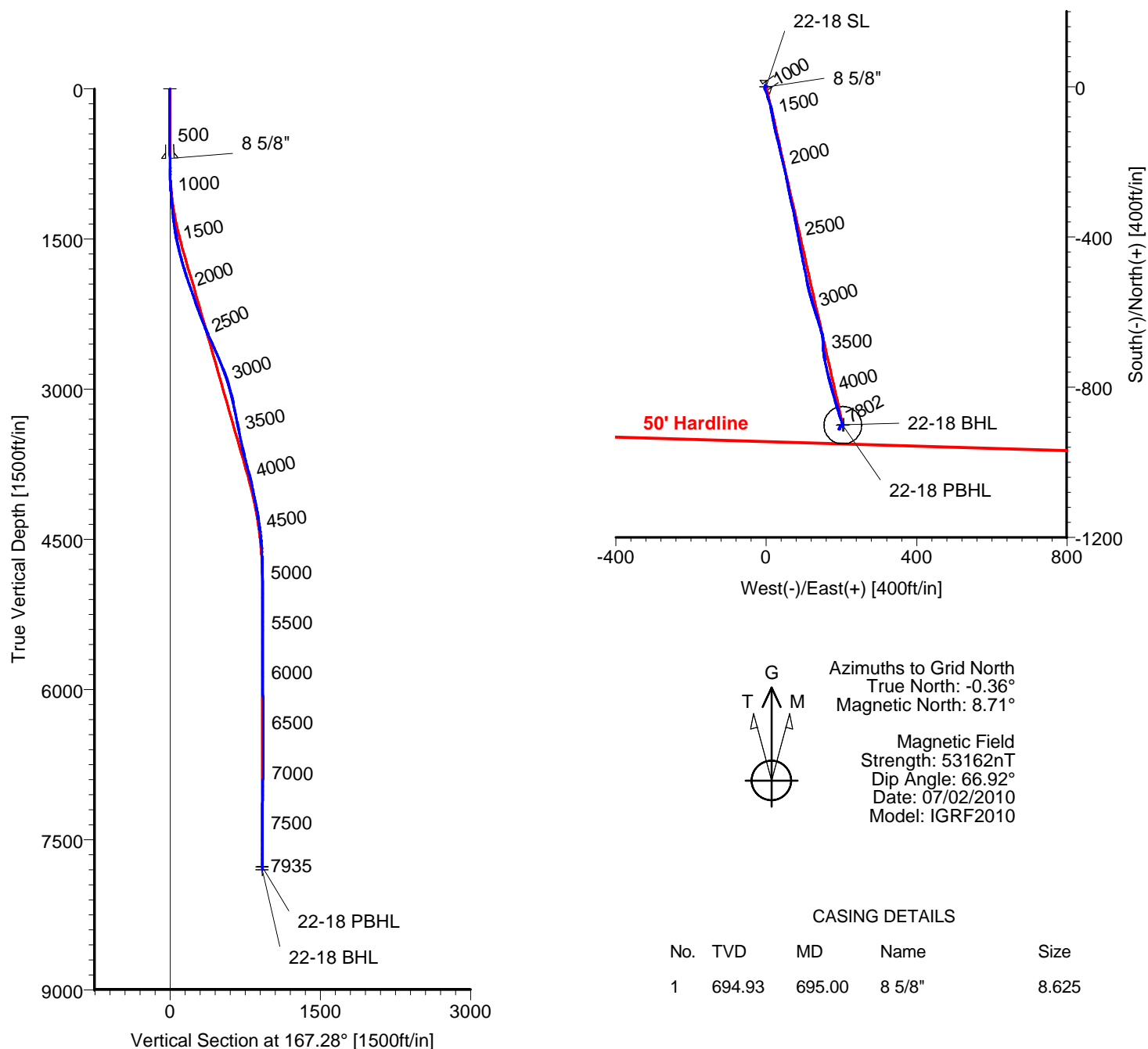


# ANADARKO PETROLEUM

Field: Weld County, CO  
Site: Ballinger 18-18 Pad  
Well: 22-18  
Wellpath: Original Hole



## CASING DETAILS

No.	TVD	MD	Name	Size
1	694.93	695.00	8 5/8"	8.625

## LEGEND

- 22-18, Original Hole, Plan #1a
- Original Hole

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
22-18 SL	0.00	0.00	0.00	40°13'44.062N	104°56'17.131W	Point
22-18 PBHL	7770.00	-901.32	203.45	40°13'35.142N	104°56'14.581W	Circle (Radius: 50)
22-18 BHL	7802.47	-900.30	205.41	40°13'35.152N	104°56'14.556W	Point

Wellpath: (22-18/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

<b>Company:</b> ANADARKO PETROLEUM				<b>Date:</b> 07/25/2010		<b>Time:</b> 08:56:23		<b>Page:</b> 1	
<b>Field:</b> Weld County, CO				<b>Co-ordinate(NE) Reference:</b> Well: 22-18, Grid North					
<b>Site:</b> Ballinger 18-18 Pad				<b>Vertical (TVD) Reference:</b> 4866'GL+13'KB 4879.0					
<b>Well:</b> 22-18				<b>Section (VS) Reference:</b> Well (0.00N,0.00E,167.28Azi)					
<b>Wellpath:</b> Original Hole				<b>Survey Calculation Method:</b> Minimum Curvature				<b>Db:</b> Sybase	

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

<b>Site:</b> Ballinger 18-18 Pad					
<b>Site Position:</b>		<b>Northing:</b> 1326733.86 ft		<b>Latitude:</b> 40 13 44.080 N	
<b>From:</b> Geographic		<b>Easting:</b> 3156865.54 ft		<b>Longitude:</b> 104 56 17.542 W	
<b>Position Uncertainty:</b> 0.00 ft				<b>North Reference:</b> Grid	
<b>Ground Level:</b> 4866.00 ft				<b>Grid Convergence:</b> 0.36 deg	

<b>Well:</b> 22-18		<b>Slot Name:</b> 22-18	
<b>Well Position:</b> +N/-S -1.61 ft		<b>Northing:</b> 1326732.25 ft	
+E/-W 31.92 ft		<b>Easting:</b> 3156897.46 ft	
<b>Position Uncertainty:</b> 0.00 ft		<b>Latitude:</b> 40 13 44.062 N	
		<b>Longitude:</b> 104 56 17.131 W	

<b>Wellpath:</b> Original Hole		<b>Drilled From:</b> Surface	
<b>Current Datum:</b> 4866'GL+13'KB		<b>Tie-on Depth:</b> 0.00 ft	
<b>Magnetic Data:</b> 07/02/2010		<b>Above System Datum:</b> Mean Sea Level	
<b>Field Strength:</b> 53162 nT		<b>Declination:</b> 9.07 deg	
<b>Vertical Section: Depth From (TVD)</b>		<b>Mag Dip Angle:</b> 66.92 deg	
ft	+N/-S ft	+E/-W ft	<b>Direction</b> deg
0.00	0.00	0.00	167.28

<b>Survey Program for Definitive Wellpath</b>				<b>Version:</b> 0	
<b>Date:</b> 07/25/2010		<b>Validated:</b> No		<b>Toolcode</b>	
<b>Actual From</b>	<b>To</b>	<b>Survey</b>	<b>Tool Name</b>		
ft	ft				
82.00	7890.00	Survey #1 (82.00-7890.00)	MWD	Std MWD	
7935.00	7935.00	Survey #2 (7935.00-7935.00)	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
82.00	0.70	305.80	82.00	0.29	-0.41	-0.38	0.85	0.85	0.00	MWD
143.00	1.10	323.70	142.99	0.98	-1.06	-1.19	0.79	0.66	29.34	MWD
202.00	1.10	335.70	201.98	1.96	-1.62	-2.26	0.39	0.00	20.34	MWD
264.00	0.90	317.70	263.97	2.86	-2.20	-3.27	0.60	-0.32	-29.03	MWD
325.00	0.50	327.20	324.97	3.44	-2.66	-3.94	0.68	-0.66	15.57	MWD
403.00	0.50	178.20	402.96	3.38	-2.84	-3.92	1.24	0.00	-191.03	MWD
494.00	1.10	175.70	493.96	2.11	-2.76	-2.67	0.66	0.66	-2.75	MWD
585.00	0.90	197.90	584.94	0.56	-2.91	-1.19	0.47	-0.22	24.40	MWD
645.00	1.10	199.30	644.93	-0.43	-3.25	-0.30	0.34	0.33	2.33	MWD
697.00	0.90	236.90	696.93	-1.12	-3.75	0.27	1.29	-0.38	72.31	MWD
788.00	1.60	221.10	787.90	-2.47	-5.19	1.27	0.85	0.77	-17.36	MWD
879.00	2.10	153.60	878.86	-4.92	-5.28	3.64	2.30	0.55	-74.18	MWD
969.00	2.80	140.60	968.78	-8.10	-3.15	7.20	0.99	0.78	-14.44	MWD
1060.00	4.60	164.10	1059.59	-13.33	-0.74	12.83	2.55	1.98	25.82	MWD
1151.00	4.90	163.80	1150.28	-20.57	1.34	20.36	0.33	0.33	-0.33	MWD
1242.00	5.80	160.60	1240.88	-28.64	3.95	28.80	1.04	0.99	-3.52	MWD
1333.00	7.60	162.00	1331.26	-38.70	7.34	39.36	1.99	1.98	1.54	MWD
1423.00	8.80	166.90	1420.34	-51.06	10.74	52.17	1.54	1.33	5.44	MWD
1514.00	11.80	169.00	1509.86	-66.98	14.09	68.44	3.32	3.30	2.31	MWD
1605.00	13.70	169.70	1598.61	-86.72	17.80	88.51	2.09	2.09	0.77	MWD
1696.00	15.00	168.30	1686.77	-108.85	22.11	111.05	1.48	1.43	-1.54	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM	<b>Date:</b> 07/25/2010	<b>Time:</b> 08:56:23	<b>Page:</b> 2
<b>Field:</b> Weld County, CO	<b>Co-ordinate(NE) Reference:</b> Well: 22-18, Grid North		
<b>Site:</b> Ballinger 18-18 Pad	<b>Vertical (TVD) Reference:</b> 4866'GL+13'KB 4879.0		
<b>Well:</b> 22-18	<b>Section (VS) Reference:</b> Well (0.00N,0.00E,167.28Azi)		
<b>Wellpath:</b> Original Hole	<b>Survey Calculation Method:</b> Minimum Curvature		<b>Db:</b> Sybase

### 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
1787.00	16.40	164.80	1774.38	-132.78	27.87	135.66	1.86	1.54	-3.85	MWD
1878.00	18.10	166.90	1861.28	-158.95	34.44	162.63	1.99	1.87	2.31	MWD
1969.00	19.40	166.90	1947.45	-187.44	41.07	191.88	1.43	1.43	0.00	MWD
2059.00	19.00	166.90	2032.45	-216.27	47.78	221.48	0.44	-0.44	0.00	MWD
2150.00	18.70	169.70	2118.57	-245.05	53.74	250.87	1.05	-0.33	3.08	MWD
2241.00	20.20	168.00	2204.37	-274.77	59.62	281.16	1.76	1.65	-1.87	MWD
2332.00	21.60	168.00	2289.38	-306.52	66.37	313.62	1.54	1.54	0.00	MWD
2423.00	21.60	167.30	2373.99	-339.25	73.53	347.11	0.28	0.00	-0.77	MWD
2514.00	24.50	170.10	2457.72	-374.18	80.46	382.72	3.41	3.19	3.08	MWD
2605.00	25.20	169.40	2540.29	-411.81	87.27	420.92	0.83	0.77	-0.77	MWD
2696.00	23.60	169.00	2623.16	-448.74	94.31	458.49	1.77	-1.76	-0.44	MWD
2787.00	22.50	168.30	2706.90	-483.67	101.32	494.11	1.25	-1.21	-0.77	MWD
2878.00	21.60	169.40	2791.24	-517.19	107.93	528.26	1.09	-0.99	1.21	MWD
2969.00	19.00	165.20	2876.59	-547.98	114.80	559.81	3.27	-2.86	-4.62	MWD
3060.00	16.40	163.40	2963.27	-574.62	122.25	587.43	2.92	-2.86	-1.98	MWD
3151.00	14.40	161.70	3051.00	-597.68	129.47	611.52	2.25	-2.20	-1.87	MWD
3242.00	11.40	162.40	3139.69	-617.00	135.75	631.74	3.30	-3.30	0.77	MWD
3333.00	12.10	163.10	3228.79	-634.69	141.24	650.22	0.79	0.77	0.77	MWD
3423.00	12.00	164.10	3316.80	-652.72	146.55	668.97	0.26	-0.11	1.11	MWD
3514.00	11.30	174.00	3405.94	-670.68	150.07	687.27	2.32	-0.77	10.88	MWD
3605.00	11.40	178.90	3495.16	-688.54	151.17	704.93	1.07	0.11	5.38	MWD
3696.00	12.10	174.30	3584.25	-707.03	152.29	723.21	1.28	0.77	-5.05	MWD
3787.00	15.10	168.00	3672.70	-728.12	155.71	744.53	3.67	3.30	-6.92	MWD
3878.00	14.80	168.30	3760.62	-751.09	160.53	768.00	0.34	-0.33	0.33	MWD
3969.00	15.10	165.50	3848.54	-773.95	165.85	791.47	0.86	0.33	-3.08	MWD
4059.00	13.00	164.80	3935.84	-795.07	171.44	813.31	2.34	-2.33	-0.78	MWD
4150.00	11.30	165.20	4024.80	-813.57	176.40	832.44	1.87	-1.87	0.44	MWD
4241.00	12.00	163.40	4113.92	-831.25	181.38	850.79	0.87	0.77	-1.98	MWD
4331.00	10.60	162.00	4202.18	-848.09	186.62	868.37	1.59	-1.56	-1.56	MWD
4422.00	8.60	165.20	4291.90	-862.63	190.94	883.50	2.27	-2.20	3.52	MWD
4513.00	7.60	165.90	4381.99	-875.05	194.14	896.32	1.10	-1.10	0.77	MWD
4604.00	6.00	156.00	4472.35	-885.23	197.55	907.00	2.17	-1.76	-10.88	MWD
4694.00	4.10	159.50	4562.00	-892.54	200.59	914.80	2.14	-2.11	3.89	MWD
4785.00	2.10	162.00	4652.86	-897.17	202.24	919.69	2.20	-2.20	2.75	MWD
4876.00	1.80	165.20	4743.81	-900.14	203.12	922.77	0.35	-0.33	3.52	MWD
4967.00	0.50	201.40	4834.79	-901.89	203.34	924.53	1.57	-1.43	39.78	MWD
5058.00	0.50	203.80	4925.78	-902.63	203.04	925.18	0.02	0.00	2.64	MWD
5148.00	0.40	203.10	5015.78	-903.27	202.75	925.75	0.11	-0.11	-0.78	MWD
5239.00	0.50	226.70	5106.78	-903.84	202.34	926.21	0.23	0.11	25.93	MWD
5421.00	0.40	259.00	5288.77	-904.50	201.14	926.59	0.15	-0.05	17.75	MWD
5602.00	0.70	311.10	5469.77	-903.90	199.69	925.68	0.31	0.17	28.78	MWD
5784.00	0.70	220.70	5651.76	-904.01	198.12	925.45	0.55	0.00	-49.67	MWD
5966.00	0.70	201.70	5833.74	-905.89	196.99	927.03	0.13	0.00	-10.44	MWD
6147.00	0.90	192.20	6014.73	-908.30	196.28	929.23	0.13	0.11	-5.25	MWD
6329.00	0.50	201.70	6196.71	-910.44	195.68	931.18	0.23	-0.22	5.22	MWD
6511.00	0.30	227.00	6378.71	-911.50	195.04	932.08	0.14	-0.11	13.90	MWD
6692.00	0.50	264.70	6559.70	-911.90	193.91	932.21	0.18	0.11	20.83	MWD
6874.00	0.30	277.70	6741.70	-911.91	192.64	931.94	0.12	-0.11	7.14	MWD
7056.00	2.10	26.60	6923.66	-908.86	193.66	929.20	1.22	0.99	59.84	MWD
7237.00	1.40	36.10	7104.57	-904.11	196.45	925.18	0.42	-0.39	5.25	MWD
7419.00	1.10	50.50	7286.53	-901.20	199.11	922.93	0.24	-0.16	7.91	MWD
7600.00	0.90	60.40	7467.50	-899.39	201.69	921.73	0.15	-0.11	5.47	MWD
7782.00	0.70	97.70	7649.49	-898.84	204.03	921.70	0.30	-0.11	20.49	MWD

# Allis-Chalmers Energy, Inc.

## Survey Report

<b>Company:</b> ANADARKO PETROLEUM <b>Field:</b> Weld County, CO <b>Site:</b> Ballinger 18-18 Pad <b>Well:</b> 22-18 <b>Wellpath:</b> Original Hole	<b>Date:</b> 07/25/2010 <b>Time:</b> 08:56:23 <b>Page:</b> 3 <b>Co-ordinate(NE) Reference:</b> Well: 22-18, Grid North <b>Vertical (TVD) Reference:</b> 4866'GL+13'KB 4879.0 <b>Section (VS) Reference:</b> Well (0.00N,0.00E,167.28Azi) <b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Sybase
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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
7890.00	0.90	152.20	7757.48	-899.68	205.08	922.75	0.70	0.19	50.46	MWD
7902.52	0.90	152.20	7770.00	-899.85	205.17	922.94	0.00	0.00	0.00	22-18 PBHL
7935.00	0.90	152.20	7802.47	-900.30	205.41	923.43	0.00	0.00	0.00	22-18 BHL

### Targets

Name	Description Dip. Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<---- Latitude ----><--- Longitude --->			Deg	Min	Sec	Deg	Min	Sec
22-18 SL		0.00	0.00	0.00	1326732.253156	897.46	40	13	44.062	N	104	56	17.131	W	
22-18 PBHL		7770.00	-901.32	203.45	1325830.923157	100.92	40	13	35.142	N	104	56	14.581	W	
-Circle (Radius: 50)															
22-18 BHL		7802.47	-900.30	205.41	1325831.953157	102.87	40	13	35.152	N	104	56	14.556	W	