



ProDirectional

**HOBBS OCD**

**FEB 10 2020**

**RECEIVED**



# **Marathon Oil**

## **Corporation**

**Blueberry Hill 19 WA Fee No. 4H**  
**Lea County, NM**

**December 03, 2019**

**Job No. LNM1454619**  
**API No. 30-025-44666**

## **Survey Completion Report**



**PRODIRECTIONAL**

## *Survey Certification Letter*

December 03, 2019



**Marathon Oil<sup>®</sup>**  
Corporation

Operator Name: Marathon Oil  
Well Name: Blueberry Hill 19 WA Fee No. 4H  
County/Parish: Lea County,  
State: NM  
Rig Name: Precision 101  
Job Number: LNM1454619

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

| <u>Surveyor</u> | <u>Surveyed Depths</u> | <u>Projection to Bit</u> | <u>Dates Performed</u> | <u>Type of Survey</u> |
|-----------------|------------------------|--------------------------|------------------------|-----------------------|
| ProDirectional  | 1,189' MD – 20,005' MD | 20,064' MD               | 07/09/19 – 11/11/19    | MWD                   |

Sincerely,

Mike Coats  
Regulatory Specialist  
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

[prodirectional.com](http://prodirectional.com)

*The Standard of Excellence in Directional Supervision*



# Marathon Oil

## Marathon Oil

Lea County, NM  
Blueberry Hill 19 WA Fee  
No. 4H  
OH

Survey: ProDirectional

## Survey Report

03 December, 2019



|                  |                                 |                                     |                    |
|------------------|---------------------------------|-------------------------------------|--------------------|
| <b>Company:</b>  | Marathon Oil                    | <b>Local Co-ordinate Reference:</b> | Well No. 4H        |
| <b>Project:</b>  | Lea County, NM(NAD 83)          | <b>TVD Reference:</b>               | Well @ 3362.00usft |
| <b>Site:</b>     | Blueberry Hill 19 WA Fee        | <b>MD Reference:</b>                | Well @ 3362.00usft |
| <b>Well:</b>     | No. 4H                          | <b>North Reference:</b>             | Grid               |
| <b>Wellbore:</b> | OH                              | <b>Survey Calculation Method:</b>   | Minimum Curvature  |
| <b>Design:</b>   | MWD-127'-20005', PTB: 20064' MD | <b>Database:</b>                    | WellPlanner1       |

|                    |                           |                      |                |
|--------------------|---------------------------|----------------------|----------------|
| <b>Project</b>     | Lea County, NM(NAD 83)    |                      |                |
| <b>Map System:</b> | US State Plane 1983       | <b>System Datum:</b> | Mean Sea Level |
| <b>Geo Datum:</b>  | North American Datum 1983 |                      |                |
| <b>Map Zone:</b>   | New Mexico Eastern Zone   |                      |                |

|                              |                          |                          |                 |
|------------------------------|--------------------------|--------------------------|-----------------|
| <b>Site</b>                  | Blueberry Hill 19 WA Fee |                          |                 |
| <b>Site Position:</b>        |                          | <b>Northing:</b>         | 439,067.81 usft |
| <b>From:</b>                 | Map                      | <b>Easting:</b>          | 829,278.18 usft |
| <b>Position Uncertainty:</b> | 0.00 usft                | <b>Slot Radius:</b>      | 13-3/16 "       |
|                              |                          | <b>Latitude:</b>         | 32.2036473      |
|                              |                          | <b>Longitude:</b>        | -103.4024110    |
|                              |                          | <b>Grid Convergence:</b> | 0.50 °          |

|                             |                    |                            |                  |
|-----------------------------|--------------------|----------------------------|------------------|
| <b>Well</b>                 | No. 4H, LNM1454619 |                            |                  |
| <b>Well Position</b>        | +N/-S              | 0.00 usft                  | <b>Northing:</b> |
|                             | +E/-W              | 0.00 usft                  | <b>Easting:</b>  |
| <b>Position Uncertainty</b> | 0.00 usft          | <b>Wellhead Elevation:</b> | usft             |
|                             |                    | <b>Latitude:</b>           | 32.2036466       |
|                             |                    | <b>Longitude:</b>          | -103.4023140     |
|                             |                    | <b>Ground Level:</b>       | 3,337.00 usft    |

|                  |                   |                    |                            |
|------------------|-------------------|--------------------|----------------------------|
| <b>Wellbore</b>  | OH                |                    |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b>     |
|                  | HDGM              | 6/20/2019          | 6.62                       |
|                  |                   |                    | <b>Dip Angle (°)</b>       |
|                  |                   |                    | 59.85                      |
|                  |                   |                    | <b>Field Strength (nT)</b> |
|                  |                   |                    | 47,891.30                  |

|                          |                                 |                      |                      |
|--------------------------|---------------------------------|----------------------|----------------------|
| <b>Design</b>            | MWD-127'-20005', PTB: 20064' MD |                      |                      |
| <b>Audit Notes:</b>      |                                 |                      |                      |
| <b>Version:</b>          | 1.0                             | <b>Phase:</b>        | ACTUAL               |
|                          |                                 | <b>Tie On Depth:</b> | 0.00                 |
| <b>Vertical Section:</b> | <b>Depth From (TVD)</b>         | <b>+N/-S</b>         | <b>+E/-W</b>         |
|                          | (usft)                          | (usft)               | (usft)               |
|                          | 0.00                            | 0.00                 | 0.00                 |
|                          |                                 |                      | <b>Direction (°)</b> |
|                          |                                 |                      | 359.45               |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

| Survey Program |              | Date              | 12/3/2019  |                 |  |
|----------------|--------------|-------------------|------------|-----------------|--|
| From<br>(usft) | To<br>(usft) | Survey (Wellbore) | Tool Name  | Description     |  |
| 127.00         | 1,111.00     | Survey #1 (OH)    | MWD - OWSG | MWD - OWSG      |  |
| 1,189.00       | 20,064.00    | Survey #2 (OH)    | MWD+HDGM   | OWSG MWD + HRGM |  |

| Survey                         |            |                      |               |                  |               |               |                            |                        |                    |                   |  |
|--------------------------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|--|
| MD<br>(usft)                   | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |  |
| 0.00                           | 0.00       | 0.00                 | 0.00          | 0.00             | 0.00          | 0.00          | 0.00                       | 0.00                   | 439,067.81         | 829,308.18        |  |
| 127.00                         | 0.70       | 146.00               | 127.00        | -0.65            | -0.64         | 0.43          | 0.78                       | 146.00                 | 439,067.17         | 829,308.61        |  |
| 211.00                         | 0.40       | 266.00               | 210.99        | -1.09            | -1.09         | 0.43          | 1.17                       | 158.53                 | 439,066.72         | 829,308.61        |  |
| 296.00                         | 0.80       | 4.00                 | 295.99        | -0.52            | -0.52         | 0.17          | 0.55                       | 161.46                 | 439,067.29         | 829,308.35        |  |
| 387.00                         | 0.60       | 181.00               | 386.99        | -0.36            | -0.36         | 0.21          | 0.42                       | 149.81                 | 439,067.45         | 829,308.39        |  |
| 481.00                         | 0.90       | 316.00               | 480.99        | -0.32            | -0.32         | -0.31         | 0.45                       | 224.13                 | 439,067.49         | 829,307.87        |  |
| 576.00                         | 0.80       | 91.00                | 575.98        | 0.21             | 0.20          | -0.17         | 0.26                       | 320.66                 | 439,068.01         | 829,308.01        |  |
| 670.00                         | 0.70       | 214.00               | 669.98        | -0.29            | -0.28         | 0.17          | 0.33                       | 149.36                 | 439,067.53         | 829,308.35        |  |
| 765.00                         | 0.90       | 264.00               | 764.97        | -0.83            | -0.84         | -0.90         | 1.23                       | 226.83                 | 439,066.97         | 829,307.28        |  |
| 859.00                         | 0.50       | 67.00                | 858.97        | -0.75            | -0.76         | -1.26         | 1.47                       | 238.81                 | 439,067.05         | 829,306.92        |  |
| 954.00                         | 0.80       | 225.00               | 953.96        | -1.05            | -1.07         | -1.34         | 1.71                       | 231.53                 | 439,066.74         | 829,306.84        |  |
| 1,111.00                       | 1.10       | 15.00                | 1,110.95      | -0.37            | -0.39         | -1.73         | 1.77                       | 257.40                 | 439,067.42         | 829,306.45        |  |
| 1,189.00                       | 0.80       | 273.00               | 1,188.95      | 0.39             | 0.37          | -2.08         | 2.11                       | 279.98                 | 439,068.18         | 829,306.10        |  |
| Pro MWD First Survey: 1189' MD |            |                      |               |                  |               |               |                            |                        |                    |                   |  |
| 1,283.00                       | 0.90       | 285.40               | 1,282.94      | 0.63             | 0.60          | -3.44         | 3.50                       | 279.82                 | 439,068.41         | 829,304.74        |  |
| 1,377.00                       | 0.90       | 273.30               | 1,376.93      | 0.88             | 0.83          | -4.89         | 4.96                       | 279.68                 | 439,068.64         | 829,303.29        |  |
| 1,471.00                       | 0.90       | 269.60               | 1,470.91      | 0.93             | 0.87          | -6.37         | 6.43                       | 277.80                 | 439,068.68         | 829,301.81        |  |
| 1,565.00                       | 0.30       | 112.30               | 1,564.91      | 0.84             | 0.77          | -6.88         | 6.92                       | 276.41                 | 439,068.58         | 829,301.30        |  |
| 1,655.00                       | 1.00       | 100.60               | 1,654.90      | 0.60             | 0.54          | -5.89         | 5.91                       | 275.23                 | 439,068.35         | 829,302.29        |  |
| 1,744.00                       | 0.80       | 99.70                | 1,743.89      | 0.34             | 0.29          | -4.51         | 4.52                       | 273.70                 | 439,068.10         | 829,303.67        |  |
| 1,834.00                       | 0.80       | 94.70                | 1,833.89      | 0.17             | 0.13          | -3.27         | 3.27                       | 272.36                 | 439,067.94         | 829,304.91        |  |



# ProDirectional Survey Report



**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

## Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 1,923.00     | 0.70       | 78.80                | 1,922.88      | 0.21             | 0.19          | -2.12         | 2.12                       | 275.11                 | 439,068.00         | 829,306.06        |
| 2,013.00     | 0.80       | 74.20                | 2,012.87      | 0.48             | 0.47          | -0.97         | 1.08                       | 295.68                 | 439,068.28         | 829,307.21        |
| 2,102.00     | 1.70       | 151.70               | 2,101.85      | -0.53            | -0.53         | 0.25          | 0.58                       | 154.38                 | 439,067.28         | 829,308.43        |
| 2,191.00     | 2.40       | 169.10               | 2,190.80      | -3.53            | -3.52         | 1.23          | 3.73                       | 160.72                 | 439,064.29         | 829,309.41        |
| 2,281.00     | 2.20       | 167.90               | 2,280.72      | -7.08            | -7.06         | 1.95          | 7.32                       | 164.56                 | 439,060.75         | 829,310.13        |
| 2,370.00     | 2.60       | 175.50               | 2,369.65      | -10.76           | -10.74        | 2.47          | 11.02                      | 167.07                 | 439,057.07         | 829,310.65        |
| 2,460.00     | 3.60       | 180.80               | 2,459.51      | -15.63           | -15.60        | 2.59          | 15.81                      | 170.59                 | 439,052.21         | 829,310.77        |
| 2,549.00     | 3.40       | 175.10               | 2,548.35      | -21.05           | -21.02        | 2.77          | 21.21                      | 172.49                 | 439,046.79         | 829,310.95        |
| 2,639.00     | 3.50       | 191.60               | 2,638.19      | -26.40           | -26.37        | 2.45          | 26.49                      | 174.70                 | 439,041.44         | 829,310.63        |
| 2,728.00     | 3.40       | 194.10               | 2,727.02      | -31.61           | -31.60        | 1.26          | 31.62                      | 177.72                 | 439,036.21         | 829,309.44        |
| 2,818.00     | 3.10       | 187.70               | 2,816.88      | -36.60           | -36.60        | 0.28          | 36.60                      | 179.56                 | 439,031.21         | 829,308.46        |
| 2,907.00     | 3.00       | 181.80               | 2,905.75      | -41.31           | -41.31        | -0.11         | 41.31                      | 180.16                 | 439,026.50         | 829,308.07        |
| 2,997.00     | 2.70       | 175.00               | 2,995.64      | -45.77           | -45.77        | 0.00          | 45.77                      | 180.00                 | 439,022.04         | 829,308.18        |
| 3,086.00     | 2.70       | 168.80               | 3,084.54      | -49.92           | -49.92        | 0.59          | 49.92                      | 179.33                 | 439,017.89         | 829,308.77        |
| 3,176.00     | 2.80       | 176.00               | 3,174.44      | -54.20           | -54.19        | 1.15          | 54.20                      | 178.78                 | 439,013.62         | 829,309.33        |
| 3,266.00     | 2.80       | 170.20               | 3,264.33      | -58.56           | -58.55        | 1.68          | 58.57                      | 178.36                 | 439,009.26         | 829,309.86        |
| 3,355.00     | 3.20       | 185.50               | 3,353.21      | -63.18           | -63.16        | 1.81          | 63.19                      | 178.36                 | 439,004.65         | 829,309.99        |
| 3,445.00     | 3.30       | 184.50               | 3,443.07      | -68.26           | -68.25        | 1.37          | 68.26                      | 178.85                 | 438,999.56         | 829,309.55        |
| 3,534.00     | 3.30       | 179.30               | 3,531.92      | -73.37           | -73.36        | 1.20          | 73.37                      | 179.06                 | 438,994.45         | 829,309.38        |
| 3,624.00     | 3.00       | 173.00               | 3,621.79      | -78.30           | -78.29        | 1.52          | 78.31                      | 178.89                 | 438,989.52         | 829,309.70        |
| 3,714.00     | 3.30       | 179.70               | 3,711.65      | -83.23           | -83.22        | 1.82          | 83.24                      | 178.75                 | 438,984.59         | 829,310.00        |
| 3,804.00     | 3.40       | 178.70               | 3,801.50      | -88.49           | -88.48        | 1.89          | 88.50                      | 178.77                 | 438,979.33         | 829,310.07        |
| 3,894.00     | 3.30       | 180.10               | 3,891.34      | -93.75           | -93.74        | 1.95          | 93.76                      | 178.81                 | 438,974.07         | 829,310.13        |
| 3,983.00     | 3.00       | 182.40               | 3,980.21      | -98.64           | -98.62        | 1.85          | 98.64                      | 178.93                 | 438,969.19         | 829,310.03        |
| 4,073.00     | 3.00       | 184.80               | 4,070.08      | -103.33          | -103.32       | 1.55          | 103.34                     | 179.14                 | 438,964.49         | 829,309.73        |
| 4,163.00     | 2.60       | 184.50               | 4,159.98      | -107.71          | -107.71       | 1.19          | 107.71                     | 179.37                 | 438,960.10         | 829,309.37        |
| 4,252.00     | 2.70       | 161.60               | 4,248.88      | -111.72          | -111.71       | 1.70          | 111.72                     | 179.13                 | 438,956.10         | 829,309.88        |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 4,342.00     | 3.60       | 130.60               | 4,338.75      | -115.60          | -115.56       | 4.51          | 115.65                     | 177.76                 | 438,952.25         | 829,312.69        |
| 4,432.00     | 4.60       | 118.10               | 4,428.52      | -119.19          | -119.10       | 9.84          | 119.50                     | 175.28                 | 438,948.71         | 829,318.02        |
| 4,522.00     | 5.10       | 113.70               | 4,518.20      | -122.56          | -122.40       | 16.69         | 123.54                     | 172.24                 | 438,945.41         | 829,324.87        |
| 4,611.00     | 5.40       | 102.70               | 4,606.83      | -125.14          | -124.92       | 24.39         | 127.27                     | 168.95                 | 438,942.89         | 829,332.57        |
| 4,701.00     | 1.50       | 51.60                | 4,696.66      | -125.39          | -125.11       | 29.45         | 128.53                     | 166.75                 | 438,942.70         | 829,337.63        |
| 4,791.00     | 0.40       | 352.80               | 4,786.65      | -124.36          | -124.07       | 30.34         | 127.73                     | 166.26                 | 438,943.74         | 829,338.52        |
| 4,880.00     | 1.40       | 51.60                | 4,875.64      | -123.38          | -123.09       | 31.15         | 126.97                     | 165.80                 | 438,944.72         | 829,339.33        |
| 4,970.00     | 1.80       | 100.20               | 4,965.61      | -122.97          | -122.65       | 33.40         | 127.12                     | 164.77                 | 438,945.16         | 829,341.58        |
| 5,060.00     | 3.00       | 160.30               | 5,055.54      | -125.46          | -125.12       | 35.59         | 130.09                     | 164.12                 | 438,942.69         | 829,343.77        |
| 5,150.00     | 3.50       | 194.80               | 5,145.40      | -130.33          | -130.00       | 35.68         | 134.80                     | 164.65                 | 438,937.81         | 829,343.86        |
| 5,239.00     | 3.70       | 217.90               | 5,234.23      | -135.20          | -134.89       | 33.22         | 138.92                     | 166.16                 | 438,932.92         | 829,341.40        |
| 5,329.00     | 3.20       | 211.30               | 5,324.07      | -139.61          | -139.33       | 30.13         | 142.55                     | 167.80                 | 438,928.48         | 829,338.31        |
| 5,419.00     | 3.00       | 226.90               | 5,413.94      | -143.34          | -143.08       | 27.11         | 145.63                     | 169.27                 | 438,924.73         | 829,335.29        |
| 5,508.00     | 3.00       | 234.50               | 5,502.82      | -146.25          | -146.03       | 23.51         | 147.91                     | 170.85                 | 438,921.78         | 829,331.69        |
| 5,598.00     | 3.20       | 233.80               | 5,592.69      | -149.06          | -148.88       | 19.57         | 150.16                     | 172.51                 | 438,918.93         | 829,327.75        |
| 5,688.00     | 3.20       | 246.90               | 5,682.55      | -151.49          | -151.35       | 15.23         | 152.11                     | 174.25                 | 438,916.46         | 829,323.41        |
| 5,778.00     | 3.30       | 251.70               | 5,772.40      | -153.24          | -153.15       | 10.46         | 153.50                     | 176.09                 | 438,914.66         | 829,318.64        |
| 5,867.00     | 2.80       | 251.80               | 5,861.28      | -154.68          | -154.63       | 5.96          | 154.74                     | 177.79                 | 438,913.18         | 829,314.14        |
| 5,957.00     | 2.30       | 254.90               | 5,951.19      | -155.80          | -155.79       | 2.13          | 155.80                     | 179.22                 | 438,912.02         | 829,310.31        |
| 6,047.00     | 2.20       | 252.60               | 6,041.12      | -156.75          | -156.77       | -1.26         | 156.78                     | 180.46                 | 438,911.04         | 829,306.92        |
| 6,136.00     | 2.00       | 252.80               | 6,130.06      | -157.69          | -157.74       | -4.38         | 157.80                     | 181.59                 | 438,910.07         | 829,303.80        |
| 6,226.00     | 1.40       | 254.80               | 6,220.02      | -158.42          | -158.50       | -6.94         | 158.65                     | 182.51                 | 438,909.31         | 829,301.24        |
| 6,316.00     | 0.60       | 249.50               | 6,310.00      | -158.86          | -158.95       | -8.44         | 159.17                     | 183.04                 | 438,908.86         | 829,299.74        |
| 6,405.00     | 0.70       | 285.90               | 6,399.00      | -158.87          | -158.96       | -9.40         | 159.24                     | 183.38                 | 438,908.85         | 829,298.78        |
| 6,495.00     | 1.00       | 322.90               | 6,488.99      | -158.08          | -158.19       | -10.40        | 158.53                     | 183.76                 | 438,909.62         | 829,297.78        |
| 6,584.00     | 0.80       | 319.30               | 6,577.98      | -156.98          | -157.10       | -11.27        | 157.50                     | 184.11                 | 438,910.71         | 829,296.91        |
| 6,674.00     | 0.80       | 328.10               | 6,667.97      | -155.96          | -156.09       | -12.02        | 156.55                     | 184.40                 | 438,911.72         | 829,296.16        |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 6,763.00     | 0.30       | 46.50                | 6,756.97      | -155.27          | -155.40       | -12.18        | 155.87                     | 184.48                 | 438,912.41         | 829,296.00        |
| 6,853.00     | 0.60       | 114.80               | 6,848.96      | -155.32          | -155.43       | -11.58        | 155.86                     | 184.26                 | 438,912.38         | 829,296.60        |
| 6,943.00     | 0.50       | 121.90               | 6,936.96      | -155.73          | -155.84       | -10.82        | 156.21                     | 183.97                 | 438,911.97         | 829,297.36        |
| 7,033.00     | 0.40       | 121.10               | 7,026.96      | -156.10          | -156.21       | -10.21        | 156.54                     | 183.74                 | 438,911.60         | 829,297.97        |
| 7,122.00     | 0.30       | 114.70               | 7,115.95      | -156.37          | -156.47       | -9.74         | 156.77                     | 183.56                 | 438,911.34         | 829,298.44        |
| 7,212.00     | 0.30       | 84.90                | 7,205.95      | -156.45          | -156.54       | -9.29         | 156.82                     | 183.40                 | 438,911.27         | 829,298.89        |
| 7,302.00     | 0.40       | 87.60                | 7,295.95      | -156.42          | -156.51       | -8.74         | 156.75                     | 183.20                 | 438,911.30         | 829,299.44        |
| 7,391.00     | 0.50       | 78.70                | 7,384.95      | -156.34          | -156.42       | -8.05         | 156.63                     | 182.95                 | 438,911.39         | 829,300.13        |
| 7,481.00     | 0.40       | 81.70                | 7,474.95      | -156.22          | -156.30       | -7.35         | 156.47                     | 182.69                 | 438,911.51         | 829,300.83        |
| 7,570.00     | 0.30       | 61.50                | 7,563.94      | -156.07          | -156.14       | -6.84         | 156.29                     | 182.51                 | 438,911.67         | 829,301.34        |
| 7,660.00     | 0.40       | 58.20                | 7,653.94      | -155.80          | -155.86       | -6.37         | 155.99                     | 182.34                 | 438,911.95         | 829,301.81        |
| 7,750.00     | 0.50       | 68.30                | 7,743.94      | -155.49          | -155.55       | -5.73         | 155.66                     | 182.11                 | 438,912.26         | 829,302.45        |
| 7,839.00     | 0.50       | 78.30                | 7,832.94      | -155.28          | -155.33       | -4.99         | 155.41                     | 181.84                 | 438,912.48         | 829,303.19        |
| 7,929.00     | 0.40       | 61.80                | 7,922.93      | -155.06          | -155.10       | -4.33         | 155.16                     | 181.60                 | 438,912.71         | 829,303.85        |
| 8,019.00     | 0.20       | 79.20                | 8,012.93      | -154.88          | -154.93       | -3.90         | 154.97                     | 181.44                 | 438,912.88         | 829,304.28        |
| 8,108.00     | 0.20       | 77.40                | 8,101.93      | -154.82          | -154.86       | -3.60         | 154.90                     | 181.33                 | 438,912.95         | 829,304.58        |
| 8,198.00     | 0.30       | 78.80                | 8,191.93      | -154.74          | -154.78       | -3.21         | 154.82                     | 181.19                 | 438,913.03         | 829,304.97        |
| 8,288.00     | 0.30       | 102.20               | 8,281.93      | -154.75          | -154.79       | -2.75         | 154.81                     | 181.02                 | 438,913.02         | 829,305.43        |
| 8,377.00     | 0.40       | 95.90                | 8,370.93      | -154.84          | -154.87       | -2.21         | 154.88                     | 180.82                 | 438,912.94         | 829,305.97        |
| 8,467.00     | 0.50       | 109.70               | 8,460.93      | -155.01          | -155.03       | -1.53         | 155.04                     | 180.57                 | 438,912.78         | 829,306.65        |
| 8,556.00     | 0.60       | 100.60               | 8,549.92      | -155.24          | -155.25       | -0.71         | 155.25                     | 180.26                 | 438,912.56         | 829,307.47        |
| 8,645.00     | 0.70       | 97.50                | 8,638.92      | -155.40          | -155.41       | 0.29          | 155.41                     | 179.89                 | 438,912.40         | 829,308.47        |
| 8,735.00     | 0.70       | 96.40                | 8,728.91      | -155.55          | -155.54       | 1.38          | 155.55                     | 179.49                 | 438,912.27         | 829,309.56        |
| 8,824.00     | 0.70       | 93.10                | 8,817.90      | -155.65          | -155.63       | 2.46          | 155.65                     | 179.09                 | 438,912.18         | 829,310.64        |
| 8,914.00     | 0.60       | 107.90               | 8,907.90      | -155.83          | -155.80       | 3.46          | 155.84                     | 178.73                 | 438,912.01         | 829,311.64        |
| 9,003.00     | 0.50       | 124.80               | 8,996.89      | -156.20          | -156.17       | 4.22          | 156.23                     | 178.45                 | 438,911.64         | 829,312.40        |
| 9,093.00     | 0.60       | 119.20               | 9,086.89      | -156.66          | -156.62       | 4.96          | 156.70                     | 178.19                 | 438,911.19         | 829,313.14        |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 9,182.00     | 0.70       | 107.40               | 9,175.88      | -157.06          | -157.01       | 5.88          | 157.12                     | 177.85                 | 438,910.80         | 829,314.06        |
| 9,271.00     | 0.90       | 97.80                | 9,264.87      | -157.33          | -157.27       | 7.09          | 157.43                     | 177.42                 | 438,910.54         | 829,315.27        |
| 9,361.00     | 1.10       | 79.40                | 9,354.86      | -157.28          | -157.21       | 8.64          | 157.44                     | 176.85                 | 438,910.60         | 829,316.82        |
| 9,450.00     | 1.10       | 83.50                | 9,443.84      | -157.05          | -156.95       | 10.33         | 157.29                     | 176.23                 | 438,910.86         | 829,318.51        |
| 9,539.00     | 1.10       | 91.60                | 9,532.83      | -156.99          | -156.88       | 12.04         | 157.34                     | 175.61                 | 438,910.93         | 829,320.22        |
| 9,629.00     | 0.80       | 63.10                | 9,622.82      | -156.74          | -156.62       | 13.46         | 157.20                     | 175.09                 | 438,911.19         | 829,321.64        |
| 9,718.00     | 0.90       | 46.20                | 9,711.81      | -155.99          | -155.86       | 14.52         | 156.53                     | 174.68                 | 438,911.95         | 829,322.70        |
| 9,804.00     | 0.80       | 56.00                | 9,797.80      | -155.19          | -155.05       | 15.50         | 155.83                     | 174.29                 | 438,912.76         | 829,323.68        |
| 9,893.00     | 0.30       | 53.10                | 9,886.79      | -154.71          | -154.56       | 16.20         | 155.41                     | 174.01                 | 438,913.25         | 829,324.38        |
| 9,983.00     | 0.80       | 30.30                | 9,976.79      | -154.03          | -153.88       | 16.71         | 154.79                     | 173.80                 | 438,913.93         | 829,324.89        |
| 10,072.00    | 0.80       | 19.20                | 10,065.78     | -152.92          | -152.76       | 17.23         | 153.73                     | 173.57                 | 438,915.05         | 829,325.41        |
| 10,162.00    | 1.10       | 3.30                 | 10,155.77     | -151.46          | -151.30       | 17.48         | 152.31                     | 173.41                 | 438,916.51         | 829,325.66        |
| 10,251.00    | 0.80       | 318.60               | 10,244.76     | -150.14          | -149.98       | 17.12         | 150.96                     | 173.49                 | 438,917.83         | 829,325.30        |
| 10,340.00    | 0.40       | 310.30               | 10,333.75     | -149.47          | -149.32       | 16.47         | 150.22                     | 173.70                 | 438,918.49         | 829,324.65        |
| 10,430.00    | 0.40       | 356.50               | 10,423.75     | -148.95          | -148.80       | 16.22         | 149.68                     | 173.78                 | 438,919.01         | 829,324.40        |
| 10,519.00    | 0.30       | 176.80               | 10,512.75     | -148.87          | -148.72       | 16.21         | 149.60                     | 173.78                 | 438,919.09         | 829,324.39        |
| 10,608.00    | 1.20       | 242.60               | 10,601.74     | -149.52          | -149.38       | 15.40         | 150.17                     | 174.12                 | 438,918.43         | 829,323.58        |
| 10,698.00    | 1.60       | 250.10               | 10,691.71     | -150.37          | -150.24       | 13.38         | 150.84                     | 174.91                 | 438,917.57         | 829,321.56        |
| 10,787.00    | 1.30       | 237.40               | 10,780.69     | -151.31          | -151.21       | 11.36         | 151.64                     | 175.70                 | 438,916.60         | 829,319.54        |
| 10,877.00    | 0.70       | 246.60               | 10,870.67     | -152.07          | -151.98       | 9.99          | 152.31                     | 176.24                 | 438,915.83         | 829,318.17        |
| 10,966.00    | 0.70       | 248.30               | 10,959.66     | -152.48          | -152.40       | 8.99          | 152.66                     | 176.62                 | 438,915.41         | 829,317.17        |
| 11,056.00    | 0.60       | 239.80               | 11,049.66     | -152.91          | -152.84       | 8.07          | 153.05                     | 176.98                 | 438,914.97         | 829,316.25        |
| 11,145.00    | 0.30       | 247.00               | 11,138.66     | -153.23          | -153.16       | 7.45          | 153.34                     | 177.21                 | 438,914.65         | 829,315.63        |
| 11,235.00    | 1.00       | 355.60               | 11,228.65     | -152.53          | -152.47       | 7.18          | 152.64                     | 177.30                 | 438,915.34         | 829,315.36        |
| 11,324.00    | 1.70       | 6.40                 | 11,317.63     | -150.45          | -150.39       | 7.26          | 150.56                     | 177.23                 | 438,917.42         | 829,315.44        |
| 11,413.00    | 1.00       | 8.80                 | 11,406.60     | -148.37          | -148.31       | 7.53          | 148.50                     | 177.09                 | 438,919.50         | 829,315.71        |
| 11,503.00    | 0.30       | 342.70               | 11,496.59     | -147.37          | -147.30       | 7.58          | 147.50                     | 177.05                 | 438,920.51         | 829,315.76        |



# ProDirectional Survey Report



**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

## Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 11,592.00    | 0.90       | 347.10               | 11,585.59     | -146.46          | -146.40       | 7.36          | 146.59                     | 177.12                 | 438,921.41         | 829,315.54        |
| 11,681.00    | 0.40       | 355.50               | 11,674.58     | -145.47          | -145.41       | 7.18          | 145.59                     | 177.18                 | 438,922.40         | 829,315.36        |
| 11,769.00    | 0.50       | 7.80                 | 11,762.58     | -144.79          | -144.72       | 7.20          | 144.90                     | 177.15                 | 438,923.09         | 829,315.38        |
| 11,860.00    | 0.60       | 4.40                 | 11,853.58     | -143.92          | -143.85       | 7.29          | 144.04                     | 177.10                 | 438,923.96         | 829,315.47        |
| 11,892.00    | 0.50       | 26.50                | 11,885.58     | -143.63          | -143.56       | 7.37          | 143.75                     | 177.06                 | 438,924.25         | 829,315.55        |
| 11,987.00    | 7.60       | 3.20                 | 11,980.28     | -136.98          | -136.91       | 7.91          | 137.14                     | 176.70                 | 438,930.90         | 829,316.09        |
| 12,081.00    | 13.90      | 1.60                 | 12,072.58     | -119.48          | -119.40       | 8.57          | 119.71                     | 175.90                 | 438,948.41         | 829,316.75        |
| 12,176.00    | 24.00      | 1.70                 | 12,162.32     | -88.69           | -88.60        | 9.46          | 89.11                      | 173.90                 | 438,979.21         | 829,317.64        |
| 12,271.00    | 32.30      | 357.00               | 12,246.02     | -43.94           | -43.86        | 8.71          | 44.72                      | 168.77                 | 439,023.95         | 829,316.89        |
| 12,365.00    | 41.70      | 357.00               | 12,321.01     | 12.51            | 12.57         | 5.75          | 13.82                      | 24.57                  | 439,080.38         | 829,313.93        |
| 12,459.00    | 50.70      | 356.00               | 12,386.00     | 80.20            | 80.21         | 1.57          | 80.23                      | 1.12                   | 439,148.02         | 829,309.75        |
| 12,553.00    | 58.10      | 354.70               | 12,440.68     | 156.37           | 156.34        | -4.67         | 156.40                     | 358.29                 | 439,224.15         | 829,303.51        |
| 12,647.00    | 67.20      | 353.40               | 12,483.83     | 239.40           | 239.28        | -13.35        | 239.66                     | 356.81                 | 439,307.09         | 829,294.83        |
| 12,742.00    | 80.50      | 356.70               | 12,510.20     | 330.17           | 329.98        | -21.12        | 330.66                     | 356.34                 | 439,397.79         | 829,287.06        |
| 12,836.00    | 89.30      | 1.00                 | 12,518.55     | 423.68           | 423.48        | -22.97        | 424.10                     | 356.90                 | 439,491.29         | 829,285.21        |
| 12,930.00    | 90.20      | 1.10                 | 12,518.96     | 517.64           | 517.46        | -21.25        | 517.90                     | 357.65                 | 439,585.27         | 829,286.93        |
| 13,024.00    | 91.70      | 3.20                 | 12,517.40     | 611.52           | 611.37        | -17.72        | 611.63                     | 358.34                 | 439,679.18         | 829,290.46        |
| 13,119.00    | 92.40      | 3.10                 | 12,514.00     | 706.26           | 706.17        | -12.50        | 706.28                     | 358.99                 | 439,773.98         | 829,295.68        |
| 13,213.00    | 91.80      | 5.00                 | 12,510.56     | 799.89           | 799.87        | -5.87         | 799.89                     | 359.58                 | 439,867.68         | 829,302.31        |
| 13,308.00    | 93.30      | 6.30                 | 12,506.33     | 894.23           | 894.31        | 3.47          | 894.31                     | 0.22                   | 439,962.12         | 829,311.65        |
| 13,402.00    | 91.90      | 8.30                 | 12,502.07     | 987.25           | 987.44        | 15.40         | 987.56                     | 0.89                   | 440,055.25         | 829,323.58        |
| 13,496.00    | 90.50      | 8.50                 | 12,500.10     | 1,080.08         | 1,080.41      | 29.13         | 1,080.80                   | 1.54                   | 440,148.22         | 829,337.31        |
| 13,590.00    | 91.30      | 7.70                 | 12,498.62     | 1,173.00         | 1,173.46      | 42.38         | 1,174.23                   | 2.07                   | 440,241.27         | 829,350.56        |
| 13,685.00    | 91.80      | 5.40                 | 12,496.05     | 1,267.23         | 1,267.80      | 53.21         | 1,268.91                   | 2.40                   | 440,335.61         | 829,361.39        |
| 13,779.00    | 93.10      | 8.40                 | 12,492.03     | 1,360.34         | 1,361.02      | 64.49         | 1,362.55                   | 2.71                   | 440,428.83         | 829,372.67        |
| 13,873.00    | 90.50      | 13.10                | 12,489.08     | 1,452.44         | 1,453.29      | 82.01         | 1,455.60                   | 3.23                   | 440,521.10         | 829,390.19        |
| 13,967.00    | 92.30      | 13.20                | 12,486.78     | 1,543.73         | 1,544.79      | 103.39        | 1,548.25                   | 3.83                   | 440,612.60         | 829,411.57        |



# ProDirectional Survey Report



**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

## Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 14,084.00    | 94.10      | 13.10                | 12,480.25     | 1,657.22         | 1,658.54      | 129.96        | 1,663.63                   | 4.48                   | 440,726.35         | 829,438.14        |
| 14,178.00    | 96.00      | 13.90                | 12,471.98     | 1,748.05         | 1,749.59      | 151.82        | 1,756.16                   | 4.96                   | 440,817.40         | 829,460.00        |
| 14,273.00    | 97.10      | 10.70                | 12,461.14     | 1,840.05         | 1,841.79      | 171.92        | 1,849.79                   | 5.33                   | 440,909.60         | 829,480.10        |
| 14,367.00    | 96.30      | 6.80                 | 12,450.17     | 1,932.16         | 1,934.04      | 186.12        | 1,942.97                   | 5.50                   | 441,001.85         | 829,494.30        |
| 14,462.00    | 97.10      | 4.90                 | 12,439.08     | 2,025.92         | 2,027.89      | 195.74        | 2,037.32                   | 5.51                   | 441,095.70         | 829,503.92        |
| 14,556.00    | 96.70      | 4.30                 | 12,427.79     | 2,118.86         | 2,120.91      | 203.22        | 2,130.63                   | 5.47                   | 441,188.72         | 829,511.40        |
| 14,651.00    | 95.80      | 4.40                 | 12,417.45     | 2,212.95         | 2,215.07      | 210.38        | 2,225.04                   | 5.43                   | 441,282.88         | 829,518.56        |
| 14,745.00    | 96.60      | 3.30                 | 12,407.29     | 2,306.13         | 2,308.31      | 216.66        | 2,318.46                   | 5.36                   | 441,376.12         | 829,524.84        |
| 14,840.00    | 96.00      | 1.20                 | 12,396.87     | 2,400.43         | 2,402.66      | 220.37        | 2,412.74                   | 5.24                   | 441,470.47         | 829,528.55        |
| 14,934.00    | 93.10      | 359.40               | 12,389.41     | 2,494.11         | 2,496.35      | 220.85        | 2,506.10                   | 5.06                   | 441,564.16         | 829,529.03        |
| 15,028.00    | 93.80      | 358.90               | 12,383.76     | 2,587.94         | 2,590.17      | 219.46        | 2,599.45                   | 4.84                   | 441,657.98         | 829,527.64        |
| 15,122.00    | 95.70      | 358.60               | 12,375.97     | 2,681.61         | 2,683.82      | 217.42        | 2,692.61                   | 4.63                   | 441,751.63         | 829,525.60        |
| 15,216.00    | 93.80      | 358.60               | 12,368.19     | 2,775.27         | 2,777.46      | 215.13        | 2,785.78                   | 4.43                   | 441,845.27         | 829,523.31        |
| 15,311.00    | 94.40      | 358.10               | 12,361.40     | 2,870.01         | 2,872.18      | 212.40        | 2,880.02                   | 4.23                   | 441,939.99         | 829,520.58        |
| 15,405.00    | 93.60      | 358.60               | 12,354.84     | 2,963.76         | 2,965.91      | 209.70        | 2,973.31                   | 4.04                   | 442,033.72         | 829,517.88        |
| 15,500.00    | 96.20      | 358.50               | 12,346.72     | 3,058.39         | 3,060.52      | 207.31        | 3,067.54                   | 3.88                   | 442,128.33         | 829,515.49        |
| 15,594.00    | 95.30      | 359.10               | 12,337.31     | 3,151.91         | 3,154.03      | 205.35        | 3,160.71                   | 3.73                   | 442,221.84         | 829,513.53        |
| 15,689.00    | 93.30      | 0.10                 | 12,330.18     | 3,246.64         | 3,248.75      | 204.69        | 3,255.20                   | 3.61                   | 442,316.56         | 829,512.87        |
| 15,784.00    | 93.70      | 0.80                 | 12,324.38     | 3,341.45         | 3,343.57      | 205.43        | 3,349.88                   | 3.52                   | 442,411.38         | 829,513.61        |
| 15,879.00    | 95.90      | 2.30                 | 12,316.44     | 3,436.04         | 3,438.20      | 207.99        | 3,444.48                   | 3.46                   | 442,506.01         | 829,516.17        |
| 15,973.00    | 96.00      | 359.90               | 12,306.69     | 3,529.49         | 3,531.67      | 209.79        | 3,537.89                   | 3.40                   | 442,599.48         | 829,517.97        |
| 16,068.00    | 94.50      | 2.10                 | 12,298.00     | 3,624.05         | 3,626.24      | 211.44        | 3,632.40                   | 3.34                   | 442,694.05         | 829,519.62        |
| 16,163.00    | 94.60      | 1.70                 | 12,290.46     | 3,718.66         | 3,720.89      | 214.58        | 3,727.07                   | 3.30                   | 442,788.70         | 829,522.76        |
| 16,257.00    | 93.30      | 0.70                 | 12,283.98     | 3,812.39         | 3,814.65      | 216.54        | 3,820.79                   | 3.25                   | 442,882.46         | 829,524.72        |
| 16,351.00    | 92.90      | 354.30               | 12,278.90     | 3,906.15         | 3,908.37      | 212.45        | 3,914.14                   | 3.11                   | 442,976.18         | 829,520.63        |
| 16,446.00    | 93.80      | 354.30               | 12,273.34     | 4,000.60         | 4,002.74      | 203.03        | 4,007.88                   | 2.90                   | 443,070.55         | 829,511.21        |
| 16,540.00    | 96.00      | 357.80               | 12,265.31     | 4,094.07         | 4,096.15      | 196.57        | 4,100.86                   | 2.75                   | 443,163.96         | 829,504.75        |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127'-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

| MD<br>(usft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|--------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 16,635.00    | 97.80      | 357.40               | 12,253.90     | 4,188.33         | 4,190.38      | 192.63        | 4,194.80                   | 2.63                   | 443,258.19         | 829,500.81        |
| 16,729.00    | 94.80      | 0.10                 | 12,243.59     | 4,281.74         | 4,283.77      | 190.59        | 4,288.00                   | 2.55                   | 443,351.58         | 829,498.77        |
| 16,823.00    | 94.10      | 1.40                 | 12,236.29     | 4,375.43         | 4,377.47      | 191.82        | 4,381.67                   | 2.51                   | 443,445.28         | 829,500.00        |
| 16,918.00    | 96.20      | 2.80                 | 12,227.76     | 4,469.94         | 4,472.02      | 195.29        | 4,476.28                   | 2.50                   | 443,539.83         | 829,503.47        |
| 17,013.00    | 93.30      | 2.80                 | 12,219.90     | 4,564.44         | 4,566.57      | 199.91        | 4,570.94                   | 2.51                   | 443,634.38         | 829,508.09        |
| 17,107.00    | 90.40      | 0.20                 | 12,216.86     | 4,658.31         | 4,660.47      | 202.37        | 4,664.86                   | 2.49                   | 443,728.28         | 829,510.55        |
| 17,202.00    | 92.30      | 359.30               | 12,214.63     | 4,753.28         | 4,755.44      | 201.95        | 4,759.72                   | 2.43                   | 443,823.25         | 829,510.13        |
| 17,296.00    | 94.30      | 0.10                 | 12,209.21     | 4,847.12         | 4,849.27      | 201.46        | 4,853.46                   | 2.38                   | 443,917.08         | 829,509.64        |
| 17,391.00    | 94.40      | 2.50                 | 12,202.01     | 4,941.79         | 4,943.97      | 203.61        | 4,948.16                   | 2.36                   | 444,011.78         | 829,511.79        |
| 17,485.00    | 96.30      | 2.80                 | 12,193.24     | 5,035.23         | 5,037.45      | 207.94        | 5,041.74                   | 2.36                   | 444,105.26         | 829,516.12        |
| 17,579.00    | 95.30      | 0.60                 | 12,183.74     | 5,128.67         | 5,130.92      | 210.71        | 5,135.25                   | 2.35                   | 444,198.73         | 829,518.89        |
| 17,674.00    | 93.90      | 0.50                 | 12,176.12     | 5,223.34         | 5,225.61      | 211.62        | 5,229.90                   | 2.32                   | 444,293.42         | 829,519.80        |
| 17,769.00    | 91.60      | 359.80               | 12,171.57     | 5,318.22         | 5,320.50      | 211.87        | 5,324.71                   | 2.28                   | 444,388.31         | 829,520.05        |
| 17,863.00    | 92.80      | 359.20               | 12,167.96     | 5,412.15         | 5,414.42      | 211.05        | 5,418.53                   | 2.23                   | 444,482.23         | 829,519.23        |
| 17,958.00    | 94.70      | 359.20               | 12,161.75     | 5,506.94         | 5,509.20      | 209.72        | 5,513.19                   | 2.18                   | 444,577.01         | 829,517.90        |
| 18,053.00    | 95.00      | 359.50               | 12,153.71     | 5,601.60         | 5,603.86      | 208.65        | 5,607.74                   | 2.13                   | 444,671.67         | 829,516.83        |
| 18,147.00    | 94.10      | 359.50               | 12,146.26     | 5,695.30         | 5,697.56      | 207.83        | 5,701.35                   | 2.09                   | 444,765.37         | 829,516.01        |
| 18,242.00    | 96.00      | 359.20               | 12,137.89     | 5,789.93         | 5,792.18      | 206.76        | 5,795.87                   | 2.04                   | 444,859.99         | 829,514.94        |
| 18,337.00    | 97.40      | 359.40               | 12,126.81     | 5,884.27         | 5,886.52      | 205.61        | 5,890.11                   | 2.00                   | 444,954.33         | 829,513.79        |
| 18,432.00    | 98.60      | 359.10               | 12,113.59     | 5,978.35         | 5,980.58      | 204.38        | 5,984.08                   | 1.96                   | 445,048.39         | 829,512.56        |
| 18,526.00    | 97.00      | 358.40               | 12,100.83     | 6,071.47         | 6,073.69      | 202.34        | 6,077.06                   | 1.91                   | 445,141.50         | 829,510.52        |
| 18,621.00    | 97.60      | 358.40               | 12,088.76     | 6,165.68         | 6,167.88      | 199.71        | 6,171.11                   | 1.85                   | 445,235.69         | 829,507.89        |
| 18,715.00    | 99.30      | 358.80               | 12,074.95     | 6,258.65         | 6,260.83      | 197.44        | 6,263.94                   | 1.81                   | 445,328.64         | 829,505.62        |
| 18,809.00    | 99.60      | 358.70               | 12,059.52     | 6,351.36         | 6,353.53      | 195.42        | 6,356.54                   | 1.76                   | 445,421.34         | 829,503.60        |
| 18,903.00    | 100.90     | 358.00               | 12,042.79     | 6,443.84         | 6,445.99      | 192.75        | 6,448.87                   | 1.71                   | 445,513.80         | 829,500.93        |
| 18,997.00    | 101.80     | 358.80               | 12,024.29     | 6,535.99         | 6,538.11      | 190.18        | 6,540.88                   | 1.67                   | 445,605.92         | 829,498.36        |
| 19,091.00    | 102.20     | 359.40               | 12,004.75     | 6,627.93         | 6,630.05      | 188.74        | 6,632.73                   | 1.63                   | 445,697.86         | 829,496.92        |

**Company:** Marathon Oil  
**Project:** Lea County, NM(NAD 83)  
**Site:** Blueberry Hill 19 WA Fee  
**Well:** No. 4H  
**Wellbore:** OH  
**Design:** MWD-127-20005', PTB: 20064' MD

**Local Co-ordinate Reference:** Well No. 4H  
**TVD Reference:** Well @ 3362.00usft  
**MD Reference:** Well @ 3362.00usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** WellPlanner1

### Survey

| MD<br>(usft)                  | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(usft) | V. Sec<br>(usft) | N/S<br>(usft) | E/W<br>(usft) | Closure Distance<br>(usft) | Closure Azimuth<br>(°) | Northing<br>(usft) | Easting<br>(usft) |
|-------------------------------|------------|----------------------|---------------|------------------|---------------|---------------|----------------------------|------------------------|--------------------|-------------------|
| 19,185.00                     | 92.00      | 352.40               | 11,993.13     | 6,720.85         | 6,722.90      | 182.02        | 6,725.37                   | 1.55                   | 445,790.71         | 829,490.20        |
| 19,280.00                     | 92.60      | 355.50               | 11,989.32     | 6,815.32         | 6,817.29      | 172.01        | 6,819.45                   | 1.45                   | 445,885.10         | 829,480.19        |
| 19,374.00                     | 94.30      | 357.30               | 11,983.66     | 6,909.01         | 6,910.92      | 166.12        | 6,912.92                   | 1.38                   | 445,978.73         | 829,474.30        |
| 19,468.00                     | 99.00      | 1.00                 | 11,972.77     | 7,002.33         | 7,004.24      | 164.72        | 7,006.17                   | 1.35                   | 446,072.05         | 829,472.90        |
| 19,563.00                     | 99.00      | 1.90                 | 11,957.91     | 7,096.10         | 7,098.04      | 167.10        | 7,100.00                   | 1.35                   | 446,165.85         | 829,475.28        |
| 19,657.00                     | 98.60      | 2.80                 | 11,943.53     | 7,188.88         | 7,190.85      | 170.90        | 7,192.88                   | 1.36                   | 446,258.66         | 829,479.08        |
| 19,751.00                     | 99.40      | 3.30                 | 11,928.82     | 7,281.54         | 7,283.56      | 175.84        | 7,285.68                   | 1.38                   | 446,351.37         | 829,484.02        |
| 19,846.00                     | 99.40      | 2.80                 | 11,913.31     | 7,375.08         | 7,377.15      | 180.83        | 7,379.37                   | 1.40                   | 446,444.96         | 829,489.01        |
| 19,941.00                     | 100.00     | 2.10                 | 11,897.30     | 7,468.59         | 7,470.71      | 184.83        | 7,472.99                   | 1.42                   | 446,538.52         | 829,493.01        |
| 20,005.00                     | 99.90      | 1.80                 | 11,886.24     | 7,531.57         | 7,533.71      | 186.98        | 7,536.03                   | 1.42                   | 446,601.52         | 829,495.16        |
| <b>Last Survey: 20005' MD</b> |            |                      |               |                  |               |               |                            |                        |                    |                   |
| 20,064.00                     | 99.90      | 1.80                 | 11,876.10     | 7,589.64         | 7,591.80      | 188.81        | 7,594.15                   | 1.42                   | 446,659.61         | 829,496.99        |
| <b>PTB: 20064' MD</b>         |            |                      |               |                  |               |               |                            |                        |                    |                   |

### Design Annotations

| Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Local Coordinates |                 | Comment                        |
|-----------------------------|-----------------------------|-------------------|-----------------|--------------------------------|
|                             |                             | +N/-S<br>(usft)   | +E/-W<br>(usft) |                                |
| 1,189.00                    | 1,188.95                    | 0.37              | -2.08           | Pro MWD First Survey: 1189' MD |
| 20,005.00                   | 11,886.24                   | 7,533.71          | 186.98          | Last Survey: 20005' MD         |
| 20,064.00                   | 11,876.10                   | 7,591.80          | 188.81          | PTB: 20064' MD                 |