

# Silver Oak Drilling, LLC

PO Box 1370  
Artesia, NM 88211-1370  
505/748-1288

November 8, 2006

COG, LLC  
Fasken Center, Tower II  
550 West Texas Ave, Suite 1300  
Midland, TX 79701

RE: Harvard Federal #7  
990' FNL & 330' FWL  
Sec. 12, T17S, R30E  
Eddy County, New Mexico



Dear Sir,

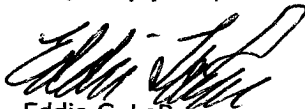
30-010-35055

The following is the Deviation Survey for the above captioned well.

| <u>DEPTH</u> | <u>DEVIATION</u> | <u>DEPTH</u> | <u>DEVIATION</u> |
|--------------|------------------|--------------|------------------|
| 245'         | 3/4°             | 1083'        | 2°               |
| 522'         | 2°               | 1320'        | 1 3/4°           |
| 767'         | 2°               | 1508'        | 2°               |

Thereafter drilled directionally and supplied separately.

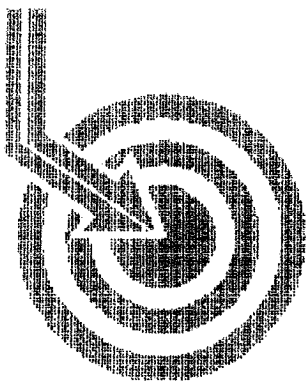
Very truly yours,

  
Eddie C. LaRue  
Operations Manager

State of New Mexico }  
County of Eddy }

The foregoing was acknowledged before me this 8<sup>th</sup> day of November, 2006.

\_\_\_\_\_  
Notary Public



# Scientific Drilling

## MACK ENERGY

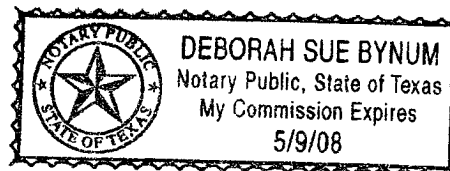
Field: Undes Loco Hills  
Site: Eddy County, NM  
Well: Harvard Federal #7  
Wellpath: DH - Job #32D1006841  
Survey: 10/17/06-10/29/06

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

.....*Deborah Sue Bynum*.....Company Representative

Notorized this date 2<sup>nd</sup> of December, 2006.

*Deborah Sue Bynum*  
Notary Signature  
County of Midland  
State of Texas





Scientific  
Drilling

# Scientific Drilling International Survey Report

Company: MACK ENERGY  
Field: Undes Loco Hills  
Site: Eddy County, NM  
Well: Harvard Federal #7  
Wellpath: VH - Job #32K1006842

Date: 11/06/2006 Time: 21:09:28 Page: 1  
Co-ordinate(N/E) Reference: Site: Eddy County, NM, Grid North  
Vertical (TVD) Reference: SITE 0.0  
Section (VS) Reference: Well (0.00N,0.00E,5.19Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey: 10/18/06 Start Date: 10/18/2006  
KSRG 0'-1536'  
Company: Scientific Drilling Internatio Engineer: Madrid/Rando  
Tool: Keeper;Keeper 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        | 359.78      | 0.00      | 0.00     | 0.00      | 0.00      | 0.00             | 0.00       | 0.00        |
| 100.00   | 0.61        | 337.27      | 100.00    | 0.47     | 0.49      | -0.21     | 0.61             | 0.53       | 337.27      |
| 200.00   | 0.76        | 27.08       | 199.99    | 1.56     | 1.57      | -0.11     | 0.59             | 1.58       | 356.02      |
| 300.00   | 0.80        | 30.32       | 299.98    | 2.80     | 2.77      | 0.54      | 0.06             | 2.82       | 11.15       |
| 400.00   | 1.81        | 71.53       | 399.96    | 4.07     | 3.87      | 2.40      | 1.32             | 4.55       | 31.76       |
| 500.00   | 2.08        | 80.12       | 499.90    | 5.17     | 4.68      | 5.68      | 0.40             | 7.36       | 50.52       |
| 600.00   | 1.64        | 83.58       | 599.85    | 5.93     | 5.15      | 8.89      | 0.45             | 10.28      | 59.91       |
| 700.00   | 1.59        | 84.70       | 699.81    | 6.48     | 5.44      | 11.69     | 0.06             | 12.90      | 65.05       |
| 800.00   | 1.38        | 88.13       | 799.77    | 6.88     | 5.61      | 14.28     | 0.23             | 15.34      | 68.56       |
| 900.00   | 1.34        | 90.23       | 899.75    | 7.13     | 5.64      | 16.65     | 0.06             | 17.58      | 71.28       |
| 1000.00  | 1.48        | 86.38       | 999.71    | 7.42     | 5.72      | 19.11     | 0.17             | 19.95      | 73.34       |
| 1100.00  | 1.66        | 86.36       | 1099.68   | 7.84     | 5.89      | 21.84     | 0.18             | 22.63      | 74.90       |
| 1200.00  | 1.74        | 85.36       | 1199.63   | 8.33     | 6.11      | 24.80     | 0.09             | 25.54      | 76.17       |
| 1300.00  | 1.80        | 84.52       | 1299.59   | 8.88     | 6.38      | 27.88     | 0.07             | 28.60      | 77.11       |
| 1400.00  | 1.89        | 85.52       | 1399.53   | 9.44     | 6.66      | 31.09     | 0.10             | 31.79      | 77.91       |
| 1500.00  | 1.75        | 86.63       | 1499.48   | 9.95     | 6.88      | 34.26     | 0.14             | 34.94      | 78.65       |
| 1536.00  | 1.76        | 85.76       | 1535.47   | 10.12    | 6.95      | 35.36     | 0.08             | 36.03      | 78.88       |



# Scientific Drilling International Survey Report

|                                       |                                   |                                          |                   |
|---------------------------------------|-----------------------------------|------------------------------------------|-------------------|
| <b>Company:</b> MACK ENERGY           | <b>Date:</b> 11/30/2006           | <b>Time:</b> 14:49:18                    | <b>Page:</b> 1    |
| <b>Field:</b> Undes Loco Hills        | <b>Co-ordinate(NE) Reference:</b> | <b>Site:</b> Eddy County, NM, Grid North |                   |
| <b>Site:</b> Eddy County, NM          | <b>Vertical (TVD) Reference:</b>  | <b>SITE</b> 0.0                          |                   |
| <b>Well:</b> Harvard Federal #7       | <b>Section (VS) Reference:</b>    | <b>Well</b> (0.00N,0.00E,5.19Azi)        |                   |
| <b>Wellpath:</b> DH - Job #32D1006841 | <b>Survey Calculation Method:</b> | <b>Minimum Curvature</b>                 | <b>Db:</b> Sybase |

|                                                   |                                       |
|---------------------------------------------------|---------------------------------------|
| <b>Survey:</b> 10/17/06-10/29/06                  | <b>Start Date:</b> 10/17/2006         |
| MWD 1621'-5826'                                   |                                       |
| <b>Company:</b> Scientific Drilling International | <b>Engineer:</b> Johns/Puntney/Lopez  |
| <b>Tool:</b> MWD/MWD                              | <b>Tied-to:</b> From: Definitive Path |

## 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 |
|----------|-------------|-------------|-----------|----------|-----------|-----------|------------------|------------|-------------|
| 1536.00  | 1.76        | 85.76       | 1535.47   | 10.12    | 6.95      | 35.36     | 0.00             | 36.03      | 78.88       |
| 1621.00  | 1.95        | 98.11       | 1620.42   | 10.26    | 6.84      | 38.09     | 0.52             | 38.70      | 79.82       |
| 1652.00  | 1.95        | 98.11       | 1651.40   | 10.21    | 6.69      | 39.13     | 0.00             | 39.70      | 80.29       |
| 1683.00  | 2.00        | 73.85       | 1682.39   | 10.38    | 6.77      | 40.17     | 2.68             | 40.74      | 80.43       |
| 1714.00  | 2.15        | 60.75       | 1713.37   | 10.90    | 7.20      | 41.20     | 1.60             | 41.83      | 80.08       |
| 1746.00  | 3.04        | 27.92       | 1745.33   | 12.02    | 8.25      | 42.12     | 5.30             | 42.92      | 78.92       |
| 1777.00  | 4.16        | 8.68        | 1776.27   | 13.90    | 10.09     | 42.68     | 5.27             | 43.85      | 76.70       |
| 1809.00  | 4.70        | 1.10        | 1808.18   | 16.37    | 12.54     | 42.88     | 2.49             | 44.68      | 73.69       |
| 1840.00  | 5.89        | 354.20      | 1839.05   | 19.20    | 15.40     | 42.74     | 4.35             | 45.43      | 70.19       |
| 1871.00  | 7.43        | 345.20      | 1869.84   | 22.64    | 18.92     | 42.07     | 5.99             | 46.13      | 65.79       |
| 1903.00  | 8.07        | 341.50      | 1901.54   | 26.65    | 23.05     | 40.83     | 2.53             | 46.88      | 60.55       |
| 1933.00  | 7.92        | 340.80      | 1931.25   | 30.46    | 27.00     | 39.48     | 0.60             | 47.83      | 55.64       |
| 1965.00  | 7.84        | 340.20      | 1962.95   | 34.44    | 31.13     | 38.02     | 0.36             | 49.14      | 50.68       |
| 1996.00  | 7.75        | 339.50      | 1993.66   | 38.24    | 35.08     | 36.57     | 0.42             | 50.67      | 46.19       |
| 2027.00  | 7.41        | 338.60      | 2024.39   | 41.91    | 38.90     | 35.11     | 1.16             | 52.40      | 42.07       |
| 2059.00  | 8.13        | 340.30      | 2056.10   | 45.81    | 42.95     | 33.59     | 2.36             | 54.52      | 38.03       |
| 2089.00  | 8.35        | 339.90      | 2085.79   | 49.71    | 46.99     | 32.13     | 0.76             | 56.92      | 34.36       |
| 2121.00  | 8.19        | 340.10      | 2117.46   | 53.87    | 51.32     | 30.55     | 0.51             | 59.72      | 30.77       |
| 2152.00  | 7.96        | 339.20      | 2148.15   | 57.80    | 55.40     | 29.04     | 0.85             | 62.55      | 27.66       |
| 2184.00  | 7.88        | 339.00      | 2179.84   | 61.76    | 59.52     | 27.47     | 0.26             | 65.55      | 24.77       |
| 2216.00  | 8.38        | 338.60      | 2211.52   | 65.81    | 63.74     | 25.83     | 1.57             | 68.77      | 22.06       |
| 2247.00  | 8.30        | 339.80      | 2242.19   | 69.85    | 67.94     | 24.23     | 0.62             | 72.13      | 19.63       |
| 2278.00  | 8.27        | 342.90      | 2272.87   | 73.94    | 72.17     | 22.80     | 1.44             | 75.69      | 17.53       |
| 2310.00  | 8.27        | 344.60      | 2304.54   | 78.22    | 76.59     | 21.52     | 0.76             | 79.56      | 15.69       |
| 2342.00  | 8.08        | 344.50      | 2336.21   | 82.48    | 80.98     | 20.30     | 0.60             | 83.48      | 14.08       |
| 2373.00  | 8.09        | 344.30      | 2366.91   | 86.56    | 85.18     | 19.13     | 0.10             | 87.30      | 12.66       |
| 2405.00  | 7.11        | 343.10      | 2398.62   | 90.50    | 89.24     | 17.95     | 3.10             | 91.03      | 11.37       |
| 2436.00  | 5.59        | 340.90      | 2429.43   | 93.65    | 92.50     | 16.89     | 4.96             | 94.03      | 10.35       |
| 2467.00  | 5.51        | 338.50      | 2460.29   | 96.36    | 95.31     | 15.85     | 0.79             | 96.62      | 9.44        |
| 2498.00  | 5.50        | 339.50      | 2491.14   | 99.02    | 98.09     | 14.79     | 0.31             | 99.20      | 8.57        |
| 2529.00  | 5.44        | 343.52      | 2522.00   | 101.73   | 100.89    | 13.85     | 1.25             | 101.84     | 7.82        |
| 2560.00  | 4.43        | 340.42      | 2552.89   | 104.18   | 103.43    | 13.03     | 3.37             | 104.24     | 7.18        |
| 2592.00  | 3.40        | 337.93      | 2584.81   | 106.15   | 105.47    | 12.26     | 3.26             | 106.18     | 6.63        |
| 2623.00  | 2.52        | 333.09      | 2615.77   | 107.54   | 106.93    | 11.61     | 2.95             | 107.56     | 6.20        |
| 2655.00  | 1.58        | 318.92      | 2647.75   | 108.44   | 107.89    | 11.00     | 3.32             | 108.45     | 5.82        |
| 2686.00  | 0.90        | 280.50      | 2678.74   | 108.76   | 108.26    | 10.48     | 3.35             | 108.76     | 5.53        |
| 2717.00  | 0.83        | 240.19      | 2709.74   | 108.65   | 108.19    | 10.05     | 1.93             | 108.65     | 5.31        |
| 2748.00  | 1.05        | 240.15      | 2740.74   | 108.36   | 107.94    | 9.61      | 0.71             | 108.36     | 5.09        |
| 2779.00  | 0.81        | 217.10      | 2771.73   | 108.01   | 107.62    | 9.23      | 1.42             | 108.02     | 4.90        |
| 2810.00  | 0.69        | 215.40      | 2802.73   | 107.67   | 107.29    | 8.99      | 0.39             | 107.67     | 4.79        |
| 2841.00  | 0.38        | 220.20      | 2833.73   | 107.42   | 107.06    | 8.81      | 1.01             | 107.42     | 4.71        |
| 2873.00  | 0.61        | 212.18      | 2865.73   | 107.18   | 106.84    | 8.65      | 0.75             | 107.19     | 4.63        |
| 2904.00  | 0.69        | 208.30      | 2896.73   | 106.86   | 106.53    | 8.48      | 0.29             | 106.87     | 4.55        |
| 2936.00  | 0.74        | 208.50      | 2928.72   | 106.50   | 106.18    | 8.29      | 0.16             | 106.51     | 4.46        |
| 2967.00  | 0.58        | 183.50      | 2959.72   | 106.16   | 105.85    | 8.18      | 1.05             | 106.17     | 4.42        |
| 2998.00  | 0.23        | 179.70      | 2990.72   | 105.94   | 105.63    | 8.17      | 1.13             | 105.95     | 4.42        |
| 3030.00  | 0.26        | 117.80      | 3022.72   | 105.85   | 105.53    | 8.24      | 0.79             | 105.85     | 4.46        |
| 3059.00  | 0.35        | 168.00      | 3051.72   | 105.74   | 105.42    | 8.31      | 0.94             | 105.74     | 4.51        |
| 3091.00  | 0.20        | 203.20      | 3083.72   | 105.59   | 105.27    | 8.31      | 0.69             | 105.60     | 4.51        |



# Scientific Drilling International Survey Report

Company: MACK ENERGY  
Field: Undes Loco Hills  
Site: Eddy County, NM  
Well: Harvard Federal #7  
Wellpath: DH - Job #32D1006841

Date: 11/30/2006 Time: 14:49:18 Page: 2  
Co-ordinate(NE) Reference: Site: Eddy County, NM, Grid North  
Vertical (TVD) Reference: SITE 0.0  
Section (VS) Reference: Well (0.00N,0.00E,5.19Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

## 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 |
|----------|-------------|-------------|-----------|----------|-----------|-----------|------------------|------------|-------------|
| 3123.00  | 0.28        | 212.60      | 3115.72   | 105.47   | 105.15    | 8.25      | 0.28             | 105.47     | 4.48        |
| 3161.00  | 0.28        | 250.60      | 3153.72   | 105.35   | 105.04    | 8.11      | 0.48             | 105.35     | 4.41        |
| 3193.00  | 0.26        | 280.30      | 3185.72   | 105.32   | 105.03    | 7.96      | 0.44             | 105.33     | 4.34        |
| 3223.00  | 0.31        | 45.14       | 3215.72   | 105.39   | 105.10    | 7.95      | 1.69             | 105.40     | 4.33        |
| 3252.00  | 0.40        | 57.80       | 3244.72   | 105.51   | 105.21    | 8.10      | 0.41             | 105.52     | 4.40        |
| 3283.00  | 0.44        | 97.53       | 3275.72   | 105.57   | 105.25    | 8.31      | 0.93             | 105.58     | 4.51        |
| 3315.00  | 0.31        | 94.55       | 3307.72   | 105.57   | 105.23    | 8.51      | 0.41             | 105.57     | 4.63        |
| 3346.00  | 0.38        | 32.37       | 3338.72   | 105.66   | 105.31    | 8.65      | 1.17             | 105.66     | 4.70        |
| 3378.00  | 0.32        | 11.50       | 3370.71   | 105.84   | 105.48    | 8.73      | 0.44             | 105.84     | 4.73        |
| 3409.00  | 0.12        | 330.20      | 3401.71   | 105.95   | 105.60    | 8.73      | 0.78             | 105.96     | 4.73        |
| 3440.00  | 0.17        | 349.10      | 3432.71   | 106.02   | 105.67    | 8.70      | 0.22             | 106.03     | 4.71        |
| 3472.00  | 0.15        | 75.90       | 3464.71   | 106.08   | 105.73    | 8.74      | 0.69             | 106.09     | 4.72        |
| 3503.00  | 0.29        | 97.93       | 3495.71   | 106.09   | 105.73    | 8.85      | 0.52             | 106.10     | 4.79        |
| 3534.00  | 0.44        | 109.90      | 3526.71   | 106.06   | 105.68    | 9.04      | 0.54             | 106.06     | 4.89        |
| 3566.00  | 0.46        | 111.60      | 3558.71   | 105.99   | 105.59    | 9.28      | 0.08             | 105.99     | 5.02        |
| 3597.00  | 0.08        | 113.10      | 3589.71   | 105.95   | 105.53    | 9.41      | 1.23             | 105.95     | 5.10        |
| 3629.00  | 0.31        | 294.30      | 3621.71   | 105.97   | 105.56    | 9.35      | 1.22             | 105.97     | 5.06        |
| 3660.00  | 0.24        | 258.20      | 3652.71   | 105.98   | 105.58    | 9.21      | 0.59             | 105.98     | 4.99        |
| 3691.00  | 0.34        | 295.50      | 3683.71   | 105.99   | 105.61    | 9.07      | 0.67             | 105.99     | 4.91        |
| 3723.00  | 0.22        | 323.00      | 3715.71   | 106.07   | 105.70    | 8.94      | 0.55             | 106.07     | 4.84        |
| 3753.00  | 0.47        | 311.20      | 3745.71   | 106.19   | 105.82    | 8.82      | 0.86             | 106.19     | 4.76        |
| 3785.00  | 0.44        | 308.70      | 3777.71   | 106.33   | 105.99    | 8.62      | 0.11             | 106.34     | 4.65        |
| 3816.00  | 0.48        | 296.70      | 3808.71   | 106.45   | 106.12    | 8.41      | 0.34             | 106.45     | 4.53        |
| 3848.00  | 0.51        | 294.80      | 3840.71   | 106.54   | 106.24    | 8.17      | 0.11             | 106.55     | 4.39        |
| 3879.00  | 0.29        | 266.00      | 3871.71   | 106.58   | 106.29    | 7.96      | 0.94             | 106.59     | 4.28        |
| 3911.00  | 0.20        | 232.20      | 3903.71   | 106.53   | 106.25    | 7.84      | 0.52             | 106.54     | 4.22        |
| 3941.00  | 0.24        | 152.50      | 3933.71   | 106.44   | 106.16    | 7.82      | 0.95             | 106.45     | 4.22        |
| 3972.00  | 0.38        | 120.30      | 3964.71   | 106.34   | 106.05    | 7.94      | 0.70             | 106.35     | 4.28        |
| 4003.00  | 0.22        | 105.10      | 3995.71   | 106.28   | 105.99    | 8.09      | 0.57             | 106.30     | 4.36        |
| 4035.00  | 0.30        | 108.40      | 4027.70   | 106.25   | 105.94    | 8.23      | 0.25             | 106.26     | 4.44        |
| 4066.00  | 0.41        | 121.70      | 4058.70   | 106.19   | 105.86    | 8.40      | 0.44             | 106.19     | 4.54        |
| 4098.00  | 0.46        | 125.60      | 4090.70   | 106.07   | 105.73    | 8.60      | 0.18             | 106.08     | 4.65        |
| 4128.00  | 0.43        | 102.20      | 4120.70   | 106.00   | 105.63    | 8.81      | 0.61             | 106.00     | 4.77        |
| 4159.00  | 0.41        | 103.90      | 4151.70   | 105.96   | 105.58    | 9.03      | 0.08             | 105.97     | 4.89        |
| 4190.00  | 0.21        | 174.10      | 4182.70   | 105.89   | 105.50    | 9.14      | 1.27             | 105.89     | 4.95        |
| 4221.00  | 0.18        | 248.90      | 4213.70   | 105.81   | 105.42    | 9.10      | 0.77             | 105.82     | 4.94        |
| 4253.00  | 0.24        | 264.50      | 4245.70   | 105.78   | 105.40    | 8.99      | 0.26             | 105.78     | 4.88        |
| 4284.00  | 0.32        | 273.00      | 4276.70   | 105.76   | 105.40    | 8.84      | 0.29             | 105.77     | 4.79        |
| 4314.00  | 0.23        | 278.70      | 4306.70   | 105.77   | 105.41    | 8.70      | 0.31             | 105.77     | 4.72        |
| 4344.00  | 0.40        | 296.60      | 4336.70   | 105.81   | 105.47    | 8.54      | 0.65             | 105.81     | 4.63        |
| 4376.00  | 0.42        | 304.50      | 4368.70   | 105.91   | 105.58    | 8.35      | 0.19             | 105.91     | 4.52        |
| 4407.00  | 0.34        | 344.10      | 4399.70   | 106.05   | 105.74    | 8.23      | 0.87             | 106.06     | 4.45        |
| 4426.00  | 0.18        | 338.50      | 4418.70   | 106.13   | 105.82    | 8.20      | 0.85             | 106.14     | 4.43        |
| 4467.00  | 0.26        | 336.50      | 4459.70   | 106.27   | 105.96    | 8.14      | 0.20             | 106.28     | 4.39        |
| 4499.00  | 0.42        | 339.30      | 4491.70   | 106.43   | 106.14    | 8.07      | 0.50             | 106.45     | 4.35        |
| 4529.00  | 0.44        | 355.20      | 4521.70   | 106.65   | 106.36    | 8.02      | 0.40             | 106.66     | 4.31        |
| 4558.00  | 0.50        | 336.50      | 4550.70   | 106.87   | 106.58    | 7.96      | 0.56             | 106.88     | 4.27        |
| 4589.00  | 0.38        | 295.30      | 4581.69   | 107.02   | 106.75    | 7.82      | 1.06             | 107.04     | 4.19        |
| 4621.00  | 0.38        | 316.60      | 4613.69   | 107.13   | 106.87    | 7.65      | 0.44             | 107.15     | 4.09        |
| 4652.00  | 0.43        | 309.70      | 4644.69   | 107.26   | 107.02    | 7.49      | 0.23             | 107.29     | 4.00        |
| 4683.00  | 0.36        | 348.10      | 4675.69   | 107.42   | 107.19    | 7.38      | 0.86             | 107.45     | 3.94        |
| 4714.00  | 0.35        | 330.80      | 4706.69   | 107.59   | 107.37    | 7.31      | 0.35             | 107.62     | 3.90        |



Scientific  
Drilling

# Scientific Drilling International Survey Report

Company: MACK ENERGY  
Field: Undes Loco Hills  
Site: Eddy County, NM  
Well: Harvard Federal #7  
Wellpath: DH - Job #32D1006841

Date: 11/30/2006 Time: 14:49:18 Page: 3  
Co-ordinate(NE) Reference: Site: Eddy County, NM, Grid North  
Vertical (TVD) Reference: SITE 0.0  
Section (VS) Reference: Well (0.00N,0.00E,5.19Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

## Survey

| MD<br>ft | Incl<br>deg | Azlm<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 |
|----------|-------------|-------------|-----------|----------|-----------|-----------|------------------|------------|-------------|
| 4745.00  | 0.08        | 347.10      | 4737.69   | 107.69   | 107.47    | 7.26      | 0.88             | 107.72     | 3.86        |
| 4774.00  | 0.41        | 133.50      | 4766.69   | 107.65   | 107.42    | 7.33      | 1.65             | 107.67     | 3.90        |
| 4805.00  | 0.51        | 135.10      | 4797.69   | 107.49   | 107.25    | 7.51      | 0.33             | 107.51     | 4.00        |
| 4836.00  | 0.22        | 84.30       | 4828.69   | 107.41   | 107.16    | 7.66      | 1.32             | 107.43     | 4.09        |
| 4868.00  | 0.17        | 38.85       | 4860.69   | 107.46   | 107.20    | 7.76      | 0.49             | 107.48     | 4.14        |
| 4899.00  | 0.40        | 57.45       | 4891.69   | 107.57   | 107.29    | 7.88      | 0.79             | 107.58     | 4.20        |
| 4931.00  | 0.26        | 35.32       | 4923.69   | 107.70   | 107.41    | 8.01      | 0.58             | 107.71     | 4.27        |
| 4962.00  | 0.15        | 105.70      | 4954.69   | 107.75   | 107.46    | 8.09      | 0.82             | 107.76     | 4.31        |
| 4993.00  | 0.26        | 149.50      | 4985.69   | 107.69   | 107.39    | 8.17      | 0.59             | 107.70     | 4.35        |
| 5024.00  | 0.24        | 110.80      | 5016.69   | 107.61   | 107.30    | 8.26      | 0.54             | 107.62     | 4.40        |
| 5055.00  | 0.39        | 121.60      | 5047.69   | 107.55   | 107.23    | 8.41      | 0.52             | 107.56     | 4.49        |
| 5086.00  | 0.48        | 145.60      | 5078.69   | 107.40   | 107.06    | 8.58      | 0.65             | 107.41     | 4.58        |
| 5117.00  | 0.48        | 159.40      | 5109.69   | 107.18   | 106.84    | 8.70      | 0.37             | 107.19     | 4.65        |
| 5148.00  | 0.48        | 161.90      | 5140.68   | 106.95   | 106.59    | 8.78      | 0.07             | 106.95     | 4.71        |
| 5179.00  | 0.36        | 169.10      | 5171.68   | 106.74   | 106.37    | 8.84      | 0.42             | 106.74     | 4.75        |
| 5210.00  | 0.47        | 128.60      | 5202.68   | 106.57   | 106.20    | 8.96      | 0.98             | 106.57     | 4.82        |
| 5241.00  | 0.51        | 126.80      | 5233.68   | 106.43   | 106.03    | 9.17      | 0.14             | 106.43     | 4.94        |
| 5272.00  | 0.57        | 137.00      | 5264.68   | 106.25   | 105.84    | 9.38      | 0.36             | 106.25     | 5.07        |
| 5302.00  | 0.51        | 137.00      | 5294.68   | 106.07   | 105.63    | 9.58      | 0.20             | 106.07     | 5.18        |
| 5334.00  | 0.71        | 129.90      | 5326.68   | 105.86   | 105.40    | 9.83      | 0.67             | 105.86     | 5.33        |
| 5364.00  | 0.66        | 153.20      | 5356.68   | 105.61   | 105.13    | 10.05     | 0.94             | 105.61     | 5.46        |
| 5394.00  | 0.84        | 136.40      | 5386.67   | 105.31   | 104.81    | 10.28     | 0.94             | 105.32     | 5.60        |
| 5425.00  | 0.75        | 134.70      | 5417.67   | 105.04   | 104.51    | 10.58     | 0.30             | 105.04     | 5.78        |
| 5456.00  | 0.61        | 135.50      | 5448.67   | 104.80   | 104.25    | 10.84     | 0.45             | 104.81     | 5.93        |
| 5488.00  | 0.62        | 291.10      | 5480.67   | 104.74   | 104.19    | 10.79     | 3.76             | 104.74     | 5.92        |
| 5519.00  | 0.62        | 296.60      | 5511.66   | 104.84   | 104.32    | 10.49     | 0.19             | 104.85     | 5.74        |
| 5551.00  | 0.56        | 318.36      | 5543.66   | 105.01   | 104.52    | 10.23     | 0.72             | 105.02     | 5.59        |
| 5583.00  | 0.36        | 65.97       | 5575.66   | 105.17   | 104.67    | 10.22     | 2.35             | 105.17     | 5.57        |
| 5613.00  | 0.58        | 86.21       | 5605.66   | 105.24   | 104.72    | 10.45     | 0.91             | 105.24     | 5.70        |
| 5645.00  | 0.62        | 80.65       | 5637.66   | 105.31   | 104.76    | 10.79     | 0.22             | 105.32     | 5.88        |
| 5675.00  | 0.63        | 82.98       | 5667.66   | 105.38   | 104.81    | 11.11     | 0.09             | 105.40     | 6.05        |
| 5708.00  | 0.70        | 88.08       | 5700.66   | 105.45   | 104.84    | 11.49     | 0.28             | 105.47     | 6.26        |
| 5735.00  | 0.76        | 133.67      | 5727.65   | 105.36   | 104.72    | 11.79     | 2.10             | 105.38     | 6.42        |
| 5765.00  | 0.83        | 143.14      | 5757.65   | 105.07   | 104.41    | 12.06     | 0.50             | 105.10     | 6.59        |
| 5826.00  | 0.83        | 143.14      | 5818.64   | 104.42   | 103.70    | 12.59     | 0.00             | 104.46     | 6.92        |
| 6235     | 0.83        | 143.14      | 5827.64   | 104.42   | 103.70    | 12.59     | 0.00             | 104.46     | 6.92        |



Scientific  
Drilling

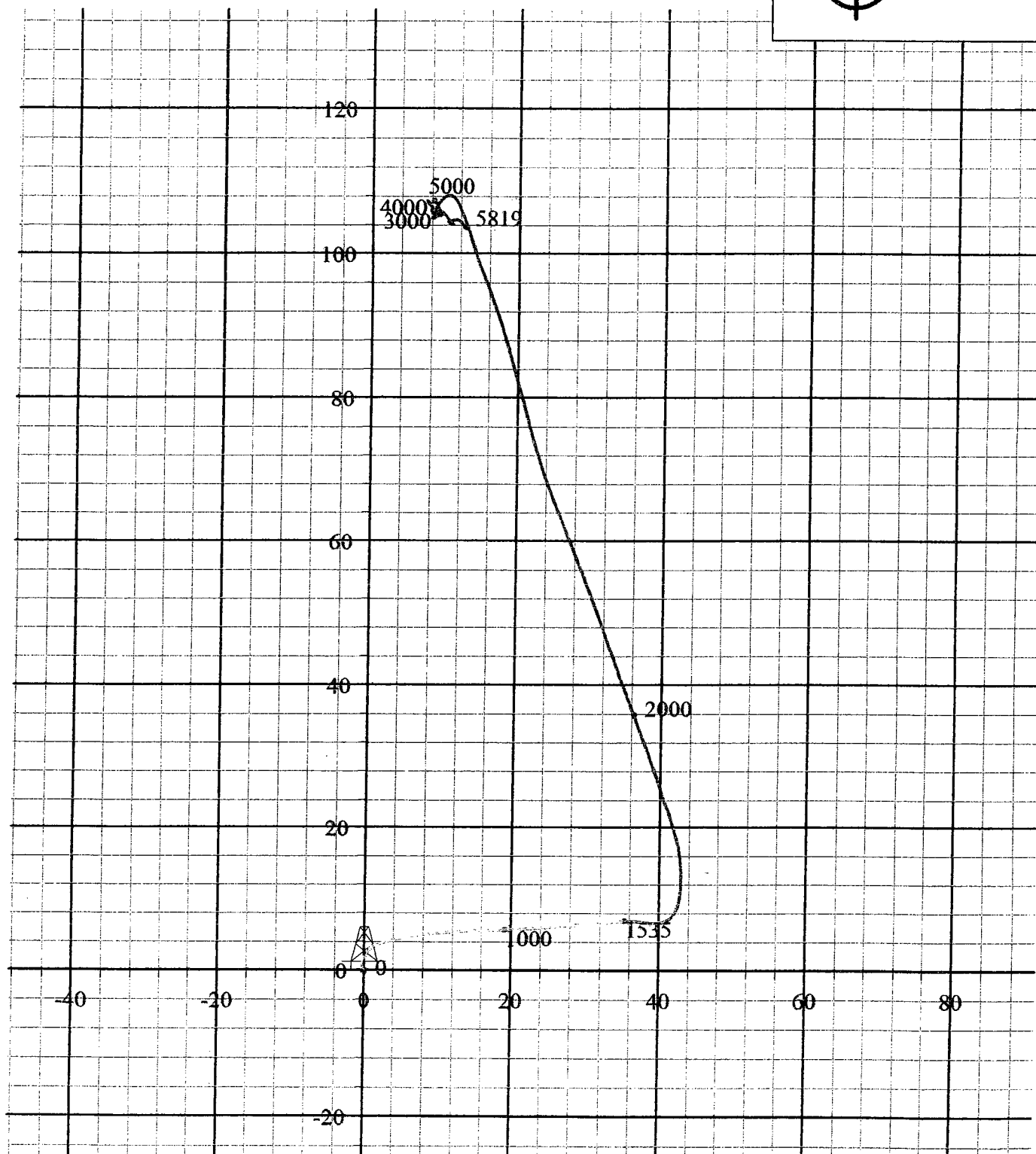
Field: Undes Loco Hills  
Site: Eddy County, NM  
Well: Harvard Federal #7  
Wellpath: DH - Job #32D1006841  
Survey: 10/17/06-10/29/06



Azimuths to Grid North  
True North: 0.00°  
Magnetic North: 0.00°

Magnetic Field  
Strength: 0nT  
Dip Angle: 0.00°  
Date: 11/30/2006  
Model: igrf2000

South(-)/North(+) [20ft/in]



West(-)/East(+) [20ft/in]

Scientific Drilling International  
Survey Report

Company: MACK ENERGY  
 Time: 14:39:58 Page: 1  
 Field: Undesignated Loco Hills  
 Reference Site: Eddy County, NM, Grid North  
 Site: Eddy County, NM  
 Reference: SITE 0.0  
 Well: Harvard Federal #7  
 Reference: Well (0.00N,0.00E,5.19Azi)  
 Wellpath: DH - Job #32D1006841  
 Method: Minimum Curvature Db: Sybase

Date: 01/10/2007

Co-ordinate(NE)

Vertical (TVD)

Section (VS)

Survey Calculation

Survey: 10/17/06-10/29/06  
 10/17/2006

Start Date:

MWD 1621'-5826' w/projection at 6235'MD  
 Company: Scientific Drilling Internatio  
 Johns/Puntney/Lopez  
 Tool: MWD;MWD  
 From: Definitive Path

Engineer:

Tied-to:

| Survey |         | MD      |           | Incl  |     | Azim   |     | TVD     |    | VS    |    | N/S   |    |
|--------|---------|---------|-----------|-------|-----|--------|-----|---------|----|-------|----|-------|----|
| E/W    | DLS     | ft      | deg/100ft | ClsD  | deg | ClsA   | deg | ft      | ft | ft    | ft | ft    | ft |
|        |         | 1536.00 |           | 1.76  |     | 85.76  |     | 1535.47 |    | 10.12 |    | 6.95  |    |
| 35.36  | 0.00    |         |           | 36.03 |     | 78.88  |     |         |    |       |    |       |    |
|        | 1621.00 |         |           | 1.95  |     | 98.11  |     | 1620.42 |    | 10.26 |    | 6.84  |    |
| 38.09  | 0.52    |         |           | 38.70 |     | 79.82  |     |         |    |       |    |       |    |
|        | 1652.00 |         |           | 1.95  |     | 98.11  |     | 1651.40 |    | 10.21 |    | 6.69  |    |
| 39.13  | 0.00    |         |           | 39.70 |     | 80.29  |     |         |    |       |    |       |    |
|        | 1683.00 |         |           | 2.00  |     | 73.85  |     | 1682.39 |    | 10.38 |    | 6.77  |    |
| 40.17  | 2.68    |         |           | 40.74 |     | 80.43  |     |         |    |       |    |       |    |
|        | 1714.00 |         |           | 2.15  |     | 60.75  |     | 1713.37 |    | 10.90 |    | 7.20  |    |
| 41.20  | 1.60    |         |           | 41.83 |     | 80.08  |     |         |    |       |    |       |    |
|        | 1746.00 |         |           | 3.04  |     | 27.92  |     | 1745.33 |    | 12.02 |    | 8.25  |    |
| 42.12  | 5.30    |         |           | 42.92 |     | 78.92  |     |         |    |       |    |       |    |
|        | 1777.00 |         |           | 4.16  |     | 8.68   |     | 1776.27 |    | 13.90 |    | 10.09 |    |
| 42.68  | 5.27    |         |           | 43.85 |     | 76.70  |     |         |    |       |    |       |    |
|        | 1809.00 |         |           | 4.70  |     | 1.10   |     | 1808.18 |    | 16.37 |    | 12.54 |    |
| 42.88  | 2.49    |         |           | 44.68 |     | 73.69  |     |         |    |       |    |       |    |
|        | 1840.00 |         |           | 5.89  |     | 354.20 |     | 1839.05 |    | 19.20 |    | 15.40 |    |
| 42.74  | 4.35    |         |           | 45.43 |     | 70.19  |     |         |    |       |    |       |    |
|        | 1871.00 |         |           | 7.43  |     | 345.20 |     | 1869.84 |    | 22.64 |    | 18.92 |    |
| 42.07  | 5.99    |         |           | 46.13 |     | 65.79  |     |         |    |       |    |       |    |
|        | 1903.00 |         |           | 8.07  |     | 341.50 |     | 1901.54 |    | 26.65 |    | 23.05 |    |
| 40.83  | 2.53    |         |           | 46.88 |     | 60.55  |     |         |    |       |    |       |    |
|        | 1933.00 |         |           | 7.92  |     | 340.80 |     | 1931.25 |    | 30.46 |    | 27.00 |    |
| 39.48  | 0.60    |         |           | 47.83 |     | 55.64  |     |         |    |       |    |       |    |
|        | 1965.00 |         |           | 7.84  |     | 340.20 |     | 1962.95 |    | 34.44 |    | 31.13 |    |
| 38.02  | 0.36    |         |           | 49.14 |     | 50.68  |     |         |    |       |    |       |    |
|        | 1996.00 |         |           | 7.75  |     | 339.50 |     | 1993.66 |    | 38.24 |    | 35.08 |    |
| 36.57  | 0.42    |         |           | 50.67 |     | 46.19  |     |         |    |       |    |       |    |

## HARVARD #7.TXT

|       |                 |                |                 |         |        |        |
|-------|-----------------|----------------|-----------------|---------|--------|--------|
| 35.11 | 2027.00<br>1.16 | 7.41<br>52.40  | 338.60<br>42.07 | 2024.39 | 41.91  | 38.90  |
| 33.59 | 2059.00<br>2.36 | 8.13<br>54.52  | 340.30<br>38.03 | 2056.10 | 45.81  | 42.95  |
| 32.13 | 2089.00<br>0.76 | 8.35<br>56.92  | 339.90<br>34.36 | 2085.79 | 49.71  | 46.99  |
| 30.55 | 2121.00<br>0.51 | 8.19<br>59.72  | 340.10<br>30.77 | 2117.46 | 53.87  | 51.32  |
| 29.04 | 2152.00<br>0.85 | 7.96<br>62.55  | 339.20<br>27.66 | 2148.15 | 57.80  | 55.40  |
| 27.47 | 2184.00<br>0.26 | 7.88<br>65.55  | 339.00<br>24.77 | 2179.84 | 61.76  | 59.52  |
| 25.83 | 2216.00<br>1.57 | 8.38<br>68.77  | 338.60<br>22.06 | 2211.52 | 65.81  | 63.74  |
| 24.23 | 2247.00<br>0.62 | 8.30<br>72.13  | 339.80<br>19.63 | 2242.19 | 69.85  | 67.94  |
| 22.80 | 2278.00<br>1.44 | 8.27<br>75.69  | 342.90<br>17.53 | 2272.87 | 73.94  | 72.17  |
| 21.52 | 2310.00<br>0.76 | 8.27<br>79.56  | 344.60<br>15.69 | 2304.54 | 78.22  | 76.59  |
| 20.30 | 2342.00<br>0.60 | 8.08<br>83.48  | 344.50<br>14.08 | 2336.21 | 82.48  | 80.98  |
| 19.13 | 2373.00<br>0.10 | 8.09<br>87.30  | 344.30<br>12.66 | 2366.91 | 86.56  | 85.18  |
| 17.95 | 2405.00<br>3.10 | 7.11<br>91.03  | 343.10<br>11.37 | 2398.62 | 90.50  | 89.24  |
| 16.89 | 2436.00<br>4.96 | 5.59<br>94.03  | 340.90<br>10.35 | 2429.43 | 93.65  | 92.50  |
| 15.85 | 2467.00<br>0.79 | 5.51<br>96.62  | 338.50<br>9.44  | 2460.29 | 96.36  | 95.31  |
| 14.79 | 2498.00<br>0.31 | 5.50<br>99.20  | 339.50<br>8.57  | 2491.14 | 99.02  | 98.09  |
| 13.85 | 2529.00<br>1.25 | 5.44<br>101.84 | 343.52<br>7.82  | 2522.00 | 101.73 | 100.89 |
| 13.03 | 2560.00<br>3.37 | 4.43<br>104.24 | 340.42<br>7.18  | 2552.89 | 104.18 | 103.43 |
| 12.26 | 2592.00<br>3.26 | 3.40<br>106.18 | 337.93<br>6.63  | 2584.81 | 106.15 | 105.47 |
| 11.61 | 2623.00<br>2.95 | 2.52<br>107.56 | 333.09<br>6.20  | 2615.77 | 107.54 | 106.93 |
| 11.00 | 2655.00<br>3.32 | 1.58<br>108.45 | 318.92<br>5.82  | 2647.75 | 108.44 | 107.89 |
| 10.48 | 2686.00<br>3.35 | 0.90<br>108.76 | 280.50<br>5.53  | 2678.74 | 108.76 | 108.26 |
| 10.05 | 2717.00<br>1.93 | 0.83<br>108.65 | 240.19<br>5.31  | 2709.74 | 108.65 | 108.19 |
| 9.61  | 2748.00<br>0.71 | 1.05<br>108.36 | 240.15<br>5.09  | 2740.74 | 108.36 | 107.94 |
| 9.23  | 2779.00<br>1.42 | 0.81<br>108.02 | 217.10<br>4.90  | 2771.73 | 108.01 | 107.62 |
| 8.99  | 2810.00<br>0.39 | 0.69<br>107.67 | 215.40<br>4.79  | 2802.73 | 107.67 | 107.29 |
| 8.81  | 2841.00<br>1.01 | 0.38<br>107.42 | 220.20<br>4.71  | 2833.73 | 107.42 | 107.06 |
| 8.65  | 2873.00<br>0.75 | 0.61<br>107.19 | 212.18<br>4.63  | 2865.73 | 107.18 | 106.84 |

| HARVARD #7.TXT |         |        |        |         |        |        |
|----------------|---------|--------|--------|---------|--------|--------|
| 8.48           | 2904.00 | 0.69   | 208.30 | 2896.73 | 106.86 | 106.53 |
|                | 0.29    | 106.87 | 4.55   |         |        |        |
| 8.29           | 2936.00 | 0.74   | 208.50 | 2928.72 | 106.50 | 106.18 |
|                | 0.16    | 106.51 | 4.46   |         |        |        |
| 8.18           | 2967.00 | 0.58   | 183.50 | 2959.72 | 106.16 | 105.85 |
|                | 1.05    | 106.17 | 4.42   |         |        |        |
| 8.17           | 2998.00 | 0.23   | 179.70 | 2990.72 | 105.94 | 105.63 |
|                | 1.13    | 105.95 | 4.42   |         |        |        |
| 8.24           | 3030.00 | 0.26   | 117.80 | 3022.72 | 105.85 | 105.53 |
|                | 0.79    | 105.85 | 4.46   |         |        |        |
| 8.31           | 3059.00 | 0.35   | 168.00 | 3051.72 | 105.74 | 105.42 |
|                | 0.94    | 105.74 | 4.51   |         |        |        |
| 8.31           | 3091.00 | 0.20   | 203.20 | 3083.72 | 105.59 | 105.27 |
|                | 0.69    | 105.60 | 4.51   |         |        |        |

Scientific Drilling International  
Survey Report

Company: MACK ENERGY  
Time: 14:39:58 Page: 2  
Field: Undesignated Loco Hills  
Reference: Site: Eddy County, NM, Grid North  
Site: Eddy County, NM  
Reference: SITE 0.0  
Well: Harvard Federal #7  
Reference: well (0.00N,0.00E,5.19Azi)  
Wellpath: DH - Job #32D1006841  
Method: Minimum Curvature Db: Sybase

Date: 01/10/2007  
Co-ordinate(NE)  
Vertical (TVD)  
Section (VS)  
Survey Calculation

| Survey |                              |                                        |                                         |           |          |           |
|--------|------------------------------|----------------------------------------|-----------------------------------------|-----------|----------|-----------|
| E/W    | MD<br>DLS<br>ft<br>deg/100ft | Incl<br>C <sub>1</sub> SD<br>deg<br>ft | Azim<br>C <sub>1</sub> SA<br>deg<br>deg | TVD<br>ft | VS<br>ft | N/S<br>ft |
| 8.25   | 3123.00<br>0.28              | 0.28<br>105.47                         | 212.60<br>4.48                          | 3115.72   | 105.47   | 105.15    |
| 8.11   | 3161.00<br>0.48              | 0.28<br>105.35                         | 250.60<br>4.41                          | 3153.72   | 105.35   | 105.04    |
| 7.96   | 3193.00<br>0.44              | 0.26<br>105.33                         | 280.30<br>4.34                          | 3185.72   | 105.32   | 105.03    |
| 7.95   | 3223.00<br>1.69              | 0.31<br>105.40                         | 45.14<br>4.33                           | 3215.72   | 105.39   | 105.10    |
| 8.10   | 3252.00<br>0.41              | 0.40<br>105.52                         | 57.80<br>4.40                           | 3244.72   | 105.51   | 105.21    |
| 8.31   | 3283.00<br>0.93              | 0.44<br>105.58                         | 97.53<br>4.51                           | 3275.72   | 105.57   | 105.25    |
| 8.51   | 3315.00<br>0.41              | 0.31<br>105.57                         | 94.55<br>4.63                           | 3307.72   | 105.57   | 105.23    |
|        | 3346.00                      | 0.38                                   | 32.37                                   | 3338.72   | 105.66   | 105.31    |

## HARVARD #7.TXT

|      |         |        |        |         |        |        |
|------|---------|--------|--------|---------|--------|--------|
| 8.65 | 1.17    | 105.66 | 4.70   |         |        |        |
|      | 3378.00 | 0.32   | 11.50  | 3370.71 | 105.84 | 105.48 |
| 8.73 | 0.44    | 105.84 | 4.73   |         |        |        |
|      | 3409.00 | 0.12   | 330.20 | 3401.71 | 105.95 | 105.60 |
| 8.73 | 0.78    | 105.96 | 4.73   |         |        |        |
|      | 3440.00 | 0.17   | 349.10 | 3432.71 | 106.02 | 105.67 |
| 8.70 | 0.22    | 106.03 | 4.71   |         |        |        |
|      | 3472.00 | 0.15   | 75.90  | 3464.71 | 106.08 | 105.73 |
| 8.74 | 0.69    | 106.09 | 4.72   |         |        |        |
|      | 3503.00 | 0.29   | 97.93  | 3495.71 | 106.09 | 105.73 |
| 8.85 | 0.52    | 106.10 | 4.79   |         |        |        |
|      | 3534.00 | 0.44   | 109.90 | 3526.71 | 106.06 | 105.68 |
| 9.04 | 0.54    | 106.06 | 4.89   |         |        |        |
|      | 3566.00 | 0.46   | 111.60 | 3558.71 | 105.99 | 105.59 |
| 9.28 | 0.08    | 105.99 | 5.02   |         |        |        |
|      | 3597.00 | 0.08   | 113.10 | 3589.71 | 105.95 | 105.53 |
| 9.41 | 1.23    | 105.95 | 5.10   |         |        |        |
|      | 3629.00 | 0.31   | 294.30 | 3621.71 | 105.97 | 105.56 |
| 9.35 | 1.22    | 105.97 | 5.06   |         |        |        |
|      | 3660.00 | 0.24   | 258.20 | 3652.71 | 105.98 | 105.58 |
| 9.21 | 0.59    | 105.98 | 4.99   |         |        |        |
|      | 3691.00 | 0.34   | 295.50 | 3683.71 | 105.99 | 105.61 |
| 9.07 | 0.67    | 105.99 | 4.91   |         |        |        |
|      | 3723.00 | 0.22   | 323.00 | 3715.71 | 106.07 | 105.70 |
| 8.94 | 0.55    | 106.07 | 4.84   |         |        |        |
|      | 3753.00 | 0.47   | 311.20 | 3745.71 | 106.19 | 105.82 |
| 8.82 | 0.86    | 106.19 | 4.76   |         |        |        |
|      | 3785.00 | 0.44   | 308.70 | 3777.71 | 106.33 | 105.99 |
| 8.62 | 0.11    | 106.34 | 4.65   |         |        |        |
|      | 3816.00 | 0.48   | 296.70 | 3808.71 | 106.45 | 106.12 |
| 8.41 | 0.34    | 106.45 | 4.53   |         |        |        |
|      | 3848.00 | 0.51   | 294.80 | 3840.71 | 106.54 | 106.24 |
| 8.17 | 0.11    | 106.55 | 4.39   |         |        |        |
|      | 3879.00 | 0.29   | 266.00 | 3871.71 | 106.58 | 106.29 |
| 7.96 | 0.94    | 106.59 | 4.28   |         |        |        |
|      | 3911.00 | 0.20   | 232.20 | 3903.71 | 106.53 | 106.25 |
| 7.84 | 0.52    | 106.54 | 4.22   |         |        |        |
|      | 3941.00 | 0.24   | 152.50 | 3933.71 | 106.44 | 106.16 |
| 7.82 | 0.95    | 106.45 | 4.22   |         |        |        |
|      | 3972.00 | 0.38   | 120.30 | 3964.71 | 106.34 | 106.05 |
| 7.94 | 0.70    | 106.35 | 4.28   |         |        |        |
|      | 4003.00 | 0.22   | 105.10 | 3995.71 | 106.28 | 105.99 |
| 8.09 | 0.57    | 106.30 | 4.36   |         |        |        |
|      | 4035.00 | 0.30   | 108.40 | 4027.70 | 106.25 | 105.94 |
| 8.23 | 0.25    | 106.26 | 4.44   |         |        |        |
|      | 4066.00 | 0.41   | 121.70 | 4058.70 | 106.19 | 105.86 |
| 8.40 | 0.44    | 106.19 | 4.54   |         |        |        |
|      | 4098.00 | 0.46   | 125.60 | 4090.70 | 106.07 | 105.73 |
| 8.60 | 0.18    | 106.08 | 4.65   |         |        |        |
|      | 4128.00 | 0.43   | 102.20 | 4120.70 | 106.00 | 105.63 |
| 8.81 | 0.61    | 106.00 | 4.77   |         |        |        |
|      | 4159.00 | 0.41   | 103.90 | 4151.70 | 105.96 | 105.58 |
| 9.03 | 0.08    | 105.97 | 4.89   |         |        |        |
|      | 4190.00 | 0.21   | 174.10 | 4182.70 | 105.89 | 105.50 |
| 9.14 | 1.27    | 105.89 | 4.95   |         |        |        |
|      | 4221.00 | 0.18   | 248.90 | 4213.70 | 105.81 | 105.42 |
| 9.10 | 0.77    | 105.82 | 4.94   |         |        |        |

| HARVARD #7.TXT |                 |                |                |         |        |        |
|----------------|-----------------|----------------|----------------|---------|--------|--------|
| 8.99           | 4253.00<br>0.26 | 0.24<br>105.78 | 264.50<br>4.88 | 4245.70 | 105.78 | 105.40 |
| 8.84           | 4284.00<br>0.29 | 0.32<br>105.77 | 273.00<br>4.79 | 4276.70 | 105.76 | 105.40 |
| 8.70           | 4314.00<br>0.31 | 0.23<br>105.77 | 278.70<br>4.72 | 4306.70 | 105.77 | 105.41 |
| 8.54           | 4344.00<br>0.65 | 0.40<br>105.81 | 296.60<br>4.63 | 4336.70 | 105.81 | 105.47 |
| 8.35           | 4376.00<br>0.19 | 0.42<br>105.91 | 304.50<br>4.52 | 4368.70 | 105.91 | 105.58 |
| 8.23           | 4407.00<br>0.87 | 0.34<br>106.06 | 344.10<br>4.45 | 4399.70 | 106.05 | 105.74 |
| 8.20           | 4426.00<br>0.85 | 0.18<br>106.14 | 338.50<br>4.43 | 4418.70 | 106.13 | 105.82 |
| 8.14           | 4467.00<br>0.20 | 0.26<br>106.28 | 336.50<br>4.39 | 4459.70 | 106.27 | 105.96 |
| 8.07           | 4499.00<br>0.50 | 0.42<br>106.45 | 339.30<br>4.35 | 4491.70 | 106.43 | 106.14 |
| 8.02           | 4529.00<br>0.40 | 0.44<br>106.66 | 355.20<br>4.31 | 4521.70 | 106.65 | 106.36 |
| 7.96           | 4558.00<br>0.56 | 0.50<br>106.88 | 336.50<br>4.27 | 4550.70 | 106.87 | 106.58 |
| 7.82           | 4589.00<br>1.06 | 0.38<br>107.04 | 295.30<br>4.19 | 4581.69 | 107.02 | 106.75 |
| 7.65           | 4621.00<br>0.44 | 0.38<br>107.15 | 316.60<br>4.09 | 4613.69 | 107.13 | 106.87 |
| 7.49           | 4652.00<br>0.23 | 0.43<br>107.29 | 309.70<br>4.00 | 4644.69 | 107.26 | 107.02 |
| 7.38           | 4683.00<br>0.86 | 0.36<br>107.45 | 348.10<br>3.94 | 4675.69 | 107.42 | 107.19 |
| 7.31           | 4714.00<br>0.35 | 0.35<br>107.62 | 330.80<br>3.90 | 4706.69 | 107.59 | 107.37 |

# Scientific Drilling International Survey Report

Company: MACK ENERGY  
Time: 14:39:58 Page: 3  
Field: Undesignated Loco Hills  
Reference: Site: Eddy County, NM, Grid North  
Site: Eddy County, NM  
Reference: SITE 0.0  
Well: Harvard Federal #7  
Reference: Well (0.00N,0.00E,5.19Azi)  
Wellpath: DH - Job #32D1006841  
Method: Minimum Curvature Db: Sybase

Date: 01/10/2007  
Co-ordinate(N/E)  
Vertical (TVD)  
Section (VS)  
Survey Calculation

| Survey | MD | Incl | Azim | TVD | VS | N/S |
|--------|----|------|------|-----|----|-----|
|--------|----|------|------|-----|----|-----|

Page 5

## HARVARD #7.TXT

| E/W   | DLS<br>ft<br>deg/100ft | ClSD<br>deg<br>ft | ClSA<br>deg<br>deg | ft      | ft     | ft     |
|-------|------------------------|-------------------|--------------------|---------|--------|--------|
|       | 4745.00                | 0.08              | 347.10             | 4737.69 | 107.69 | 107.47 |
| 7.26  | 0.88                   | 107.72            | 3.86               |         |        |        |
|       | 4774.00                | 0.41              | 133.50             | 4766.69 | 107.65 | 107.42 |
| 7.33  | 1.65                   | 107.67            | 3.90               |         |        |        |
|       | 4805.00                | 0.51              | 135.10             | 4797.69 | 107.49 | 107.25 |
| 7.51  | 0.33                   | 107.51            | 4.00               |         |        |        |
|       | 4836.00                | 0.22              | 84.30              | 4828.69 | 107.41 | 107.16 |
| 7.66  | 1.32                   | 107.43            | 4.09               |         |        |        |
|       | 4868.00                | 0.17              | 38.85              | 4860.69 | 107.46 | 107.20 |
| 7.76  | 0.49                   | 107.48            | 4.14               |         |        |        |
|       | 4899.00                | 0.40              | 57.45              | 4891.69 | 107.57 | 107.29 |
| 7.88  | 0.79                   | 107.58            | 4.20               |         |        |        |
|       | 4931.00                | 0.26              | 35.32              | 4923.69 | 107.70 | 107.41 |
| 8.01  | 0.58                   | 107.71            | 4.27               |         |        |        |
|       | 4962.00                | 0.15              | 105.70             | 4954.69 | 107.75 | 107.46 |
| 8.09  | 0.82                   | 107.76            | 4.31               |         |        |        |
|       | 4993.00                | 0.26              | 149.50             | 4985.69 | 107.69 | 107.39 |
| 8.17  | 0.59                   | 107.70            | 4.35               |         |        |        |
|       | 5024.00                | 0.24              | 110.80             | 5016.69 | 107.61 | 107.30 |
| 8.26  | 0.54                   | 107.62            | 4.40               |         |        |        |
|       | 5055.00                | 0.39              | 121.60             | 5047.69 | 107.55 | 107.23 |
| 8.41  | 0.52                   | 107.56            | 4.49               |         |        |        |
|       | 5086.00                | 0.48              | 145.60             | 5078.69 | 107.40 | 107.06 |
| 8.58  | 0.65                   | 107.41            | 4.58               |         |        |        |
|       | 5117.00                | 0.48              | 159.40             | 5109.69 | 107.18 | 106.84 |
| 8.70  | 0.37                   | 107.19            | 4.65               |         |        |        |
|       | 5148.00                | 0.48              | 161.90             | 5140.68 | 106.95 | 106.59 |
| 8.78  | 0.07                   | 106.95            | 4.71               |         |        |        |
|       | 5179.00                | 0.36              | 169.10             | 5171.68 | 106.74 | 106.37 |
| 8.84  | 0.42                   | 106.74            | 4.75               |         |        |        |
|       | 5210.00                | 0.47              | 128.60             | 5202.68 | 106.57 | 106.20 |
| 8.96  | 0.98                   | 106.57            | 4.82               |         |        |        |
|       | 5241.00                | 0.51              | 126.80             | 5233.68 | 106.43 | 106.03 |
| 9.17  | 0.14                   | 106.43            | 4.94               |         |        |        |
|       | 5272.00                | 0.57              | 137.00             | 5264.68 | 106.25 | 105.84 |
| 9.38  | 0.36                   | 106.25            | 5.07               |         |        |        |
|       | 5302.00                | 0.51              | 137.00             | 5294.68 | 106.07 | 105.63 |
| 9.58  | 0.20                   | 106.07            | 5.18               |         |        |        |
|       | 5334.00                | 0.71              | 129.90             | 5326.68 | 105.86 | 105.40 |
| 9.83  | 0.67                   | 105.86            | 5.33               |         |        |        |
|       | 5364.00                | 0.66              | 153.20             | 5356.68 | 105.61 | 105.13 |
| 10.05 | 0.94                   | 105.61            | 5.46               |         |        |        |
|       | 5394.00                | 0.84              | 136.40             | 5386.67 | 105.31 | 104.81 |
| 10.28 | 0.94                   | 105.32            | 5.60               |         |        |        |
|       | 5425.00                | 0.75              | 134.70             | 5417.67 | 105.04 | 104.51 |
| 10.58 | 0.30                   | 105.04            | 5.78               |         |        |        |
|       | 5456.00                | 0.61              | 135.50             | 5448.67 | 104.80 | 104.25 |
| 10.84 | 0.45                   | 104.81            | 5.93               |         |        |        |
|       | 5488.00                | 0.62              | 291.10             | 5480.67 | 104.74 | 104.19 |
| 10.79 | 3.76                   | 104.74            | 5.92               |         |        |        |
|       | 5519.00                | 0.62              | 296.60             | 5511.66 | 104.84 | 104.32 |
| 10.49 | 0.19                   | 104.85            | 5.74               |         |        |        |
|       | 5551.00                | 0.56              | 318.36             | 5543.66 | 105.01 | 104.52 |
| 10.23 | 0.72                   | 105.02            | 5.59               |         |        |        |

|       |         |        | HARVARD #7.TXT |         |        |        |
|-------|---------|--------|----------------|---------|--------|--------|
|       | 5583.00 | 0.36   | 65.97          | 5575.66 | 105.17 | 104.67 |
| 10.22 | 2.35    | 105.17 | 5.57           |         |        |        |
|       | 5613.00 | 0.58   | 86.21          | 5605.66 | 105.24 | 104.72 |
| 10.45 | 0.91    | 105.24 | 5.70           |         |        |        |
|       | 5645.00 | 0.62   | 80.65          | 5637.66 | 105.31 | 104.76 |
| 10.79 | 0.22    | 105.32 | 5.88           |         |        |        |
|       | 5675.00 | 0.63   | 82.98          | 5667.66 | 105.38 | 104.81 |
| 11.11 | 0.09    | 105.40 | 6.05           |         |        |        |
|       | 5708.00 | 0.70   | 88.08          | 5700.66 | 105.45 | 104.84 |
| 11.49 | 0.28    | 105.47 | 6.26           |         |        |        |
|       | 5735.00 | 0.76   | 133.67         | 5727.65 | 105.36 | 104.72 |
| 11.79 | 2.10    | 105.38 | 6.42           |         |        |        |
|       | 5765.00 | 0.83   | 143.14         | 5757.65 | 105.07 | 104.41 |
| 12.06 | 0.50    | 105.10 | 6.59           |         |        |        |
|       | 5826.00 | 0.83   | 143.14         | 5818.64 | 104.42 | 103.70 |
| 12.59 | 0.00    | 104.46 | 6.92           |         |        |        |
|       | 6235.00 | 0.83   | 143.14         | 6227.60 | 100.02 | 98.96  |
| 16.15 | 0.00    | 100.27 | 9.27           |         |        |        |