# Scientific Drilling

**E.O.G.**

Field: MacKenzie
Site: Eddy County, NM
Well: MacKenzie 13 Fee #1H
Wellpath: VH- Job #32K0605461
Survey: 6/28/05

This survey is correct to the best of my knowledge
and is supported by actual field data.

.....Company Representative

Notorized this date 18th of July, 2005.

Deborah Sue Bynum
Notary Signature
County of Midland
State of Texas

NOTARY PUBLIC STATE OF TEXAS
DEBORAH SUE BYNUM
Notary Public, State of Texas
My Commission Expires
5/9/08

Scientific Drilling

# Scientific Drilling International
## Survey Report

| | | | | | |
|---|---|---|---|---|---|
| **Company:** | E.O.G. | **Date:** 7/17/2005 | **Time:** 10:56:22 | **Page:** | 1 |
| **Field:** | MacKenzie | **Co-ordinate(NE) Reference:** | Site: Eddy County, NM, Grid North | | |
| **Site:** | Eddy County, NM | **Vertical (TVD) Reference:** | SITE 0.0 | | |
| **Well:** | MacKenzie 13 Fee #1H | **Section (VS) Reference:** | Well (0.00N,0.00E,359.97Azi) | | |
| **Wellpath:** | VH- Job #32K0605461 | **Survey Calculation Method:** | Minimum Curvature | **Db:** | Sybase |

| | | | |
|---|---|---|---|
| **Survey:** | 6/28/05<br>KSRG 0'-4696' | **Start Date:** | 6/28/2005 |
| **Company:** | Scientific Drilling Internatio | **Engineer:** | Carter/Warren w/Rotary |
| **Tool:** | Keeper;Keeper Surface Readout Gyro | **Tied-to:** | From Surface |

**Survey**

| MD<br>ft | Incl<br>deg | Azim<br>deg | TVD<br>ft | VS<br>ft | N/S<br>ft | E/W<br>ft | DLS<br>deg/100ft | ClsD<br>ft | ClsA<br>deg |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 100.00 | 0.22 | 353.31 | 100.00 | 0.19 | 0.19 | -0.02 | 0.22 | 0.19 | 353.31 |
| 200.00 | 0.43 | 355.41 | 200.00 | 0.76 | 0.76 | -0.07 | 0.21 | 0.76 | 354.35 |
| 300.00 | 0.04 | 279.28 | 300.00 | 1.14 | 1.14 | -0.14 | 0.42 | 1.14 | 353.01 |
| 400.00 | 0.19 | 244.40 | 400.00 | 1.07 | 1.07 | -0.32 | 0.16 | 1.12 | 343.18 |
| 500.00 | 0.18 | 211.55 | 500.00 | 0.86 | 0.86 | -0.55 | 0.11 | 1.03 | 327.27 |
| 600.00 | 0.78 | 180.94 | 599.99 | 0.05 | 0.05 | -0.65 | 0.63 | 0.65 | 274.33 |
| 700.00 | 1.57 | 163.00 | 699.97 | -1.94 | -1.94 | -0.26 | 0.86 | 1.96 | 187.60 |
| 800.00 | 2.00 | 146.00 | 799.92 | -4.70 | -4.70 | 1.12 | 0.68 | 4.83 | 166.62 |
| 900.00 | 1.71 | 138.56 | 899.87 | -7.27 | -7.26 | 3.08 | 0.38 | 7.89 | 157.02 |
| 1000.00 | 1.82 | 141.41 | 999.82 | -9.63 | -9.62 | 5.06 | 0.14 | 10.87 | 152.27 |
| 1100.00 | 1.87 | 138.51 | 1099.77 | -12.09 | -12.09 | 7.13 | 0.11 | 14.03 | 149.46 |
| 1200.00 | 1.69 | 138.01 | 1199.72 | -14.41 | -14.40 | 9.20 | 0.18 | 17.09 | 147.44 |
| 1300.00 | 1.67 | 139.81 | 1299.68 | -16.62 | -16.61 | 11.12 | 0.06 | 19.99 | 146.19 |
| 1400.00 | 1.47 | 136.96 | 1399.64 | -18.67 | -18.66 | 12.94 | 0.21 | 22.71 | 145.27 |
| 1500.00 | 1.42 | 137.96 | 1499.61 | -20.53 | -20.52 | 14.65 | 0.06 | 25.21 | 144.49 |
| 1600.00 | 1.30 | 135.02 | 1599.58 | -22.25 | -22.24 | 16.28 | 0.14 | 27.56 | 143.81 |
| 1700.00 | 1.21 | 149.11 | 1699.56 | -23.96 | -23.95 | 17.62 | 0.32 | 29.74 | 143.66 |
| 1800.00 | 0.87 | 152.20 | 1799.54 | -25.54 | -25.53 | 18.52 | 0.34 | 31.54 | 144.05 |
| 1900.00 | 0.86 | 136.21 | 1899.53 | -26.75 | -26.74 | 19.39 | 0.24 | 33.03 | 144.06 |
| 2000.00 | 0.67 | 146.76 | 1999.52 | -27.79 | -27.77 | 20.23 | 0.24 | 34.36 | 143.93 |
| 2100.00 | 0.43 | 141.06 | 2099.52 | -28.57 | -28.56 | 20.79 | 0.25 | 35.32 | 143.95 |
| 2200.00 | 0.55 | 122.84 | 2199.51 | -29.12 | -29.11 | 21.43 | 0.20 | 36.14 | 143.64 |
| 2300.00 | 0.63 | 120.07 | 2299.51 | -29.66 | -29.64 | 22.30 | 0.08 | 37.10 | 143.04 |
| 2400.00 | 0.45 | 112.24 | 2399.50 | -30.08 | -30.07 | 23.14 | 0.19 | 37.94 | 142.41 |
| 2500.00 | 0.41 | 122.27 | 2499.50 | -30.42 | -30.41 | 23.81 | 0.09 | 38.62 | 141.94 |
| 2600.00 | 0.55 | 141.80 | 2599.50 | -30.99 | -30.98 | 24.41 | 0.21 | 39.44 | 141.76 |
| 2700.00 | 0.47 | 175.97 | 2699.49 | -31.77 | -31.76 | 24.73 | 0.31 | 40.26 | 142.09 |
| 2800.00 | 0.39 | 145.39 | 2799.49 | -32.46 | -32.45 | 24.96 | 0.24 | 40.94 | 142.44 |
| 2900.00 | 0.55 | 164.86 | 2899.49 | -33.21 | -33.19 | 25.28 | 0.22 | 41.72 | 142.71 |
| 3000.00 | 0.37 | 177.33 | 2999.48 | -33.99 | -33.98 | 25.42 | 0.20 | 42.43 | 143.21 |
| 3100.00 | 0.38 | 173.43 | 3099.48 | -34.65 | -34.63 | 25.47 | 0.03 | 42.99 | 143.67 |
| 3200.00 | 0.36 | 161.71 | 3199.48 | -35.27 | -35.26 | 25.61 | 0.08 | 43.58 | 144.01 |
| 3300.00 | 0.43 | 149.61 | 3299.48 | -35.90 | -35.88 | 25.89 | 0.11 | 44.25 | 144.18 |
| 3400.00 | 0.46 | 136.49 | 3399.48 | -36.51 | -36.50 | 26.36 | 0.11 | 45.02 | 144.16 |
| 3500.00 | 0.60 | 137.61 | 3499.47 | -37.19 | -37.17 | 26.99 | 0.14 | 45.94 | 144.02 |
| 3600.00 | 0.42 | 139.49 | 3599.47 | -37.85 | -37.84 | 27.58 | 0.18 | 46.82 | 143.91 |
| 3700.00 | 0.52 | 120.68 | 3699.46 | -38.37 | -38.35 | 28.21 | 0.18 | 47.61 | 143.66 |
| 3800.00 | 0.68 | 113.11 | 3799.46 | -38.83 | -38.81 | 29.14 | 0.18 | 48.54 | 143.10 |
| 3900.00 | 0.92 | 89.55 | 3899.45 | -39.06 | -39.04 | 30.49 | 0.40 | 49.54 | 142.01 |
| 4000.00 | 1.25 | 85.81 | 3999.43 | -38.97 | -38.96 | 32.38 | 0.34 | 50.66 | 140.26 |
| 4100.00 | 1.25 | 72.35 | 4099.41 | -38.56 | -38.55 | 34.51 | 0.29 | 51.74 | 138.16 |
| 4200.00 | 1.33 | 74.95 | 4199.38 | -37.93 | -37.91 | 36.67 | 0.10 | 52.75 | 135.95 |
| 4300.00 | 1.32 | 75.20 | 4299.35 | -37.34 | -37.32 | 38.91 | 0.01 | 53.91 | 133.81 |
| 4400.00 | 1.46 | 74.80 | 4399.33 | -36.71 | -36.69 | 41.25 | 0.14 | 55.20 | 131.65 |
| 4500.00 | 1.40 | 71.69 | 4499.29 | -35.99 | -35.97 | 43.64 | 0.10 | 56.55 | 129.50 |
| 4600.00 | 1.53 | 83.66 | 4599.26 | -35.46 | -35.44 | 46.12 | 0.33 | 58.17 | 127.54 |
| 4696.00 | 1.37 | 76.58 | 4695.23 | -35.06 | -35.03 | 48.51 | 0.25 | 59.84 | 125.83 |

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**Well:** MacKenzie 13 Fee #1H
**Wellpath:** VH- Job #32K0605461
**Survey:** 6/28/05