



Scientific Drilling Houston

Final Survey Report



Company: EL PASO PRODUCTION	Date: 4/12/2005	Time: 11:15:31	Page: 1
Field: VERMEJO FIELD, NEW MEXICO	Co-ordinate(NE) Reference: Well: WELL D-190, Grid North		
Site: RATON (D190)	Vertical (TVD) Reference: SITE 0.0		
Well: WELL D-190	Section (VS) Reference: Well (0.00N,0.00E,270.00Azi)		
Wellpath: LOWER	Survey Calculation Method: Minimum Curvature	Db: Sybase	

Field: VERMEJO FIELD, NEW MEXICO			
Map System: US State Plane Coordinate System 1927		Map Zone: New Mexico, Eastern Zone	
Geo Datum: NAD27 (Clarke 1866)		Coordinate System: Well Centre	
Sys Datum: Mean Sea Level		Geomagnetic Model: igrf2005	

Site: RATON (D190)			
Site Position:	Northing: 2154230.3580 ft	Latitude: 36 55 4.130 N	
From: Map	Easting: 276281.0895 ft	Longitude: 105 5 55.070 W	
Position Uncertainty: 0.0 ft		North Reference: Grid	
Ground Level: 8116.0 ft		Grid Convergence: -0.46 deg	

Well: WELL D-190			
Slot Name:			
Well Position:	+N/-S 0.0 ft	Northing: 2154230.3580 ft	Latitude: 36 55 4.130 N
	+E/-W 0.0 ft	Easting: 276281.0895 ft	Longitude: 105 5 55.070 W
Position Uncertainty: 0.0 ft			

Wellpath: LOWER			
Current Datum: SITE	Height 0.0 ft	Drilled From: Surface	
Magnetic Data: 3/2/2005		Tie-on Depth: 0.0 ft	
Field Strength: 51883 nT		Above System Datum: Mean Sea Level	
Vertical Section: Depth From (TVD)	+N/-S ft	Declination: 9.48 deg	
		Mag Dip Angle: 64.28 deg	
		+E/-W ft	Direction deg
	0.0	0.0	270.00

Survey										
MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	ClsD ft	ClsA deg	Tool
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	TIE LINE
100.0	0.19	185.55	100.0	-0.2	0.0	0.0	0.19	0.2	185.55	SDI Keeper
200.0	0.86	352.66	200.0	0.4	-0.1	0.1	1.05	0.4	342.84	SDI Keeper
300.0	1.42	325.63	300.0	2.2	-0.9	0.9	0.76	2.4	337.06	SDI Keeper
400.0	1.21	321.33	400.0	4.0	-2.3	2.3	0.23	4.6	330.46	SDI Keeper
500.0	0.86	318.36	499.9	5.4	-3.4	3.4	0.35	6.4	327.56	SDI Keeper
600.0	0.78	322.56	599.9	6.5	-4.4	4.4	0.10	7.8	326.25	SDI Keeper
700.0	0.98	316.32	699.9	7.7	-5.4	5.4	0.22	9.4	325.08	SDI Keeper
800.0	0.90	317.66	799.9	8.9	-6.5	6.5	0.08	11.0	323.87	SDI Keeper
875.0	0.94	322.29	874.9	9.8	-7.3	7.3	0.11	12.2	323.49	SDI Keeper
900.0	3.10	300.01	899.9	10.3	-8.0	8.0	9.03	13.0	322.29	SDI E-FIELD
931.0	16.20	286.00	930.4	11.9	-12.9	12.9	42.62	17.5	312.80	SDI E-FIELD
962.0	28.42	288.01	959.0	15.4	-24.1	24.1	39.49	28.6	302.60	SDI E-FIELD
994.0	41.52	287.90	985.2	21.0	-41.5	41.5	40.94	46.5	296.89	SDI E-FIELD
1026.0	54.38	288.10	1006.5	28.4	-64.0	64.0	40.19	70.0	293.89	SDI E-FIELD
1057.0	67.12	288.35	1021.7	36.8	-89.7	89.7	41.10	96.9	292.32	SDI E-FIELD
1088.0	80.98	289.45	1030.2	46.5	-117.8	117.8	44.84	126.6	291.52	SDI E-FIELD
1117.0	92.29	287.50	1031.9	55.6	-145.2	145.2	39.57	155.5	290.95	SDI E-FIELD
1148.0	91.48	283.56	1030.8	63.9	-175.1	175.1	12.97	186.4	290.05	SDI E-FIELD
1180.0	89.90	279.21	1030.5	70.2	-206.4	206.4	14.46	218.0	288.79	SDI E-FIELD
1209.0	89.29	275.23	1030.7	73.9	-235.2	235.2	13.88	246.5	287.44	SDI E-FIELD
1241.0	88.96	270.42	1031.2	75.4	-267.1	267.1	15.06	277.6	285.77	SDI E-FIELD
1273.0	89.90	267.21	1031.5	74.8	-299.1	299.1	10.45	308.3	284.04	SDI E-FIELD
1304.0	92.92	267.32	1030.7	73.3	-330.1	330.1	9.75	338.1	282.52	SDI E-FIELD
1335.0	90.74	268.99	1029.7	72.3	-361.0	361.0	8.86	368.2	281.32	SDI E-FIELD
1366.0	90.71	272.04	1029.3	72.6	-392.0	392.0	9.84	398.7	280.49	SDI E-FIELD
1398.0	90.64	273.33	1028.9	74.1	-424.0	424.0	4.04	430.4	279.91	SDI E-FIELD
1430.0	87.75	270.76	1029.4	75.2	-456.0	456.0	12.08	462.1	279.37	SDI E-FIELD



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el paso Production

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Wellpath: LOWER

Date: 4/12/2005 Time: 11:15:31 Page: 2
Co-ordinate(NE) Reference: Well: WELL D-190, Grid North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,270.00Azi)
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	ClsD ft	ClsA deg	Tool
1460.0	87.07	267.11	1030.8	74.7	-485.9	485.9	12.36	491.6	278.74	SDI E-FIELD
1491.0	89.83	263.15	1031.6	72.0	-516.8	516.8	15.57	521.8	277.94	SDI E-FIELD
1523.0	91.04	260.63	1031.3	67.5	-548.5	548.5	8.74	552.6	277.02	SDI E-FIELD
1554.0	88.39	257.74	1031.5	61.7	-578.9	578.9	12.65	582.2	276.08	SDI E-FIELD
1584.0	88.55	254.78	1032.3	54.6	-608.0	608.0	9.88	610.5	275.13	SDI E-FIELD
1615.0	89.87	258.45	1032.7	47.4	-638.2	638.2	12.58	639.9	274.25	SDI E-FIELD
1646.0	91.61	261.46	1032.3	42.0	-668.7	668.7	11.21	670.0	273.59	SDI E-FIELD
1678.0	91.72	262.74	1031.4	37.6	-700.4	700.4	4.01	701.4	273.07	SDI E-FIELD
1709.0	90.17	259.98	1030.9	33.0	-731.0	731.0	10.21	731.8	272.58	SDI E-FIELD
1741.0	89.70	256.76	1030.9	26.5	-762.4	762.4	10.17	762.8	271.99	SDI E-FIELD
1772.0	91.41	255.99	1030.6	19.2	-792.5	792.5	6.05	792.7	271.39	SDI E-FIELD
1804.0	92.69	259.72	1029.5	12.5	-823.7	823.7	12.32	823.8	270.87	SDI E-FIELD
1835.0	91.24	262.56	1028.4	7.7	-854.4	854.4	10.28	854.4	270.52	SDI E-FIELD
1866.0	89.63	263.60	1028.2	4.0	-885.1	885.1	6.18	885.1	270.26	SDI E-FIELD
1897.0	89.16	260.27	1028.5	-0.4	-915.8	915.8	10.85	915.8	269.98	SDI E-FIELD
1929.0	89.76	256.10	1028.8	-6.9	-947.1	947.1	13.16	947.2	269.58	SDI E-FIELD
1961.0	90.30	254.54	1028.8	-15.0	-978.1	978.1	5.16	978.2	269.12	SDI E-FIELD
1992.0	91.71	257.77	1028.3	-22.5	-1008.2	1008.2	11.37	1008.4	268.72	SDI E-FIELD
2022.0	91.92	261.24	1027.3	-27.9	-1037.7	1037.7	11.58	1038.0	268.46	SDI E-FIELD
2053.0	92.56	264.34	1026.1	-31.8	-1068.4	1068.4	10.20	1068.9	268.29	SDI E-FIELD
2084.0	92.29	267.58	1024.8	-34.0	-1099.3	1099.3	10.48	1099.8	268.23	SDI E-FIELD
2116.0	90.47	270.09	1024.0	-34.6	-1131.3	1131.3	9.69	1131.8	268.25	SDI E-FIELD
2147.0	89.43	271.94	1024.0	-34.1	-1162.2	1162.2	6.85	1162.7	268.32	SDI E-FIELD
2178.0	89.80	275.43	1024.2	-32.1	-1193.2	1193.2	11.32	1193.6	268.46	SDI E-FIELD
2210.0	92.22	274.90	1023.7	-29.2	-1225.0	1225.0	7.74	1225.4	268.63	SDI E-FIELD
2241.0	92.05	271.17	1022.5	-27.6	-1256.0	1256.0	12.04	1256.3	268.74	SDI E-FIELD
2272.0	91.75	268.57	1021.5	-27.6	-1286.9	1286.9	8.44	1287.2	268.77	SDI E-FIELD
2304.0	90.40	266.46	1020.9	-29.0	-1318.9	1318.9	7.83	1319.2	268.74	SDI E-FIELD
2335.0	90.00	269.20	1020.8	-30.2	-1349.9	1349.9	8.93	1350.2	268.72	SDI E-FIELD
2368.0	92.32	271.80	1020.1	-29.9	-1382.9	1382.9	10.56	1383.2	268.76	SDI E-FIELD
2400.0	92.65	274.99	1018.7	-28.0	-1414.8	1414.8	10.01	1415.1	268.87	SDI E-FIELD
2430.0	90.00	273.95	1018.0	-25.7	-1444.7	1444.7	9.49	1444.9	268.98	SDI E-FIELD
2461.0	88.82	271.12	1018.4	-24.3	-1475.6	1475.6	9.89	1475.8	269.06	SDI E-FIELD
2492.0	90.00	269.04	1018.7	-24.3	-1506.6	1506.6	7.71	1506.8	269.08	SDI E-FIELD
2523.0	89.36	267.72	1018.8	-25.2	-1537.6	1537.6	4.73	1537.8	269.06	SDI E-FIELD
2555.0	90.30	270.70	1018.9	-25.6	-1569.6	1569.6	9.76	1569.8	269.07	SDI E-FIELD
2586.0	91.28	274.64	1018.5	-24.2	-1600.6	1600.6	13.10	1600.8	269.14	SDI E-FIELD
2618.0	92.49	276.22	1017.5	-21.1	-1632.4	1632.4	6.22	1632.5	269.26	SDI E-FIELD
2649.0	91.11	273.33	1016.5	-18.5	-1663.3	1663.3	10.33	1663.4	269.36	SDI E-FIELD
2681.0	90.34	269.93	1016.1	-17.6	-1695.3	1695.3	10.89	1695.4	269.40	SDI E-FIELD
2712.0	90.64	267.48	1015.8	-18.3	-1726.3	1726.3	7.96	1726.3	269.39	SDI E-FIELD
2743.0	91.98	271.94	1015.1	-18.5	-1757.2	1757.2	15.02	1757.3	269.40	SDI E-FIELD
2775.0	92.25	275.43	1013.9	-16.4	-1789.1	1789.1	10.93	1789.2	269.47	SDI E-FIELD
2806.0	90.91	276.92	1013.1	-13.1	-1819.9	1819.9	6.46	1820.0	269.59	SDI E-FIELD
2838.0	90.60	279.13	1012.7	-8.6	-1851.6	1851.6	6.97	1851.7	269.73	SDI E-FIELD
2870.0	88.32	276.37	1013.0	-4.3	-1883.3	1883.3	11.19	1883.3	269.87	SDI E-FIELD
2901.0	87.58	273.16	1014.1	-1.8	-1914.2	1914.2	10.62	1914.2	269.95	SDI E-FIELD
2933.0	89.66	271.02	1014.8	-0.6	-1946.2	1946.2	9.32	1946.2	269.98	SDI E-FIELD
2965.0	89.90	267.99	1015.0	-0.9	-1978.2	1978.2	9.50	1978.2	269.98	SDI E-FIELD
2996.0	89.63	265.54	1015.1	-2.6	-2009.1	2009.1	7.95	2009.1	269.93	SDI E-FIELD
3028.0	91.51	268.36	1014.8	-4.3	-2041.1	2041.1	10.59	2041.1	269.88	SDI E-FIELD
3058.0	92.08	272.09	1013.8	-4.2	-2071.0	2071.0	12.57	2071.0	269.88	SDI E-FIELD



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Wellpath: LOWER

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Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	ClsD ft	ClsA deg	Tool
3089.0	91.75	273.97	1012.8	-2.6	-2102.0	2102.0	6.15	2102.0	269.93	SDI E-FIELD
3121.0	89.82	272.34	1012.3	-0.8	-2133.9	2133.9	7.89	2133.9	269.98	SDI E-FIELD
3152.0	89.60	269.43	1012.5	-0.3	-2164.9	2164.9	9.41	2164.9	269.99	SDI E-FIELD
3183.0	88.02	267.83	1013.2	-1.1	-2195.9	2195.9	7.25	2195.9	269.97	SDI E-FIELD
3215.0	88.42	270.94	1014.1	-1.4	-2227.9	2227.9	9.79	2227.9	269.96	SDI E-FIELD
3245.0	90.60	271.48	1014.4	-0.8	-2257.9	2257.9	7.49	2257.9	269.98	SDI E-FIELD
3275.0	90.60	271.48	1014.1	0.0	-2287.9	2287.9	0.00	2287.9	270.00	PROJECTED DEPTH



Scientific Drilling

EL PASO PRODUCTION

RATON WELL D-190
LOWER LATERAL
VERMEJO FIELD, NEW MEXICO



ALL DEPTHS SHOWN ARE
MEASURED DEPTHS

