



P. O. Box 35040, Houston, Texas 77235-5040, Phone: (713) 729-4595

December 30, 1987

Harvey E. Yates Company  
P.O. Drawer 1933  
Roswell, NM 78711

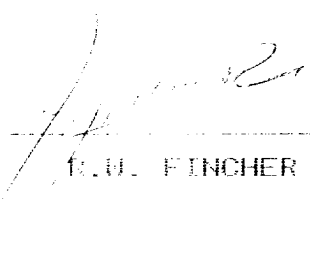
Attention: Mr. RAY NOKES

Re: HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT # 3  
LEA COUNTY NEW MEXICO  
LATERAL # 1  
MAGNETIC MULTISHOT SURVEY 07 NOV 1987  
SURVEYOR: D. GAMEL  
COMPOSITE SURVEY FROM KOP TO 9081. TD  
LATERAL #2  
MAGNETIC MULTISHOT SURVEY 12 NOV 1987  
SURVEYOR: D. GAMEL  
COMPOSITE SURVEY FROM KOP TO 8740. PROJECTED TO TD,  
8821

Dear Mr. Nokes,

ROGER FINCHER, being duly sworn, deposes and says that; he is employed by Eastman Christensen supervising well-bore surveying performed by Eastman Christensen on the above referenced well; that under his direction these survey(s) have been conducted or supervised on the date(s), to the depth(s), and by the survey operator(s) stated.

The data for this survey information has been examined by me and is true and correct to the best of my knowledge.



R.O. FINCHER

RECEIVED  
JAN 5 1988  
CO-OP  
WORKS OFFICE



EASTMAN CHRISTENSEN

RECORD OF SURVEY

FOR

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* * * * *
*
* OPERATOR   : HARVEY E. YATES COMPANY
*
* WELL NAME  : YOUNG DEEP UNIT #8
*
* LOCATION   : LEA COUNTY, NEW MEXICO
*
* JOB NUMBER : LATERAL #1
*
* RIG        :
*
* DECLINATION : 10.00 E
*
* * * * *
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EC DISTRICT : LATERAL DRILLING

RECEIVED

JAN 5 1988

OCD  
HOBBS OFFICE

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87 PAGE NO. 2

OUR REF. NO. : S00021.4HY

DECLINATION : 10.00 JOB NUMBER : LATERAL #1

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|------------------|--------------------|
| 8895.00           | 2 30                  | N 21 0 E                  | 0.00             | 8891.32                   | 177.20 N 53.94 W           | 185.23              | N 16 56 W        | 0.00               |
| 8902.00           | 2 30                  | N 71 30 E                 | 7.00             | 8898.31                   | 177.40 N 53.73 W           | 185.36              | N 16 51 W        | 30.46              |
| 8903.00           | 3 15                  | N 73 0 E                  | 1.00             | 8899.31                   | 177.42 N 53.68 W           | 185.36              | N 16 50 W        | 75.37              |
| 8904.00           | 5 15                  | N 74 30 E                 | 1.00             | 8900.31                   | 177.44 N 53.61 W           | 185.36              | N 16 49 W        | 200.29             |
| 8905.00           | 7 0                   | N 76 0 E                  | 1.00             | 8901.30                   | 177.47 N 53.50 W           | 185.36              | N 16 47 W        | 175.72             |
| 8906.00           | 9 0                   | N 77 0 E                  | 1.00             | 8902.29                   | 177.50 N 53.37 W           | 185.35              | N 16 44 W        | 200.48             |
| 8907.00           | 11 0                  | N 78 30 E                 | 1.00             | 8903.28                   | 177.54 N 53.20 W           | 185.34              | N 16 41 W        | 201.67             |
| 8908.00           | 13 0                  | N 80 0 E                  | 1.00             | 8904.26                   | 177.58 N 53.00 W           | 185.31              | N 16 37 W        | 202.40             |
| 8909.00           | 15 0                  | N 81 30 E                 | 1.00             | 8905.23                   | 177.61 N 52.76 W           | 185.28              | N 16 33 W        | 203.25             |
| 8910.00           | 16 30                 | N 82 30 E                 | 1.00             | 8906.19                   | 177.65 N 52.49 W           | 185.24              | N 16 28 W        | 152.43             |
| 8911.00           | 19 0                  | N 84 0 E                  | 1.00             | 8907.14                   | 177.69 N 52.18 W           | 185.19              | N 16 22 W        | 254.13             |
| 8912.00           | 22 0                  | N 85 30 E                 | 1.00             | 8908.08                   | 177.72 N 51.84 W           | 185.13              | N 16 16 W        | 304.54             |
| 8913.00           | 25 15                 | N 87 0 E                  | 1.00             | 8909.00                   | 177.75 N 51.44 W           | 185.04              | N 16 8 W         | 330.49             |
| 8914.00           | 29 0                  | N 88 30 E                 | 1.00             | 8909.88                   | 177.76 N 50.98 W           | 184.93              | N 16 0 W         | 381.16             |
| 8915.00           | 32 0                  | N 89 30 E                 | 1.00             | 8910.75                   | 177.77 N 50.47 W           | 184.80              | N 15 51 W        | 304.25             |
| 8916.00           | 35 30                 | S 89 0 E                  | 1.00             | 8911.58                   | 177.77 N 49.92 W           | 184.65              | N 15 41 W        | 359.76             |
| 8917.00           | 39 0                  | S 87 30 E                 | 1.00             | 8912.37                   | 177.75 N 49.31 W           | 184.47              | N 15 30 W        | 361.56             |
| 8918.00           | 42 0                  | S 86 0 E                  | 1.00             | 8913.13                   | 177.72 N 48.66 W           | 184.26              | N 15 19 W        | 315.40             |
| 8919.00           | 44 30                 | S 85 0 E                  | 1.00             | 8913.86                   | 177.66 N 47.98 W           | 184.03              | N 15 7 W         | 259.21             |
| 8920.00           | 47 0                  | S 83 0 E                  | 1.00             | 8914.56                   | 177.59 N 47.27 W           | 183.77              | N 14 54 W        | 288.11             |
| 8921.00           | 50 0                  | S 82 0 E                  | 1.00             | 8915.22                   | 177.49 N 46.53 W           | 183.49              | N 14 41 W        | 309.20             |
| 8922.00           | 53 0                  | S 80 0 E                  | 1.00             | 8915.84                   | 177.37 N 45.75 W           | 183.17              | N 14 28 W        | 338.35             |
| 8923.00           | 55 0                  | S 80 0 E                  | 1.00             | 8916.43                   | 177.23 N 44.96 W           | 182.84              | N 14 14 W        | 200.00             |
| 8924.00           | 58 15                 | S 77 0 E                  | 1.00             | 8916.98                   | 177.06 N 44.14 W           | 182.48              | N 14 0 W         | 410.30             |
| 8925.00           | 61 15                 | S 76 0 E                  | 1.00             | 8917.49                   | 176.86 N 43.30 W           | 182.08              | N 13 45 W        | 312.18             |
| 8926.00           | 64 0                  | S 74 0 E                  | 1.00             | 8917.95                   | 176.63 N 42.44 W           | 181.66              | N 13 31 W        | 327.35             |
| 8927.00           | 66 45                 | S 74 0 E                  | 1.00             | 8918.36                   | 176.38 N 41.57 W           | 181.21              | N 13 16 W        | 275.00             |
| 8928.00           | 69 0                  | S 72 0 E                  | 1.00             | 8918.74                   | 176.11 N 40.68 W           | 180.74              | N 13 0 W         | 291.45             |
| 8929.00           | 71 30                 | S 72 0 E                  | 1.00             | 8919.08                   | 175.82 N 39.79 W           | 180.26              | N 12 45 W        | 250.00             |
| 8930.00           | 74 30                 | S 72 0 E                  | 1.00             | 8919.37                   | 175.52 N 38.88 W           | 179.77              | N 12 29 W        | 300.00             |

CONTINUED ON NEXT PAGE ...

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87 PAGE NO. 3

OUR REF. NO. : S00021.4HY

DECLINATION : 10.00 JOB NUMBER : LATERAL #1

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|------------------|--------------------|
| 8931.00           | 78 0                  | S 71 0 E                  | 1.00             | 8919.61                   | 175.21 N 37.96 W           | 179.28              | N 12 13 W        | 363.22             |
| 8932.00           | 81 30                 | S 71 0 E                  | 1.00             | 8919.78                   | 174.89 N 37.03 W           | 178.77              | N 11 57 W        | 350.00             |
| 8933.00           | 85 0                  | S 70 0 E                  | 1.00             | 8919.90                   | 174.56 N 36.09 W           | 178.25              | N 11 41 W        | 363.81             |
| 8934.00           | 86 0                  | S 69 0 E                  | 1.00             | 8919.98                   | 174.21 N 35.16 W           | 177.72              | N 11 25 W        | 141.20             |
| 8935.00           | 88 0                  | S 70 0 E                  | 1.00             | 8920.03                   | 173.86 N 34.22 W           | 177.20              | N 11 8 W         | 223.54             |
| 8936.00           | 88 0                  | S 70 0 E                  | 1.00             | 8920.07                   | 173.52 N 33.28 W           | 176.68              | N 10 51 W        | 0.00               |
| 8940.00           | 88 15                 | S 70 0 E                  | 4.00             | 8920.20                   | 172.15 N 29.53 W           | 174.67              | N 9 44 W         | 6.25               |
| 8945.00           | 88 0                  | S 70 0 E                  | 5.00             | 8920.36                   | 170.44 N 24.83 W           | 172.24              | N 8 17 W         | 5.00               |
| 8950.00           | 86 30                 | S 70 0 E                  | 5.00             | 8920.60                   | 168.74 N 20.14 W           | 169.93              | N 6 48 W         | 30.00              |
| 8955.00           | 85 30                 | S 70 0 E                  | 5.00             | 8920.95                   | 167.03 N 15.45 W           | 167.74              | N 5 17 W         | 20.00              |
| 8960.00           | 84 0                  | S 70 0 E                  | 5.00             | 8921.41                   | 165.33 N 10.77 W           | 165.68              | N 3 44 W         | 30.00              |
| 8965.00           | 83 30                 | S 70 0 E                  | 5.00             | 8921.95                   | 163.63 N 6.10 W            | 163.74              | N 2 8 W          | 10.00              |
| 8970.00           | 82 45                 | S 70 0 E                  | 5.00             | 8922.55                   | 161.93 N 1.44 W            | 161.94              | N 0 30 W         | 15.00              |
| 8975.00           | 82 15                 | S 70 0 E                  | 5.00             | 8923.20                   | 160.23 N 3.22 E            | 160.27              | N 1 9 E          | 10.00              |
| 8980.00           | 81 30                 | S 69 0 E                  | 5.00             | 8923.91                   | 158.50 N 7.86 E            | 158.69              | N 2 50 E         | 24.84              |
| 8985.00           | 80 30                 | S 65 0 E                  | 5.00             | 8924.69                   | 156.57 N 12.40 E           | 157.06              | N 4 32 E         | 81.51              |
| 8988.00           | 80 0                  | S 65 0 E                  | 3.00             | 8925.20                   | 155.32 N 15.08 E           | 156.05              | N 5 33 E         | 16.67              |
| 8990.00           | 80 30                 | S 68 0 E                  | 2.00             | 8925.54                   | 154.54 N 16.89 E           | 155.46              | N 6 14 E         | 149.93             |
| 8995.00           | 81 0                  | S 68 0 E                  | 5.00             | 8926.34                   | 152.69 N 21.47 E           | 154.19              | N 8 0 E          | 10.00              |
| 9000.00           | 81 0                  | S 68 0 E                  | 5.00             | 8927.13                   | 150.84 N 26.04 E           | 153.07              | N 9 48 E         | 0.00               |
| 9005.00           | 81 0                  | S 68 0 E                  | 5.00             | 8927.91                   | 148.99 N 30.62 E           | 152.10              | N 11 37 E        | 0.00               |
| 9010.00           | 81 30                 | S 68 0 E                  | 5.00             | 8928.67                   | 147.14 N 35.21 E           | 151.29              | N 13 27 E        | 10.00              |
| 9015.00           | 82 0                  | S 67 0 E                  | 5.00             | 8929.39                   | 145.24 N 39.78 E           | 150.59              | N 15 19 E        | 22.18              |
| 9020.00           | 82 0                  | S 64 0 E                  | 5.00             | 8930.08                   | 143.19 N 44.28 E           | 149.88              | N 17 11 E        | 59.42              |
| 9022.00           | 82 0                  | S 64 0 E                  | 2.00             | 8930.36                   | 142.32 N 46.06 E           | 149.59              | N 17 56 E        | 0.00               |
| 9081.00           | 84 0                  | S 62 0 E                  | 59.00            | 8937.55                   | 115.74 N 98.23 E           | 151.81              | N 40 19 E        | 4.78               |

CLOSURE - DISTANCE : 151.81  
DIRECTION : N 40 19 E

REPORT UNITS : Feet  
SURVEY CALCULATION METHOD : Radius of curvature

RECEIVED  
JAN 5 1988  
OCD  
HOBBS OFFICE

SURVEY RUN INFORMATION

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THIS SURVEY WAS TIED-ON TO THE VERTICAL WELL SURVEY AT  
8895 FEET MEASURED DEPTH.

1 INCH

(FOR SCALING PURPOSES)

NOTES: COORDINATES  
TO BE USED

170 V. SECTION PLANE N3°00'W  
SURVEY S00022.127

SCALE 1"=100 FT. SLOPE 100:87.00 BASE 87.00

HARVEY E. YATES COMPANY

YOUNG DEEP UNIT, 28  
LEA COUNTY, NEW HAMPSHIRE

2017 50027

RECEIVED  
JAN 5 1988  
OCD  
HOBBS OFFICE

EASTMAN CHRISTENSEN

RECORD OF SURVEY

FOR

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* * * * *
*
* OPERATOR   : HARVEY E. YATES COMPANY
*
* WELL NAME  : YOUNG DEEP UNIT #8
*
* LOCATION   : LEA COUNTY, NEW MEXICO
*
* JOB NUMBER : LATERAL #2
*
* RIG        :
*
* DECLINATION : 10.00 E
*
* * * * *
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EC DISTRICT : LATERAL DRILLING

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87      PAGE NO. 2  
OUR REF. NO. : S00022.4HY  
DECLINATION : 10.00 JOB NUMBER : LATERAL #2

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | R E C T A N G U L A R<br>C O O R D I N A T E S |         | C L O S U R E<br>DISTANCE      DIRECTION<br>D M |        | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|------------------------------------------------|---------|-------------------------------------------------|--------|--------------------|
| 8700.00           | 3 30                  | N 24 0 E                  | 0.00             | 8696.55                   | 168.69 N                                       | 57.87 W | 178.34 N 18 56 W                                | 0.00   |                    |
| 8714.00           | 4 30                  | N 4 0 E                   | 14.00            | 8710.52                   | 169.63 N                                       | 57.63 W | 179.16 N 18 46 W                                | 12.16  |                    |
| 8715.00           | 6 45                  | N 4 0 E                   | 1.00             | 8711.51                   | 169.73 N                                       | 57.63 W | 179.25 N 18 45 W                                | 225.00 |                    |
| 8716.00           | 8 45                  | N 4 0 E                   | 1.00             | 8712.50                   | 169.87 N                                       | 57.62 W | 179.37 N 18 44 W                                | 200.00 |                    |
| 8717.00           | 11 30                 | N 4 0 E                   | 1.00             | 8713.49                   | 170.04 N                                       | 57.61 W | 179.53 N 18 43 W                                | 275.00 |                    |
| 8718.00           | 15 0                  | N 4 0 E                   | 1.00             | 8714.46                   | 170.27 N                                       | 57.59 W | 179.74 N 18 41 W                                | 350.00 |                    |
| 8719.00           | 18 45                 | N 4 0 E                   | 1.00             | 8715.42                   | 170.56 N                                       | 57.57 W | 180.01 N 18 39 W                                | 375.00 |                    |
| 8720.00           | 22 45                 | N 4 0 E                   | 1.00             | 8716.35                   | 170.91 N                                       | 57.55 W | 180.34 N 18 36 W                                | 400.00 |                    |
| 8721.00           | 26 0                  | N 4 0 E                   | 1.00             | 8717.26                   | 171.32 N                                       | 57.52 W | 180.72 N 18 33 W                                | 325.00 |                    |
| 8722.00           | 30 0                  | N 4 0 E                   | 1.00             | 8718.15                   | 171.79 N                                       | 57.48 W | 181.15 N 18 30 W                                | 400.00 |                    |
| 8723.00           | 33 15                 | N 6 0 E                   | 1.00             | 8719.00                   | 172.31 N                                       | 57.44 W | 181.64 N 18 26 W                                | 341.46 |                    |
| 8724.00           | 36 30                 | N 7 0 E                   | 1.00             | 8719.82                   | 172.88 N                                       | 57.37 W | 182.15 N 18 22 W                                | 329.98 |                    |
| 8725.00           | 39 45                 | N 7 0 E                   | 1.00             | 8720.60                   | 173.49 N                                       | 57.30 W | 182.71 N 18 17 W                                | 325.00 |                    |
| 8726.00           | 42 15                 | N 7 0 E                   | 1.00             | 8721.36                   | 174.15 N                                       | 57.22 W | 183.31 N 18 11 W                                | 250.00 |                    |
| 8727.00           | 45 15                 | N 7 0 E                   | 1.00             | 8722.08                   | 174.83 N                                       | 57.13 W | 183.93 N 18 6 W                                 | 300.00 |                    |
| 8728.00           | 49 45                 | N 7 0 E                   | 1.00             | 8722.76                   | 175.56 N                                       | 57.04 W | 184.60 N 18 0 W                                 | 450.00 |                    |
| 8729.00           | 52 0                  | N 8 0 E                   | 1.00             | 8723.39                   | 176.33 N                                       | 56.94 W | 185.30 N 17 54 W                                | 237.99 |                    |
| 8730.00           | 55 0                  | N 8 0 E                   | 1.00             | 8723.98                   | 177.13 N                                       | 56.83 W | 186.02 N 17 47 W                                | 300.00 |                    |
| 8731.00           | 58 0                  | N 8 0 E                   | 1.00             | 8724.53                   | 177.95 N                                       | 56.72 W | 186.77 N 17 41 W                                | 300.00 |                    |
| 8732.00           | 61 0                  | N 8 0 E                   | 1.00             | 8725.04                   | 178.81 N                                       | 56.60 W | 187.55 N 17 34 W                                | 300.00 |                    |
| 8733.00           | 64 30                 | N 8 0 E                   | 1.00             | 8725.50                   | 179.69 N                                       | 56.47 W | 188.35 N 17 27 W                                | 350.00 |                    |
| 8734.00           | 68 0                  | N 8 0 E                   | 1.00             | 8725.90                   | 180.59 N                                       | 56.34 W | 189.18 N 17 20 W                                | 350.00 |                    |
| 8735.00           | 70 15                 | N 8 0 E                   | 1.00             | 8726.26                   | 181.52 N                                       | 56.21 W | 190.02 N 17 12 W                                | 225.00 |                    |
| 8736.00           | 73 30                 | N 9 0 E                   | 1.00             | 8726.57                   | 182.46 N                                       | 56.07 W | 190.88 N 17 5 W                                 | 338.61 |                    |
| 8737.00           | 76 30                 | N 9 0 E                   | 1.00             | 8726.83                   | 183.41 N                                       | 55.92 W | 191.75 N 16 57 W                                | 300.00 |                    |
| 8738.00           | 79 15                 | N 9 0 E                   | 1.00             | 8727.04                   | 184.38 N                                       | 55.77 W | 192.63 N 16 50 W                                | 275.00 |                    |
| 8739.00           | 82 15                 | N 9 0 E                   | 1.00             | 8727.20                   | 185.35 N                                       | 55.62 W | 193.52 N 16 42 W                                | 300.00 |                    |
| 8740.00           | 85 45                 | N 9 0 E                   | 1.00             | 8727.30                   | 186.34 N                                       | 55.46 W | 194.41 N 16 34 W                                | 350.00 |                    |
| 8741.00           | 88 30                 | N 9 0 E                   | 1.00             | 8727.35                   | 187.32 N                                       | 55.30 W | 195.31 N 16 27 W                                | 275.00 |                    |
| 8742.00           | 91 30                 | N 9 0 E                   | 1.00             | 8727.35                   | 188.31 N                                       | 55.15 W | 196.22 N 16 19 W                                | 300.00 |                    |

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JAN 5 1988

OCD  
HOBBS OFFICE

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87      PAGE NO. 3  
OUR REF. NO. : S00022.4HY  
DECLINATION : 10.00 JOB NUMBER : LATERAL #2

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | R E C T A N G U L A R<br>C O O R D I N A T E S |         | C L O S U R E<br>D I S T A N C E   D I R E C T I O N<br>D M |  | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|------------------------------------------------|---------|-------------------------------------------------------------|--|--------------------|
| 8743.00           | 94 30                 | N 9 0 E                   | 1.00             | 8727.30                   | 189.30 N                                       | 54.99 W | 197.12 N 16 12 W                                            |  | 300.00             |
| 8744.00           | 97 30                 | N 9 0 E                   | 1.00             | 8727.20                   | 190.28 N                                       | 54.84 W | 198.02 N 16 5 W                                             |  | 300.00             |
| 8745.00           | 100 30                | N 9 0 E                   | 1.00             | 8727.04                   | 191.25 N                                       | 54.68 W | 198.92 N 15 57 W                                            |  | 300.00             |
| 8746.00           | 103 0                 | N 9 0 E                   | 1.00             | 8726.84                   | 192.22 N                                       | 54.53 W | 199.80 N 15 50 W                                            |  | 250.00             |
| 8747.00           | 106 0                 | N 9 0 E                   | 1.00             | 8726.59                   | 193.18 N                                       | 54.38 W | 200.68 N 15 43 W                                            |  | 300.00             |
| 8748.00           | 107 0                 | N 9 0 E                   | 1.00             | 8726.30                   | 194.12 N                                       | 54.23 W | 201.55 N 15 36 W                                            |  | 100.00             |
| 8821.50           | 107 0                 | N 9 0 E                   | 73.50            | 8704.81                   | 263.55 N                                       | 43.23 W | 267.07 N 9 19 W                                             |  | 0.00               |

CLOSURE - DISTANCE : 267.07  
DIRECTION : N 9 19 W

REPORT UNITS : Feet  
SURVEY CALCULATION METHOD : Radius of curvature

#### SURVEY RUN INFORMATION

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THIS SURVEY WAS TIED-ON TO THE VERTICAL SURVEY AT  
8700 FEET MEASURED DEPTH. THE FINAL STATION AT 8821.5  
FEET MEASURED DEPTH IS A PROJECTION TO TD. IT WAS NOT  
POSSIBLE TO GET AN ACTUAL MAGNETIC MULTISHOT TOOL PAST  
THE END OF THE CURVE AND INTO THE HORIZONTAL SECTION.

EASTMAN CHRISTENSEN

RECORD OF SURVEY

FOR

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* * * * *
*
* OPERATOR   : HARVEY E. YATES COMPANY
*
* WELL NAME  : YOUNG DEEP UNIT #8
*
* LOCATION   : LEA COUNTY, NEW MEXICO
*
* JOB NUMBER : VERTICAL WELL
*
* RIG        :
*
* DECLINATION : 10.00 E
*
* * * * *
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EC DISTRICT : LATERAL DRILLING

HOBBS OFFICE  
OCCO  
JAN 5 1988  
RECEIVED

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87      PAGE NO. 2  
OUR REF. NO. : S00025.4HY  
DECLINATION : 10.00 JOB NUMBER : VERTICAL WELL

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|------------------|--------------------|
| 0.00              | 0 0                   | N 0 0 E                   | 0.00             | 0.00                      | 0.00 N 0.00 E              | 0.00                | S 90 0 E         | 0.00               |
| 100.00            | 0 15                  | N 41 0 W                  | 100.00           | 100.00                    | 0.16 N 0.14 W              | 0.22                | N 41 0 W         | 0.25               |
| 200.00            | 0 30                  | N 55 0 W                  | 100.00           | 200.00                    | 0.60 N 0.63 W              | 0.87                | N 46 15 W        | 0.26               |
| 300.00            | 0 30                  | N 61 0 W                  | 100.00           | 299.99                    | 1.06 N 1.37 W              | 1.73                | N 52 8 W         | 0.05               |
| 400.00            | 0 45                  | N 71 0 W                  | 100.00           | 399.99                    | 1.51 N 2.37 W              | 2.81                | N 57 29 W        | 0.27               |
| 500.00            | 0 30                  | N 56 0 W                  | 100.00           | 499.98                    | 1.99 N 3.34 W              | 3.89                | N 59 10 W        | 0.30               |
| 600.00            | 0 30                  | N 56 0 W                  | 100.00           | 599.98                    | 2.48 N 4.06 W              | 4.76                | N 58 35 W        | 0.00               |
| 700.00            | 0 30                  | N 52 0 W                  | 100.00           | 699.97                    | 2.99 N 4.77 W              | 5.63                | N 57 53 W        | 0.03               |
| 800.00            | 0 30                  | N 53 0 W                  | 100.00           | 799.97                    | 3.53 N 5.46 W              | 6.50                | N 57 9 W         | 0.01               |
| 900.00            | 0 30                  | N 56 0 W                  | 100.00           | 899.97                    | 4.03 N 6.17 W              | 7.37                | N 56 51 W        | 0.03               |
| 1000.00           | 0 45                  | N 37 0 W                  | 100.00           | 999.96                    | 4.78 N 6.96 W              | 8.45                | N 55 31 W        | 0.32               |
| 1100.00           | 0 45                  | N 50 0 W                  | 100.00           | 1099.95                   | 5.73 N 7.86 W              | 9.73                | N 53 55 W        | 0.17               |
| 1200.00           | 0 45                  | N 52 0 W                  | 100.00           | 1199.94                   | 6.55 N 8.88 W              | 11.03               | N 53 34 W        | 0.03               |
| 1300.00           | 0 30                  | N 32 0 W                  | 100.00           | 1299.94                   | 7.36 N 9.61 W              | 12.10               | N 52 32 W        | 0.33               |
| 1400.00           | 0 30                  | N 7 0 W                   | 100.00           | 1399.93                   | 8.18 N 9.89 W              | 12.84               | N 50 26 W        | 0.22               |
| 1500.00           | 0 30                  | N 1 0 E                   | 100.00           | 1499.93                   | 9.05 N 9.94 W              | 13.44               | N 47 41 W        | 0.07               |
| 1600.00           | 0 30                  | N 30 0 E                  | 100.00           | 1599.93                   | 9.88 N 9.71 W              | 13.85               | N 44 30 W        | 0.25               |
| 1700.00           | 0 30                  | N 40 0 E                  | 100.00           | 1699.92                   | 10.59 N 9.21 W             | 14.04               | N 41 0 W         | 0.09               |
| 1800.00           | 0 30                  | N 31 0 E                  | 100.00           | 1799.92                   | 11.30 N 8.70 W             | 14.27               | N 37 36 W        | 0.08               |
| 1900.00           | 0 30                  | N 48 0 E                  | 100.00           | 1899.91                   | 11.97 N 8.15 W             | 14.48               | N 34 14 W        | 0.15               |
| 2000.00           | 0 15                  | N 57 0 E                  | 100.00           | 1999.91                   | 12.37 N 7.63 W             | 14.54               | N 31 40 W        | 0.26               |
| 2100.00           | 0 30                  | N 41 0 E                  | 100.00           | 2099.91                   | 12.80 N 7.14 W             | 14.66               | N 29 8 W         | 0.27               |
| 2200.00           | 0 45                  | N 34 0 E                  | 100.00           | 2199.90                   | 13.67 N 6.47 W             | 15.12               | N 25 20 W        | 0.26               |
| 2300.00           | 0 45                  | N 47 0 E                  | 100.00           | 2299.90                   | 14.66 N 5.62 W             | 15.70               | N 20 59 W        | 0.17               |
| 2400.00           | 1 15                  | N 29 0 E                  | 100.00           | 2399.88                   | 16.03 N 4.55 W             | 16.67               | N 15 52 W        | 0.58               |
| 2500.00           | 1 15                  | N 24 0 E                  | 100.00           | 2499.86                   | 17.98 N 3.58 W             | 18.34               | N 11 16 W        | 0.11               |
| 2600.00           | 1 15                  | N 14 0 E                  | 100.00           | 2599.83                   | 20.04 N 2.87 W             | 20.25               | N 8 9 W          | 0.22               |
| 2700.00           | 1 0                   | N 11 0 W                  | 100.00           | 2699.81                   | 21.99 N 2.82 W             | 22.17               | N 7 19 W         | 0.54               |
| 2800.00           | 1 0                   | N 31 0 W                  | 100.00           | 2799.80                   | 23.61 N 3.44 W             | 23.86               | N 8 18 W         | 0.35               |
| 2900.00           | 1 0                   | N 57 0 W                  | 100.00           | 2899.78                   | 24.86 N 4.65 W             | 25.29               | N 10 35 W        | 0.45               |

CONTINUED ON NEXT PAGE ...

HARVEY E. YATES COMPANY  
YOUNG DEEP UNIT #8  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87 PAGE NO. 3  
OUR REF. NO. : S00025.4HY  
DECLINATION : 10.00 JOB NUMBER : VERTICAL WELL

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|------------------|--------------------|
| 3000.00           | 1 0                   | N 46 0 W                  | 100.00           | 2999.77                   | 25.94 N 6.01 W             | 26.63               | N 13 2 W         | 0.19               |
| 3100.00           | 0 45                  | N 49 0 W                  | 100.00           | 3099.76                   | 26.97 N 7.13 W             | 27.90               | N 14 49 W        | 0.25               |
| 3200.00           | 0 30                  | N 35 0 W                  | 100.00           | 3199.75                   | 27.78 N 7.86 W             | 28.87               | N 15 48 W        | 0.29               |
| 3300.00           | 0 30                  | N 27 0 W                  | 100.00           | 3299.75                   | 28.53 N 8.31 W             | 29.72               | N 16 15 W        | 0.07               |
| 3400.00           | 0 30                  | N 29 0 W                  | 100.00           | 3399.74                   | 29.30 N 8.72 W             | 30.57               | N 16 35 W        | 0.02               |
| 3500.00           | 0 30                  | N 35 0 W                  | 100.00           | 3499.74                   | 30.04 N 9.18 W             | 31.41               | N 17 0 W         | 0.05               |
| 3600.00           | 0 45                  | N 34 0 W                  | 100.00           | 3599.73                   | 30.94 N 9.80 W             | 32.46               | N 17 35 W        | 0.25               |
| 3700.00           | 0 45                  | N 36 0 W                  | 100.00           | 3699.72                   | 32.01 N 10.55 W            | 33.71               | N 18 15 W        | 0.03               |
| 3800.00           | 0 30                  | N 42 0 W                  | 100.00           | 3799.72                   | 32.86 N 11.24 W            | 34.73               | N 18 53 W        | 0.26               |
| 3900.00           | 0 30                  | N 56 0 W                  | 100.00           | 3899.71                   | 33.43 N 11.90 W            | 35.49               | N 19 35 W        | 0.12               |
| 4000.00           | 0 45                  | N 50 0 W                  | 100.00           | 3999.71                   | 34.09 N 12.77 W            | 36.40               | N 20 32 W        | 0.26               |
| 4100.00           | 1 0                   | N 49 0 W                  | 100.00           | 4099.70                   | 35.08 N 13.93 W            | 37.75               | N 21 40 W        | 0.25               |
| 4200.00           | 1 0                   | N 55 0 W                  | 100.00           | 4199.68                   | 36.15 N 15.31 W            | 39.26               | N 22 57 W        | 0.10               |
| 4300.00           | 1 0                   | N 49 0 W                  | 100.00           | 4299.67                   | 37.23 N 16.68 W            | 40.79               | N 24 8 W         | 0.10               |
| 4400.00           | 1 0                   | N 43 0 W                  | 100.00           | 4399.65                   | 38.44 N 17.93 W            | 42.42               | N 25 1 W         | 0.10               |
| 4500.00           | 1 15                  | N 35 0 W                  | 100.00           | 4499.63                   | 39.97 N 19.17 W            | 44.33               | N 25 38 W        | 0.29               |
| 4600.00           | 1 0                   | N 36 0 W                  | 100.00           | 4599.61                   | 41.56 N 20.31 W            | 46.26               | N 26 3 W         | 0.25               |
| 4700.00           | 1 15                  | N 45 0 W                  | 100.00           | 4699.59                   | 43.06 N 21.59 W            | 48.16               | N 26 38 W        | 0.31               |
| 4800.00           | 1 15                  | N 35 0 W                  | 100.00           | 4799.57                   | 44.73 N 22.99 W            | 50.29               | N 27 12 W        | 0.22               |
| 4900.00           | 1 15                  | N 37 0 W                  | 100.00           | 4899.54                   | 46.49 N 24.27 W            | 52.44               | N 27 34 W        | 0.04               |
| 5000.00           | 1 0                   | N 29 0 W                  | 100.00           | 4999.52                   | 48.14 N 25.34 W            | 54.40               | N 27 46 W        | 0.29               |
| 5100.00           | 1 15                  | N 33 0 W                  | 100.00           | 5099.50                   | 49.82 N 26.35 W            | 56.36               | N 27 52 W        | 0.26               |
| 5200.00           | 1 15                  | N 34 0 W                  | 100.00           | 5199.48                   | 51.64 N 27.55 W            | 58.53               | N 28 5 W         | 0.02               |
| 5300.00           | 1 15                  | N 47 0 W                  | 100.00           | 5299.46                   | 53.29 N 28.97 W            | 60.66               | N 28 31 W        | 0.28               |
| 5400.00           | 1 15                  | N 48 0 W                  | 100.00           | 5399.43                   | 54.77 N 30.57 W            | 62.72               | N 29 10 W        | 0.02               |
| 5500.00           | 1 30                  | N 45 0 W                  | 100.00           | 5499.40                   | 56.42 N 32.31 W            | 65.02               | N 29 48 W        | 0.26               |
| 5600.00           | 1 45                  | N 48 0 W                  | 100.00           | 5599.36                   | 58.37 N 34.37 W            | 67.74               | N 30 29 W        | 0.26               |
| 5700.00           | 1 30                  | N 47 0 W                  | 100.00           | 5699.32                   | 60.29 N 36.46 W            | 70.46               | N 31 10 W        | 0.25               |
| 5800.00           | 1 30                  | N 51 0 W                  | 100.00           | 5799.29                   | 62.00 N 38.44 W            | 72.95               | N 31 48 W        | 0.10               |
| 5900.00           | 1 30                  | N 45 0 W                  | 100.00           | 5899.25                   | 63.76 N 40.38 W            | 75.47               | N 32 21 W        | 0.16               |

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HOBBS  
OFFICE  
JAN 5 1988  
RECEIVED

HARVEY E. YATES COMPANY  
 YOUNG DEEP UNIT #8  
 LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87      PAGE NO. 4  
 OUR REF. NO. : S00025.4HY  
 DECLINATION : 10.00 JOB NUMBER : VERTICAL WELL

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|------------------|--------------------|
| 6000.00           | 1 30                  | N 47 0 W                  | 100.00           | 5999.22                   | 65.57 N 42.26 W            | 78.01               | N 32 48 W        | 0.05               |
| 6100.00           | 1 45                  | N 44 0 W                  | 100.00           | 6099.18                   | 67.56 N 44.29 W            | 80.78               | N 33 15 W        | 0.26               |
| 6200.00           | 2 0                   | N 44 0 W                  | 100.00           | 6199.13                   | 69.91 N 46.56 W            | 84.00               | N 33 40 W        | 0.25               |
| 6300.00           | 1 45                  | N 47 0 W                  | 100.00           | 6299.07                   | 72.21 N 48.89 W            | 87.20               | N 34 6 W         | 0.27               |
| 6400.00           | 2 0                   | N 50 0 W                  | 100.00           | 6399.02                   | 74.37 N 51.34 W            | 90.38               | N 34 37 W        | 0.27               |
| 6500.00           | 1 45                  | N 48 0 W                  | 100.00           | 6498.97                   | 76.52 N 53.81 W            | 93.55               | N 35 7 W         | 0.26               |
| 6600.00           | 1 45                  | N 44 0 W                  | 100.00           | 6598.92                   | 78.64 N 56.01 W            | 96.55               | N 35 27 W        | 0.12               |
| 6700.00           | 1 45                  | N 45 0 W                  | 100.00           | 6698.87                   | 80.82 N 58.15 W            | 99.57               | N 35 44 W        | 0.03               |
| 6800.00           | 1 45                  | N 51 0 W                  | 100.00           | 6798.83                   | 82.86 N 60.42 W            | 102.55              | N 36 6 W         | 0.18               |
| 6900.00           | 1 45                  | N 45 0 W                  | 100.00           | 6898.78                   | 84.91 N 62.69 W            | 105.54              | N 36 26 W        | 0.18               |
| 7000.00           | 2 0                   | N 38 0 W                  | 100.00           | 6998.73                   | 87.35 N 64.85 W            | 108.80              | N 36 35 W        | 0.34               |
| 7100.00           | 2 0                   | N 36 0 W                  | 100.00           | 7098.67                   | 90.14 N 66.95 W            | 112.29              | N 36 36 W        | 0.07               |
| 7200.00           | 2 15                  | N 27 0 W                  | 100.00           | 7198.60                   | 93.30 N 68.89 W            | 115.97              | N 36 26 W        | 0.42               |
| 7300.00           | 2 15                  | N 7 0 W                   | 100.00           | 7298.52                   | 97.03 N 70.03 W            | 119.67              | N 35 49 W        | 0.78               |
| 7400.00           | 2 15                  | N 14 0 E                  | 100.00           | 7398.44                   | 100.93 N 69.79 W           | 122.71              | N 34 40 W        | 0.82               |
| 7500.00           | 2 30                  | N 1 0 E                   | 100.00           | 7498.36                   | 105.03 N 69.25 W           | 125.81              | N 33 24 W        | 0.59               |
| 7600.00           | 2 30                  | N 15 0 E                  | 100.00           | 7598.26                   | 109.34 N 68.65 W           | 129.10              | N 32 7 W         | 0.61               |
| 7700.00           | 2 45                  | N 10 0 E                  | 100.00           | 7698.16                   | 113.81 N 67.66 W           | 132.40              | N 30 44 W        | 0.34               |
| 7800.00           | 2 45                  | N 9 0 E                   | 100.00           | 7798.04                   | 118.54 N 66.86 W           | 136.10              | N 29 26 W        | 0.05               |
| 7900.00           | 2 45                  | N 5 0 E                   | 100.00           | 7897.93                   | 123.30 N 66.28 W           | 139.99              | N 28 16 W        | 0.19               |
| 8000.00           | 2 45                  | N 5 0 E                   | 100.00           | 7997.81                   | 128.08 N 65.86 W           | 144.02              | N 27 13 W        | 0.00               |
| 8100.00           | 2 45                  | N 1 0 W                   | 100.00           | 8097.69                   | 132.87 N 65.69 W           | 148.23              | N 26 18 W        | 0.29               |
| 8200.00           | 3 0                   | N 7 0 E                   | 100.00           | 8197.57                   | 137.88 N 65.43 W           | 152.62              | N 25 23 W        | 0.47               |
| 8300.00           | 3 15                  | N 7 0 E                   | 100.00           | 8297.42                   | 143.29 N 64.77 W           | 157.25              | N 24 19 W        | 0.25               |
| 8400.00           | 3 45                  | N 15 0 E                  | 100.00           | 8397.23                   | 149.28 N 63.60 W           | 162.26              | N 23 5 W         | 0.70               |
| 8500.00           | 4 0                   | N 13 0 E                  | 100.00           | 8497.01                   | 155.84 N 61.97 W           | 167.70              | N 21 41 W        | 0.28               |
| 8600.00           | 4 0                   | N 17 0 E                  | 100.00           | 8596.76                   | 162.57 N 60.16 W           | 173.35              | N 20 18 W        | 0.28               |
| 8700.00           | 3 30                  | N 24 0 E                  | 100.00           | 8696.55                   | 168.69 N 57.87 W           | 178.35              | N 18 56 W        | 0.68               |
| 8800.00           | 2 30                  | N 27 0 E                  | 100.00           | 8796.41                   | 173.42 N 55.62 W           | 182.12              | N 17 47 W        | 1.01               |
| 8895.00           | 2 30                  | N 21 0 E                  | 95.00            | 8891.32                   | 177.20 N 53.94 W           | 185.23              | N 16 56 W        | 0.28               |

CONTINUED ON NEXT PAGE ...

HARVEY E. YATES COMPANY  
 YOUNG DEEP UNIT #8  
 LEA COUNTY, NEW MEXICO

DATE PRINTED : 23-DEC-87      PAGE NO. 5  
 OUR REF. NO. : S00025.4HY  
 DECLINATION : 10.00 JOB NUMBER : VERTICAL WELL

| MEASURED<br>DEPTH | DRIFT<br>ANGLE<br>D M | DRIFT<br>DIRECTION<br>D M | COURSE<br>LENGTH | TRUE<br>VERTICAL<br>DEPTH | RECTANGULAR<br>COORDINATES | CLOSURE<br>DISTANCE | CLOSURE<br>DIRECTION<br>D M | DOGLEG<br>SEVERITY |
|-------------------|-----------------------|---------------------------|------------------|---------------------------|----------------------------|---------------------|-----------------------------|--------------------|
| 8908.00           | 2 15                  | N 22 0 E                  | 13.00            | 8904.31                   | 177.70 N 53.74 W           | 185.65              | N 16 50 W                   | 1.95               |
| 8920.00           | 2 30                  | N 19 0 E                  | 12.00            | 8916.30                   | 178.17 N 53.56 W           | 186.05              | N 16 44 W                   | 2.33               |
| 8930.00           | 2 30                  | N 16 0 E                  | 10.00            | 8926.29                   | 178.58 N 53.43 W           | 186.41              | N 16 39 W                   | 1.31               |
| 8940.00           | 2 15                  | N 17 0 E                  | 10.00            | 8936.28                   | 178.98 N 53.32 W           | 186.75              | N 16 35 W                   | 2.53               |
| 8950.00           | 2 15                  | N 15 0 E                  | 10.00            | 8946.27                   | 179.36 N 53.21 W           | 187.08              | N 16 31 W                   | 0.79               |
| 9000.00           | 1 45                  | N 14 0 E                  | 50.00            | 8996.24                   | 181.05 N 52.77 W           | 188.58              | N 16 15 W                   | 1.00               |

CLOSURE - DISTANCE : 188.58  
 DIRECTION : N 16 15 W

REPORT UNITS : Feet  
 SURVEY CALCULATION METHOD : Radius of curvature

#### SURVEY RUN INFORMATION

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GRYO MULTI-SHOT BY MIDLAND, REDUCED BY LATERAL  
 THIS SURVEY USED FOR LATERAL TIE

RECEIVED  
JAN 5 1988  
DCD  
HOBBS OFFICE