

30-015-39027

L, 14, 19S, 28E, 2080 FSL 330 FWL



EXPLORING WHAT'S POSSIBLE

## Apache Corporation

Eddy County, NM (NAD27 NME)

Palmillo 14 State Com

#1H

WB1/Job #1411057

Survey: Phoenix MWD Survey

## Standard Survey Report

25 August, 2014

NM OIL CONSERVATION  
ARTESIA DISTRICT

NOV 14 2014

RECEIVED



PHOENIX  
TECHNOLOGY SERVICES

|           |                             |                              |                                |
|-----------|-----------------------------|------------------------------|--------------------------------|
| Company:  | Apache Corporation          | Local Co-ordinate Reference: | Well #1H                       |
| Project:  | Eddy County, NM (NAD27 NME) | TVD Reference:               | KB @ 3479.00usft (Pioneer, 28) |
| Site:     | Palmillo 14 State Com       | MD Reference:                | KB @ 3479.00usft (Pioneer, 28) |
| Well:     | #1H                         | North Reference:             | Grid                           |
| Wellbore: | WB1/Job #1411057            | Survey Calculation Method:   | Minimum Curvature              |
| Design:   | Surveys (Pioneer 28)        | Database:                    | GCR DB                         |

|                                       |                                      |               |                |
|---------------------------------------|--------------------------------------|---------------|----------------|
| Project: Eddy County, NM (NAD27, NME) |                                      |               |                |
| Map System:                           | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum:                            | NAD 1927 (NADCON CONUS)              |               |                |
| Map Zone:                             | New Mexico East 3001                 |               |                |

|                       |  |           |  |                 |  |                       |  |                    |  |                    |  |
|-----------------------|--|-----------|--|-----------------|--|-----------------------|--|--------------------|--|--------------------|--|
| Site                  |  |           |  |                 |  | Palmillo 14 State Com |  |                    |  |                    |  |
| Site Position:        |  | Northing: |  | 602,138.10 usft |  | Latitude:             |  | 32° 39' 18.90442 N |  |                    |  |
| From:                 |  | Map       |  | Easting:        |  | 555,133.20 usft       |  | Longitude:         |  | 104° 9' 15.10476 W |  |
| Position Uncertainty: |  | 0.00 usft |  | Slot Radius:    |  | 13-3/16 "             |  | Grid Convergence:  |  | 0.10 °             |  |

|                      |      |           |                     |                 |               |                    |
|----------------------|------|-----------|---------------------|-----------------|---------------|--------------------|
| Well                 | #1H  |           |                     |                 |               |                    |
| Well Position        | +N-S | 0.00 usft | Northing:           | 603,557.40 usft | Latitude:     | 32° 39' 32.94925 N |
|                      | +E-W | 0.00 usft | Easting:            | 555,136.60 usft | Longitude:    | 104° 9' 15.03697 W |
| Position Uncertainty |      | 0.00 usft | Wellhead Elevation: | usft            | Ground Level: | 3,454.00 usft      |

|           |  |  |  |  |  |                  |  |             |  |                 |  |               |  |                     |  |
|-----------|--|--|--|--|--|------------------|--|-------------|--|-----------------|--|---------------|--|---------------------|--|
| Wellbore  |  |  |  |  |  | WB1/Job #1411057 |  |             |  |                 |  |               |  |                     |  |
| Magnetics |  |  |  |  |  | Model Name       |  | Sample Date |  | Declination (°) |  | Dip Angle (°) |  | Field Strength (nT) |  |
|           |  |  |  |  |  | BGGM2013         |  | 07/31/14    |  | 7.63            |  | 60.40         |  | 48,468              |  |

|                   |                            |                      |                 |                  |      |
|-------------------|----------------------------|----------------------|-----------------|------------------|------|
| Design            |                            | Surveys (Pioneer 28) |                 |                  |      |
| Audit Notes:      |                            |                      |                 |                  |      |
| Version:          | 1.0                        | Phase:               | ACTUAL          | Tie On Depth:    | 0.00 |
| Vertical Section: | Depth From (TVD)<br>(usft) | +N/-S<br>(usft)      | +E/-W<br>(usft) | Direction<br>(°) |      |
|                   | 0.00                       | 0.00                 | 0.00            | 89.55            |      |

| Survey Program |           | Date                                     | 08/25/14     |                                       |  |
|----------------|-----------|------------------------------------------|--------------|---------------------------------------|--|
| From (usft)    | To (usft) | Survey (Wellbore)                        | Tool Name    | Description                           |  |
| 100.00         | 6,800.00  | Gyrodata Gyro Surveys (WB1/Job #1411057) | NS-GYRO-MS   | North sensing gyrocompassing m/s      |  |
| 6,810.00       | 11,874.00 | Phoenix MWD Survey (WB1/Job #1411057)    | PHX+MWD+BGGM | PHX+MWD+BGGM v3: standard declination |  |

| Survey                         |                 |             |                       |              |              |                         |                         |                        |                       |
|--------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| Measured Depth (usft)          | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
| 6,800.00                       | 2.58            | 277.44      | 6,798.94              | 46.84        | -45.13       | -44.76                  | 0.00                    | 0.00                   | 0.00                  |
| Tie-on to Gyrodata Gyro Survey |                 |             |                       |              |              |                         |                         |                        |                       |
| 6,810.00                       | 2.50            | 280.80      | 6,808.93              | 46.91        | -45.57       | -45.20                  | 1.69                    | -0.80                  | 33.60                 |
| First Phoenix MWD Survey       |                 |             |                       |              |              |                         |                         |                        |                       |
| 6,842.00                       | 2.00            | 282.00      | 6,840.91              | 47.16        | -46.80       | -46.43                  | 1.57                    | -1.56                  | 3.75                  |
| 6,873.00                       | 1.00            | 288.70      | 6,871.89              | 47.36        | -47.58       | -47.21                  | 3.27                    | -3.23                  | 21.61                 |
| 6,905.00                       | 0.30            | 54.60       | 6,903.89              | 47.49        | -47.78       | -47.41                  | 3.75                    | -2.19                  | 393.44                |
| 6,936.00                       | 1.60            | 91.70       | 6,934.89              | 47.53        | -47.28       | -46.91                  | 4.43                    | 4.19                   | 119.68                |
| 6,968.00                       | 3.20            | 95.00       | 6,966.86              | 47.44        | -45.95       | -45.57                  | 5.02                    | 5.00                   | 10.31                 |

|           |                             |                              |                               |
|-----------|-----------------------------|------------------------------|-------------------------------|
| Company:  | Apache Corporation          | Local Co-ordinate Reference: | Well #1H                      |
| Project:  | Eddy County, NM (NAD27 NME) | TVD Reference:               | KB @ 3479.00usft (Pioneer 28) |
| Site:     | Palmillo 14 State Com       | MD Reference:                | KB @ 3479.00usft (Pioneer 28) |
| Well:     | #1H                         | North Reference:             | Grid                          |
| Wellbore: | WB1/Job #1411057            | Survey Calculation Method:   | Minimum Curvature             |
| Design:   | Surveys (Pioneer 28)        | Database:                    | GCR-DB                        |

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 6,999.00              | 4.80            | 93.80       | 6,997.78              | 47.28        | -43.79       | -43.42                  | 5.17                    | 5.16                   | -3.87                 |
| 7,031.00              | 6.40            | 91.30       | 7,029.63              | 47.15        | -40.67       | -40.30                  | 5.06                    | 5.00                   | -7.81                 |
| 7,062.00              | 8.70            | 87.00       | 7,060.36              | 47.23        | -36.60       | -36.23                  | 7.63                    | 7.42                   | -13.87                |
| 7,093.00              | 12.50           | 83.70       | 7,090.82              | 47.72        | -30.92       | -30.55                  | 12.41                   | 12.26                  | -10.65                |
| 7,124.00              | 17.50           | 81.10       | 7,120.76              | 48.81        | -22.98       | -22.59                  | 16.27                   | 16.13                  | -8.39                 |
| 7,156.00              | 23.10           | 81.40       | 7,150.76              | 50.50        | -12.01       | -11.61                  | 17.50                   | 17.50                  | 0.94                  |
| 7,187.00              | 28.30           | 83.20       | 7,178.68              | 52.28        | 1.31         | 1.72                    | 16.96                   | 16.77                  | 5.81                  |
| 7,218.00              | 32.20           | 86.00       | 7,205.46              | 53.72        | 16.85        | 17.27                   | 13.38                   | 12.58                  | 9.03                  |
| 7,250.00              | 35.80           | 87.30       | 7,231.98              | 54.76        | 34.71        | 35.14                   | 11.48                   | 11.25                  | 4.06                  |
| 7,281.00              | 39.70           | 88.40       | 7,256.49              | 55.46        | 53.67        | 54.11                   | 12.77                   | 12.58                  | 3.55                  |
| 7,313.00              | 44.00           | 90.10       | 7,280.32              | 55.73        | 75.02        | 75.45                   | 13.90                   | 13.44                  | 5.31                  |
| 7,344.00              | 48.40           | 92.70       | 7,301.78              | 55.16        | 97.37        | 97.80                   | 15.43                   | 14.19                  | 8.39                  |
| 7,375.00              | 52.70           | 94.00       | 7,321.47              | 53.76        | 121.26       | 121.68                  | 14.24                   | 13.87                  | 4.19                  |
| 7,407.00              | 55.30           | 94.40       | 7,340.28              | 51.86        | 147.08       | 147.48                  | 8.19                    | 8.13                   | 1.25                  |
| 7,438.00              | 58.40           | 94.90       | 7,357.23              | 49.75        | 172.95       | 173.33                  | 10.09                   | 10.00                  | 1.61                  |
| 7,469.00              | 60.70           | 95.40       | 7,372.94              | 47.35        | 199.56       | 199.93                  | 7.55                    | 7.42                   | 1.61                  |
| 7,501.00              | 63.60           | 95.30       | 7,387.88              | 44.72        | 227.73       | 228.07                  | 9.07                    | 9.06                   | -0.31                 |
| 7,532.00              | 64.70           | 95.30       | 7,401.40              | 42.14        | 255.51       | 255.83                  | 3.55                    | 3.55                   | 0.00                  |
| 7,564.00              | 67.70           | 95.30       | 7,414.31              | 39.44        | 284.66       | 284.96                  | 9.38                    | 9.38                   | 0.00                  |
| 7,595.00              | 71.80           | 95.40       | 7,425.04              | 36.72        | 313.61       | 313.89                  | 13.23                   | 13.23                  | 0.32                  |
| 7,626.00              | 75.20           | 95.30       | 7,433.84              | 33.95        | 343.20       | 343.45                  | 10.97                   | 10.97                  | -0.32                 |
| 7,658.00              | 77.50           | 95.30       | 7,441.39              | 31.08        | 374.16       | 374.39                  | 7.19                    | 7.19                   | 0.00                  |
| 7,689.00              | 80.30           | 95.30       | 7,447.36              | 28.27        | 404.44       | 404.65                  | 9.03                    | 9.03                   | 0.00                  |
| 7,720.00              | 82.90           | 94.90       | 7,451.89              | 25.55        | 434.99       | 435.18                  | 8.48                    | 8.39                   | -1.29                 |
| 7,760.00              | 86.00           | 95.00       | 7,455.76              | 22.11        | 474.65       | 474.81                  | 7.75                    | 7.75                   | 0.25                  |
| 7,854.00              | 86.40           | 95.30       | 7,461.99              | 13.69        | 568.06       | 568.15                  | 0.53                    | 0.43                   | 0.32                  |
| 7,948.00              | 87.30           | 95.30       | 7,467.15              | 5.02         | 661.52       | 661.54                  | 0.96                    | 0.96                   | 0.00                  |
| 8,043.00              | 88.50           | 94.60       | 7,470.63              | -3.17        | 756.10       | 756.05                  | 1.46                    | 1.26                   | -0.74                 |
| 8,137.00              | 93.40           | 93.60       | 7,469.07              | -9.89        | 849.81       | 849.71                  | 5.32                    | 5.21                   | -1.06                 |
| 8,231.00              | 92.10           | 91.50       | 7,464.56              | -14.06       | 943.61       | 943.47                  | 2.63                    | -1.38                  | -2.23                 |
| 8,326.00              | 91.30           | 90.10       | 7,461.75              | -15.39       | 1,038.55     | 1,038.40                | 1.70                    | -0.84                  | -1.47                 |
| 8,420.00              | 90.10           | 89.00       | 7,460.60              | -14.65       | 1,132.54     | 1,132.39                | 1.73                    | -1.28                  | -1.17                 |
| 8,514.00              | 89.30           | 87.30       | 7,461.09              | -11.62       | 1,226.48     | 1,226.35                | 2.00                    | -0.85                  | -1.81                 |
| 8,608.00              | 89.10           | 87.30       | 7,462.40              | -7.19        | 1,320.37     | 1,320.27                | 0.21                    | -0.21                  | 0.00                  |
| 8,702.00              | 89.00           | 87.30       | 7,463.96              | -2.76        | 1,414.25     | 1,414.19                | 0.11                    | -0.11                  | 0.00                  |
| 8,796.00              | 88.70           | 87.00       | 7,465.85              | 1.91         | 1,508.12     | 1,508.09                | 0.45                    | -0.32                  | -0.32                 |
| 8,890.00              | 88.20           | 87.10       | 7,468.39              | 6.75         | 1,601.96     | 1,601.96                | 0.54                    | -0.53                  | 0.11                  |
| 8,984.00              | 87.60           | 87.90       | 7,471.83              | 10.84        | 1,695.80     | 1,695.84                | 1.06                    | -0.64                  | 0.85                  |
| 9,079.00              | 86.90           | 90.50       | 7,476.39              | 12.17        | 1,790.68     | 1,790.72                | 2.83                    | -0.74                  | 2.74                  |
| 9,173.00              | 88.10           | 91.60       | 7,480.49              | 10.45        | 1,884.57     | 1,884.59                | 1.73                    | 1.28                   | 1.17                  |
| 9,267.00              | 89.30           | 92.00       | 7,482.63              | 7.50         | 1,978.50     | 1,978.49                | 1.35                    | 1.28                   | 0.43                  |
| 9,361.00              | 89.10           | 91.10       | 7,483.94              | 4.95         | 2,072.45     | 2,072.43                | 0.98                    | -0.21                  | -0.96                 |
| 9,455.00              | 88.60           | 90.50       | 7,485.83              | 3.64         | 2,166.42     | 2,166.38                | 0.83                    | -0.53                  | -0.64                 |

|                  |                            |                                     |                               |
|------------------|----------------------------|-------------------------------------|-------------------------------|
| <b>Company:</b>  | Apache Corporation         | <b>Local Co-ordinate Reference:</b> | Well #1H                      |
| <b>Project:</b>  | Eddy County NM (NAD27 NME) | <b>TVD Reference:</b>               | KB @ 3479.00usft (Pioneer 28) |
| <b>Site:</b>     | Palmillo-14 State Com      | <b>MD Reference:</b>                | KB @ 3479.00usft (Pioneer 28) |
| <b>Well:</b>     | #1H                        | <b>North Reference:</b>             | Grid                          |
| <b>Wellbore:</b> | WB1/Job #1411057           | <b>Survey Calculation Method:</b>   | Minimum Curvature             |
| <b>Design:</b>   | Surveys (Pioneer 28)       | <b>Database:</b>                    | GCR DB                        |

| Survey                                 |                 |             |                       |              |              |                         |                         |                        |                       |  |
|----------------------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft)                  | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 9,549.00                               | 88.10           | 89.70       | 7,488.53              | 3.48         | 2,260.38     | 2,260.34                | 1.00                    | -0.53                  | -0.85                 |  |
| 9,643.00                               | 88.10           | 89.20       | 7,491.65              | 4.38         | 2,354.33     | 2,354.29                | 0.53                    | 0.00                   | -0.53                 |  |
| 9,737.00                               | 87.90           | 88.60       | 7,494.93              | 6.18         | 2,448.25     | 2,448.22                | 0.67                    | -0.21                  | -0.64                 |  |
| 9,831.00                               | 87.40           | 88.20       | 7,498.78              | 8.81         | 2,542.13     | 2,542.13                | 0.68                    | -0.53                  | -0.43                 |  |
| 9,925.00                               | 87.20           | 88.20       | 7,503.21              | 11.76        | 2,635.98     | 2,636.00                | 0.21                    | -0.21                  | 0.00                  |  |
| 10,019.00                              | 88.30           | 88.90       | 7,506.90              | 14.13        | 2,729.88     | 2,729.91                | 1.39                    | 1.17                   | 0.74                  |  |
| 10,114.00                              | 88.00           | 88.50       | 7,509.97              | 16.29        | 2,824.81     | 2,824.85                | 0.53                    | -0.32                  | -0.42                 |  |
| 10,208.00                              | 87.40           | 88.40       | 7,513.74              | 18.83        | 2,918.69     | 2,918.75                | 0.65                    | -0.64                  | -0.11                 |  |
| 10,303.00                              | 87.00           | 88.30       | 7,518.38              | 21.56        | 3,013.54     | 3,013.62                | 0.43                    | -0.42                  | -0.11                 |  |
| 10,398.00                              | 86.50           | 88.10       | 7,523.77              | 24.54        | 3,108.34     | 3,108.44                | 0.57                    | -0.53                  | -0.21                 |  |
| 10,492.00                              | 86.50           | 89.00       | 7,529.51              | 26.91        | 3,202.14     | 3,202.25                | 0.96                    | 0.00                   | 0.96                  |  |
| 10,586.00                              | 86.80           | 89.10       | 7,535.00              | 28.47        | 3,295.96     | 3,296.08                | 0.34                    | 0.32                   | 0.11                  |  |
| 10,680.00                              | 86.00           | 88.20       | 7,540.90              | 30.68        | 3,389.75     | 3,389.89                | 1.28                    | -0.85                  | -0.96                 |  |
| 10,774.00                              | 84.70           | 87.60       | 7,548.52              | 34.11        | 3,483.37     | 3,483.53                | 1.52                    | -1.38                  | -0.64                 |  |
| 10,868.00                              | 84.40           | 88.80       | 7,557.45              | 37.05        | 3,576.90     | 3,577.08                | 1.31                    | -0.32                  | 1.28                  |  |
| 10,962.00                              | 84.30           | 90.80       | 7,566.71              | 37.38        | 3,670.44     | 3,670.62                | 2.12                    | -0.11                  | 2.13                  |  |
| 11,056.00                              | 84.90           | 92.10       | 7,575.55              | 35.01        | 3,763.99     | 3,764.15                | 1.52                    | 0.64                   | 1.38                  |  |
| 11,151.00                              | 85.60           | 91.70       | 7,583.42              | 31.87        | 3,858.61     | 3,858.74                | 0.85                    | 0.74                   | -0.42                 |  |
| 11,245.00                              | 84.50           | 92.20       | 7,591.53              | 28.68        | 3,952.20     | 3,952.31                | 1.28                    | -1.17                  | 0.53                  |  |
| 11,339.00                              | 85.60           | 92.30       | 7,599.64              | 25.01        | 4,045.78     | 4,045.85                | 1.18                    | 1.17                   | 0.11                  |  |
| 11,433.00                              | 88.00           | 92.50       | 7,604.89              | 21.08        | 4,139.54     | 4,139.58                | 2.56                    | 2.55                   | 0.21                  |  |
| 11,527.00                              | 88.00           | 92.50       | 7,608.17              | 16.98        | 4,233.40     | 4,233.40                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,621.00                              | 87.90           | 91.80       | 7,611.53              | 13.45        | 4,327.27     | 4,327.24                | 0.75                    | -0.11                  | -0.74                 |  |
| 11,715.00                              | 87.80           | 91.90       | 7,615.06              | 10.42        | 4,421.15     | 4,421.10                | 0.15                    | -0.11                  | 0.11                  |  |
| 11,807.00                              | 88.10           | 91.50       | 7,618.35              | 7.69         | 4,513.06     | 4,512.98                | 0.54                    | 0.33                   | -0.43                 |  |
| Last Phoenix MWD Survey                |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 11,827.86                              | 88.10           | 91.50       | 7,619.04              | 7.15         | 4,533.90     | 4,533.81                | 0.00                    | 0.00                   | 0.00                  |  |
| 330' Hardline Crossing at 11827.86' MD |                 |             |                       |              |              |                         |                         |                        |                       |  |
| 11,874.00                              | 88.10           | 91.50       | 7,620.57              | 5.94         | 4,580.00     | 4,579.90                | 0.00                    | 0.00                   | 0.00                  |  |
| Projection to TD                       |                 |             |                       |              |              |                         |                         |                        |                       |  |

| Survey Annotations    |                       |                   |              |                                        |  |
|-----------------------|-----------------------|-------------------|--------------|----------------------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates |              |                                        |  |
|                       |                       | +N/-S (usft)      | +E/-W (usft) | Comment                                |  |
| 6,800.00              | 6,798.94              | 46.84             | -45.13       | Tie-on to Gyrodata Gyro Survey         |  |
| 6,810.00              | 6,808.93              | 46.91             | -45.57       | First Phoenix MWD Survey               |  |
| 11,807.00             | 7,618.35              | 7.69              | 4,513.06     | Last Phoenix MWD Survey                |  |
| 11,827.86             | 7,619.04              | 7.15              | 4,533.90     | 330' Hardline Crossing at 11827.86' MD |  |
| 11,874.00             | 7,620.57              | 5.94              | 4,580.00     | Projection to TD                       |  |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|