



Scientific Drilling Survey Report

SUR: H-36-20s-37e, 2374/N & 511/E
BHL: H-36-20s-37e, 1905/N & 92/E
API # 30-025-26624

Company: ConocoPhillips	Date: 10/29/2004	Time: 08:17:34	Page: 1
Field: Hardy 36 State	Co-ordinate(NE) Reference:	Site: Lea County, TX, Grid North	
Site: Lea County, TX	Vertical (TVD) Reference:	SITE 0.0	
Well: Hardy 36 State #28	Section (VS) Reference:	Well (0.00N,0.00E,41.88Azi)	
Wellpath: 1	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Hardy 36 State

Map System: US State Plane Coordinate System 1983
Geo Datum: GRS 1980
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Eastern Zone
Coordinate System: Site Centre
Geomagnetic Model: Wmm_2000

Site: Lea County, TX

Site Position:	Northing: 558421.00 ft	Latitude: 32 31 52.194 N
From: Map	Easting: 850058.00 ft	Longitude: 103 19 53.874 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 0.00 ft		Grid Convergence: 0.54 deg

Well: Hardy 36 State #28

Slot Name:

Well Position: +N/-S 0.00 ft	Northing: 558421.00 ft	Latitude: 32 31 52.194 N
+E/-W 0.00 ft	Easting: 850058.00 ft	Longitude: 103 19 53.874 W
Position Uncertainty: 0.00 ft		

Wellpath: 1

Current Datum: SITE	Height 0.00 ft	Drilled From: Surface
Magnetic Data: 5/12/2004		Tie-on Depth: 0.00 ft
Field Strength: 49710 nT		Above System Datum: Mean Sea Level
Vertical Section: Depth From (TVD)	+N/-S	Declination: 8.38 deg
ft	ft	Mag Dip Angle: 60.78 deg
		+E/-W
		ft
		Direction
		deg
0.00	0.00	0.00 41.88

Survey Program for Definitive Wellpath

Date: 10/29/2004	Validated: No	Version: 0
Actual From ft	To ft	Toolcode
100.00	5588.00	Gyro (100.00-5588.00)
5712.00	8072.00	MWD (5712.00-8072.00)
		Tool Name
		Keeper
		MWD
		Keeper Standard Rate Gyro
		MWD - Standard ISCWSA

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	359.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
100.00	0.47	47.05	100.00	0.28	0.30	0.41	0.47	0.47	0.00	Keeper
200.00	0.46	47.16	200.00	0.83	0.89	1.22	0.01	-0.01	0.11	Keeper
300.00	0.52	44.75	299.99	1.43	1.51	2.07	0.06	0.06	-2.41	Keeper
400.00	0.52	43.14	399.99	2.08	2.14	2.98	0.01	0.00	-1.61	Keeper
500.00	0.46	44.03	499.98	2.70	2.73	3.83	0.06	-0.06	0.89	Keeper
600.00	0.43	48.60	599.98	3.24	3.29	4.61	0.05	-0.03	4.57	Keeper
700.00	0.25	62.72	699.98	3.59	3.76	5.18	0.20	-0.18	14.12	Keeper
800.00	0.30	104.51	799.98	3.62	4.21	5.51	0.20	0.05	41.79	Keeper
900.00	0.37	114.27	899.98	3.42	4.76	5.72	0.09	0.07	9.76	Keeper
1000.00	0.25	133.41	999.98	3.14	5.21	5.82	0.16	-0.12	19.14	Keeper
1100.00	0.32	135.74	1099.97	2.79	5.56	5.79	0.07	0.07	2.33	Keeper
1200.00	0.28	126.83	1199.97	2.44	5.96	5.79	0.06	-0.04	-8.91	Keeper
1300.00	0.33	94.81	1299.97	2.27	6.44	5.99	0.17	0.05	-32.02	Keeper
1400.00	0.36	114.52	1399.97	2.12	7.01	6.26	0.12	0.03	19.71	Keeper
1500.00	0.82	93.62	1499.96	1.94	8.01	6.79	0.50	0.46	-20.90	Keeper
1600.00	1.09	90.96	1599.95	1.88	9.68	7.86	0.27	0.27	-2.66	Keeper
1700.00	1.29	89.53	1699.93	1.87	11.75	9.24	0.20	0.20	-1.43	Keeper
1800.00	1.33	89.09	1799.90	1.90	14.04	10.79	0.04	0.04	-0.44	Keeper
1900.00	1.41	82.84	1899.87	2.07	16.42	12.50	0.17	0.08	-6.25	Keeper
2000.00	1.52	82.26	1999.84	2.41	18.95	14.44	0.11	0.11	-0.58	Keeper
2100.00	1.96	73.97	2099.79	3.06	21.91	16.90	0.51	0.44	-8.29	Keeper



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Well: Hardy 36 State #28	Section (VS) Reference:	Well (0.00N,0.00E,41.88Azi)	
Wellpath: 1	Survey Calculation Method:	Minimum Curvature	Db: 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
2200.00	2.05	76.16	2199.73	3.96	25.29	19.83	0.12	0.09	2.19	Keeper
2300.00	2.45	76.64	2299.66	4.88	29.11	23.06	0.40	0.40	0.48	Keeper
2400.00	2.60	76.42	2399.56	5.90	33.39	26.69	0.15	0.15	-0.22	Keeper
2500.00	3.60	74.70	2499.41	7.27	38.63	31.19	1.00	1.00	-1.72	Keeper
2600.00	3.96	73.34	2599.19	9.08	44.96	36.78	0.37	0.36	-1.36	Keeper
2700.00	4.12	74.01	2698.95	11.06	51.72	42.77	0.17	0.16	0.67	Keeper
2800.00	3.52	70.02	2798.72	13.10	58.06	48.51	0.66	-0.60	-3.99	Keeper
2900.00	3.04	69.89	2898.56	15.06	63.44	53.56	0.48	-0.48	-0.13	Keeper
3000.00	2.77	67.41	2998.43	16.90	68.16	58.08	0.30	-0.27	-2.48	Keeper
3100.00	2.36	69.00	3098.33	18.57	72.31	62.10	0.42	-0.41	1.59	Keeper
3200.00	1.94	68.62	3198.26	19.92	75.81	65.44	0.42	-0.42	-0.38	Keeper
3300.00	1.63	70.22	3298.21	21.02	78.72	68.20	0.31	-0.31	1.60	Keeper
3400.00	1.59	72.16	3398.17	21.93	81.38	70.65	0.07	-0.04	1.94	Keeper
3500.00	1.51	69.10	3498.13	22.82	83.93	73.02	0.12	-0.08	-3.06	Keeper
3600.00	1.45	65.03	3598.10	23.83	86.31	75.36	0.12	-0.06	-4.07	Keeper
3700.00	1.19	63.78	3698.07	24.82	88.39	77.49	0.26	-0.26	-1.25	Keeper
3800.00	0.83	66.87	3798.06	25.56	89.99	79.11	0.36	-0.36	3.09	Keeper
3900.00	0.80	64.18	3898.05	26.15	91.28	80.41	0.05	-0.03	-2.69	Keeper
4000.00	0.84	63.09	3998.04	26.79	92.57	81.74	0.04	0.04	-1.09	Keeper
4100.00	0.77	67.35	4098.03	27.38	93.84	83.03	0.09	-0.07	4.26	Keeper
4200.00	0.78	69.21	4198.02	27.88	95.10	84.24	0.03	0.01	1.86	Keeper
4300.00	0.84	70.51	4298.01	28.36	96.42	85.49	0.06	0.06	1.30	Keeper
4400.00	0.68	53.10	4398.00	28.97	97.59	86.71	0.28	-0.16	-17.41	Keeper
4500.00	0.60	20.91	4497.99	29.81	98.25	87.78	0.36	-0.08	-32.19	Keeper
4600.00	0.59	22.48	4597.99	30.78	98.63	88.76	0.02	-0.01	1.57	Keeper
4700.00	0.60	21.06	4697.98	31.74	99.02	89.73	0.02	0.01	-1.42	Keeper
4800.00	0.48	23.07	4797.98	32.61	99.37	90.62	0.12	-0.12	2.01	Keeper
4900.00	0.42	29.43	4897.98	33.32	99.72	91.37	0.08	-0.06	6.36	Keeper
5000.00	0.50	4.51	4997.97	34.07	99.93	92.08	0.21	0.08	-24.92	Keeper
5100.00	0.51	6.42	5097.97	34.95	100.01	92.79	0.02	0.01	1.91	Keeper
5200.00	0.49	4.00	5197.97	35.82	100.09	93.49	0.03	-0.02	-2.42	Keeper
5300.00	0.62	2.74	5297.96	36.79	100.15	94.24	0.13	0.13	-1.26	Keeper
5400.00	0.73	16.08	5397.95	37.94	100.35	95.24	0.19	0.11	13.34	Keeper
5500.00	0.75	27.11	5497.95	39.13	100.83	96.44	0.14	0.02	11.03	Keeper
5588.00	0.85	49.40	5585.94	40.07	101.58	97.65	0.37	0.11	25.33	Keeper
5712.00	1.50	39.20	5709.91	41.93	103.31	100.18	0.55	0.52	-8.23	MWD
5776.00	2.50	31.60	5773.87	43.76	104.57	102.39	1.61	1.56	-11.87	MWD
5840.00	3.90	31.80	5837.77	46.80	106.45	105.91	2.19	2.19	0.31	MWD
5904.00	5.00	34.50	5901.58	50.95	109.17	110.82	1.75	1.72	4.22	MWD
5999.00	5.60	33.10	5996.17	58.25	114.05	119.50	0.65	0.63	-1.47	MWD
6067.00	6.70	35.00	6063.78	64.28	118.14	126.72	1.64	1.62	2.79	MWD
6163.00	7.70	37.50	6159.02	73.97	125.26	138.69	1.09	1.04	2.60	MWD
6257.00	7.80	35.20	6252.16	84.17	132.78	151.31	0.35	0.11	-2.45	MWD
6322.00	9.10	33.90	6316.45	92.05	138.18	160.78	2.02	2.00	-2.00	MWD
6385.00	9.30	35.60	6378.64	100.32	143.93	170.77	0.54	0.32	2.70	MWD
6449.00	10.10	37.90	6441.73	108.95	150.38	181.51	1.39	1.25	3.59	MWD
6512.00	11.10	38.60	6503.65	118.05	157.56	193.08	1.60	1.59	1.11	MWD
6640.00	14.80	34.60	6628.38	141.15	174.54	221.61	2.97	2.89	-3.12	MWD
6704.00	16.30	35.30	6690.03	155.21	184.37	238.64	2.36	2.34	1.09	MWD
6767.00	16.90	37.50	6750.41	169.69	195.05	256.55	1.38	0.95	3.49	MWD
6863.00	17.10	36.50	6842.21	192.10	211.94	284.52	0.37	0.21	-1.04	MWD
6926.00	17.00	37.00	6902.44	206.90	223.00	302.91	0.28	-0.16	0.79	MWD
6990.00	17.00	37.50	6963.65	221.80	234.32	321.56	0.23	0.00	0.78	MWD



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Site: Lea County, TX
Well: Hardy 36 State #28
Wellpath: 1

Date: 10/29/2004 **Time:** 08:17:34 **Page:** 3
Co-ordinate(NE) Reference: Site: Lea County, TX, Grid North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,41.88Azi)
Survey Calculation Method: Minimum Curvature **Db:** 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
7086.00	16.50	36.90	7055.57	243.83	251.05	349.14	0.55	-0.52	-0.62	MWD
7150.00	17.80	38.10	7116.73	258.80	262.54	367.95	2.11	2.03	1.87	MWD
7214.00	17.80	37.70	7177.66	274.24	274.56	387.47	0.19	0.00	-0.62	MWD
7340.00	17.60	36.70	7297.70	304.75	297.72	425.65	0.29	-0.16	-0.79	MWD
7468.00	17.10	36.00	7419.88	335.49	320.35	463.64	0.42	-0.39	-0.55	MWD
7521.00	17.40	35.80	7470.49	348.22	329.57	479.27	0.58	0.57	-0.38	MWD
7649.00	16.80	34.90	7592.83	378.92	351.35	516.67	0.51	-0.47	-0.70	MWD
7744.00	16.50	35.90	7683.85	401.10	367.11	543.71	0.44	-0.32	1.05	MWD
7807.00	16.50	35.10	7744.26	415.67	377.50	561.49	0.36	0.00	-1.27	MWD
7903.00	15.40	36.90	7836.56	437.02	392.99	587.73	1.26	-1.15	1.87	MWD
7999.00	13.40	40.00	7929.54	455.73	407.80	611.55	2.23	-2.08	3.23	MWD
8072.00	13.40	40.00	8000.55	468.69	418.67	628.46	0.00	0.00	0.00	MWD

