



Scientific Drilling Houston

Final Survey Report

el paso | Production

Company: EL PASO PRODUCTION	Date: 3/18/2005	Time: 10:33:42	Page: 1
Field: VERMEJO FIELD, NEW MEXICO	Co-ordinate(NE) Reference: Well: WELL D-193, Grid North		
Site: RATON (D193)	Vertical (TVD) Reference: SITE 0.0		
Well: WELL D-193	Section (VS) Reference: Well (0.00N,0.00E,319.00Azi)		
Wellpath: LATERAL	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 (D193)			
SECTION 23, T31N-R17E			
Site Position:	Northing:	ft	Latitude:
From: Lease Line	Easting:	ft	Longitude:
Position Uncertainty: 0.0 ft			North Reference: Grid
Ground Level: 8240.0 ft			Grid Convergence: -0.46 deg

Well: WELL D-193				Slot Name:			
Well Position:	+N/-S	0.0 ft	Northing: 2151470.1619 ft	Latitude:	36 54	36.750 N	
	+E/-W	0.0 ft	Easting: 275177.9426 ft	Longitude:	105 6	8.380 W	
Position Uncertainty: 0.0 ft							

Wellpath: LATERAL				Drilled From: Surface			
				Tie-on Depth: 0.0 ft			
Current Datum: SITE				Above System Datum: Mean Sea Level			
Magnetic Data: 3/1/2005				Declination: 9.49 deg			
Field Strength: 51879 nT				Mag Dip Angle: 64.27 deg			
Vertical Section: Depth From (TVD)				+N/-S			
ft				ft			
0.0				0.0			
				ft			
				ft			
				deg			
				deg			
0.0				0.0			
				0.0			
				319.00			

Survey										
MD	Incl	Azlm	TVD	N/S	E/W	VS	DLS	ChD	ChA	Tool
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	TIE LINE
100.0	0.31	235.12	100.0	-0.2	-0.2	0.0	0.31	0.3	235.12	SDI Keeper
200.0	0.12	22.17	200.0	-0.2	-0.4	0.1	0.42	0.5	242.28	SDI Keeper
300.0	1.88	301.15	300.0	0.7	-1.8	1.7	1.87	1.9	292.51	SDI Keeper
400.0	1.95	324.12	399.9	3.0	-4.2	5.0	0.77	5.1	305.37	SDI Keeper
500.0	1.55	343.94	499.9	5.6	-5.5	7.9	0.72	7.9	315.50	SDI Keeper
600.0	1.25	13.57	599.9	8.0	-5.7	9.7	0.77	9.8	324.72	SDI Keeper
700.0	1.64	38.73	699.8	10.2	-4.5	10.6	0.74	11.1	336.10	SDI Keeper
800.0	1.44	26.70	799.8	12.4	-3.0	11.4	0.38	12.8	346.20	SDI Keeper
900.0	1.07	40.50	899.8	14.2	-1.9	12.0	0.48	14.4	352.49	SDI Keeper
1000.0	1.11	46.42	999.7	15.6	-0.6	12.2	0.12	15.6	357.91	SDI Keeper
1038.0	3.88	322.45	1037.7	16.9	-1.1	13.5	10.32	16.9	356.32	SDI E-FIELD
1054.0	9.37	302.34	1053.6	18.0	-2.5	15.3	36.74	18.2	352.05	SDI E-FIELD
1085.0	21.00	300.58	1083.5	22.2	-9.5	23.0	37.54	24.1	336.94	SDI E-FIELD
1116.0	30.90	294.94	1111.3	28.4	-21.5	35.5	32.87	35.6	322.90	SDI E-FIELD
1147.0	38.71	304.36	1136.8	37.3	-36.7	52.2	30.52	52.3	315.40	SDI E-FIELD
1178.0	46.20	294.81	1158.6	47.4	-54.9	71.9	31.82	72.6	310.81	SDI E-FIELD
1210.0	57.60	302.39	1179.4	59.6	-76.9	95.4	40.16	97.3	307.76	SDI E-FIELD
1241.0	68.74	304.94	1193.3	74.9	-99.9	122.1	36.67	124.9	306.87	SDI E-FIELD
1270.0	78.50	305.32	1201.5	90.9	-122.6	149.1	33.68	152.6	306.55	SDI E-FIELD
1301.0	85.63	308.66	1205.8	109.4	-147.1	179.1	25.35	183.3	306.63	SDI E-FIELD
1332.0	88.15	310.63	1207.5	129.1	-171.0	209.6	10.31	214.2	307.06	SDI E-FIELD
1363.0	87.78	314.24	1208.6	150.0	-193.8	240.4	11.70	245.1	307.74	SDI E-FIELD
1395.0	88.93	317.84	1209.5	173.0	-216.0	272.3	11.81	276.8	308.70	SDI E-FIELD
1426.0	90.07	320.67	1209.8	196.5	-236.2	303.3	9.84	307.3	309.76	SDI E-FIELD
1458.0	90.71	324.05	1209.5	221.9	-255.8	335.2	10.75	338.6	310.94	SDI E-FIELD
1490.0	90.94	327.52	1209.1	248.3	-273.8	367.0	10.87	369.6	312.21	SDI E-FIELD
1521.0	91.58	331.08	1208.4	275.0	-289.6	397.5	11.67	399.3	313.52	SDI E-FIELD



Scientific Drilling Houston

Final Survey Report

el paso | Production

Company: EL PASO PRODUCTION
Field: VERMEJO FIELD, NEW MEXICO
Site: RATON (D193)
Well: WELL D-193
Wellpath: LATERAL

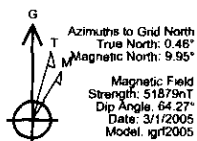
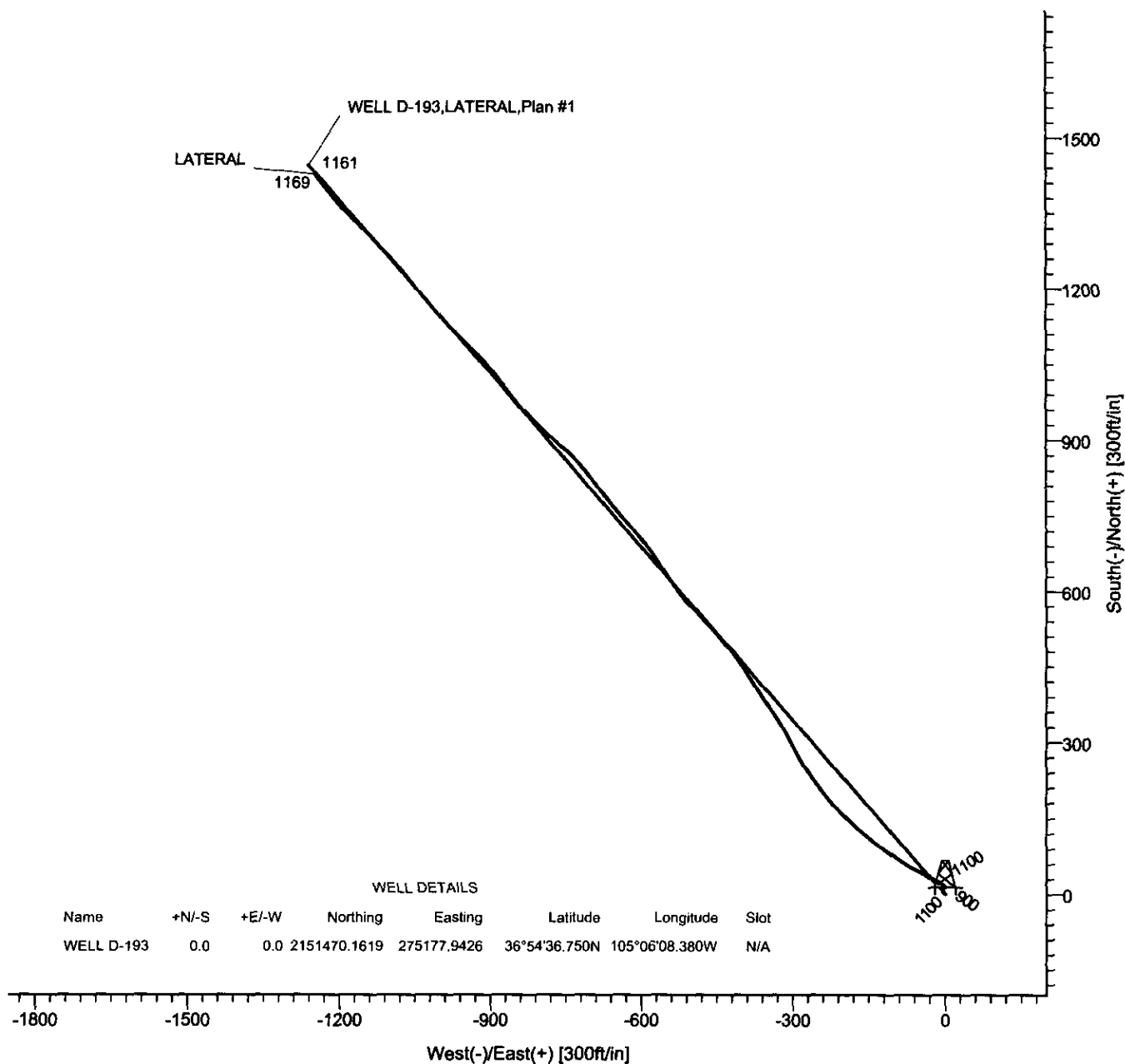
Date: 3/18/2005 Time: 10:33:42 Page: 2
Co-ordinate(NE) Reference: Well: WELL D-193, Grid North
Vertical (TVD) Reference: SITE 0.0
Section (VS) Reference: Well (0.00N,0.00E,319.00Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azlm deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	ClsD ft	ClsA deg	Tool
1552.0	90.34	332.34	1207.9	302.3	-304.3	427.7	5.70	428.9	314.81	SDI E-FIELD
1584.0	89.03	329.48	1208.1	330.2	-319.8	459.0	9.83	459.7	315.91	SDI E-FIELD
1615.0	88.86	326.29	1208.6	356.5	-336.3	489.7	10.30	490.1	316.67	SDI E-FIELD
1646.0	88.22	325.36	1209.4	382.1	-353.7	520.4	3.64	520.7	317.21	SDI E-FIELD
1678.0	88.86	327.93	1210.2	408.8	-371.3	552.1	8.27	552.3	317.75	SDI E-FIELD
1709.0	92.02	326.87	1210.0	434.8	-388.0	582.8	10.75	582.8	318.26	SDI E-FIELD
1741.0	92.02	324.45	1208.9	461.3	-406.0	614.6	7.56	614.6	318.65	SDI E-FIELD
1773.0	89.90	321.75	1208.3	486.9	-425.3	646.5	10.73	646.5	318.87	SDI E-FIELD
1804.0	91.38	319.45	1208.0	510.9	-444.9	677.5	8.82	677.5	318.95	SDI E-FIELD
1835.0	93.27	316.92	1206.7	533.9	-465.6	708.4	10.18	708.4	318.91	SDI E-FIELD
1866.0	93.09	316.11	1205.0	556.4	-486.9	739.3	2.67	739.3	318.81	SDI E-FIELD
1897.0	93.54	319.39	1203.2	579.3	-507.7	770.3	10.66	770.3	318.77	SDI E-FIELD
1928.0	94.24	323.02	1201.1	603.4	-527.1	801.2	11.90	801.2	318.86	SDI E-FIELD
1959.0	93.46	325.86	1199.0	628.6	-545.0	832.0	9.48	832.0	319.07	SDI E-FIELD
1991.0	92.79	327.12	1197.3	655.2	-562.7	863.6	4.45	863.7	319.34	SDI E-FIELD
2022.0	90.94	324.04	1196.3	680.8	-580.2	894.4	11.59	894.5	319.56	SDI E-FIELD
2054.0	89.63	321.04	1196.1	706.2	-599.7	926.4	10.23	926.4	319.66	SDI E-FIELD
2086.0	89.87	318.54	1196.3	730.6	-620.3	958.3	7.85	958.4	319.67	SDI E-FIELD
2117.0	90.77	317.54	1196.1	753.6	-641.0	989.3	4.34	989.4	319.62	SDI E-FIELD
2147.0	92.08	321.02	1195.3	778.4	-660.8	1019.3	12.39	1019.4	319.61	SDI E-FIELD
2179.0	91.75	324.00	1194.3	801.7	-680.1	1051.2	9.36	1051.3	319.69	SDI E-FIELD
2211.0	90.13	321.48	1193.7	827.2	-699.4	1083.2	9.36	1083.3	319.78	SDI E-FIELD
2242.0	89.03	318.58	1194.0	851.0	-719.3	1114.2	10.00	1114.3	319.79	SDI E-FIELD
2273.0	89.83	314.62	1194.3	873.5	-740.6	1145.1	13.03	1145.2	319.71	SDI E-FIELD
2305.0	90.88	311.57	1194.1	895.3	-764.0	1177.0	10.19	1177.0	319.53	SDI E-FIELD
2336.0	90.57	311.17	1193.6	915.8	-787.3	1207.7	1.85	1207.7	319.32	SDI E-FIELD
2368.0	93.79	314.41	1192.4	937.5	-810.7	1239.5	14.27	1239.5	319.15	SDI E-FIELD
2399.0	95.69	318.42	1189.9	959.9	-832.0	1270.3	14.27	1270.3	319.08	SDI E-FIELD
2431.0	94.88	321.51	1186.9	984.3	-852.5	1302.2	9.94	1302.2	319.10	SDI E-FIELD
2463.0	92.69	322.56	1184.8	1009.5	-872.1	1334.0	7.59	1334.1	319.17	SDI E-FIELD
2494.0	90.77	321.23	1183.9	1033.9	-891.3	1365.0	7.53	1365.0	319.24	SDI E-FIELD
2525.0	88.38	317.81	1184.1	1057.4	-911.4	1396.0	13.46	1396.0	319.24	SDI E-FIELD
2557.0	89.68	314.68	1184.6	1080.5	-933.5	1427.9	10.59	1427.9	319.18	SDI E-FIELD
2589.0	91.04	314.35	1184.4	1103.0	-956.3	1459.8	4.37	1459.8	319.07	SDI E-FIELD
2620.0	91.38	317.97	1183.8	1125.3	-977.8	1490.8	11.73	1490.8	319.01	SDI E-FIELD
2652.0	91.55	319.15	1183.0	1149.3	-999.0	1522.8	3.72	1522.8	319.00	SDI E-FIELD
2684.0	91.48	318.42	1182.1	1173.4	-1020.0	1554.8	2.29	1554.8	319.00	SDI E-FIELD
2715.0	93.36	319.97	1180.8	1196.8	-1040.3	1585.7	7.86	1585.7	319.00	SDI E-FIELD
2747.0	93.80	321.31	1178.8	1221.5	-1060.5	1617.7	4.40	1617.7	319.03	SDI E-FIELD
2778.0	92.35	318.98	1177.1	1245.3	-1080.4	1648.6	8.84	1648.6	319.06	SDI E-FIELD
2809.0	91.35	317.44	1176.1	1268.4	-1101.0	1679.6	5.92	1679.6	319.04	SDI E-FIELD
2841.0	90.24	318.14	1175.7	1292.1	-1122.5	1711.6	4.10	1711.6	319.02	SDI E-FIELD
2873.0	89.63	314.89	1175.7	1315.3	-1144.5	1743.5	10.33	1743.5	318.97	SDI E-FIELD
2904.0	90.17	314.13	1175.8	1337.0	-1166.6	1774.4	3.01	1774.4	318.89	SDI E-FIELD
2936.0	91.68	316.86	1175.3	1359.8	-1189.1	1806.4	9.75	1806.4	318.83	SDI E-FIELD
2968.0	93.23	319.63	1173.9	1383.7	-1210.4	1838.3	9.91	1838.3	318.82	SDI E-FIELD
2999.0	94.85	322.35	1171.7	1407.7	-1229.8	1869.2	10.19	1869.2	318.86	SDI E-FIELD
3028.0	94.85	322.35	1169.3	1430.6	-1247.5	1898.1	0.00	1898.1	318.91	Projected Depth

3028.00' MD 94.85° INCLINATION 322.35° AZIMUTH 1169.30' TVD
1430.60' NORTH 1247.50' WEST of SURFACE LOCATION
1898.10' CLOSURE DISTANCE 318.91° CLOSURE AZIMUTH

ALL DEPTHS SHOWN ARE
TRUE VERTICAL DEPTHS



March 17, 2005
Scientific Drilling
281.443.4600



EL PASO PRODUCTION
RATON WELL D-193
LATERAL
VERMILIO FIELD, NEW MEXICO



ALL DEPTHS SHOWN ARE
MEASURED DEPTHS

