

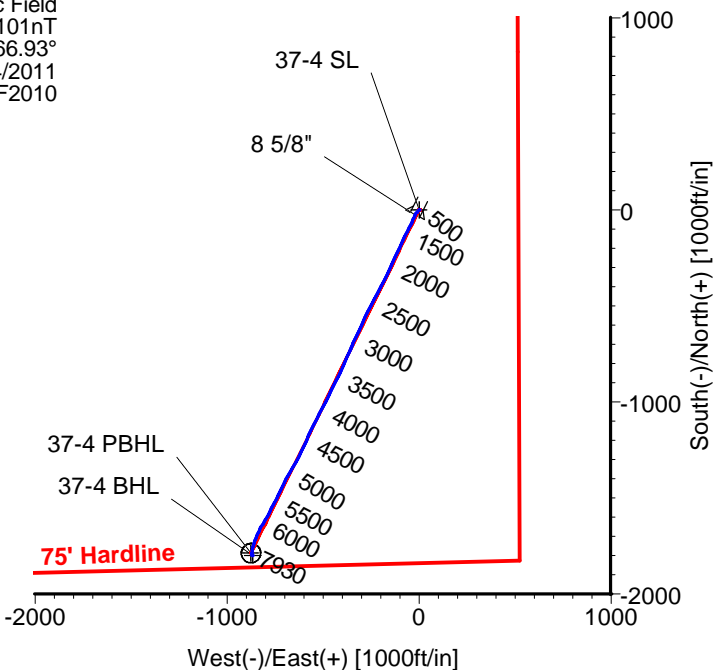
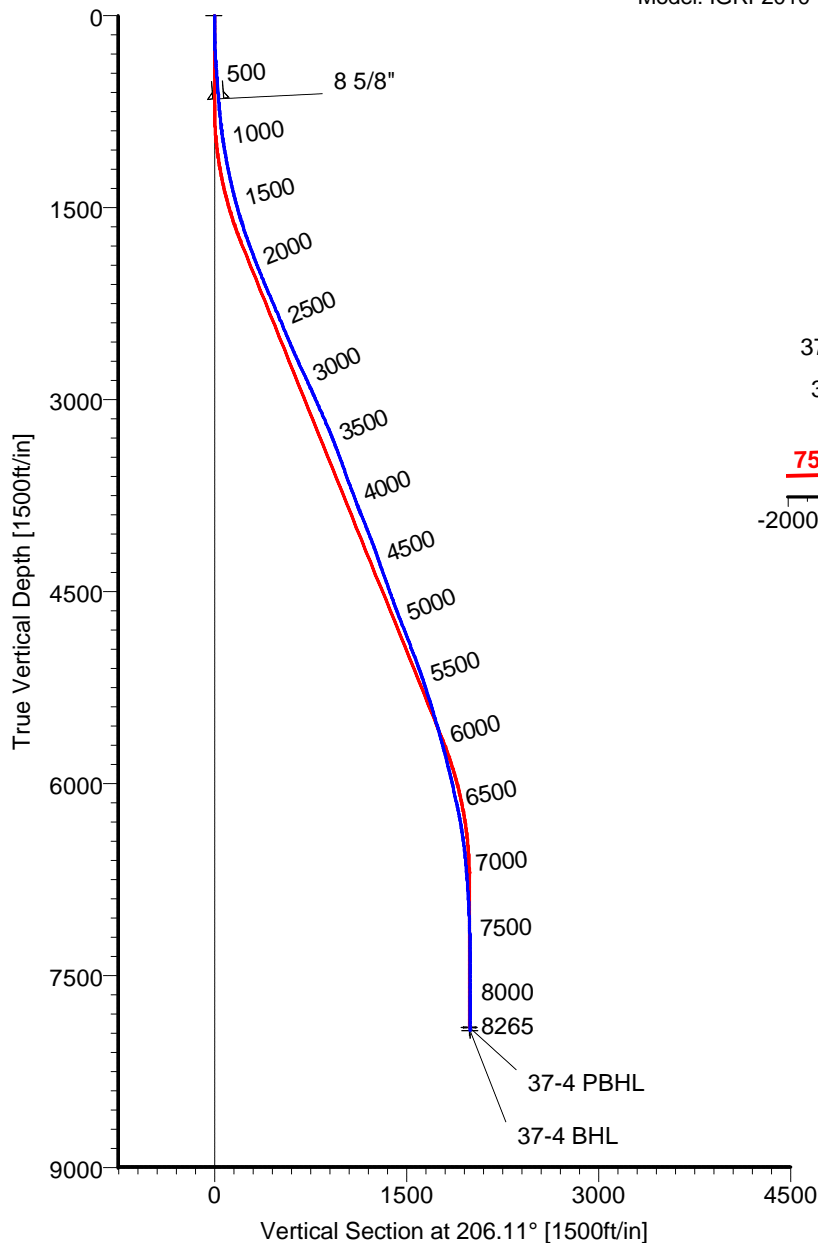
ANADARKO PETROLEUM

Field: Weld County, CO
Site: Spivey 9-4 Pad
Well: 37-4
Wellpath: Original Hole



Azimuths to Grid North
True North: -0.47°
Magnetic North: 8.40°

Magnetic Field
Strength: 53101nT
Dip Angle: 66.93°
Date: 05/14/2011
Model: IGRF2010



CASING DETAILS

No.	TVD	MD	Name	Size
1	650.83	652.00	8 5/8"	8.625

LEGEND

- 37-4, Original Hole, Plan #2
- Original Hole

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
37-4 SL	0.00	0.00	0.00	40°15'06.512N	104°46'29.268W	Point
37-4 PBHL	7905.00	-1787.78	-876.21	40°14'48.916N	104°46'40.756W	Circle (Radius: 50)
37-4 BHL	7929.54	-1799.13	-868.33	40°14'48.803N	104°46'40.656W	Point

Wellpath: (37-4/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

Created By: Ivonne Gonzalez

Date: 05/07/2011

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Spivey 9-4 Pad Well: 37-4 Wellpath: Original Hole	Date: 05/07/2011 Co-ordinate(NE) Reference: Vertical (TVD) Reference: Section (VS) Reference: Survey Calculation Method:	Time: 07:12:08 Well: 37-4, Grid North 4834'GL+15'KB 4849.0 Well (0.00N,0.00E,206.11Azi) Minimum Curvature	Page: 1 Db: Sybase
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Field: Weld County, CO	
Map System: US State Plane Coordinate System 1983 Geo Datum: GRS 1980 Sys Datum: Mean Sea Level	Map Zone: Colorado, Northern Zone Coordinate System: Well Centre Geomagnetic Model: IGRF2010

Site: Spivey 9-4 Pad Centered on 39-4 Site Position: From: Geographic Position Uncertainty: 0.00 ft Ground Level: 4834.00 ft	Northing: 1335419.65 ft Easting: 3202430.70 ft Latitude: 40 15 6.646 N Longitude: 104 46 29.158 W North Reference: Grid Grid Convergence: 0.47 deg
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Well: 37-4 Well Position: +N/-S -13.65 ft +E/-W -8.40 ft Position Uncertainty: 0.00 ft	Slot Name: 37-4 Well Position: +N/-S -13.65 ft +E/-W -8.40 ft Position Uncertainty: 0.00 ft
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Wellpath: Original Hole Current Datum: 4834'GL+15'KB Magnetic Data: 05/14/2011 Field Strength: 53101 nT Vertical Section: Depth From (TVD) ft	Drilled From: Surface Tie-on Depth: 0.00 ft Above System Datum: Mean Sea Level Declination: 8.87 deg Mag Dip Angle: 66.93 deg +N/-S ft +E/-W ft Direction deg
0.00	0.00

Survey Program for Definitive Wellpath			
Date: 05/07/2011	Validated: No	Version: 1	
Actual From ft	To ft	Survey	Toolcode Tool Name
51.00	8220.00	Survey #1 (51.00-8220.00)	MWD
8265.00	8265.00	Survey #2 (8265.00-8265.00)	Project

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
51.00	0.50	268.30	51.00	-0.01	-0.22	0.10	0.98	0.98	0.00	MWD
142.00	0.70	225.80	141.99	-0.41	-1.02	0.81	0.52	0.22	-46.70	MWD
231.00	2.60	229.70	230.95	-2.09	-2.95	3.17	2.14	2.13	4.38	MWD
321.00	3.90	218.10	320.81	-5.82	-6.39	8.04	1.61	1.44	-12.89	MWD
428.00	4.40	219.10	427.53	-11.87	-11.23	15.60	0.47	0.47	0.93	MWD
518.00	4.60	215.60	517.25	-17.48	-15.51	22.52	0.38	0.22	-3.89	MWD
607.00	4.60	209.60	605.96	-23.49	-19.35	29.60	0.54	0.00	-6.74	MWD
684.00	4.00	202.90	682.75	-28.65	-21.92	35.37	1.02	-0.78	-8.70	MWD
746.00	5.10	203.60	744.55	-33.16	-23.86	40.28	1.78	1.77	1.13	MWD
837.00	6.00	205.40	835.12	-41.17	-27.52	49.08	1.01	0.99	1.98	MWD
927.00	7.90	200.80	924.46	-51.20	-31.73	59.94	2.20	2.11	-5.11	MWD
1018.00	9.20	209.60	1014.45	-63.37	-37.55	73.43	2.02	1.43	9.67	MWD
1109.00	10.40	206.80	1104.12	-77.03	-44.85	88.90	1.42	1.32	-3.08	MWD
1200.00	11.40	208.60	1193.48	-92.26	-52.85	106.10	1.16	1.10	1.98	MWD
1290.00	12.30	206.40	1281.56	-108.65	-61.37	124.57	1.12	1.00	-2.44	MWD
1381.00	13.50	204.00	1370.26	-127.04	-70.00	144.88	1.44	1.32	-2.64	MWD
1472.00	15.00	203.30	1458.46	-147.56	-78.98	167.26	1.66	1.65	-0.77	MWD
1563.00	16.00	204.30	1546.15	-169.81	-88.80	191.56	1.14	1.10	1.10	MWD
1653.00	18.10	204.00	1632.19	-193.88	-99.59	217.93	2.34	2.33	-0.33	MWD
1744.00	19.20	205.00	1718.41	-220.36	-111.67	247.02	1.26	1.21	1.10	MWD
1835.00	20.40	207.20	1804.03	-248.03	-125.24	277.84	1.55	1.32	2.42	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Spivey 9-4 Pad Well: 37-4 Wellpath: Original Hole	Date: 05/07/2011 Co-ordinate(NE) Reference: Well: 37-4, Grid North Vertical (TVD) Reference: 4834'GL+15'KB 4849.0 Section (VS) Reference: Well (0.00N,0.00E,206.11Azi) Survey Calculation Method: Minimum Curvature	Time: 07:12:08 Page: 2 Db: 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
1926.00	20.90	205.00	1889.18	-276.85	-139.35	309.92	1.01	0.55	-2.42	MWD
2017.00	21.80	206.10	1973.94	-306.73	-153.65	343.05	1.08	0.99	1.21	MWD
2107.00	22.50	204.70	2057.30	-337.39	-168.19	376.98	0.97	0.78	-1.56	MWD
2198.00	23.20	206.80	2141.15	-369.21	-183.55	412.31	1.18	0.77	2.31	MWD
2289.00	23.40	208.20	2224.73	-401.13	-200.17	448.29	0.65	0.22	1.54	MWD
2380.00	23.20	207.90	2308.31	-432.90	-217.10	484.26	0.26	-0.22	-0.33	MWD
2471.00	23.10	206.40	2391.99	-464.73	-233.42	520.03	0.66	-0.11	-1.65	MWD
2562.00	22.70	207.50	2475.81	-496.29	-249.47	555.44	0.64	-0.44	1.21	MWD
2652.00	23.40	208.20	2558.63	-527.45	-265.93	590.66	0.84	0.78	0.78	MWD
2743.00	23.80	205.40	2642.02	-559.96	-282.35	627.08	1.31	0.44	-3.08	MWD
2834.00	25.00	204.30	2724.89	-594.07	-298.14	664.66	1.41	1.32	-1.21	MWD
2925.00	24.80	204.30	2807.43	-628.99	-313.91	702.95	0.22	-0.22	0.00	MWD
3016.00	25.30	204.30	2889.87	-664.11	-329.76	741.46	0.55	0.55	0.00	MWD
3106.00	23.60	204.00	2971.80	-698.10	-345.00	778.69	1.89	-1.89	-0.33	MWD
3197.00	24.50	204.30	3054.90	-731.94	-360.18	815.76	1.00	0.99	0.33	MWD
3288.00	23.60	204.30	3138.00	-765.74	-375.44	852.82	0.99	-0.99	0.00	MWD
3379.00	23.10	204.30	3221.54	-798.61	-390.28	888.87	0.55	-0.55	0.00	MWD
3470.00	21.60	202.60	3305.71	-830.34	-404.07	923.43	1.79	-1.65	-1.87	MWD
3561.00	20.90	206.40	3390.52	-860.35	-417.72	956.39	1.70	-0.77	4.18	MWD
3651.00	20.40	206.10	3474.74	-888.81	-431.76	988.12	0.57	-0.56	-0.33	MWD
3742.00	19.70	206.80	3560.22	-916.75	-445.65	1019.32	0.81	-0.77	0.77	MWD
3833.00	19.70	206.40	3645.90	-944.17	-459.39	1050.00	0.15	0.00	-0.44	MWD
3924.00	20.40	207.90	3731.38	-971.93	-473.63	1081.19	0.95	0.77	1.65	MWD
4015.00	20.40	206.10	3816.68	-1000.19	-488.03	1112.90	0.69	0.00	-1.98	MWD
4105.00	22.50	207.20	3900.44	-1029.60	-502.80	1145.81	2.38	2.33	1.22	MWD
4197.00	22.50	207.20	3985.44	-1060.91	-518.89	1181.01	0.00	0.00	0.00	MWD
4287.00	21.60	206.80	4068.85	-1091.01	-534.24	1214.79	1.01	-1.00	-0.44	MWD
4378.00	20.20	207.20	4153.86	-1119.94	-548.97	1247.25	1.55	-1.54	0.44	MWD
4469.00	18.70	206.40	4239.67	-1146.98	-562.64	1277.55	1.67	-1.65	-0.88	MWD
4560.00	19.90	203.60	4325.55	-1174.24	-575.33	1307.61	1.66	1.32	-3.08	MWD
4650.00	19.40	203.30	4410.31	-1202.00	-587.37	1337.84	0.57	-0.56	-0.33	MWD
4742.00	19.70	206.10	4497.01	-1229.96	-600.24	1368.61	1.07	0.33	3.04	MWD
4832.00	20.20	204.30	4581.61	-1257.75	-613.30	1399.31	0.88	0.56	-2.00	MWD
4923.00	20.90	207.20	4666.82	-1286.50	-627.19	1431.24	1.36	0.77	3.19	MWD
5014.00	21.80	209.30	4751.58	-1315.68	-642.88	1464.34	1.30	0.99	2.31	MWD
5105.00	21.30	210.00	4836.21	-1344.73	-659.41	1497.70	0.62	-0.55	0.77	MWD
5196.00	20.90	211.40	4921.11	-1372.90	-676.13	1530.36	0.71	-0.44	1.54	MWD
5286.00	21.10	209.60	5005.14	-1400.68	-692.50	1562.51	0.75	0.22	-2.00	MWD
5377.00	20.10	207.90	5090.32	-1428.75	-707.91	1594.49	1.28	-1.10	-1.87	MWD
5468.00	18.80	205.00	5176.13	-1455.86	-721.42	1624.78	1.78	-1.43	-3.19	MWD
5559.00	17.40	202.60	5262.62	-1481.71	-732.85	1653.02	1.74	-1.54	-2.64	MWD
5650.00	17.20	206.40	5349.51	-1506.32	-744.06	1680.06	1.26	-0.22	4.18	MWD
5740.00	17.20	208.20	5435.48	-1529.97	-756.26	1706.67	0.59	0.00	2.00	MWD
5831.00	16.70	206.80	5522.53	-1553.50	-768.52	1733.19	0.71	-0.55	-1.54	MWD
5922.00	15.30	207.50	5610.00	-1575.82	-779.96	1758.26	1.55	-1.54	0.77	MWD
6013.00	15.30	207.50	5697.78	-1597.12	-791.05	1782.27	0.00	0.00	0.00	MWD
6104.00	14.40	210.70	5785.74	-1617.50	-802.37	1805.55	1.34	-0.99	3.52	MWD
6194.00	14.10	213.50	5872.97	-1636.26	-814.13	1827.58	0.84	-0.33	3.11	MWD
6285.00	13.40	209.30	5961.36	-1654.70	-825.41	1849.10	1.34	-0.77	-4.62	MWD
6376.00	12.80	204.30	6050.00	-1673.09	-834.72	1869.71	1.41	-0.66	-5.49	MWD
6467.00	12.50	203.30	6138.79	-1691.32	-842.76	1889.62	0.41	-0.33	-1.10	MWD
6558.00	11.10	202.20	6227.86	-1708.47	-849.97	1908.19	1.56	-1.54	-1.21	MWD
6648.00	9.90	200.10	6316.36	-1723.76	-855.90	1924.53	1.40	-1.33	-2.33	MWD

Allis-Chalmers Energy, Inc.

Survey Report

Company: ANADARKO PETROLEUM Field: Weld County, CO Site: Spivey 9-4 Pad Well: 37-4 Wellpath: Original Hole	Date: 05/07/2011 Co-ordinate(NE) Reference: Well: 37-4, Grid North Vertical (TVD) Reference: 4834'GL+15'KB 4849.0 Section (VS) Reference: Well (0.00N,0.00E,206.11Azi) Survey Calculation Method: Minimum Curvature	Time: 07:12:08 Page: 3 Db: 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
6739.00	8.30	199.10	6406.21	-1737.32	-860.74	1938.83	1.77	-1.76	-1.10	MWD
6830.00	6.90	197.00	6496.41	-1748.75	-864.49	1950.75	1.57	-1.54	-2.31	MWD
6921.00	5.60	192.70	6586.86	-1758.31	-867.06	1960.46	1.52	-1.43	-4.73	MWD
7102.00	4.20	188.50	6767.20	-1773.48	-869.98	1975.37	0.80	-0.77	-2.32	MWD
7193.00	3.50	188.90	6857.99	-1779.52	-870.90	1981.20	0.77	-0.77	0.44	MWD
7284.00	3.20	186.80	6948.84	-1784.79	-871.63	1986.25	0.36	-0.33	-2.31	MWD
7375.00	2.60	180.80	7039.72	-1789.37	-871.96	1990.52	0.74	-0.66	-6.59	MWD
7466.00	2.30	172.30	7130.64	-1793.25	-871.75	1993.90	0.52	-0.33	-9.34	MWD
7556.00	1.80	173.80	7220.58	-1796.44	-871.35	1996.59	0.56	-0.56	1.67	MWD
7647.00	0.50	187.80	7311.56	-1798.26	-871.25	1998.18	1.45	-1.43	15.38	MWD
7738.00	0.40	189.90	7402.56	-1798.96	-871.36	1998.86	0.11	-0.11	2.31	MWD
7829.00	0.40	154.40	7493.55	-1799.56	-871.28	1999.36	0.27	0.00	-39.01	MWD
8011.00	0.50	86.60	7675.55	-1800.09	-870.21	1999.37	0.28	0.05	-37.25	MWD
8192.00	0.50	47.50	7856.54	-1799.51	-868.84	1998.24	0.18	0.00	-21.60	MWD
8220.00	0.50	55.60	7884.54	-1799.35	-868.65	1998.02	0.25	0.00	28.93	MWD
8240.46	0.50	55.60	7905.00	-1799.25	-868.50	1997.87	0.00	0.00	0.00	37-4 PBHL
8265.00	0.50	55.60	7929.54	-1799.13	-868.33	1997.68	0.00	0.00	0.00	37-4 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		
37-4 SL			0.00	0.00	0.00	1335406.00	3202422.30	40	15	6.512 N	104	46	29.268 W
37-4 PBHL			7905.00	-1787.78	-876.21	1333618.22	3201546.09	40	14	48.916 N	104	46	40.756 W
-Circle (Radius: 50)													
37-4 BHL			7929.54	-1799.13	-868.33	1333606.87	3201553.97	40	14	48.803 N	104	46	40.656 W