

UNITED STATES **NM OIL CONSERVATION**  
DEPARTMENT OF THE INTERIOR **ARTESIA DISTRICT**  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 2010

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*

RECEIVED  
JAN 04 2016

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

|                                                                                                                                                      |                                                       |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|
| 1. Type of Well<br><input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other                     |                                                       | 5. Lease Serial No.<br>NMLC049998B                       |
| 2. Name of Operator<br>APACHE CORPORATION                                                                                                            |                                                       | 6. If Indian, Allottee or Tribe Name                     |
| Contact: SORINA FLORES<br>E-Mail: sorina.flores@apachecorp.com                                                                                       |                                                       | 7. If Unit or CA/Agreement, Name and/or No.              |
| 3a. Address<br>303 VETERANS AIRPARK LANE SUITE 3000<br>MIDLAND, TX 79705                                                                             | 3b. Phone No. (include area code)<br>Ph: 432-818-1167 | 8. Well Name and No.<br>HUMMINGBIRD FEDERAL COM 18H      |
| 4. Location of Well (Footage, Sec., T., R., M., or Survey Description)<br>Sec 1 T17S R31E Mer NMP 330FNL 100FWL<br>32.869910 N Lat, 103.830900 W Lon |                                                       | 9. API Well No.<br>30-015-43486                          |
|                                                                                                                                                      |                                                       | 10. Field and Pool, or Exploratory<br>FREN;GLORIETA-YESO |
|                                                                                                                                                      |                                                       | 11. County or Parish, and State<br>EDDY COUNTY, NM       |

**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

| TYPE OF SUBMISSION                                   | TYPE OF ACTION                                |                                           |                                                    |                                           |
|------------------------------------------------------|-----------------------------------------------|-------------------------------------------|----------------------------------------------------|-------------------------------------------|
| <input checked="" type="checkbox"/> Notice of Intent | <input type="checkbox"/> Acidize              | <input type="checkbox"/> Deepen           | <input type="checkbox"/> Production (Start/Resume) | <input type="checkbox"/> Water Shut-Off   |
| <input type="checkbox"/> Subsequent Report           | <input type="checkbox"/> Alter Casing         | <input type="checkbox"/> Fracture Treat   | <input type="checkbox"/> Reclamation               | <input type="checkbox"/> Well Integrity   |
| <input type="checkbox"/> Final Abandonment Notice    | <input type="checkbox"/> Casing Repair        | <input type="checkbox"/> New Construction | <input type="checkbox"/> Recomplete                | <input checked="" type="checkbox"/> Other |
|                                                      | <input type="checkbox"/> Change Plans         | <input type="checkbox"/> Plug and Abandon | <input type="checkbox"/> Temporarily Abandon       | Change to Original A<br>PD                |
|                                                      | <input type="checkbox"/> Convert to Injection | <input type="checkbox"/> Plug Back        | <input type="checkbox"/> Water Disposal            |                                           |

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleation in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

BLM-CO-1463 NATIONWIDE; NMB000736

APACHE REQUEST TO MODIFY THE TVD/MD/CSG/BOP/MUD PROGRAM/BHP FOR THE HUMMINGBIRD FED COM 18H:

OLD TVD: 5568'/LP: 5476'/MD: 10123'  
NEW TVD: 6465'/LP: 6425'/MD: 11071'

*Extremely Low Cement for Production Casing!*

CSG - OLD PROD DEPTHS : 0' - 4999'  
4999' - 10123'

*SEE COA*

CSG - NEW PROD DEPTHS : 0' - 5947'  
5947' - 11071'

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

*Accepted for record  
LRD NMOCD 1/5/16*

|                                                                                                                                                                                                                                                                    |                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 14. I hereby certify that the foregoing is true and correct.<br>Electronic Submission #326455 verified by the BLM Well Information System<br>For APACHE CORPORATION, sent to the Carlsbad<br>Committed to AFMSS for processing by KENNETH RENNICK on 12/17/2015 () |                          |
| Name (Printed/Typed) SORINA FLORES                                                                                                                                                                                                                                 | Title SUBMITTING CONTACT |
| Signature (Electronic Submission)                                                                                                                                                                                                                                  | Date 12/16/2015          |

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

|                                                                                                                                                                                                                                                                                            |             |                                                                                                                                                                  |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Approved By _____                                                                                                                                                                                                                                                                          | Title _____ | <b>APPROVED</b><br><b>PETROLEUM ENGINEER</b><br><b>DEC 30 2015</b><br><b>Kenneth Rennick</b><br><b>BUREAU OF LAND MANAGEMENT</b><br><b>CARLSBAD FIELD OFFICE</b> | Date _____   |
| Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.                                  |             |                                                                                                                                                                  | Office _____ |
| Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. |             |                                                                                                                                                                  |              |

**\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\***

**Additional data for EC transaction #326455 that would not fit on the form**

**32. Additional remarks, continued**

\*Prod csg will be tapered string w/7" csg f/surf to KOP(cmdtd thru stage tool f/ KOP to 3000')

BOP old: 13-5/8" BOP installed & tested before drlg 9-5/8" hole  
BOP NEW: 11" BOP installed & tested before drlg 8-1/2" hole

**MUD PROGRAM:**

Old: Int shoe weight(ppg): 9.0-10.0

NEW: Int shoe weight(ppg): 8.6-10.2

BHP Old: 2449psi

BHP NEW: 2845psi

**\*\*Please see attached revised directional plan\*\***



Rennick, Kenneth <krennick@blm.gov>

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## FW: Sundries - Hummingbird Fed Com 18H

1 message

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**Flores, Sorina** <Sorina.Flores@apachecorp.com>  
To: "Rennick, Kenneth" <krennick@blm.gov>  
Cc: "Vacek, John" <John.Vacek@apachecorp.com>

Wed, Dec 30, 2015 at 12:42 PM

We will be testing to 3M. Thxs!! Happy Holidays!

**SORINA L. FLORES**

APACHE CORPORATION

*direct* 432-818-1167 | *fax* 432-818-1981

sorina.flores@apachecorp.com

**From:** Vacek, John  
**Sent:** Wednesday, December 23, 2015 12:08 PM  
**To:** Flores, Sorina <Sorina.Flores@apachecorp.com>  
**Subject:** Re: Sundries - Hummingbird Fed Com 16H & 18H

We run 3M systems for the 12-1/4" intermediate and 8-1/2" production hole. I believe we have the schematic is there for the annular on the intermediate. I'll have to look at it later.

Sent from my iPhone

On Dec 23, 2015, at 11:40 AM, Flores, Sorina <Sorina.Flores@apachecorp.com> wrote:

John... was this resolved? Thxs!

**SORINA L. FLORES**

APACHE CORPORATION

*direct* 432-818-1167 | *fax* 432-818-1981

sorina.flores@apachecorp.com

Kenneth/Ed.. attached are 2 sundries submitted today. These wells are scheduled to be drilled at the end of January 2016.. so no rush.. just wanted you to be aware of their existence. Apache is modifying the TVD/MD.. & will modify the production csg ... as well as the BOP, mud program & BHP.

Thank you!

SORINA L. FLORES  
APACHE CORPORATION  
direct 432-818-1167 | fax 432-818-1981  
sorina.flores@apachecorp.com

-----Original Message-----

From: wis-submission@blm.gov [mailto:wis-submission@blm.gov]  
Sent: Wednesday, December 16, 2015 10:50 AM  
To: Flores, Sorina <Sorina.Flores@apachecorp.com>  
Subject: EC Document Submitted

Your EC Transaction 326453, Serial Number 852-3971, was submitted to the Carlsbad, NM BLM Office. You may wish to view this action by clicking [https://urldefense.proofpoint.com/v2/url?u=https-3A\\_\\_www.blm.gov\\_wispermits\\_wis\\_SP\\_show-2Dform.do-3FFormId-3D852-26FormInstanceNumber-3D3971&d=CwlCAg&c=dbuucrGls9xXk6Z5aWDgzQ&r=TB0k9qUGxDZ4yEXIeq1fJpalu1BS4ke3WYnHUvHALM&m=BCnNwmfkxjLo6Ou8\\_04RgkYKR4n0kM4Rykyq-xi1gY&s=Fwz2ON65pbmN4SR9jVNw4Ua8VSDHtZpdRDtMyFWet1c&e=](https://urldefense.proofpoint.com/v2/url?u=https-3A__www.blm.gov_wispermits_wis_SP_show-2Dform.do-3FFormId-3D852-26FormInstanceNumber-3D3971&d=CwlCAg&c=dbuucrGls9xXk6Z5aWDgzQ&r=TB0k9qUGxDZ4yEXIeq1fJpalu1BS4ke3WYnHUvHALM&m=BCnNwmfkxjLo6Ou8_04RgkYKR4n0kM4Rykyq-xi1gY&s=Fwz2ON65pbmN4SR9jVNw4Ua8VSDHtZpdRDtMyFWet1c&e=).

—  
Kenneth Rennick

Petroleum Engineer

Bureau of Land Management

Carlsbad Field Office

(575) 234-5964

krennick@blm.gov

**From:** Rennick, Kenneth [mailto:krennick@blm.gov]  
**Sent:** Friday, December 18, 2015 12:23 PM  
**To:** Flores, Sorina <Sorina.Flores@apachecorp.com>  
**Cc:** efernand@blm.gov  
**Subject:** Re: Sundries - Hummingbird Fed Com 16H & 18H

Hello Ms. Sorina Flores!

I hope you are getting ready for Christmas!

I approved the Sundry for the 16H, please see the attachment for this approval as well as the conditions.

However for the 18H, my calculations show that the Pressure Control Equipment under the 9 5/8 inch Casing Shoe needs to be rated to 3M. My calculations are the following:

$6465 \text{ [Max TVD]} * (10.2/19.25 - 0.22) = 2003 > 2000$  Therefore Needs to be 3M

Because of this, if you may please send a email requesting the upgrade of the equipment to 3M below the 9 5/8 inch Casing Shoe. As well as send the relevant schematics for a 3M system that will be greatly appreciated.

Also can you please send the relevant schematics for the 2M Annular below the Surface Casing Shoe as proposed in the original drilling program. I did not see that schematic when I was reviewing the applications.

I am going on vacation as of today, but I will finish the review of the 18H when I get back on the 28th of December.

Have a Merry Christmas!!!

Kenneth Rennick

On Wed, Dec 16, 2015 at 9:59 AM, Flores, Sorina <Sorina.Flores@apachecorp.com> wrote:

**Hummingbird Federal Com 18H**  
**30-015-43486**  
**Apache Corporation**  
**Conditions of Approval**

**Original COA still applies, except for the replacement of the Communitization Agreement requirements and the cement fill requirements behind the 7 x 5 1/2 inch production casing. As well as amendments to the requirements for the Working Pressure of the Pressure Control Equipment.**

**Communitization Agreement:**

1. The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
2. If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
3. In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

**7 x 5 1/2 inch Production Casing:**

1. The minimum required fill of cement behind the 7 x 5 1/2 inch production casing is:
  - ☒ Cement as proposed by operator. Operator shall provide method of verification. **Excess calculate to negative 77% - Additional cement will be required.**

**Pressure Control Equipment:**

1. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 3000 (3M) psi (**Installing 3M and testing to 3000 psi**).

**KGR 12302015**





## Apache Corporation

Eddy County, NM (NAD27 NME)

Hummingbird Federal Com

#18H

OH

NM OIL CONSERVATION  
ARTESIA DISTRICT

JAN 04 2015

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Plan: Plan #2 12-15-15

## Standard Planning Report

15 December, 2015



|           |                             |                              |                             |
|-----------|-----------------------------|------------------------------|-----------------------------|
| Database: | Compass 5000 GCR            | Local Co-ordinate Reference: | Well #18H                   |
| Company:  | Apache Corporation          | TVD Reference:               | KB: 11' @ 4050.00usft (TBD) |
| Project:  | Eddy County, NM (NAD27 NME) | MD Reference:                | KB: 11' @ 4050.00usft (TBD) |
| Site:     | Hummingbird Federal Com     | North Reference:             | Grid                        |
| Well:     | #18H                        | Survey Calculation Method:   | Minimum Curvature           |
| Wellbore: | OH                          |                              |                             |
| Design:   | Plan #2 12-15-15            |                              |                             |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| 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:                 | Hummingbird Federal Com |                   |                     |
| Site Position:        |                         | Northing:         | 677,262.80 usft     |
| From:                 | Map                     | Easting:          | 655,481.80 usft     |
| Position Uncertainty: | 0.00 usft               | Slot Radius:      | 13-3/16 "           |
|                       |                         | Latitude:         | 32° 51' 39.07462 N  |
|                       |                         | Longitude:        | 103° 49' 37.14798 W |
|                       |                         | Grid Convergence: | 0.27 °              |

|                      |       |                |                     |
|----------------------|-------|----------------|---------------------|
| Well:                | #18H  |                |                     |
| Well Position        | +N/-S | 3,288.90 usft  | Northing:           |
|                      | +E/-W | -1,217.60 usft | Easting:            |
| Position Uncertainty |       | 0.00 usft      | Wellhead Elevation: |
|                      |       |                | 0.00 usft           |
|                      |       |                | Latitude:           |
|                      |       |                | 32° 52' 11.67577 N  |
|                      |       |                | Longitude:          |
|                      |       |                | 103° 49' 51.23903 W |
|                      |       |                | Ground Level:       |
|                      |       |                | 4,039.00 usft       |

|           |    |
|-----------|----|
| Wellbore: | OH |
|-----------|----|

| Magnetics | Model Name | Sample Date | Declination | Dip Angle | Field Strength |
|-----------|------------|-------------|-------------|-----------|----------------|
|           |            |             | (°)         | (°)       | (nT)           |
|           | HDGM       | 12/15/2015  | 7.47        | 60.85     | 48,582         |

|         |                  |
|---------|------------------|
| Design: | Plan #2 12-15-15 |
|---------|------------------|

|                   |                  |           |               |           |
|-------------------|------------------|-----------|---------------|-----------|
| Audit Notes:      |                  |           |               |           |
| Version:          | Phase:           | PROTOTYPE | Tie On Depth: | 0.00      |
| Vertical Section: | Depth From (TVD) | +N/-S     | +E/-W         | Direction |
|                   | (usft)           | (usft)    | (usft)        | (°)       |
|                   | 0.00             | 0.00      | 0.00          | 89.57     |

| Plan Sections |             |         |          |        |          |             |             |             |       |                 |
|---------------|-------------|---------|----------|--------|----------|-------------|-------------|-------------|-------|-----------------|
| Measured      | Inclination | Azimuth | Vertical | +N/-S  | +E/-W    | Dogleg      | Build       | Turn        | TFO   | Target          |
| Depth         | (°)         | (°)     | Depth    | (usft) | (usft)   | Rate        | Rate        | Rate        | (°)   |                 |
| (usft)        |             |         | (usft)   |        |          | (°/100usft) | (°/100usft) | (°/100usft) |       |                 |
| 0.00          | 0.00        | 0.00    | 0.00     | 0.00   | 0.00     | 0.00        | 0.00        | 0.00        | 0.00  |                 |
| 5,947.56      | 0.00        | 0.00    | 5,947.56 | 0.00   | 0.00     | 0.00        | 0.00        | 0.00        | 0.00  |                 |
| 6,693.20      | 89.48       | 89.57   | 6,425.01 | 3.52   | 473.09   | 12.00       | 12.00       | 12.01       | 89.57 |                 |
| 11,071.22     | 89.48       | 89.57   | 6,465.00 | 36.05  | 4,850.81 | 0.00        | 0.00        | 0.00        | 0.00  | BHL v2 HFC #18H |

|                  |                             |                                     |                             |
|------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Database:</b> | Compass 5000 GCR            | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Company:</b>  | Apache Corporation          | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site:</b>     | Hummingbird Federal Com     | <b>North Reference:</b>             | Grid                        |
| <b>Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Wellbore:</b> | OH                          |                                     |                             |
| <b>Design:</b>   | Plan #2 12-15-15            |                                     |                             |

| Planned Survey                      |                    |                |                          |                 |                 |                            |                            |                           |                          |  |
|-------------------------------------|--------------------|----------------|--------------------------|-----------------|-----------------|----------------------------|----------------------------|---------------------------|--------------------------|--|
| Measured Depth<br>(usft)            | Inclination<br>(°) | Azimuth<br>(°) | Vertical Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical Section<br>(usft) | Dogleg Rate<br>(°/100usft) | Build Rate<br>(°/100usft) | Turn Rate<br>(°/100usft) |  |
| 0.00                                | 0.00               | 0.00           | 0.00                     | 0.00            | 0.00            | 0.00                       | 0.00                       | 0.00                      | 0.00                     |  |
| 5,947.56                            | 0.00               | 0.00           | 5,947.56                 | 0.00            | 0.00            | 0.00                       | 0.00                       | 0.00                      | 0.00                     |  |
| <b>KOP, Begin 12.00°/100' Build</b> |                    |                |                          |                 |                 |                            |                            |                           |                          |  |
| 6,000.00                            | 6.29               | 89.57          | 5,999.89                 | 0.02            | 2.88            | 2.88                       | 12.00                      | 12.00                     | 0.00                     |  |
| 6,100.00                            | 18.29              | 89.57          | 6,097.42                 | 0.18            | 24.13           | 24.13                      | 12.00                      | 12.00                     | 0.00                     |  |
| 6,200.00                            | 30.29              | 89.57          | 6,188.40                 | 0.48            | 65.19           | 65.19                      | 12.00                      | 12.00                     | 0.00                     |  |
| 6,300.00                            | 42.29              | 89.57          | 6,268.86                 | 0.92            | 124.27          | 124.28                     | 12.00                      | 12.00                     | 0.00                     |  |
| 6,400.00                            | 54.29              | 89.57          | 6,335.27                 | 1.48            | 198.79          | 198.80                     | 12.00                      | 12.00                     | 0.00                     |  |
| 6,500.00                            | 66.29              | 89.57          | 6,384.73                 | 2.12            | 285.49          | 285.49                     | 12.00                      | 12.00                     | 0.00                     |  |
| 6,600.00                            | 78.29              | 89.57          | 6,415.09                 | 2.83            | 380.57          | 380.58                     | 12.00                      | 12.00                     | 0.00                     |  |
| 6,693.20                            | 89.48              | 89.57          | 6,425.01                 | 3.52            | 473.09          | 473.10                     | 12.00                      | 12.00                     | 0.00                     |  |
| <b>LP, Hold 89.48° Inc</b>          |                    |                |                          |                 |                 |                            |                            |                           |                          |  |
| 6,700.00                            | 89.48              | 89.57          | 6,425.07                 | 3.57            | 479.89          | 479.90                     | 0.00                       | 0.00                      | 0.00                     |  |
| 6,800.00                            | 89.48              | 89.57          | 6,425.98                 | 4.31            | 579.88          | 579.90                     | 0.00                       | 0.00                      | 0.00                     |  |
| 6,900.00                            | 89.48              | 89.57          | 6,426.89                 | 5.05            | 679.88          | 679.90                     | 0.00                       | 0.00                      | 0.00                     |  |
| 7,000.00                            | 89.48              | 89.57          | 6,427.81                 | 5.80            | 779.87          | 779.89                     | 0.00                       | 0.00                      | 0.00                     |  |
| 7,100.00                            | 89.48              | 89.57          | 6,428.72                 | 6.54            | 879.86          | 879.89                     | 0.00                       | 0.00                      | 0.00                     |  |
| 7,200.00                            | 89.48              | 89.57          | 6,429.63                 | 7.28            | 979.86          | 979.88                     | 0.00                       | 0.00                      | 0.00                     |  |
| 7,300.00                            | 89.48              | 89.57          | 6,430.55                 | 8.03            | 1,079.85        | 1,079.88                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,400.00                            | 89.48              | 89.57          | 6,431.46                 | 8.77            | 1,179.84        | 1,179.88                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,500.00                            | 89.48              | 89.57          | 6,432.38                 | 9.51            | 1,279.84        | 1,279.87                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,600.00                            | 89.48              | 89.57          | 6,433.29                 | 10.25           | 1,379.83        | 1,379.87                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,700.00                            | 89.48              | 89.57          | 6,434.20                 | 11.00           | 1,479.82        | 1,479.86                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,800.00                            | 89.48              | 89.57          | 6,435.12                 | 11.74           | 1,579.82        | 1,579.86                   | 0.00                       | 0.00                      | 0.00                     |  |
| 7,900.00                            | 89.48              | 89.57          | 6,436.03                 | 12.48           | 1,679.81        | 1,679.85                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,000.00                            | 89.48              | 89.57          | 6,436.94                 | 13.23           | 1,779.80        | 1,779.85                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,100.00                            | 89.48              | 89.57          | 6,437.86                 | 13.97           | 1,879.79        | 1,879.85                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,200.00                            | 89.48              | 89.57          | 6,438.77                 | 14.71           | 1,979.79        | 1,979.84                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,300.00                            | 89.48              | 89.57          | 6,439.68                 | 15.46           | 2,079.78        | 2,079.84                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,400.00                            | 89.48              | 89.57          | 6,440.60                 | 16.20           | 2,179.77        | 2,179.83                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,500.00                            | 89.48              | 89.57          | 6,441.51                 | 16.94           | 2,279.77        | 2,279.83                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,600.00                            | 89.48              | 89.57          | 6,442.42                 | 17.69           | 2,379.76        | 2,379.83                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,700.00                            | 89.48              | 89.57          | 6,443.34                 | 18.43           | 2,479.75        | 2,479.82                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,800.00                            | 89.48              | 89.57          | 6,444.25                 | 19.17           | 2,579.75        | 2,579.82                   | 0.00                       | 0.00                      | 0.00                     |  |
| 8,900.00                            | 89.48              | 89.57          | 6,445.17                 | 19.92           | 2,679.74        | 2,679.81                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,000.00                            | 89.48              | 89.57          | 6,446.08                 | 20.66           | 2,779.73        | 2,779.81                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,100.00                            | 89.48              | 89.57          | 6,446.99                 | 21.40           | 2,879.73        | 2,879.80                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,200.00                            | 89.48              | 89.57          | 6,447.91                 | 22.14           | 2,979.72        | 2,979.80                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,300.00                            | 89.48              | 89.57          | 6,448.82                 | 22.89           | 3,079.71        | 3,079.80                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,400.00                            | 89.48              | 89.57          | 6,449.73                 | 23.63           | 3,179.70        | 3,179.79                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,500.00                            | 89.48              | 89.57          | 6,450.65                 | 24.37           | 3,279.70        | 3,279.79                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,600.00                            | 89.48              | 89.57          | 6,451.56                 | 25.12           | 3,379.69        | 3,379.78                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,700.00                            | 89.48              | 89.57          | 6,452.47                 | 25.86           | 3,479.68        | 3,479.78                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,800.00                            | 89.48              | 89.57          | 6,453.39                 | 26.60           | 3,579.68        | 3,579.78                   | 0.00                       | 0.00                      | 0.00                     |  |
| 9,900.00                            | 89.48              | 89.57          | 6,454.30                 | 27.35           | 3,679.67        | 3,679.77                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,000.00                           | 89.48              | 89.57          | 6,455.21                 | 28.09           | 3,779.66        | 3,779.77                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,100.00                           | 89.48              | 89.57          | 6,456.13                 | 28.83           | 3,879.66        | 3,879.76                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,200.00                           | 89.48              | 89.57          | 6,457.04                 | 29.58           | 3,979.65        | 3,979.76                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,300.00                           | 89.48              | 89.57          | 6,457.95                 | 30.32           | 4,079.64        | 4,079.75                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,400.00                           | 89.48              | 89.57          | 6,458.87                 | 31.06           | 4,179.63        | 4,179.75                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,500.00                           | 89.48              | 89.57          | 6,459.78                 | 31.81           | 4,279.63        | 4,279.75                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,600.00                           | 89.48              | 89.57          | 6,460.70                 | 32.55           | 4,379.62        | 4,379.74                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,700.00                           | 89.48              | 89.57          | 6,461.61                 | 33.29           | 4,479.61        | 4,479.74                   | 0.00                       | 0.00                      | 0.00                     |  |
| 10,800.00                           | 89.48              | 89.57          | 6,462.52                 | 34.03           | 4,579.61        | 4,579.73                   | 0.00                       | 0.00                      | 0.00                     |  |



|                  |                             |                                     |                             |
|------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Database:</b> | Compass 5000 GCR            | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Company:</b>  | Apache Corporation          | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Project:</b>  | Eddy County, NM (NAD27 NME) | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site:</b>     | Hummingbird Federal Com     | <b>North Reference:</b>             | Grid                        |
| <b>Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Wellbore:</b> | OH                          |                                     |                             |
| <b>Design:</b>   | Plan #2 12-15-15            |                                     |                             |

| Planned 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) |  |
| 10,900.00             | 89.48           | 89.57       | 6,463.44              | 34.78        | 4,679.60     | 4,679.73                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,000.00             | 89.48           | 89.57       | 6,464.35              | 35.52        | 4,779.59     | 4,779.73                | 0.00                    | 0.00                   | 0.00                  |  |
| 11,071.22             | 89.48           | 89.57       | 6,465.00              | 36.05        | 4,850.81     | 4,850.94                | 0.00                    | 0.00                   | 0.00                  |  |
| TD at 11071.22        |                 |             |                       |              |              |                         |                         |                        |                       |  |

| Design Targets                                                                              |                 |               |             |            |              |              |                 |                |                    |                    |
|---------------------------------------------------------------------------------------------|-----------------|---------------|-------------|------------|--------------|--------------|-----------------|----------------|--------------------|--------------------|
| Target Name                                                                                 | hit/miss target | Dip Angle (°) | Dip Dir (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude           | Longitude          |
| MP HFC #18H                                                                                 |                 | 0.00          | 0.00        | 6,445.00   | 19.81        | 2,661.99     | 680,571.51      | 656,926.20     | 32° 52' 11.74535 N | 03° 49' 20.02689 W |
| - plan misses target center by 0.03usft at 8882.25usft MD (6445.00 TVD, 19.78 N, 2661.99 E) |                 |               |             |            |              |              |                 |                |                    |                    |
| - Point                                                                                     |                 |               |             |            |              |              |                 |                |                    |                    |
| BHL v2 HFC #18H                                                                             |                 | 0.00          | 0.00        | 6,465.00   | 36.05        | 4,850.81     | 680,587.75      | 659,115.01     | 32° 52' 11.80045 N | 03° 48' 54.36277 W |
| - plan hits target center                                                                   |                 |               |             |            |              |              |                 |                |                    |                    |
| - Point                                                                                     |                 |               |             |            |              |              |                 |                |                    |                    |

| Formations            |                       |                |           |         |                   |  |
|-----------------------|-----------------------|----------------|-----------|---------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name           | Lithology | Dip (°) | Dip Direction (°) |  |
| 744.00                | 744.00                | Rustler        |           | 0.52    | 89.57             |  |
| 1,495.00              | 1,495.00              | T/ Salt        |           | 0.52    | 89.57             |  |
| 1,960.00              | 1,960.00              | B/Salt         |           | 0.52    | 89.57             |  |
| 2,105.00              | 2,105.00              | Yates          |           | 0.52    | 89.57             |  |
| 2,396.00              | 2,396.00              | Seven Rivers   |           | 0.52    | 89.57             |  |
| 3,021.00              | 3,021.00              | Queen          |           | 0.52    | 89.57             |  |
| 3,442.00              | 3,442.00              | Grayburg       |           | 0.52    | 89.57             |  |
| 3,732.00              | 3,732.00              | San Andres     |           | 0.52    | 89.57             |  |
| 5,226.00              | 5,226.00              | Glorieta       |           | 0.52    | 89.57             |  |
| 5,283.00              | 5,283.00              | Yeso (Paddock) |           | 0.52    | 89.57             |  |
| 5,732.00              | 5,732.00              | Blinberry      |           | 0.52    | 89.57             |  |

| Plan Annotations      |                       |              |              |                              |  |
|-----------------------|-----------------------|--------------|--------------|------------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Comment                      |  |
| 5,947.56              | 5,947.56              | 0.00         | 0.00         | KOP, Begin 12.00°/100' Build |  |
| 6,693.20              | 6,425.01              | 3.52         | 473.09       | LP, Hold 89.48° Inc          |  |
| 11,071.22             | 6,465.00              | 36.05        | 4,850.81     | TD at 11071.22               |  |

# **Apache Corporation**

**Eddy County, NM (NAD27 NME)**

**Hummingbird Federal Com**

**#18H**

**OH**

**Plan #2 12-15-15**

## **Anticollision Report**

**15 December, 2015**



**PHOENIX**  
TECHNOLOGY SERVICES

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

|                                     |                                                                     |
|-------------------------------------|---------------------------------------------------------------------|
| <b>Reference:</b>                   | Plan #2 12-15-15                                                    |
| <b>Filter type:</b>                 | NO GLOBAL FILTER: Using user defined selection & filtering criteria |
| <b>Interpolation Method:</b>        | MD Interval 100.00usft                                              |
| <b>Depth Range:</b>                 | Unlimited                                                           |
| <b>Results Limited by:</b>          | Maximum center-center distance of 10,000.00 u                       |
| <b>Warning Levels Evaluated at:</b> | 2.00 Sigma                                                          |
| <b>Error Model:</b>                 | ISCWSA                                                              |
| <b>Scan Method:</b>                 | Closest Approach 3D                                                 |
| <b>Error Surface:</b>               | Elliptical Conic                                                    |
| <b>Casing Method:</b>               | Not applied                                                         |

|                     |           |                       |              |                     |
|---------------------|-----------|-----------------------|--------------|---------------------|
| Survey Tool Program |           | Date 12/15/2015       |              |                     |
| From (usft)         | To (usft) | Survey (Wellbore)     | Tool Name    | Description         |
| 0.00                | 11,071.21 | Plan #2 12-15-15 (OH) | PHX+MWD+HDGM | PHX+OWSG MWD + HDGM |

| Summary                         |              |              |                        |                         |                   |                 |
|---------------------------------|--------------|--------------|------------------------|-------------------------|-------------------|-----------------|
| Site Name                       | Reference    | Offset       | Distance               | Measured Depth          | Measured Depth    | Warning         |
| Offset Well - Wellbore - Design | Depth (usft) | Depth (usft) | Between Centres (usft) | Between Ellipses (usft) | Separation Factor |                 |
| Hummingbird Federal Com         |              |              |                        |                         |                   |                 |
| #13H - OH - Plan #1 07-30-14    | 5,039.48     | 5,033.51     | 659.81                 | 624.10                  | 18.479            | CC              |
| #13H - OH - Plan #1 07-30-14    | 5,100.00     | 5,093.01     | 659.86                 | 623.73                  | 18.266            | ES              |
| #13H - OH - Plan #1 07-30-14    | 11,071.22    | 10,123.28    | 1,108.84               | 910.28                  | 5.584             | SF              |
| #14H - OH - Plan #2 12-30-14    | 5,431.76     | 5,426.78     | 559.81                 | 521.29                  | 14.532            | CC              |
| #14H - OH - Plan #2 12-30-14    | 5,500.00     | 5,493.63     | 559.90                 | 520.90                  | 14.359            | ES              |
| #14H - OH - Plan #2 12-30-14    | 11,071.22    | 10,515.97    | 765.45                 | 527.19                  | 3.213             | SF              |
| #15H - OH - Plan #1 07-30-14    | 5,900.00     | 5,896.00     | 459.81                 | 417.92                  | 10.977            | CC              |
| #15H - OH - Plan #1 07-30-14    | 11,071.22    | 11,031.52    | 460.59                 | 142.57                  | 1.448             | Level 3, ES, SF |
| #16H - OH - Plan #2 12-11-15    | 4,953.68     | 4,951.69     | 199.90                 | 164.79                  | 5.694             | CC              |
| #16H - OH - Plan #2 12-11-15    | 5,000.00     | 4,997.65     | 199.94                 | 164.51                  | 5.643             | ES              |
| #16H - OH - Plan #2 12-11-15    | 5,100.00     | 5,091.94     | 201.78                 | 165.68                  | 5.588             | SF              |
| #17H - OH - Plan #3 12-11-15    | 5,366.07     | 5,365.07     | 99.90                  | 61.83                   | 2.624             | CC              |
| #17H - OH - Plan #3 12-11-15    | 5,412.28     | 5,411.25     | 99.90                  | 61.51                   | 2.602             | ES              |
| #17H - OH - Plan #3 12-11-15    | 5,500.00     | 5,496.75     | 100.89                 | 61.89                   | 2.587             | SF              |

| <b>Offset Design</b>   | Hummingbird Federal Com - #13H - OH - Plan #1 07-30-14 |                       |                       |                        |                 |                  |                    |            |                |                 | <b>Offset Site Error:</b> | 0.00 usft |
|------------------------|--------------------------------------------------------|-----------------------|-----------------------|------------------------|-----------------|------------------|--------------------|------------|----------------|-----------------|---------------------------|-----------|
| <b>Survey Program:</b> | 0-PHX+MWD+HDGM                                         |                       |                       |                        |                 |                  |                    |            |                |                 | <b>Offset Well Error:</b> | 0.00 usft |
| Reference              | Offset                                                 | Semi Major Axis       | Highside              | Offset Wellbore Centre | Between Centres | Between Ellipses | Minimum Separation | Warning    |                |                 |                           |           |
| Measured Depth (usft)  | Vertical Depth (usft)                                  | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft)       | Offset (usft)   | Toolface (°)     | N/S (usft)         | E/W (usft) | Centres (usft) | Ellipses (usft) | Separation (usft)         | Factor    |
| 0.00                   | 0.00                                                   | 0.00                  | 0.00                  | 0.00                   | 0.00            | 179.69           | -659.80            | 3.60       | 659.84         |                 |                           |           |
| 100.00                 | 100.00                                                 | 94.00                 | 94.00                 | 0.16                   | 0.15            | 179.69           | -659.80            | 3.60       | 659.81         | 659.50          | 0.31                      | 2,132.072 |
| 200.00                 | 200.00                                                 | 194.00                | 194.00                | 0.52                   | 0.50            | 179.69           | -659.80            | 3.60       | 659.81         | 658.80          | 1.01                      | 650.395   |
| 300.00                 | 300.00                                                 | 294.00                | 294.00                | 0.88                   | 0.85            | 179.69           | -659.80            | 3.60       | 659.81         | 658.08          | 1.73                      | 381.081   |
| 400.00                 | 400.00                                                 | 394.00                | 394.00                | 1.23                   | 1.21            | 179.69           | -659.80            | 3.60       | 659.81         | 657.36          | 2.45                      | 269.490   |
| 500.00                 | 500.00                                                 | 494.00                | 494.00                | 1.59                   | 1.57            | 179.69           | -659.80            | 3.60       | 659.81         | 656.64          | 3.17                      | 208.451   |
| 600.00                 | 600.00                                                 | 594.00                | 594.00                | 1.95                   | 1.93            | 179.69           | -659.80            | 3.60       | 659.81         | 655.93          | 3.88                      | 169.956   |
| 700.00                 | 700.00                                                 | 694.00                | 694.00                | 2.31                   | 2.29            | 179.69           | -659.80            | 3.60       | 659.81         | 655.21          | 4.60                      | 143.462   |
| 800.00                 | 800.00                                                 | 794.00                | 794.00                | 2.67                   | 2.65            | 179.69           | -659.80            | 3.60       | 659.81         | 654.49          | 5.32                      | 124.115   |
| 900.00                 | 900.00                                                 | 894.00                | 894.00                | 3.03                   | 3.01            | 179.69           | -659.80            | 3.60       | 659.81         | 653.78          | 6.03                      | 109.365   |
| 1,000.00               | 1,000.00                                               | 994.00                | 994.00                | 3.39                   | 3.36            | 179.69           | -659.80            | 3.60       | 659.81         | 653.06          | 6.75                      | 97.749    |
| 1,100.00               | 1,100.00                                               | 1,094.00              | 1,094.00              | 3.74                   | 3.72            | 179.69           | -659.80            | 3.60       | 659.81         | 652.34          | 7.47                      | 88.364    |
| 1,200.00               | 1,200.00                                               | 1,194.00              | 1,194.00              | 4.10                   | 4.08            | 179.69           | -659.80            | 3.60       | 659.81         | 651.63          | 8.18                      | 80.623    |
| 1,300.00               | 1,300.00                                               | 1,294.00              | 1,294.00              | 4.46                   | 4.44            | 179.69           | -659.80            | 3.60       | 659.81         | 650.91          | 8.90                      | 74.129    |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at</b>         | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design                                          |                       |                       |                       |                  |               |                       |                                    |             |                        |                         |                           |                   | Offset Site Error: 0.00 usft |
|--------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|------------------------------------|-------------|------------------------|-------------------------|---------------------------|-------------------|------------------------------|
| Hummingbird Federal Com - #13H - OH - Plan #1 07-30-14 |                       |                       |                       |                  |               |                       |                                    |             |                        |                         |                           |                   | Offset Well Error: 0.00 usft |
| Survey Program: 0-PHX+MWD+BGGM                         |                       |                       |                       |                  |               |                       |                                    |             |                        |                         |                           |                   |                              |
| Reference                                              | Offset                | Semi Major Axis       |                       | Distance         |               | Minimum Separation    |                                    | Warning     |                        |                         |                           |                   |                              |
| Measured Depth (usft)                                  | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N-S (usft) | +E-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning                      |
| 1,400.00                                               | 1,400.00              | 1,394.00              | 1,394.00              | 4.82             | 4.80          | 179.69                | -659.80                            | 3.60        | 659.81                 | 650.19                  | 9.62                      | 68.603            |                              |
| 1,500.00                                               | 1,500.00              | 1,494.00              | 1,494.00              | 5.18             | 5.16          | 179.69                | -659.80                            | 3.60        | 659.81                 | 649.48                  | 10.33                     | 63.844            |                              |
| 1,600.00                                               | 1,600.00              | 1,594.00              | 1,594.00              | 5.54             | 5.52          | 179.69                | -659.80                            | 3.60        | 659.81                 | 648.76                  | 11.05                     | 59.702            |                              |
| 1,700.00                                               | 1,700.00              | 1,694.00              | 1,694.00              | 5.90             | 5.87          | 179.69                | -659.80                            | 3.60        | 659.81                 | 648.04                  | 11.77                     | 56.065            |                              |
| 1,800.00                                               | 1,800.00              | 1,784.00              | 1,784.00              | 6.25             | 6.23          | 179.69                | -659.80                            | 3.60        | 659.81                 | 647.32                  | 12.49                     | 52.846            |                              |
| 1,900.00                                               | 1,900.00              | 1,894.00              | 1,894.00              | 6.61             | 6.59          | 179.69                | -659.80                            | 3.60        | 659.81                 | 646.61                  | 13.20                     | 49.976            |                              |
| 2,000.00                                               | 2,000.00              | 1,994.00              | 1,994.00              | 6.97             | 6.95          | 179.69                | -659.80                            | 3.60        | 659.81                 | 645.89                  | 13.92                     | 47.402            |                              |
| 2,100.00                                               | 2,100.00              | 2,094.00              | 2,094.00              | 7.33             | 7.31          | 179.69                | -659.80                            | 3.60        | 659.81                 | 645.17                  | 14.64                     | 45.080            |                              |
| 2,200.00                                               | 2,200.00              | 2,194.00              | 2,194.00              | 7.69             | 7.67          | 179.69                | -659.80                            | 3.60        | 659.81                 | 644.46                  | 15.35                     | 42.975            |                              |
| 2,300.00                                               | 2,300.00              | 2,294.00              | 2,294.00              | 8.05             | 8.02          | 179.69                | -659.80                            | 3.60        | 659.81                 | 643.74                  | 16.07                     | 41.058            |                              |
| 2,400.00                                               | 2,400.00              | 2,394.00              | 2,394.00              | 8.40             | 8.38          | 179.69                | -659.80                            | 3.60        | 659.81                 | 643.02                  | 16.79                     | 39.304            |                              |
| 2,500.00                                               | 2,500.00              | 2,494.00              | 2,494.00              | 8.76             | 8.74          | 179.69                | -659.80                            | 3.60        | 659.81                 | 642.31                  | 17.50                     | 37.694            |                              |
| 2,600.00                                               | 2,600.00              | 2,594.00              | 2,594.00              | 9.12             | 9.10          | 179.69                | -659.80                            | 3.60        | 659.81                 | 641.59                  | 18.22                     | 36.211            |                              |
| 2,700.00                                               | 2,700.00              | 2,694.00              | 2,694.00              | 9.48             | 9.46          | 179.69                | -659.80                            | 3.60        | 659.81                 | 640.87                  | 18.94                     | 34.840            |                              |
| 2,800.00                                               | 2,800.00              | 2,794.00              | 2,794.00              | 9.84             | 9.82          | 179.69                | -659.80                            | 3.60        | 659.81                 | 640.15                  | 19.65                     | 33.570            |                              |
| 2,900.00                                               | 2,900.00              | 2,894.00              | 2,894.00              | 10.20            | 10.18         | 179.69                | -659.80                            | 3.60        | 659.81                 | 639.44                  | 20.37                     | 32.388            |                              |
| 3,000.00                                               | 3,000.00              | 2,994.00              | 2,994.00              | 10.56            | 10.53         | 179.69                | -659.80                            | 3.60        | 659.81                 | 638.72                  | 21.09                     | 31.287            |                              |
| 3,100.00                                               | 3,100.00              | 3,094.00              | 3,094.00              | 10.91            | 10.89         | 179.69                | -659.80                            | 3.60        | 659.81                 | 638.00                  | 21.81                     | 30.258            |                              |
| 3,200.00                                               | 3,200.00              | 3,194.00              | 3,194.00              | 11.27            | 11.25         | 179.69                | -659.80                            | 3.60        | 659.81                 | 637.29                  | 22.52                     | 29.295            |                              |
| 3,300.00                                               | 3,300.00              | 3,294.00              | 3,294.00              | 11.63            | 11.61         | 179.69                | -659.80                            | 3.60        | 659.81                 | 636.57                  | 23.24                     | 28.391            |                              |
| 3,400.00                                               | 3,400.00              | 3,394.00              | 3,394.00              | 11.99            | 11.97         | 179.69                | -659.80                            | 3.60        | 659.81                 | 635.85                  | 23.96                     | 27.542            |                              |
| 3,500.00                                               | 3,500.00              | 3,494.00              | 3,494.00              | 12.35            | 12.33         | 179.69                | -659.80                            | 3.60        | 659.81                 | 635.14                  | 24.67                     | 26.742            |                              |
| 3,600.00                                               | 3,600.00              | 3,594.00              | 3,594.00              | 12.71            | 12.68         | 179.69                | -659.80                            | 3.60        | 659.81                 | 634.42                  | 25.39                     | 25.986            |                              |
| 3,700.00                                               | 3,700.00              | 3,694.00              | 3,694.00              | 13.06            | 13.04         | 179.69                | -659.80                            | 3.60        | 659.81                 | 633.70                  | 26.11                     | 25.273            |                              |
| 3,800.00                                               | 3,800.00              | 3,794.00              | 3,794.00              | 13.42            | 13.40         | 179.69                | -659.80                            | 3.60        | 659.81                 | 632.99                  | 26.82                     | 24.597            |                              |
| 3,900.00                                               | 3,900.00              | 3,894.00              | 3,894.00              | 13.78            | 13.76         | 179.69                | -659.80                            | 3.60        | 659.81                 | 632.27                  | 27.54                     | 23.957            |                              |
| 4,000.00                                               | 4,000.00              | 3,994.00              | 3,994.00              | 14.14            | 14.12         | 179.69                | -659.80                            | 3.60        | 659.81                 | 631.55                  | 28.26                     | 23.349            |                              |
| 4,100.00                                               | 4,100.00              | 4,094.00              | 4,094.00              | 14.50            | 14.48         | 179.69                | -659.80                            | 3.60        | 659.81                 | 630.83                  | 28.98                     | 22.771            |                              |
| 4,200.00                                               | 4,200.00              | 4,194.00              | 4,194.00              | 14.86            | 14.84         | 179.69                | -659.80                            | 3.60        | 659.81                 | 630.12                  | 29.69                     | 22.222            |                              |
| 4,300.00                                               | 4,300.00              | 4,294.00              | 4,294.00              | 15.22            | 15.19         | 179.69                | -659.80                            | 3.60        | 659.81                 | 629.40                  | 30.41                     | 21.698            |                              |
| 4,400.00                                               | 4,400.00              | 4,394.00              | 4,394.00              | 15.57            | 15.55         | 179.69                | -659.80                            | 3.60        | 659.81                 | 628.68                  | 31.13                     | 21.198            |                              |
| 4,500.00                                               | 4,500.00              | 4,494.00              | 4,494.00              | 15.93            | 15.91         | 179.69                | -659.80                            | 3.60        | 659.81                 | 627.97                  | 31.84                     | 20.721            |                              |
| 4,600.00                                               | 4,600.00              | 4,594.00              | 4,594.00              | 16.29            | 16.27         | 179.69                | -659.80                            | 3.60        | 659.81                 | 627.25                  | 32.56                     | 20.264            |                              |
| 4,700.00                                               | 4,700.00              | 4,694.00              | 4,694.00              | 16.65            | 16.63         | 179.69                | -659.80                            | 3.60        | 659.81                 | 626.53                  | 33.28                     | 19.828            |                              |
| 4,800.00                                               | 4,800.00              | 4,794.00              | 4,794.00              | 17.01            | 16.99         | 179.69                | -659.80                            | 3.60        | 659.81                 | 625.82                  | 33.99                     | 19.410            |                              |
| 4,900.00                                               | 4,900.00              | 4,894.00              | 4,894.00              | 17.37            | 17.34         | 179.69                | -659.80                            | 3.60        | 659.81                 | 625.10                  | 34.71                     | 19.009            |                              |
| 5,000.00                                               | 5,000.00              | 4,994.00              | 4,994.00              | 17.72            | 17.70         | 179.69                | -659.80                            | 3.60        | 659.81                 | 624.38                  | 35.43                     | 18.624            |                              |
| 5,039.48                                               | 5,039.48              | 5,033.51              | 5,033.48              | 17.87            | 17.84         | 179.58                | -659.79                            | 4.87        | 659.81                 | 624.10                  | 35.70                     | 18.479 CC         |                              |
| 5,100.00                                               | 5,100.00              | 5,093.01              | 5,092.39              | 18.08            | 18.04         | 178.88                | -659.73                            | 12.89       | 659.86                 | 623.73                  | 36.13                     | 18.266 ES         |                              |
| 5,200.00                                               | 5,200.00              | 5,184.52              | 5,179.86              | 18.44            | 18.36         | 176.59                | -659.54                            | 39.33       | 660.86                 | 624.07                  | 36.79                     | 17.965            |                              |
| 5,300.00                                               | 5,300.00              | 5,263.72              | 5,250.31              | 18.80            | 18.67         | 173.48                | -659.27                            | 75.31       | 664.99                 | 627.61                  | 37.38                     | 17.788            |                              |
| 5,400.00                                               | 5,400.00              | 5,329.48              | 5,303.64              | 19.16            | 18.97         | 170.21                | -658.99                            | 113.71      | 674.80                 | 636.88                  | 37.92                     | 17.794            |                              |
| 5,500.00                                               | 5,500.00              | 5,383.06              | 5,342.85              | 19.52            | 19.28         | 167.16                | -658.72                            | 150.17      | 692.32                 | 653.90                  | 38.42                     | 18.021            |                              |
| 5,600.00                                               | 5,600.00              | 5,425.00              | 5,370.55              | 19.88            | 19.57         | 164.58                | -658.49                            | 181.64      | 718.70                 | 679.81                  | 38.88                     | 18.484            |                              |
| 5,700.00                                               | 5,700.00              | 5,461.94              | 5,392.58              | 20.23            | 19.89         | 162.21                | -658.27                            | 211.28      | 754.19                 | 714.85                  | 39.34                     | 19.170            |                              |
| 5,800.00                                               | 5,800.00              | 5,491.06              | 5,408.30              | 20.59            | 20.18         | 160.29                | -658.09                            | 235.79      | 798.40                 | 758.61                  | 39.79                     | 20.066            |                              |
| 5,900.00                                               | 5,900.00              | 5,515.26              | 5,420.19              | 20.95            | 20.46         | 158.67                | -657.93                            | 256.86      | 850.49                 | 810.26                  | 40.23                     | 21.140            |                              |
| 6,000.00                                               | 5,999.89              | 5,536.69              | 5,429.83              | 21.30            | 20.72         | 63.54                 | -657.79                            | 276.00      | 908.56                 | 866.88                  | 41.68                     | 21.800            |                              |
| 6,100.00                                               | 6,097.42              | 5,561.36              | 5,439.84              | 21.64            | 21.05         | 55.09                 | -657.62                            | 298.54      | 965.69                 | 924.17                  | 41.52                     | 23.259            |                              |
| 6,200.00                                               | 6,188.40              | 5,589.08              | 5,449.69              | 21.99            | 21.47         | 48.23                 | -657.43                            | 324.45      | 1,018.30               | 977.96                  | 40.34                     | 25.242            |                              |
| 6,300.00                                               | 6,268.86              | 5,625.00              | 5,460.19              | 22.37            | 22.06         | 42.90                 | -657.18                            | 358.79      | 1,064.13               | 1,026.04                | 38.09                     | 27.935            |                              |
| 6,400.00                                               | 6,335.27              | 5,650.00              | 5,465.95              | 22.85            | 22.51         | 39.31                 | -657.00                            | 383.11      | 1,101.31               | 1,066.29                | 35.02                     | 31.450            |                              |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design - Hummingbird Federal Com - #13H - OH - Plan #1 07-30-14 |                       |                       |                       |                  |               |                       |                                    |                    |                        |                         |                           |                   |  | Offset Site Error: | < 0.00 usft |
|------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|------------------------------------|--------------------|------------------------|-------------------------|---------------------------|-------------------|--|--------------------|-------------|
| Survey Program: 0-PHX-MWD-BGGM                                         |                       |                       |                       |                  |               |                       |                                    |                    |                        |                         |                           |                   |  | Offset Well Error: | 0.00 usft   |
| Reference                                                              | Offset                | Semi Major Axis       |                       |                  | Distance      |                       |                                    | Minimum Separation |                        |                         | Warning                   |                   |  |                    |             |
| Measured Depth (usft)                                                  | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/S (usft) | +E/W (usft)        | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor |  |                    |             |
| 6,500.00                                                               | 6,384.73              | 5,675.00              | 5,470.44              | 23.52            | 22.99         | 36.90                 | -656.82                            | 407.71             | 1,128.78               | 1,096.91                | 31.86                     | 35.428            |  |                    |             |
| 6,600.00                                                               | 6,415.09              | 5,716.32              | 5,475.01              | 24.45            | 23.85         | 35.43                 | -656.51                            | 448.76             | 1,145.38               | 1,115.61                | 29.76                     | 38.484            |  |                    |             |
| 6,700.00                                                               | 6,425.07              | 5,772.14              | 5,476.70              | 25.63            | 25.11         | 35.00                 | -656.10                            | 504.54             | 1,150.57               | 1,120.69                | 29.88                     | 38.507            |  |                    |             |
| 6,800.00                                                               | 6,425.98              | 5,872.13              | 5,478.80              | 27.04            | 27.61         | 35.03                 | -655.36                            | 604.51             | 1,149.61               | 1,117.29                | 32.32                     | 35.572            |  |                    |             |
| 6,900.00                                                               | 6,426.89              | 5,972.12              | 5,480.90              | 28.67            | 30.35         | 35.06                 | -654.62                            | 704.48             | 1,148.64               | 1,113.60                | 35.04                     | 32.784            |  |                    |             |
| 7,000.00                                                               | 6,427.81              | 6,072.12              | 5,483.00              | 30.49            | 33.29         | 35.10                 | -653.89                            | 804.45             | 1,147.67               | 1,109.68                | 37.99                     | 30.212            |  |                    |             |
| 7,100.00                                                               | 6,428.72              | 6,172.11              | 5,485.10              | 32.46            | 36.36         | 35.13                 | -653.15                            | 904.41             | 1,146.70               | 1,105.58                | 41.12                     | 27.886            |  |                    |             |
| 7,200.00                                                               | 6,429.63              | 6,272.10              | 5,487.19              | 34.56            | 39.56         | 35.17                 | -652.41                            | 1,004.38           | 1,145.74               | 1,101.34                | 44.40                     | 25.804            |  |                    |             |
| 7,300.00                                                               | 6,430.55              | 6,372.09              | 5,489.29              | 36.76            | 42.83         | 35.20                 | -651.67                            | 1,104.35           | 1,144.77               | 1,096.97                | 47.80                     | 23.949            |  |                    |             |
| 7,400.00                                                               | 6,431.46              | 6,472.09              | 5,491.39              | 39.05            | 46.18         | 35.23                 | -650.93                            | 1,204.32           | 1,143.81               | 1,092.51                | 51.30                     | 22.298            |  |                    |             |
| 7,500.00                                                               | 6,432.38              | 6,572.08              | 5,493.49              | 41.41            | 49.58         | 35.27                 | -650.19                            | 1,304.29           | 1,142.84               | 1,087.97                | 54.87                     | 20.828            |  |                    |             |
| 7,600.00                                                               | 6,433.29              | 6,672.07              | 5,495.59              | 43.84            | 53.03         | 35.30                 | -649.46                            | 1,404.26           | 1,141.88               | 1,083.37                | 58.51                     | 19.515            |  |                    |             |
| 7,700.00                                                               | 6,434.20              | 6,772.07              | 5,497.68              | 46.32            | 56.51         | 35.34                 | -648.72                            | 1,504.22           | 1,140.91               | 1,078.70                | 62.21                     | 18.340            |  |                    |             |
| 7,800.00                                                               | 6,435.12              | 6,872.06              | 5,499.78              | 48.84            | 60.02         | 35.37                 | -647.98                            | 1,604.19           | 1,139.95               | 1,073.99                | 65.96                     | 17.283            |  |                    |             |
| 7,900.00                                                               | 6,436.03              | 6,972.05              | 5,501.88              | 51.40            | 63.55         | 35.41                 | -647.24                            | 1,704.16           | 1,138.99               | 1,069.24                | 69.74                     | 16.331            |  |                    |             |
| 8,000.00                                                               | 6,436.94              | 7,072.05              | 5,503.98              | 53.99            | 67.11         | 35.44                 | -646.50                            | 1,804.13           | 1,138.02               | 1,064.46                | 73.57                     | 15.469            |  |                    |             |
| 8,100.00                                                               | 6,437.86              | 7,172.04              | 5,506.08              | 56.61            | 70.68         | 35.48                 | -645.76                            | 1,904.10           | 1,137.06               | 1,059.64                | 77.42                     | 14.686            |  |                    |             |
| 8,200.00                                                               | 6,438.77              | 7,272.03              | 5,508.17              | 59.25            | 74.27         | 35.51                 | -645.03                            | 2,004.06           | 1,136.10               | 1,054.79                | 81.31                     | 13.973            |  |                    |             |
| 8,300.00                                                               | 6,439.68              | 7,372.02              | 5,510.27              | 61.91            | 77.87         | 35.55                 | -644.29                            | 2,104.03           | 1,135.14               | 1,049.92                | 85.22                     | 13.321            |  |                    |             |
| 8,400.00                                                               | 6,440.60              | 7,472.02              | 5,512.37              | 64.59            | 81.48         | 35.58                 | -643.55                            | 2,204.00           | 1,134.18               | 1,045.03                | 89.15                     | 12.722            |  |                    |             |
| 8,500.00                                                               | 6,441.51              | 7,572.01              | 5,514.47              | 67.29            | 85.11         | 35.62                 | -642.81                            | 2,303.97           | 1,133.22               | 1,040.12                | 93.10                     | 12.172            |  |                    |             |
| 8,600.00                                                               | 6,442.42              | 7,672.00              | 5,516.57              | 70.00            | 88.74         | 35.65                 | -642.07                            | 2,403.94           | 1,132.26               | 1,035.19                | 97.07                     | 11.664            |  |                    |             |
| 8,700.00                                                               | 6,443.34              | 7,772.00              | 5,518.66              | 72.73            | 92.38         | 35.69                 | -641.33                            | 2,503.91           | 1,131.30               | 1,030.24                | 101.06                    | 11.194            |  |                    |             |
| 8,800.00                                                               | 6,444.25              | 7,871.99              | 5,520.76              | 75.46            | 96.02         | 35.72                 | -640.60                            | 2,603.87           | 1,130.34               | 1,025.27                | 105.06                    | 10.758            |  |                    |             |
| 8,900.00                                                               | 6,445.17              | 7,971.98              | 5,522.86              | 78.21            | 99.67         | 35.76                 | -639.86                            | 2,703.84           | 1,129.38               | 1,020.29                | 109.08                    | 10.353            |  |                    |             |
| 9,000.00                                                               | 6,446.08              | 8,071.98              | 5,524.96              | 80.97            | 103.33        | 35.79                 | -639.12                            | 2,803.81           | 1,128.42               | 1,015.30                | 113.12                    | 9.976             |  |                    |             |
| 9,100.00                                                               | 6,446.99              | 8,171.97              | 5,527.06              | 83.73            | 106.99        | 35.83                 | -638.38                            | 2,903.78           | 1,127.46               | 1,010.29                | 117.17                    | 9.623             |  |                    |             |
| 9,200.00                                                               | 6,447.91              | 8,271.96              | 5,529.16              | 86.50            | 110.66        | 35.86                 | -637.64                            | 3,003.75           | 1,126.50               | 1,005.28                | 121.23                    | 9.293             |  |                    |             |
| 9,300.00                                                               | 6,448.82              | 8,371.95              | 5,531.25              | 89.28            | 114.33        | 35.90                 | -636.90                            | 3,103.72           | 1,125.55               | 1,000.25                | 125.30                    | 8.983             |  |                    |             |
| 9,400.00                                                               | 6,449.73              | 8,471.95              | 5,533.35              | 92.06            | 118.00        | 35.94                 | -636.17                            | 3,203.68           | 1,124.59               | 995.21                  | 129.38                    | 8.692             |  |                    |             |
| 9,500.00                                                               | 6,450.65              | 8,571.94              | 5,535.45              | 94.85            | 121.68        | 35.97                 | -635.43                            | 3,303.65           | 1,123.63               | 990.16                  | 133.48                    | 8.418             |  |                    |             |
| 9,600.00                                                               | 6,451.56              | 8,671.93              | 5,537.55              | 97.65            | 125.36        | 36.01                 | -634.69                            | 3,403.62           | 1,122.68               | 985.09                  | 137.58                    | 8.160             |  |                    |             |
| 9,700.00                                                               | 6,452.47              | 8,771.93              | 5,539.65              | 100.45           | 129.04        | 36.04                 | -633.95                            | 3,503.59           | 1,121.72               | 980.02                  | 141.70                    | 7.916             |  |                    |             |
| 9,800.00                                                               | 6,453.39              | 8,871.92              | 5,541.74              | 103.25           | 132.73        | 36.08                 | -633.21                            | 3,603.56           | 1,120.77               | 974.94                  | 145.82                    | 7.686             |  |                    |             |
| 9,900.00                                                               | 6,454.30              | 8,971.91              | 5,543.84              | 106.06           | 136.42        | 36.11                 | -632.47                            | 3,703.52           | 1,119.81               | 969.85                  | 149.96                    | 7.467             |  |                    |             |
| 10,000.00                                                              | 6,455.21              | 9,071.91              | 5,545.94              | 108.87           | 140.11        | 36.15                 | -631.74                            | 3,803.49           | 1,118.86               | 964.75                  | 154.10                    | 7.260             |  |                    |             |
| 10,100.00                                                              | 6,456.13              | 9,171.90              | 5,548.04              | 111.68           | 143.80        | 36.19                 | -631.00                            | 3,903.46           | 1,117.90               | 959.65                  | 158.26                    | 7.064             |  |                    |             |
| 10,200.00                                                              | 6,457.04              | 9,271.89              | 5,550.14              | 114.50           | 147.49        | 36.22                 | -630.26                            | 4,003.43           | 1,116.95               | 954.53                  | 162.42                    | 6.877             |  |                    |             |
| 10,300.00                                                              | 6,457.95              | 9,371.88              | 5,552.23              | 117.32           | 151.19        | 36.26                 | -629.52                            | 4,103.40           | 1,116.00               | 949.41                  | 166.59                    | 6.699             |  |                    |             |
| 10,400.00                                                              | 6,458.87              | 9,471.88              | 5,554.33              | 120.14           | 154.88        | 36.29                 | -628.78                            | 4,203.37           | 1,115.05               | 944.27                  | 170.77                    | 6.529             |  |                    |             |
| 10,500.00                                                              | 6,459.78              | 9,571.87              | 5,556.43              | 122.97           | 158.58        | 36.33                 | -628.04                            | 4,303.33           | 1,114.09               | 939.13                  | 174.96                    | 6.368             |  |                    |             |
| 10,600.00                                                              | 6,460.70              | 9,671.86              | 5,558.53              | 125.80           | 162.28        | 36.37                 | -627.31                            | 4,403.30           | 1,113.14               | 933.98                  | 179.16                    | 6.213             |  |                    |             |
| 10,700.00                                                              | 6,461.61              | 9,771.86              | 5,560.63              | 128.63           | 165.98        | 36.40                 | -626.57                            | 4,503.27           | 1,112.19               | 928.83                  | 183.36                    | 6.066             |  |                    |             |
| 10,800.00                                                              | 6,462.52              | 9,871.85              | 5,562.72              | 131.46           | 169.68        | 36.44                 | -625.83                            | 4,603.24           | 1,111.24               | 923.66                  | 187.58                    | 5.924             |  |                    |             |
| 10,900.00                                                              | 6,463.44              | 9,971.84              | 5,564.82              | 134.29           | 173.38        | 36.48                 | -625.09                            | 4,703.21           | 1,110.29               | 918.49                  | 191.80                    | 5.789             |  |                    |             |
| 11,000.00                                                              | 6,464.35              | 10,071.84             | 5,566.92              | 137.13           | 177.09        | 36.51                 | -624.35                            | 4,803.18           | 1,109.34               | 913.31                  | 196.02                    | 5.659             |  |                    |             |
| 11,061.98                                                              | 6,464.92              | 10,123.28             | 5,568.00              | 138.89           | 178.99        | 36.53                 | -623.97                            | 4,854.61           | 1,108.80               | 910.41                  | 198.39                    | 5.589             |  |                    |             |
| 11,071.22                                                              | 6,465.00              | 10,123.28             | 5,568.00              | 139.15           | 178.99        | 36.53                 | -623.97                            | 4,854.61           | 1,108.84               | 910.28                  | 198.56                    | 5.584 SF          |  |                    |             |

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design Hummingbird Federal Com - #14H - OH - Plan #2 12-30-14 |                   |                 |              |              |                        |                    |                  |                    |                   |         |         | Offset Site Error: |
|----------------------------------------------------------------------|-------------------|-----------------|--------------|--------------|------------------------|--------------------|------------------|--------------------|-------------------|---------|---------|--------------------|
| Survey Program: O-PHX-MWD-BGGM                                       |                   |                 |              |              |                        |                    |                  |                    |                   |         |         | 0.00 usft          |
| Reference                                                            | Offset            | Semi Major Axis |              | Distance     |                        | Minimum Separation |                  | Warning            |                   | Warning |         |                    |
| Measured Vertical                                                    | Measured Vertical | Reference       | Offset       | Highside     | Offset Wellbore Centre | Between Centres    | Between Ellipses | Minimum Separation | Separation Factor | Warning | Warning |                    |
| Depth (usft)                                                         | Depth (usft)      | Depth (usft)    | Depth (usft) | Toolface (°) | N-S (usft)             | E-W (usft)         | (usft)           | (usft)             | (usft)            |         |         |                    |
| 0.00                                                                 | 0.00              | 0.00            | 0.00         | 0.00         | 0.00                   | 179.69             | -559.80          | 3.00               | 559.83            |         |         |                    |
| 100.00                                                               | 100.00            | 95.00           | 95.00        | 0.16         | 0.15                   | 179.69             | -559.80          | 3.00               | 559.81            | 559.50  | 0.31    | 1,799.655          |
| 200.00                                                               | 200.00            | 195.00          | 195.00       | 0.52         | 0.50                   | 179.69             | -559.80          | 3.00               | 559.81            | 558.79  | 1.02    | 549.878            |
| 300.00                                                               | 300.00            | 295.00          | 295.00       | 0.88         | 0.86                   | 179.69             | -559.80          | 3.00               | 559.81            | 558.07  | 1.74    | 322.655            |
| 400.00                                                               | 400.00            | 395.00          | 395.00       | 1.23         | 1.22                   | 179.69             | -559.80          | 3.00               | 559.81            | 557.36  | 2.45    | 228.312            |
| 500.00                                                               | 500.00            | 495.00          | 495.00       | 1.59         | 1.58                   | 179.69             | -559.80          | 3.00               | 559.81            | 556.64  | 3.17    | 176.658            |
| 600.00                                                               | 600.00            | 595.00          | 595.00       | 1.95         | 1.93                   | 179.69             | -559.80          | 3.00               | 559.81            | 555.92  | 3.89    | 144.064            |
| 700.00                                                               | 700.00            | 695.00          | 695.00       | 2.31         | 2.29                   | 179.69             | -559.80          | 3.00               | 559.81            | 555.21  | 4.60    | 121.624            |
| 800.00                                                               | 800.00            | 795.00          | 795.00       | 2.67         | 2.65                   | 179.69             | -559.80          | 3.00               | 559.81            | 554.49  | 5.32    | 105.233            |
| 900.00                                                               | 900.00            | 895.00          | 895.00       | 3.03         | 3.01                   | 179.69             | -559.80          | 3.00               | 559.81            | 553.77  | 6.04    | 92.735             |
| 1,000.00                                                             | 1,000.00          | 995.00          | 995.00       | 3.39         | 3.37                   | 179.69             | -559.80          | 3.00               | 559.81            | 553.05  | 6.75    | 82.890             |
| 1,100.00                                                             | 1,100.00          | 1,095.00        | 1,095.00     | 3.74         | 3.73                   | 179.69             | -559.80          | 3.00               | 559.81            | 552.34  | 7.47    | 74.935             |
| 1,200.00                                                             | 1,200.00          | 1,195.00        | 1,195.00     | 4.10         | 4.08                   | 179.69             | -559.80          | 3.00               | 559.81            | 551.62  | 8.19    | 68.374             |
| 1,300.00                                                             | 1,300.00          | 1,295.00        | 1,295.00     | 4.46         | 4.44                   | 179.69             | -559.80          | 3.00               | 559.81            | 550.90  | 8.90    | 62.868             |
| 1,400.00                                                             | 1,400.00          | 1,395.00        | 1,395.00     | 4.82         | 4.80                   | 179.69             | -559.80          | 3.00               | 559.81            | 550.19  | 9.62    | 58.184             |
| 1,500.00                                                             | 1,500.00          | 1,495.00        | 1,495.00     | 5.18         | 5.16                   | 179.69             | -559.80          | 3.00               | 559.81            | 549.47  | 10.34   | 54.149             |
| 1,600.00                                                             | 1,600.00          | 1,595.00        | 1,595.00     | 5.54         | 5.52                   | 179.69             | -559.80          | 3.00               | 559.81            | 548.75  | 11.06   | 50.637             |
| 1,700.00                                                             | 1,700.00          | 1,695.00        | 1,695.00     | 5.90         | 5.88                   | 179.69             | -559.80          | 3.00               | 559.81            | 548.04  | 11.77   | 47.553             |
| 1,800.00                                                             | 1,800.00          | 1,795.00        | 1,795.00     | 6.25         | 6.24                   | 179.69             | -559.80          | 3.00               | 559.81            | 547.32  | 12.49   | 44.824             |
| 1,900.00                                                             | 1,900.00          | 1,895.00        | 1,895.00     | 6.61         | 6.59                   | 179.69             | -559.80          | 3.00               | 559.81            | 546.60  | 13.21   | 42.390             |
| 2,000.00                                                             | 2,000.00          | 1,995.00        | 1,995.00     | 6.97         | 6.95                   | 179.69             | -559.80          | 3.00               | 559.81            | 545.89  | 13.92   | 40.207             |
| 2,100.00                                                             | 2,100.00          | 2,095.00        | 2,095.00     | 7.33         | 7.31                   | 179.69             | -559.80          | 3.00               | 559.81            | 545.17  | 14.64   | 38.238             |
| 2,200.00                                                             | 2,200.00          | 2,195.00        | 2,195.00     | 7.69         | 7.67                   | 179.69             | -559.80          | 3.00               | 559.81            | 544.45  | 15.36   | 36.453             |
| 2,300.00                                                             | 2,300.00          | 2,295.00        | 2,295.00     | 8.05         | 8.03                   | 179.69             | -559.80          | 3.00               | 559.81            | 543.73  | 16.07   | 34.827             |
| 2,400.00                                                             | 2,400.00          | 2,395.00        | 2,395.00     | 8.40         | 8.39                   | 179.69             | -559.80          | 3.00               | 559.81            | 543.02  | 16.79   | 33.340             |
| 2,500.00                                                             | 2,500.00          | 2,495.00        | 2,495.00     | 8.76         | 8.74                   | 179.69             | -559.80          | 3.00               | 559.81            | 542.30  | 17.51   | 31.975             |
| 2,600.00                                                             | 2,600.00          | 2,595.00        | 2,595.00     | 9.12         | 9.10                   | 179.69             | -559.80          | 3.00               | 559.81            | 541.58  | 18.22   | 30.717             |
| 2,700.00                                                             | 2,700.00          | 2,695.00        | 2,695.00     | 9.48         | 9.46                   | 179.69             | -559.80          | 3.00               | 559.81            | 540.87  | 18.94   | 29.554             |
| 2,800.00                                                             | 2,800.00          | 2,795.00        | 2,795.00     | 9.84         | 9.82                   | 179.69             | -559.80          | 3.00               | 559.81            | 540.15  | 19.66   | 28.477             |
| 2,900.00                                                             | 2,900.00          | 2,895.00        | 2,895.00     | 10.20        | 10.18                  | 179.69             | -559.80          | 3.00               | 559.81            | 539.43  | 20.38   | 27.475             |
| 3,000.00                                                             | 3,000.00          | 2,995.00        | 2,995.00     | 10.56        | 10.54                  | 179.69             | -559.80          | 3.00               | 559.81            | 538.72  | 21.09   | 26.541             |
| 3,100.00                                                             | 3,100.00          | 3,095.00        | 3,095.00     | 10.91        | 10.90                  | 179.69             | -559.80          | 3.00               | 559.81            | 538.00  | 21.81   | 25.668             |
| 3,200.00                                                             | 3,200.00          | 3,195.00        | 3,195.00     | 11.27        | 11.25                  | 179.69             | -559.80          | 3.00               | 559.81            | 537.28  | 22.53   | 24.851             |
| 3,300.00                                                             | 3,300.00          | 3,295.00        | 3,295.00     | 11.63        | 11.61                  | 179.69             | -559.80          | 3.00               | 559.81            | 536.56  | 23.24   | 24.085             |
| 3,400.00                                                             | 3,400.00          | 3,395.00        | 3,395.00     | 11.99        | 11.97                  | 179.69             | -559.80          | 3.00               | 559.81            | 535.85  | 23.96   | 23.364             |
| 3,500.00                                                             | 3,500.00          | 3,495.00        | 3,495.00     | 12.35        | 12.33                  | 179.69             | -559.80          | 3.00               | 559.81            | 535.13  | 24.68   | 22.685             |
| 3,600.00                                                             | 3,600.00          | 3,595.00        | 3,595.00     | 12.71        | 12.69                  | 179.69             | -559.80          | 3.00               | 559.81            | 534.41  | 25.39   | 22.045             |
| 3,700.00                                                             | 3,700.00          | 3,695.00        | 3,695.00     | 13.06        | 13.05                  | 179.69             | -559.80          | 3.00               | 559.81            | 533.70  | 26.11   | 21.439             |
| 3,800.00                                                             | 3,800.00          | 3,795.00        | 3,795.00     | 13.42        | 13.41                  | 179.69             | -559.80          | 3.00               | 559.81            | 532.98  | 26.83   | 20.867             |
| 3,900.00                                                             | 3,900.00          | 3,895.00        | 3,895.00     | 13.78        | 13.76                  | 179.69             | -559.80          | 3.00               | 559.81            | 532.26  | 27.54   | 20.323             |
| 4,000.00                                                             | 4,000.00          | 3,995.00        | 3,995.00     | 14.14        | 14.12                  | 179.69             | -559.80          | 3.00               | 559.81            | 531.55  | 28.26   | 19.808             |
| 4,100.00                                                             | 4,100.00          | 4,095.00        | 4,095.00     | 14.50        | 14.48                  | 179.69             | -559.80          | 3.00               | 559.81            | 530.83  | 28.98   | 19.318             |
| 4,200.00                                                             | 4,200.00          | 4,195.00        | 4,195.00     | 14.86        | 14.84                  | 179.69             | -559.80          | 3.00               | 559.81            | 530.11  | 29.70   | 18.851             |
| 4,300.00                                                             | 4,300.00          | 4,295.00        | 4,295.00     | 15.22        | 15.20                  | 179.69             | -559.80          | 3.00               | 559.81            | 529.40  | 30.41   | 18.407             |
| 4,400.00                                                             | 4,400.00          | 4,395.00        | 4,395.00     | 15.57        | 15.56                  | 179.69             | -559.80          | 3.00               | 559.81            | 528.68  | 31.13   | 17.983             |
| 4,500.00                                                             | 4,500.00          | 4,495.00        | 4,495.00     | 15.93        | 15.91                  | 179.69             | -559.80          | 3.00               | 559.81            | 527.96  | 31.85   | 17.578             |
| 4,600.00                                                             | 4,600.00          | 4,595.00        | 4,595.00     | 16.29        | 16.27                  | 179.69             | -559.80          | 3.00               | 559.81            | 527.24  | 32.56   | 17.191             |
| 4,700.00                                                             | 4,700.00          | 4,695.00        | 4,695.00     | 16.65        | 16.63                  | 179.69             | -559.80          | 3.00               | 559.81            | 526.53  | 33.28   | 16.821             |
| 4,800.00                                                             | 4,800.00          | 4,795.00        | 4,795.00     | 17.01        | 16.99                  | 179.69             | -559.80          | 3.00               | 559.81            | 525.81  | 34.00   | 16.466             |
| 4,900.00                                                             | 4,900.00          | 4,895.00        | 4,895.00     | 17.37        | 17.35                  | 179.69             | -559.80          | 3.00               | 559.81            | 525.09  | 34.71   | 16.126             |
| 5,000.00                                                             | 5,000.00          | 4,995.00        | 4,995.00     | 17.72        | 17.71                  | 179.69             | -559.80          | 3.00               | 559.81            | 524.38  | 35.43   | 15.800             |
| 5,100.00                                                             | 5,100.00          | 5,095.00        | 5,095.00     | 18.08        | 18.07                  | 179.69             | -559.80          | 3.00               | 559.81            | 523.66  | 36.15   | 15.486             |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local/Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design: Hummingbird Federal Com - #14H - OH - Plan #2 12-30-14 |                       |                       |                       |                  |               |                       |             |                        |                |                 | Offset Site Error: 0.00 usft |            |         |
|-----------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|-------------|------------------------|----------------|-----------------|------------------------------|------------|---------|
| Survey Program: D-PHX-MWD-BGGM                                        |                       |                       |                       |                  |               |                       |             |                        |                |                 | Offset Well Error: 0.00 usft |            |         |
| Reference                                                             |                       | Offset                |                       | Semi Major Axis  |               | Distance              |             | Offset Wellbore Centre |                | Between         | Minimum                      | Separation | Warning |
| Measured Depth (usft)                                                 | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | +N-S (usft) | +E-W (usft)            | Centres (usft) | Ellipses (usft) | Separation (usft)            | Factor     |         |
| 5,200.00                                                              | 5,200.00              | 5,195.00              | 5,195.00              | 18.44            | 18.42         | 179.69                | -559.80     | 3.00                   | 559.81         | 522.94          | 36.87                        | 15.185     |         |
| 5,300.00                                                              | 5,300.00              | 5,295.00              | 5,295.00              | 18.80            | 18.78         | 179.69                | -559.80     | 3.00                   | 559.81         | 522.23          | 37.58                        | 14.896     |         |
| 5,400.00                                                              | 5,400.00              | 5,395.01              | 5,395.01              | 19.16            | 19.14         | 179.69                | -559.80     | 3.02                   | 559.81         | 521.51          | 38.30                        | 14.617     |         |
| 5,431.76                                                              | 5,431.76              | 5,426.78              | 5,426.74              | 19.27            | 19.25         | 179.55                | -559.79     | 4.36                   | 559.81         | 521.29          | 38.52                        | 14.532     | CC      |
| 5,500.00                                                              | 5,500.00              | 5,493.63              | 5,492.83              | 19.52            | 19.48         | 178.56                | -559.72     | 14.05                  | 559.90         | 520.90          | 38.99                        | 14.359     | ES      |
| 5,600.00                                                              | 5,600.00              | 5,584.18              | 5,578.91              | 19.88            | 19.79         | 175.74                | -559.51     | 41.66                  | 561.29         | 521.64          | 39.65                        | 14.157     |         |
| 5,700.00                                                              | 5,700.00              | 5,662.14              | 5,647.76              | 20.23            | 20.09         | 172.05                | -559.24     | 78.10                  | 566.64         | 526.40          | 40.24                        | 14.082     |         |
| 5,800.00                                                              | 5,800.00              | 5,725.00              | 5,698.35              | 20.59            | 20.38         | 168.34                | -558.97     | 115.32                 | 578.87         | 538.10          | 40.77                        | 14.199     |         |
| 5,900.00                                                              | 5,900.00              | 5,779.32              | 5,737.81              | 20.95            | 20.68         | 164.72                | -558.69     | 152.61                 | 600.11         | 558.84          | 41.27                        | 14.542     |         |
| 6,000.00                                                              | 5,999.89              | 5,825.00              | 5,767.54              | 21.30            | 21.00         | 69.97                 | -558.43     | 187.27                 | 630.52         | 588.32          | 42.21                        | 14.939     |         |
| 6,100.00                                                              | 6,097.42              | 5,867.39              | 5,792.05              | 21.64            | 21.37         | 63.59                 | -558.18     | 221.83                 | 664.13         | 621.67          | 42.46                        | 15.542     |         |
| 6,200.00                                                              | 6,188.40              | 5,912.26              | 5,814.55              | 21.99            | 21.84         | 57.90                 | -557.89     | 260.64                 | 697.16         | 655.12          | 42.04                        | 16.584     |         |
| 6,300.00                                                              | 6,268.86              | 5,957.72              | 5,833.53              | 22.37            | 22.41         | 53.26                 | -557.58     | 301.92                 | 727.10         | 686.29          | 40.81                        | 17.817     |         |
| 6,400.00                                                              | 6,335.27              | 6,000.00              | 5,847.58              | 22.85            | 23.03         | 49.81                 | -557.29     | 341.78                 | 752.09         | 713.08          | 39.01                        | 19.279     |         |
| 6,500.00                                                              | 6,384.73              | 6,050.00              | 5,859.58              | 23.52            | 23.87         | 47.29                 | -556.93     | 390.30                 | 770.77         | 733.47          | 37.30                        | 20.863     |         |
| 6,600.00                                                              | 6,415.09              | 6,100.00              | 5,866.43              | 24.45            | 24.83         | 45.85                 | -556.56     | 439.80                 | 782.30         | 745.85          | 36.44                        | 21.465     |         |
| 6,700.00                                                              | 6,425.07              | 6,153.10              | 5,868.42              | 25.63            | 25.97         | 45.42                 | -556.16     | 492.85                 | 785.99         | 748.77          | 37.22                        | 21.118     |         |
| 6,800.00                                                              | 6,425.98              | 6,253.09              | 5,870.02              | 27.04            | 28.35         | 45.45                 | -555.42     | 592.83                 | 785.51         | 745.47          | 40.04                        | 19.618     |         |
| 6,900.00                                                              | 6,426.89              | 6,353.09              | 5,871.61              | 28.67            | 30.98         | 45.49                 | -554.68     | 692.81                 | 785.03         | 741.83          | 43.20                        | 18.170     |         |
| 7,000.00                                                              | 6,427.81              | 6,453.09              | 5,873.21              | 30.49            | 33.81         | 45.52                 | -553.94     | 792.79                 | 784.56         | 737.90          | 46.66                        | 16.815     |         |
| 7,100.00                                                              | 6,428.72              | 6,553.09              | 5,874.80              | 32.46            | 36.80         | 45.56                 | -553.20     | 892.77                 | 784.08         | 733.73          | 50.35                        | 15.574     |         |
| 7,200.00                                                              | 6,429.63              | 6,653.09              | 5,876.40              | 34.56            | 39.92         | 45.60                 | -552.46     | 992.76                 | 783.60         | 729.38          | 54.22                        | 14.452     |         |
| 7,300.00                                                              | 6,430.55              | 6,753.08              | 5,877.99              | 36.76            | 43.14         | 45.63                 | -551.71     | 1,092.74               | 783.13         | 724.88          | 58.25                        | 13.445     |         |
| 7,400.00                                                              | 6,431.46              | 6,853.08              | 5,879.59              | 39.05            | 46.43         | 45.67                 | -550.97     | 1,192.72               | 782.65         | 720.26          | 62.40                        | 12.543     |         |
| 7,500.00                                                              | 6,432.38              | 6,953.08              | 5,881.18              | 41.41            | 49.79         | 45.70                 | -550.23     | 1,292.70               | 782.18         | 715.53          | 66.65                        | 11.736     |         |
| 7,600.00                                                              | 6,433.29              | 7,053.08              | 5,882.78              | 43.84            | 53.19         | 45.74                 | -549.49     | 1,392.69               | 781.70         | 710.72          | 70.98                        | 11.013     |         |
| 7,700.00                                                              | 6,434.20              | 7,153.07              | 5,884.37              | 46.32            | 56.64         | 45.77                 | -548.75     | 1,492.67               | 781.23         | 705.84          | 75.39                        | 10.362     |         |
| 7,800.00                                                              | 6,435.12              | 7,253.07              | 5,885.97              | 48.84            | 60.12         | 45.81                 | -548.00     | 1,592.65               | 780.75         | 700.89          | 79.86                        | 9.777      |         |
| 7,900.00                                                              | 6,436.03              | 7,353.07              | 5,887.56              | 51.40            | 63.63         | 45.85                 | -547.26     | 1,692.63               | 780.28         | 695.90          | 84.38                        | 9.247      |         |
| 8,000.00                                                              | 6,436.94              | 7,453.07              | 5,889.16              | 53.99            | 67.16         | 45.88                 | -546.52     | 1,792.61               | 779.80         | 690.86          | 88.94                        | 8.767      |         |
| 8,100.00                                                              | 6,437.86              | 7,553.06              | 5,890.75              | 56.61            | 70.71         | 45.92                 | -545.78     | 1,892.60               | 779.33         | 685.78          | 93.55                        | 8.331      |         |
| 8,200.00                                                              | 6,438.77              | 7,653.06              | 5,892.35              | 59.25            | 74.28         | 45.95                 | -545.04     | 1,992.58               | 778.86         | 680.67          | 98.19                        | 7.932      |         |
| 8,300.00                                                              | 6,439.68              | 7,753.06              | 5,893.94              | 61.91            | 77.87         | 45.99                 | -544.29     | 2,092.56               | 778.38         | 675.53          | 102.86                       | 7.568      |         |
| 8,400.00                                                              | 6,440.60              | 7,853.06              | 5,895.54              | 64.59            | 81.46         | 46.03                 | -543.55     | 2,192.54               | 777.91         | 670.36          | 107.55                       | 7.233      |         |
| 8,500.00                                                              | 6,441.51              | 7,953.05              | 5,897.13              | 67.29            | 85.07         | 46.06                 | -542.81     | 2,292.53               | 777.44         | 665.16          | 112.28                       | 6.924      |         |
| 8,600.00                                                              | 6,442.42              | 8,053.05              | 5,898.73              | 70.00            | 88.69         | 46.10                 | -542.07     | 2,392.51               | 776.97         | 659.95          | 117.02                       | 6.640      |         |
| 8,700.00                                                              | 6,443.34              | 8,153.05              | 5,900.32              | 72.73            | 92.32         | 46.14                 | -541.33     | 2,492.49               | 776.50         | 654.71          | 121.79                       | 6.376      |         |
| 8,800.00                                                              | 6,444.25              | 8,253.05              | 5,901.92              | 75.46            | 95.96         | 46.17                 | -540.58     | 2,592.47               | 776.02         | 649.45          | 126.57                       | 6.131      |         |
| 8,900.00                                                              | 6,445.17              | 8,353.05              | 5,903.51              | 78.21            | 99.60         | 46.21                 | -539.84     | 2,692.45               | 775.55         | 644.18          | 131.37                       | 5.903      |         |
| 9,000.00                                                              | 6,446.08              | 8,453.04              | 5,905.11              | 80.97            | 103.25        | 46.24                 | -539.10     | 2,792.44               | 775.08         | 638.89          | 136.19                       | 5.691      |         |
| 9,100.00                                                              | 6,446.99              | 8,553.04              | 5,906.70              | 83.73            | 106.90        | 46.28                 | -538.36     | 2,892.42               | 774.61         | 633.59          | 141.02                       | 5.493      |         |
| 9,200.00                                                              | 6,447.91              | 8,653.04              | 5,908.30              | 86.50            | 110.56        | 46.32                 | -537.62     | 2,992.40               | 774.14         | 628.27          | 145.87                       | 5.307      |         |
| 9,300.00                                                              | 6,448.82              | 8,753.04              | 5,909.89              | 89.28            | 114.22        | 46.35                 | -536.87     | 3,092.38               | 773.67         | 622.94          | 150.73                       | 5.133      |         |
| 9,400.00                                                              | 6,449.73              | 8,853.03              | 5,911.49              | 92.06            | 117.89        | 46.39                 | -536.13     | 3,192.37               | 773.20         | 617.60          | 155.60                       | 4.969      |         |
| 9,500.00                                                              | 6,450.65              | 8,953.03              | 5,913.08              | 94.85            | 121.56        | 46.43                 | -535.39     | 3,292.35               | 772.73         | 612.24          | 160.49                       | 4.815      |         |
| 9,600.00                                                              | 6,451.56              | 9,053.03              | 5,914.68              | 97.65            | 125.24        | 46.46                 | -534.65     | 3,392.33               | 772.26         | 606.88          | 165.39                       | 4.669      |         |
| 9,700.00                                                              | 6,452.47              | 9,153.03              | 5,916.28              | 100.45           | 128.92        | 46.50                 | -533.91     | 3,492.31               | 771.80         | 601.50          | 170.29                       | 4.532      |         |
| 9,800.00                                                              | 6,453.39              | 9,253.02              | 5,917.87              | 103.25           | 132.60        | 46.54                 | -533.16     | 3,592.29               | 771.33         | 596.12          | 175.21                       | 4.402      |         |
| 9,900.00                                                              | 6,454.30              | 9,353.02              | 5,919.47              | 106.06           | 136.28        | 46.57                 | -532.42     | 3,692.28               | 770.86         | 590.72          | 180.14                       | 4.279      |         |
| 10,000.00                                                             | 6,455.21              | 9,453.02              | 5,921.06              | 108.87           | 139.97        | 46.61                 | -531.68     | 3,792.26               | 770.39         | 585.32          | 185.08                       | 4.163      |         |
| 10,100.00                                                             | 6,456.13              | 9,553.02              | 5,922.66              | 111.68           | 143.65        | 46.65                 | -530.94     | 3,892.24               | 769.93         | 579.90          | 190.02                       | 4.052      |         |
| 10,200.00                                                             | 6,457.04              | 9,653.02              | 5,924.25              | 114.50           | 147.35        | 46.69                 | -530.20     | 3,992.22               | 769.46         | 574.48          | 194.98                       | 3.946      |         |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design                  |                       |                       |                       |                  |               |                       |            |                        |                |                 |                   |          | Hummingbird Federal Com - #14H - OH - Plan #2 12-30-14 |         | Offset Site Error: 0.00 usft |  |
|--------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|------------|------------------------|----------------|-----------------|-------------------|----------|--------------------------------------------------------|---------|------------------------------|--|
| Survey Program: 0-PHX-MWD-BGGM |                       |                       |                       |                  |               |                       |            |                        |                |                 |                   |          | Offset Well Error: 0.00 usft                           |         |                              |  |
| Reference                      |                       | Offset                |                       | Semi Major Axis  |               | Distance              |            | Offset Wellbore Centre |                | Between         | Between           | Minimum  | Separation                                             | Warning |                              |  |
| Measured Depth (usft)          | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | N/S (usft) | E/W (usft)             | Centros (usft) | Ellipses (usft) | Separation (usft) | Factor   |                                                        |         |                              |  |
| 10,300.00                      | 6,457.95              | 9,753.01              | 5,925.85              | 117.32           | 151.04        | 46.72                 | -529.45    | 4,092.21               | 768.99         | 569.05          | 199.94            | 3.846    |                                                        |         |                              |  |
| 10,400.00                      | 6,458.87              | 9,853.01              | 5,927.44              | 120.14           | 154.73        | 46.76                 | -528.71    | 4,192.19               | 768.53         | 563.61          | 204.92            | 3.750    |                                                        |         |                              |  |
| 10,500.00                      | 6,459.78              | 9,953.01              | 5,929.04              | 122.97           | 158.43        | 46.80                 | -527.97    | 4,292.17               | 768.06         | 558.16          | 209.90            | 3.659    |                                                        |         |                              |  |
| 10,600.00                      | 6,460.70              | 10,053.01             | 5,930.63              | 125.80           | 162.12        | 46.83                 | -527.23    | 4,392.15               | 767.59         | 552.70          | 214.89            | 3.572    |                                                        |         |                              |  |
| 10,700.00                      | 6,461.61              | 10,153.00             | 5,932.23              | 128.63           | 165.82        | 46.87                 | -526.49    | 4,492.13               | 767.13         | 547.24          | 219.89            | 3.489    |                                                        |         |                              |  |
| 10,800.00                      | 6,462.52              | 10,253.00             | 5,933.82              | 131.46           | 169.52        | 46.91                 | -525.74    | 4,592.12               | 766.66         | 541.77          | 224.89            | 3.409    |                                                        |         |                              |  |
| 10,900.00                      | 6,463.44              | 10,353.00             | 5,935.42              | 134.29           | 173.22        | 46.95                 | -525.00    | 4,692.10               | 766.20         | 536.29          | 229.91            | 3.333    |                                                        |         |                              |  |
| 11,000.00                      | 6,464.35              | 10,453.00             | 5,937.01              | 137.13           | 176.93        | 46.98                 | -524.26    | 4,792.08               | 765.73         | 530.80          | 234.93            | 3.259    |                                                        |         |                              |  |
| 11,063.51                      | 6,464.93              | 10,515.97             | 5,938.02              | 138.93           | 179.24        | 47.01                 | -523.79    | 4,855.05               | 765.44         | 527.34          | 238.10            | 3.215    |                                                        |         |                              |  |
| 11,071.22                      | 6,465.00              | 10,515.97             | 5,938.02              | 139.15           | 179.24        | 47.01                 | -523.79    | 4,855.05               | 765.45         | 527.19          | 238.26            | 3.213 SF |                                                        |         |                              |  |

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Hummingbird Federal Com - #15H - OH - Plan #1 07-30-14 |                       |                       |                       |                           |                       |                                    |             |                        |                         |                           |                   | Offset Site Error: |
|--------------------------------------------------------|-----------------------|-----------------------|-----------------------|---------------------------|-----------------------|------------------------------------|-------------|------------------------|-------------------------|---------------------------|-------------------|--------------------|
| Survey Program: 0-PHX-MWD-BGGM                         |                       |                       |                       |                           |                       |                                    |             |                        |                         |                           |                   | Offset Well Error: |
| Reference                                              | Offset                | Semi Major Axis       |                       | Distance                  |                       | Warning                            |             |                        |                         |                           |                   |                    |
| Measured Depth (usft)                                  | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | (Reference) Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/S (usft) | +E/W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning            |
| 0.00                                                   | 0.00                  | 0.00                  | 0.00                  | 0.00                      | 0.00                  | 179.69                             | -459.80     | 2.50                   | 459.82                  |                           |                   |                    |
| 100.00                                                 | 100.00                | 96.00                 | 96.00                 | 0.16                      | 0.15                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 459.49                    | 0.31              | 1,470.632          |
| 200.00                                                 | 200.00                | 196.00                | 196.00                | 0.52                      | 0.50                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 458.79                    | 1.02              | 450.065            |
| 300.00                                                 | 300.00                | 296.00                | 296.00                | 0.88                      | 0.86                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 458.07                    | 1.74              | 264.472            |
| 400.00                                                 | 400.00                | 396.00                | 396.00                | 1.23                      | 1.22                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 457.35                    | 2.46              | 187.254            |
| 500.00                                                 | 500.00                | 496.00                | 496.00                | 1.59                      | 1.58                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 456.63                    | 3.17              | 144.836            |
| 600.00                                                 | 600.00                | 596.00                | 596.00                | 1.95                      | 1.94                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 455.92                    | 3.89              | 118.220            |
| 700.00                                                 | 700.00                | 696.00                | 696.00                | 2.31                      | 2.30                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 455.20                    | 4.61              | 99.820             |
| 800.00                                                 | 800.00                | 796.00                | 796.00                | 2.67                      | 2.65                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 454.48                    | 5.32              | 86.376             |
| 900.00                                                 | 900.00                | 896.00                | 896.00                | 3.03                      | 3.01                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 453.77                    | 6.04              | 76.124             |
| 1,000.00                                               | 1,000.00              | 996.00                | 996.00                | 3.39                      | 3.37                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 453.05                    | 6.76              | 68.047             |
| 1,100.00                                               | 1,100.00              | 1,096.00              | 1,096.00              | 3.74                      | 3.73                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 452.33                    | 7.47              | 61.520             |
| 1,200.00                                               | 1,200.00              | 1,196.00              | 1,196.00              | 4.10                      | 4.09                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 451.62                    | 8.19              | 56.135             |
| 1,300.00                                               | 1,300.00              | 1,296.00              | 1,296.00              | 4.46                      | 4.45                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 450.90                    | 8.91              | 51.617             |
| 1,400.00                                               | 1,400.00              | 1,396.00              | 1,396.00              | 4.82                      | 4.81                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 450.18                    | 9.62              | 47.772             |
| 1,500.00                                               | 1,500.00              | 1,496.00              | 1,496.00              | 5.18                      | 5.16                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 449.46                    | 10.34             | 44.461             |
| 1,600.00                                               | 1,600.00              | 1,596.00              | 1,596.00              | 5.54                      | 5.52                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 448.75                    | 11.06             | 41.578             |
| 1,700.00                                               | 1,700.00              | 1,696.00              | 1,696.00              | 5.90                      | 5.88                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 448.03                    | 11.78             | 39.047             |
| 1,800.00                                               | 1,800.00              | 1,796.00              | 1,796.00              | 6.25                      | 6.24                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 447.31                    | 12.49             | 36.806             |
| 1,900.00                                               | 1,900.00              | 1,896.00              | 1,896.00              | 6.61                      | 6.60                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 446.60                    | 13.21             | 34.808             |
| 2,000.00                                               | 2,000.00              | 1,996.00              | 1,996.00              | 6.97                      | 6.96                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 445.88                    | 13.93             | 33.016             |
| 2,100.00                                               | 2,100.00              | 2,096.00              | 2,096.00              | 7.33                      | 7.31                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 445.16                    | 14.64             | 31.400             |
| 2,200.00                                               | 2,200.00              | 2,196.00              | 2,196.00              | 7.69                      | 7.67                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 444.45                    | 15.36             | 29.934             |
| 2,300.00                                               | 2,300.00              | 2,296.00              | 2,296.00              | 8.05                      | 8.03                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 443.73                    | 16.08             | 28.599             |
| 2,400.00                                               | 2,400.00              | 2,396.00              | 2,396.00              | 8.40                      | 8.39                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 443.01                    | 16.79             | 27.379             |
| 2,500.00                                               | 2,500.00              | 2,496.00              | 2,496.00              | 8.76                      | 8.75                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 442.30                    | 17.51             | 26.258             |
| 2,600.00                                               | 2,600.00              | 2,596.00              | 2,596.00              | 9.12                      | 9.11                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 441.58                    | 18.23             | 25.225             |
| 2,700.00                                               | 2,700.00              | 2,696.00              | 2,696.00              | 9.48                      | 9.47                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 440.86                    | 18.95             | 24.270             |
| 2,800.00                                               | 2,800.00              | 2,796.00              | 2,796.00              | 9.84                      | 9.82                  | 179.69                             | -459.80     | 2.50                   | 459.81                  | 440.14                    | 19.66             | 23.385             |
| 2,900.00                                               | 2,900.00              | 2,896.00              | 2,896.00              | 10.20                     | 10.18                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 439.43                    | 20.38             | 22.563             |
| 3,000.00                                               | 3,000.00              | 2,996.00              | 2,996.00              | 10.56                     | 10.54                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 438.71                    | 21.10             | 21.796             |
| 3,100.00                                               | 3,100.00              | 3,096.00              | 3,096.00              | 10.91                     | 10.90                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 437.99                    | 21.81             | 21.079             |
| 3,200.00                                               | 3,200.00              | 3,196.00              | 3,196.00              | 11.27                     | 11.26                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 437.28                    | 22.53             | 20.409             |
| 3,300.00                                               | 3,300.00              | 3,296.00              | 3,296.00              | 11.63                     | 11.62                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 436.56                    | 23.25             | 19.779             |
| 3,400.00                                               | 3,400.00              | 3,396.00              | 3,396.00              | 11.99                     | 11.97                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 435.84                    | 23.96             | 19.188             |
| 3,500.00                                               | 3,500.00              | 3,496.00              | 3,496.00              | 12.35                     | 12.33                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 435.13                    | 24.68             | 18.630             |
| 3,600.00                                               | 3,600.00              | 3,596.00              | 3,596.00              | 12.71                     | 12.69                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 434.41                    | 25.40             | 18.104             |
| 3,700.00                                               | 3,700.00              | 3,696.00              | 3,696.00              | 13.06                     | 13.05                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 433.69                    | 26.11             | 17.607             |
| 3,800.00                                               | 3,800.00              | 3,796.00              | 3,796.00              | 13.42                     | 13.41                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 432.98                    | 26.83             | 17.137             |
| 3,900.00                                               | 3,900.00              | 3,896.00              | 3,896.00              | 13.78                     | 13.77                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 432.26                    | 27.55             | 16.691             |
| 4,000.00                                               | 4,000.00              | 3,896.00              | 3,896.00              | 14.14                     | 14.13                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 431.54                    | 28.27             | 16.267             |
| 4,100.00                                               | 4,100.00              | 4,096.00              | 4,096.00              | 14.50                     | 14.48                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 430.82                    | 28.98             | 15.865             |
| 4,200.00                                               | 4,200.00              | 4,196.00              | 4,196.00              | 14.86                     | 14.84                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 430.11                    | 29.70             | 15.482             |
| 4,300.00                                               | 4,300.00              | 4,296.00              | 4,296.00              | 15.22                     | 15.20                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 429.39                    | 30.42             | 15.117             |
| 4,400.00                                               | 4,400.00              | 4,396.00              | 4,396.00              | 15.57                     | 15.56                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 428.67                    | 31.13             | 14.769             |
| 4,500.00                                               | 4,500.00              | 4,496.00              | 4,496.00              | 15.93                     | 15.92                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 427.96                    | 31.85             | 14.437             |
| 4,600.00                                               | 4,600.00              | 4,596.00              | 4,596.00              | 16.29                     | 16.28                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 427.24                    | 32.57             | 14.119             |
| 4,700.00                                               | 4,700.00              | 4,696.00              | 4,696.00              | 16.65                     | 16.63                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 426.52                    | 33.28             | 13.815             |
| 4,800.00                                               | 4,800.00              | 4,796.00              | 4,796.00              | 17.01                     | 16.99                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 425.81                    | 34.00             | 13.523             |
| 4,900.00                                               | 4,900.00              | 4,896.00              | 4,896.00              | 17.37                     | 17.35                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 425.09                    | 34.72             | 13.244             |
| 5,000.00                                               | 5,000.00              | 4,996.00              | 4,996.00              | 17.72                     | 17.71                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 424.37                    | 35.43             | 12.976             |
| 5,100.00                                               | 5,100.00              | 5,096.00              | 5,096.00              | 18.08                     | 18.07                 | 179.69                             | -459.80     | 2.50                   | 459.81                  | 423.65                    | 36.15             | 12.719             |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design: Hummingbird Federal Com - #15H - OH - Plan #1 07-30-14 |                       |                        |                     |                        |               |                       |                                     |                                     |                        |                         |                           |                   |         | Offset Site Error: | 0.00 usft |
|-----------------------------------------------------------------------|-----------------------|------------------------|---------------------|------------------------|---------------|-----------------------|-------------------------------------|-------------------------------------|------------------------|-------------------------|---------------------------|-------------------|---------|--------------------|-----------|
| Survey Program: 0-PHX-MWD-BGGM                                        |                       |                        |                     |                        |               |                       |                                     |                                     |                        |                         |                           |                   |         | Offset Well Error: | 0.00 usft |
| Measured Depth (usft)                                                 | Vertical Depth (usft) | Reference Depth (usft) | Offset Depth (usft) | Semi Major Axis (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre (N-S) (usft) | Offset Wellbore Centre (E-W) (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |                    |           |
| 5,200.00                                                              | 5,200.00              | 5,196.00               | 5,196.00            | 18.44                  | 18.43         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 422.94                  | 36.87                     | 12.471            |         |                    |           |
| 5,300.00                                                              | 5,300.00              | 5,296.00               | 5,296.00            | 18.80                  | 18.79         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 422.22                  | 37.59                     | 12.234            |         |                    |           |
| 5,400.00                                                              | 5,400.00              | 5,396.00               | 5,396.00            | 19.16                  | 19.14         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 421.50                  | 38.30                     | 12.005            |         |                    |           |
| 5,500.00                                                              | 5,500.00              | 5,496.00               | 5,496.00            | 19.52                  | 19.50         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 420.79                  | 39.02                     | 11.784            |         |                    |           |
| 5,600.00                                                              | 5,600.00              | 5,596.00               | 5,596.00            | 19.88                  | 19.86         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 420.07                  | 39.74                     | 11.571            |         |                    |           |
| 5,700.00                                                              | 5,700.00              | 5,696.00               | 5,696.00            | 20.23                  | 20.22         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 419.35                  | 40.45                     | 11.366            |         |                    |           |
| 5,800.00                                                              | 5,800.00              | 5,796.00               | 5,796.00            | 20.59                  | 20.58         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 418.64                  | 41.17                     | 11.168            |         |                    |           |
| 5,900.00                                                              | 5,900.00              | 5,896.00               | 5,896.00            | 20.95                  | 20.94         | 179.69                | -459.80                             | 2.50                                | 459.81                 | 417.92                  | 41.89                     | 10.977 CC         |         |                    |           |
| 5,918.32                                                              | 5,918.32              | 5,914.34               | 5,914.34            | 21.01                  | 21.00         | 90.13                 | -459.80                             | 2.55                                | 459.81                 | 417.79                  | 42.02                     | 10.943            |         |                    |           |
| 6,000.00                                                              | 5,999.89              | 5,995.59               | 5,995.09            | 21.30                  | 21.28         | 89.46                 | -459.74                             | 10.59                               | 459.83                 | 417.25                  | 42.58                     | 10.799            |         |                    |           |
| 6,100.00                                                              | 6,097.42              | 6,093.68               | 6,089.00            | 21.64                  | 21.62         | 88.55                 | -459.53                             | 38.31                               | 459.95                 | 416.69                  | 43.26                     | 10.632            |         |                    |           |
| 6,200.00                                                              | 6,188.40              | 6,190.40               | 6,174.15            | 21.99                  | 21.99         | 87.72                 | -459.20                             | 83.84                               | 460.17                 | 416.21                  | 43.97                     | 10.467            |         |                    |           |
| 6,300.00                                                              | 6,268.86              | 6,285.94               | 6,247.56            | 22.37                  | 22.45         | 86.98                 | -458.74                             | 144.73                              | 460.45                 | 415.66                  | 44.79                     | 10.280            |         |                    |           |
| 6,400.00                                                              | 6,335.27              | 6,380.51               | 6,306.88            | 22.85                  | 23.12         | 86.38                 | -458.20                             | 218.19                              | 460.73                 | 414.82                  | 45.91                     | 10.035            |         |                    |           |
| 6,500.00                                                              | 6,384.73              | 6,475.00               | 6,350.55            | 23.52                  | 24.13         | 85.92                 | -457.58                             | 301.80                              | 460.98                 | 413.43                  | 47.55                     | 9.694             |         |                    |           |
| 6,600.00                                                              | 6,415.09              | 6,567.64               | 6,376.59            | 24.45                  | 25.52         | 85.63                 | -456.92                             | 390.56                              | 461.15                 | 411.32                  | 49.83                     | 9.255             |         |                    |           |
| 6,700.00                                                              | 6,425.07              | 6,661.33               | 6,385.11            | 25.63                  | 27.29         | 85.53                 | -456.23                             | 483.71                              | 461.22                 | 408.46                  | 52.76                     | 8.742             |         |                    |           |
| 6,800.00                                                              | 6,425.98              | 6,761.33               | 6,386.25            | 27.04                  | 29.53         | 85.56                 | -455.49                             | 583.70                              | 461.20                 | 404.80                  | 56.40                     | 8.177             |         |                    |           |
| 6,900.00                                                              | 6,426.89              | 6,861.33               | 6,387.39            | 28.67                  | 32.02         | 85.58                 | -454.74                             | 683.70                              | 461.18                 | 400.67                  | 60.51                     | 7.621             |         |                    |           |
| 7,000.00                                                              | 6,427.81              | 6,961.33               | 6,388.53            | 30.49                  | 34.73         | 85.61                 | -454.00                             | 783.69                              | 461.17                 | 396.14                  | 65.03                     | 7.092             |         |                    |           |
| 7,100.00                                                              | 6,428.72              | 7,061.33               | 6,389.68            | 32.46                  | 37.62         | 85.64                 | -453.26                             | 883.68                              | 461.15                 | 391.27                  | 69.87                     | 6.600             |         |                    |           |
| 7,200.00                                                              | 6,429.63              | 7,161.33               | 6,390.82            | 34.56                  | 40.64         | 85.67                 | -452.52                             | 983.67                              | 461.13                 | 386.15                  | 74.99                     | 6.150             |         |                    |           |
| 7,300.00                                                              | 6,430.55              | 7,261.33               | 6,391.96            | 36.76                  | 43.78         | 85.70                 | -451.78                             | 1,083.66                            | 461.12                 | 380.81                  | 80.31                     | 5.742             |         |                    |           |
| 7,400.00                                                              | 6,431.46              | 7,361.33               | 6,393.10            | 39.05                  | 47.00         | 85.73                 | -451.03                             | 1,183.65                            | 461.10                 | 375.29                  | 85.81                     | 5.373             |         |                    |           |
| 7,500.00                                                              | 6,432.38              | 7,461.33               | 6,394.24            | 41.41                  | 50.29         | 85.75                 | -450.29                             | 1,283.64                            | 461.08                 | 369.63                  | 91.45                     | 5.042             |         |                    |           |
| 7,600.00                                                              | 6,433.29              | 7,561.33               | 6,395.38            | 43.84                  | 53.64         | 85.78                 | -449.55                             | 1,383.63                            | 461.07                 | 363.85                  | 97.22                     | 4.743             |         |                    |           |
| 7,700.00                                                              | 6,434.20              | 7,661.33               | 6,396.53            | 46.32                  | 57.03         | 85.81                 | -448.81                             | 1,483.62                            | 461.05                 | 357.98                  | 103.08                    | 4.473             |         |                    |           |
| 7,800.00                                                              | 6,435.12              | 7,761.33               | 6,397.67            | 48.84                  | 60.47         | 85.84                 | -448.07                             | 1,583.61                            | 461.04                 | 352.02                  | 108.02                    | 4.229             |         |                    |           |
| 7,900.00                                                              | 6,436.03              | 7,861.33               | 6,398.81            | 51.40                  | 63.93         | 85.87                 | -447.32                             | 1,683.60                            | 461.02                 | 345.99                  | 115.04                    | 4.008             |         |                    |           |
| 8,000.00                                                              | 6,436.94              | 7,961.33               | 6,399.95            | 53.99                  | 67.43         | 85.90                 | -446.58                             | 1,783.59                            | 461.01                 | 339.90                  | 121.11                    | 3.806             |         |                    |           |
| 8,100.00                                                              | 6,437.86              | 8,061.33               | 6,401.09            | 56.61                  | 70.85         | 85.92                 | -445.84                             | 1,883.58                            | 460.99                 | 333.75                  | 127.24                    | 3.623             |         |                    |           |
| 8,200.00                                                              | 6,438.77              | 8,161.33               | 6,402.23            | 59.25                  | 74.49         | 85.95                 | -445.10                             | 1,983.57                            | 460.98                 | 327.57                  | 133.41                    | 3.455             |         |                    |           |
| 8,300.00                                                              | 6,439.68              | 8,261.33               | 6,403.37            | 61.91                  | 78.05         | 85.98                 | -444.36                             | 2,083.56                            | 460.96                 | 321.34                  | 139.62                    | 3.302             |         |                    |           |
| 8,400.00                                                              | 6,440.60              | 8,361.33               | 6,404.52            | 64.59                  | 81.62         | 86.01                 | -443.61                             | 2,183.55                            | 460.95                 | 315.08                  | 145.86                    | 3.160             |         |                    |           |
| 8,500.00                                                              | 6,441.51              | 8,461.33               | 6,405.66            | 67.29                  | 85.21         | 86.04                 | -442.87                             | 2,283.54                            | 460.93                 | 308.79                  | 152.14                    | 3.030             |         |                    |           |
| 8,600.00                                                              | 6,442.42              | 8,561.33               | 6,406.80            | 70.00                  | 88.80         | 86.07                 | -442.13                             | 2,383.53                            | 460.92                 | 302.48                  | 158.44                    | 2.909             |         |                    |           |
| 8,700.00                                                              | 6,443.34              | 8,661.33               | 6,407.94            | 72.73                  | 92.41         | 86.09                 | -441.39                             | 2,483.52                            | 460.90                 | 296.14                  | 164.76                    | 2.797             |         |                    |           |
| 8,800.00                                                              | 6,444.25              | 8,761.33               | 6,409.08            | 75.46                  | 96.03         | 86.12                 | -440.65                             | 2,583.51                            | 460.89                 | 289.78                  | 171.11                    | 2.694             |         |                    |           |
| 8,900.00                                                              | 6,445.17              | 8,861.33               | 6,410.22            | 78.21                  | 99.65         | 86.15                 | -439.90                             | 2,683.50                            | 460.87                 | 283.40                  | 177.47                    | 2.597             |         |                    |           |
| 9,000.00                                                              | 6,446.08              | 8,961.33               | 6,411.37            | 80.97                  | 103.29        | 86.18                 | -439.16                             | 2,783.49                            | 460.86                 | 277.01                  | 183.85                    | 2.507             |         |                    |           |
| 9,100.00                                                              | 6,446.99              | 9,061.33               | 6,412.51            | 83.73                  | 106.93        | 86.21                 | -438.42                             | 2,883.48                            | 460.85                 | 270.60                  | 190.25                    | 2.422             |         |                    |           |
| 9,200.00                                                              | 6,447.91              | 9,161.33               | 6,413.65            | 86.50                  | 110.57        | 86.24                 | -437.68                             | 2,983.48                            | 460.83                 | 264.18                  | 196.65                    | 2.343             |         |                    |           |
| 9,300.00                                                              | 6,448.82              | 9,261.33               | 6,414.79            | 89.28                  | 114.22        | 86.26                 | -436.94                             | 3,083.47                            | 460.82                 | 257.74                  | 203.08                    | 2.269             |         |                    |           |
| 9,400.00                                                              | 6,449.73              | 9,361.33               | 6,415.93            | 92.06                  | 117.88        | 86.29                 | -436.19                             | 3,183.46                            | 460.80                 | 251.30                  | 209.51                    | 2.199             |         |                    |           |
| 9,500.00                                                              | 6,450.65              | 9,461.33               | 6,417.07            | 94.85                  | 121.54        | 86.32                 | -435.45                             | 3,283.45                            | 460.79                 | 244.84                  | 215.95                    | 2.134             |         |                    |           |
| 9,600.00                                                              | 6,451.56              | 9,561.33               | 6,418.22            | 97.65                  | 125.20        | 86.35                 | -434.71                             | 3,383.44                            | 460.78                 | 238.37                  | 222.40                    | 2.072             |         |                    |           |
| 9,700.00                                                              | 6,452.47              | 9,661.33               | 6,419.36            | 100.45                 | 128.87        | 86.38                 | -433.97                             | 3,483.43                            | 460.76                 | 231.90                  | 228.86                    | 2.013             |         |                    |           |
| 9,800.00                                                              | 6,453.39              | 9,761.33               | 6,420.50            | 103.25                 | 132.54        | 86.41                 | -433.23                             | 3,583.42                            | 460.75                 | 225.42                  | 235.33                    | 1.958             |         |                    |           |
| 9,900.00                                                              | 6,454.30              | 9,861.32               | 6,421.64            | 106.06                 | 136.21        | 86.43                 | -432.48                             | 3,683.41                            | 460.74                 | 218.93                  | 241.81                    | 1.905             |         |                    |           |
| 10,000.00                                                             | 6,455.21              | 9,961.32               | 6,422.78            | 108.87                 | 139.89        | 86.46                 | -431.74                             | 3,783.40                            | 460.72                 | 212.43                  | 248.29                    | 1.856             |         |                    |           |
| 10,100.00                                                             | 6,456.13              | 10,061.32              | 6,423.92            | 111.68                 | 143.57        | 86.49                 | -431.00                             | 3,883.39                            | 460.71                 | 205.93                  | 254.78                    | 1.808             |         |                    |           |
| 10,200.00                                                             | 6,457.04              | 10,161.32              | 6,425.07            | 114.50                 | 147.25        | 86.52                 | -430.26                             | 3,983.38                            | 460.70                 | 199.42                  | 261.28                    | 1.763             |         |                    |           |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

|                                                                              |                          |                        |                     |                     |                               |                        |                         |                           |                          |               |        |                                     |
|------------------------------------------------------------------------------|--------------------------|------------------------|---------------------|---------------------|-------------------------------|------------------------|-------------------------|---------------------------|--------------------------|---------------|--------|-------------------------------------|
| <b>Offset Design:</b> Hummingbird Federal Com - #15H - OH - Plan #1 07-30-14 |                          |                        |                     |                     |                               |                        |                         |                           |                          |               |        | <b>Offset Site Error:</b> 0.00 usft |
| <b>Survey Program:</b> 0-PHX-MWD-BGGM                                        |                          |                        |                     |                     |                               |                        |                         |                           |                          |               |        | <b>Offset Well Error:</b> 0.00 usft |
| <b>Reference</b>                                                             | <b>Offset</b>            | <b>Semi Major Axis</b> |                     | <b>Distance</b>     |                               | <b>Warning</b>         |                         |                           |                          |               |        |                                     |
| <b>Measured Vertical</b>                                                     | <b>Measured Vertical</b> | <b>Reference</b>       | <b>Offset</b>       | <b>Highside</b>     | <b>Offset Wellbore Centre</b> | <b>Between Centres</b> | <b>Between Ellipses</b> | <b>Minimum Separation</b> | <b>Separation Factor</b> |               |        |                                     |
| <b>Depth (usft)</b>                                                          | <b>Depth (usft)</b>      | <b>Depth (usft)</b>    | <b>Depth (usft)</b> | <b>Toolface (°)</b> | <b>N-S (usft)</b>             | <b>E-W (usft)</b>      | <b>(usft)</b>           | <b>(usft)</b>             | <b>(usft)</b>            | <b>(usft)</b> |        |                                     |
| 10,300.00                                                                    | 6,457.95                 | 10,261.32              | 6,426.21            | 117.32              | 150.94                        | 86.55                  | -429.52                 | 4,083.37                  | 460.69                   | 192.91        | 267.78 | 1.720                               |
| 10,400.00                                                                    | 6,458.87                 | 10,361.32              | 6,427.35            | 120.14              | 154.62                        | 86.58                  | -428.77                 | 4,183.36                  | 460.67                   | 186.39        | 274.28 | 1.680                               |
| 10,500.00                                                                    | 6,459.78                 | 10,461.32              | 6,428.49            | 122.97              | 158.31                        | 86.60                  | -428.03                 | 4,283.35                  | 460.66                   | 179.87        | 280.79 | 1.641                               |
| 10,600.00                                                                    | 6,460.70                 | 10,561.32              | 6,429.63            | 125.80              | 162.00                        | 86.63                  | -427.29                 | 4,383.34                  | 460.65                   | 173.34        | 287.31 | 1.603                               |
| 10,700.00                                                                    | 6,461.61                 | 10,661.32              | 6,430.77            | 128.63              | 165.69                        | 86.66                  | -426.55                 | 4,483.33                  | 460.64                   | 166.81        | 293.83 | 1.568                               |
| 10,800.00                                                                    | 6,462.52                 | 10,761.32              | 6,431.92            | 131.46              | 169.39                        | 86.69                  | -425.81                 | 4,583.32                  | 460.62                   | 160.27        | 300.35 | 1.534                               |
| 10,900.00                                                                    | 6,463.44                 | 10,861.32              | 6,433.06            | 134.29              | 173.08                        | 86.72                  | -425.06                 | 4,683.31                  | 460.61                   | 153.73        | 306.88 | 1.501                               |
| 11,000.00                                                                    | 6,464.35                 | 10,961.32              | 6,434.20            | 137.13              | 176.78                        | 86.75                  | -424.32                 | 4,783.30                  | 460.60                   | 147.19        | 313.41 | 1.470 Level 3                       |
| 11,049.01                                                                    | 6,464.80                 | 11,010.33              | 6,434.78            | 138.52              | 178.59                        | 86.78                  | -423.96                 | 4,832.31                  | 460.59                   | 143.98        | 316.61 | 1.455 Level 3                       |
| 11,071.22                                                                    | 6,465.00                 | 11,031.52              | 6,435.00            | 139.15              | 179.37                        | 86.78                  | -423.80                 | 4,853.50                  | 460.59                   | 142.57        | 318.02 | 1.448 Level 3, ES, SF               |

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design: Hummingbird Federal Com - #16H - OH - Plan #2 12-11-15 |                       |                       |                       |                  |               |                       |                               |                        |                         |                           |                   | Offset Site Error: | 0.00 usft |
|-----------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|-------------------------------|------------------------|-------------------------|---------------------------|-------------------|--------------------|-----------|
| Survey Program: 0-RHX-MWD-HDGM                                        |                       |                       |                       |                  |               |                       |                               |                        |                         |                           |                   | Offset Well Error: | 0.00 usft |
| Reference                                                             | Offset                | Semi Major Axis       |                       | Distance         |               | Warning               |                               |                        |                         |                           |                   |                    |           |
| Measured Depth (usft)                                                 | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor |                    |           |
| 0.00                                                                  | 0.00                  | 0.00                  | 0.00                  | 0.00             | 0.00          | 179.68                | -199.90                       | 1.10                   | 199.91                  |                           |                   |                    |           |
| 100.00                                                                | 100.00                | 98.00                 | 98.00                 | 0.16             | 0.16          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 199.59                    | 0.32              | 632.906            |           |
| 200.00                                                                | 200.00                | 198.00                | 198.00                | 0.52             | 0.51          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 198.87                    | 1.03              | 194.304            |           |
| 300.00                                                                | 300.00                | 298.00                | 298.00                | 0.88             | 0.87          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 198.16                    | 1.75              | 114.508            |           |
| 400.00                                                                | 400.00                | 398.00                | 398.00                | 1.23             | 1.23          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 197.44                    | 2.46              | 81.172             |           |
| 500.00                                                                | 500.00                | 498.00                | 498.00                | 1.59             | 1.59          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 196.72                    | 3.18              | 62.870             |           |
| 600.00                                                                | 600.00                | 598.00                | 598.00                | 1.95             | 1.94          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 196.01                    | 3.90              | 51.302             |           |
| 700.00                                                                | 700.00                | 698.00                | 698.00                | 2.31             | 2.30          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 195.29                    | 4.61              | 43.330             |           |
| 800.00                                                                | 800.00                | 798.00                | 798.00                | 2.67             | 2.66          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 194.57                    | 5.33              | 37.502             |           |
| 900.00                                                                | 900.00                | 898.00                | 898.00                | 3.03             | 3.02          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 193.86                    | 6.05              | 33.056             |           |
| 1,000.00                                                              | 1,000.00              | 998.00                | 998.00                | 3.39             | 3.38          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 193.14                    | 6.76              | 29.552             |           |
| 1,100.00                                                              | 1,100.00              | 1,098.00              | 1,098.00              | 3.74             | 3.74          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 192.42                    | 7.48              | 26.720             |           |
| 1,200.00                                                              | 1,200.00              | 1,198.00              | 1,198.00              | 4.10             | 4.10          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 191.70                    | 8.20              | 24.384             |           |
| 1,300.00                                                              | 1,300.00              | 1,298.00              | 1,298.00              | 4.46             | 4.45          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 190.99                    | 8.92              | 22.423             |           |
| 1,400.00                                                              | 1,400.00              | 1,398.00              | 1,398.00              | 4.82             | 4.81          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 190.27                    | 9.63              | 20.754             |           |
| 1,500.00                                                              | 1,500.00              | 1,498.00              | 1,498.00              | 5.18             | 5.17          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 189.55                    | 10.35             | 19.316             |           |
| 1,600.00                                                              | 1,600.00              | 1,598.00              | 1,598.00              | 5.54             | 5.53          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 188.84                    | 11.07             | 18.065             |           |
| 1,700.00                                                              | 1,700.00              | 1,698.00              | 1,698.00              | 5.90             | 5.89          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 188.12                    | 11.78             | 16.965             |           |
| 1,800.00                                                              | 1,800.00              | 1,798.00              | 1,798.00              | 6.25             | 6.25          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 187.40                    | 12.50             | 15.992             |           |
| 1,900.00                                                              | 1,900.00              | 1,898.00              | 1,898.00              | 6.61             | 6.60          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 186.69                    | 13.22             | 15.125             |           |
| 2,000.00                                                              | 2,000.00              | 1,998.00              | 1,998.00              | 6.97             | 6.96          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 185.97                    | 13.93             | 14.347             |           |
| 2,100.00                                                              | 2,100.00              | 2,098.00              | 2,098.00              | 7.33             | 7.32          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 185.25                    | 14.65             | 13.645             |           |
| 2,200.00                                                              | 2,200.00              | 2,198.00              | 2,198.00              | 7.69             | 7.68          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 184.54                    | 15.37             | 13.008             |           |
| 2,300.00                                                              | 2,300.00              | 2,298.00              | 2,298.00              | 8.05             | 8.04          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 183.82                    | 16.08             | 12.428             |           |
| 2,400.00                                                              | 2,400.00              | 2,398.00              | 2,398.00              | 8.40             | 8.40          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 183.10                    | 16.80             | 11.898             |           |
| 2,500.00                                                              | 2,500.00              | 2,498.00              | 2,498.00              | 8.76             | 8.76          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 182.38                    | 17.52             | 11.411             |           |
| 2,600.00                                                              | 2,600.00              | 2,598.00              | 2,598.00              | 9.12             | 9.11          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 181.67                    | 18.24             | 10.962             |           |
| 2,700.00                                                              | 2,700.00              | 2,698.00              | 2,698.00              | 9.48             | 9.47          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 180.95                    | 18.95             | 10.548             |           |
| 2,800.00                                                              | 2,800.00              | 2,798.00              | 2,798.00              | 9.84             | 9.83          | 179.68                | -199.90                       | 1.10                   | 199.90                  | 180.23                    | 19.67             | 10.163             |           |
| 2,900.00                                                              | 2,900.00              | 2,898.00              | 2,898.00              | 10.20            | 10.19         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 179.52                    | 20.39             | 9.806              |           |
| 3,000.00                                                              | 3,000.00              | 2,998.00              | 2,998.00              | 10.56            | 10.55         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 178.80                    | 21.10             | 9.473              |           |
| 3,100.00                                                              | 3,100.00              | 3,098.00              | 3,098.00              | 10.91            | 10.91         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 178.08                    | 21.82             | 9.161              |           |
| 3,200.00                                                              | 3,200.00              | 3,198.00              | 3,198.00              | 11.27            | 11.26         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 177.37                    | 22.54             | 8.870              |           |
| 3,300.00                                                              | 3,300.00              | 3,298.00              | 3,298.00              | 11.63            | 11.62         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 176.65                    | 23.25             | 8.596              |           |
| 3,400.00                                                              | 3,400.00              | 3,398.00              | 3,398.00              | 11.99            | 11.98         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 175.93                    | 23.97             | 8.339              |           |
| 3,500.00                                                              | 3,500.00              | 3,498.00              | 3,498.00              | 12.35            | 12.34         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 175.22                    | 24.69             | 8.097              |           |
| 3,600.00                                                              | 3,600.00              | 3,598.00              | 3,598.00              | 12.71            | 12.70         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 174.50                    | 25.40             | 7.869              |           |
| 3,700.00                                                              | 3,700.00              | 3,698.00              | 3,698.00              | 13.06            | 13.06         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 173.78                    | 26.12             | 7.653              |           |
| 3,800.00                                                              | 3,800.00              | 3,798.00              | 3,798.00              | 13.42            | 13.42         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 173.06                    | 26.84             | 7.448              |           |
| 3,900.00                                                              | 3,900.00              | 3,898.00              | 3,898.00              | 13.78            | 13.77         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 172.35                    | 27.56             | 7.255              |           |
| 4,000.00                                                              | 4,000.00              | 3,998.00              | 3,998.00              | 14.14            | 14.13         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 171.63                    | 28.27             | 7.071              |           |
| 4,100.00                                                              | 4,100.00              | 4,098.00              | 4,098.00              | 14.50            | 14.49         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 170.91                    | 28.99             | 6.896              |           |
| 4,200.00                                                              | 4,200.00              | 4,198.00              | 4,198.00              | 14.86            | 14.85         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 170.20                    | 29.71             | 6.729              |           |
| 4,300.00                                                              | 4,300.00              | 4,298.00              | 4,298.00              | 15.22            | 15.21         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 169.48                    | 30.42             | 6.571              |           |
| 4,400.00                                                              | 4,400.00              | 4,398.00              | 4,398.00              | 15.57            | 15.57         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 168.76                    | 31.14             | 6.419              |           |
| 4,500.00                                                              | 4,500.00              | 4,498.00              | 4,498.00              | 15.93            | 15.93         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 168.05                    | 31.86             | 6.275              |           |
| 4,600.00                                                              | 4,600.00              | 4,598.00              | 4,598.00              | 16.29            | 16.28         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 167.33                    | 32.57             | 6.137              |           |
| 4,700.00                                                              | 4,700.00              | 4,698.00              | 4,698.00              | 16.65            | 16.64         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 166.61                    | 33.29             | 6.005              |           |
| 4,800.00                                                              | 4,800.00              | 4,798.00              | 4,798.00              | 17.01            | 17.00         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 165.89                    | 34.01             | 5.878              |           |
| 4,900.00                                                              | 4,900.00              | 4,898.00              | 4,898.00              | 17.37            | 17.36         | 179.68                | -199.90                       | 1.10                   | 199.90                  | 165.18                    | 34.73             | 5.757              |           |
| 4,953.68                                                              | 4,953.68              | 4,951.69              | 4,951.68              | 17.56            | 17.55         | 179.57                | -199.90                       | 1.48                   | 199.90                  | 164.79                    | 35.11             | 5.694 CC           |           |
| 5,000.00                                                              | 5,000.00              | 4,997.65              | 4,997.44              | 17.72            | 17.71         | 178.41                | -199.87                       | 5.53                   | 199.94                  | 164.51                    | 35.43             | 5.643 ES           |           |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design: Hummingbird Federal Com - #16H - OH - Plan #2 12-11-15 |                             |                             |                             |                     |                  |                             |                        |               |                              |                               |                                 |                      | Offset Site Error: 0.00 usft |
|-----------------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------|------------------|-----------------------------|------------------------|---------------|------------------------------|-------------------------------|---------------------------------|----------------------|------------------------------|
| Survey Program: 0-PHX-MWD-HDGM                                        |                             |                             |                             |                     |                  |                             |                        |               |                              |                               |                                 |                      | Offset Well Error: 0.00 usft |
| Reference                                                             |                             | Offset                      |                             | Semi Major Axis     |                  | Highside<br>Toolface<br>(°) | Offset Wellbore Centre |               | Distance                     |                               | Minimum<br>Separation<br>(usft) | Separation<br>Factor | Warning                      |
| Measured<br>Depth<br>(usft)                                           | Vertical<br>Depth<br>(usft) | Measured<br>Depth<br>(usft) | Vertical<br>Depth<br>(usft) | Reference<br>(usft) | Offset<br>(usft) |                             | N-S<br>(usft)          | E-W<br>(usft) | Between<br>Centres<br>(usft) | Between<br>Ellipses<br>(usft) |                                 |                      |                              |
| 5,100.00                                                              | 5,100.00                    | 5,091.94                    | 5,088.99                    | 18.08               | 18.03            | 172.17                      | -199.70                | 27.46         | 201.78                       | 165.68                        | 36.11                           | 5.588 SF             |                              |
| 5,200.00                                                              | 5,200.00                    | 5,175.00                    | 5,164.71                    | 18.44               | 18.32            | 162.90                      | -199.45                | 61.34         | 211.31                       | 174.58                        | 36.73                           | 5.753                |                              |
| 5,300.00                                                              | 5,300.00                    | 5,244.65                    | 5,222.90                    | 18.80               | 18.58            | 153.45                      | -199.17                | 99.52         | 234.98                       | 197.68                        | 37.30                           | 6.300                |                              |
| 5,400.00                                                              | 5,400.00                    | 5,300.00                    | 5,264.79                    | 19.16               | 18.82            | 145.71                      | -198.90                | 135.65        | 275.15                       | 237.31                        | 37.84                           | 7.272                |                              |
| 5,500.00                                                              | 5,500.00                    | 5,350.00                    | 5,298.81                    | 19.52               | 19.08            | 139.07                      | -198.63                | 172.25        | 329.85                       | 291.46                        | 38.39                           | 8.593                |                              |
| 5,600.00                                                              | 5,600.00                    | 5,385.57                    | 5,320.59                    | 19.88               | 19.29            | 134.72                      | -198.42                | 200.36        | 395.56                       | 356.65                        | 38.91                           | 10.166               |                              |
| 5,700.00                                                              | 5,700.00                    | 5,416.43                    | 5,337.75                    | 20.23               | 19.49            | 131.25                      | -198.23                | 226.01        | 469.20                       | 429.77                        | 39.44                           | 11.898               |                              |
| 5,800.00                                                              | 5,800.00                    | 5,442.00                    | 5,350.69                    | 20.59               | 19.68            | 128.61                      | -198.07                | 248.06        | 548.50                       | 508.54                        | 39.95                           | 13.728               |                              |
| 5,900.00                                                              | 5,900.00                    | 5,463.41                    | 5,360.60                    | 20.95               | 19.86            | 126.55                      | -197.93                | 267.03        | 631.88                       | 591.42                        | 40.46                           | 15.617               |                              |
| 6,000.00                                                              | 5,999.89                    | 5,482.59                    | 5,368.75                    | 21.30               | 20.02            | 29.92                       | -197.80                | 284.39        | 717.08                       | 676.71                        | 40.37                           | 17.764               |                              |
| 6,100.00                                                              | 6,097.42                    | 5,500.00                    | 5,375.54                    | 21.64               | 20.18            | 22.32                       | -197.68                | 300.42        | 796.06                       | 756.83                        | 39.24                           | 20.289               |                              |
| 6,200.00                                                              | 6,188.40                    | 5,525.00                    | 5,384.26                    | 21.99               | 20.43            | 17.69                       | -197.50                | 323.85        | 865.76                       | 829.23                        | 36.53                           | 23.702               |                              |
| 6,300.00                                                              | 6,268.86                    | 5,559.13                    | 5,394.15                    | 22.37               | 20.80            | 14.78                       | -197.26                | 356.50        | 924.57                       | 892.21                        | 32.36                           | 28.572               |                              |
| 6,400.00                                                              | 6,335.27                    | 5,588.91                    | 5,400.88                    | 22.85               | 21.15            | 13.01                       | -197.05                | 385.51        | 971.42                       | 944.42                        | 27.00                           | 35.979               |                              |
| 6,500.00                                                              | 6,384.73                    | 5,625.00                    | 5,406.55                    | 23.52               | 21.61            | 11.91                       | -196.78                | 421.14        | 1,005.43                     | 984.45                        | 20.98                           | 47.920               |                              |
| 6,600.00                                                              | 6,415.09                    | 5,650.00                    | 5,408.91                    | 24.45               | 21.95            | 11.35                       | -196.60                | 446.03        | 1,025.89                     | 1,010.62                      | 15.27                           | 67.181               |                              |
| 6,700.00                                                              | 6,425.07                    | 5,694.17                    | 5,410.13                    | 25.63               | 22.59            | 11.16                       | -196.27                | 490.17        | 1,032.51                     | 1,020.06                      | 12.45                           | 82.920               |                              |
| 6,800.00                                                              | 6,425.98                    | 5,794.17                    | 5,411.00                    | 27.04               | 24.22            | 11.16                       | -195.53                | 590.16        | 1,032.55                     | 1,018.88                      | 13.68                           | 75.505               |                              |
| 6,900.00                                                              | 6,426.89                    | 5,894.17                    | 5,411.87                    | 28.67               | 26.05            | 11.16                       | -194.79                | 690.15        | 1,032.60                     | 1,017.56                      | 15.04                           | 68.676               |                              |
| 7,000.00                                                              | 6,427.81                    | 5,994.17                    | 5,412.74                    | 30.49               | 28.06            | 11.16                       | -194.04                | 790.15        | 1,032.64                     | 1,016.14                      | 16.50                           | 62.580               |                              |
| 7,100.00                                                              | 6,428.72                    | 6,094.17                    | 5,413.61                    | 32.46               | 30.22            | 11.16                       | -193.30                | 890.14        | 1,032.69                     | 1,014.64                      | 18.05                           | 57.225               |                              |
| 7,200.00                                                              | 6,429.63                    | 6,194.17                    | 5,414.47                    | 34.56               | 32.48            | 11.16                       | -192.56                | 990.14        | 1,032.73                     | 1,013.08                      | 19.65                           | 52.551               |                              |
| 7,300.00                                                              | 6,430.55                    | 6,294.17                    | 5,415.34                    | 36.76               | 34.84            | 11.16                       | -191.82                | 1,090.13      | 1,032.78                     | 1,011.47                      | 21.30                           | 48.476               |                              |
| 7,400.00                                                              | 6,431.46                    | 6,394.17                    | 5,416.21                    | 39.05               | 37.27            | 11.16                       | -191.08                | 1,190.12      | 1,032.82                     | 1,009.83                      | 22.99                           | 44.915               |                              |
| 7,500.00                                                              | 6,432.38                    | 6,494.17                    | 5,417.08                    | 41.41               | 39.76            | 11.16                       | -190.33                | 1,290.12      | 1,032.87                     | 1,008.15                      | 24.71                           | 41.792               |                              |
| 7,600.00                                                              | 6,433.29                    | 6,594.17                    | 5,417.95                    | 43.84               | 42.29            | 11.16                       | -189.59                | 1,390.11      | 1,032.91                     | 1,006.45                      | 26.46                           | 39.040               |                              |
| 7,700.00                                                              | 6,434.20                    | 6,694.17                    | 5,418.81                    | 46.32               | 44.87            | 11.16                       | -188.85                | 1,490.10      | 1,032.96                     | 1,004.74                      | 28.22                           | 36.602               |                              |
| 7,800.00                                                              | 6,435.12                    | 6,794.17                    | 5,419.68                    | 48.84               | 47.49            | 11.16                       | -188.11                | 1,590.10      | 1,033.00                     | 1,003.00                      | 30.00                           | 34.433               |                              |
| 7,900.00                                                              | 6,436.03                    | 6,894.17                    | 5,420.55                    | 51.40               | 50.13            | 11.16                       | -187.37                | 1,690.09      | 1,033.05                     | 1,001.25                      | 31.79                           | 32.494               |                              |
| 8,000.00                                                              | 6,436.94                    | 6,994.17                    | 5,421.42                    | 53.99               | 52.80            | 11.16                       | -186.62                | 1,790.08      | 1,033.09                     | 999.50                        | 33.60                           | 30.751               |                              |
| 8,100.00                                                              | 6,437.86                    | 7,094.17                    | 5,422.29                    | 56.61               | 55.48            | 11.16                       | -185.88                | 1,890.08      | 1,033.14                     | 997.73                        | 35.41                           | 29.177               |                              |
| 8,200.00                                                              | 6,438.77                    | 7,194.17                    | 5,423.15                    | 59.25               | 58.19            | 11.16                       | -185.14                | 1,990.07      | 1,033.18                     | 995.95                        | 37.23                           | 27.751               |                              |
| 8,300.00                                                              | 6,439.68                    | 7,294.17                    | 5,424.02                    | 61.91               | 60.91            | 11.16                       | -184.40                | 2,090.06      | 1,033.23                     | 994.17                        | 39.06                           | 26.454               |                              |
| 8,400.00                                                              | 6,440.60                    | 7,394.17                    | 5,424.89                    | 64.59               | 63.65            | 11.16                       | -183.66                | 2,190.06      | 1,033.27                     | 992.38                        | 40.89                           | 25.268               |                              |
| 8,500.00                                                              | 6,441.51                    | 7,494.17                    | 5,425.76                    | 67.29               | 66.39            | 11.16                       | -182.91                | 2,290.05      | 1,033.32                     | 990.58                        | 42.73                           | 24.182               |                              |
| 8,600.00                                                              | 6,442.42                    | 7,594.17                    | 5,426.63                    | 70.00               | 69.15            | 11.16                       | -182.17                | 2,390.04      | 1,033.36                     | 988.79                        | 44.58                           | 23.182               |                              |
| 8,700.00                                                              | 6,443.34                    | 7,694.17                    | 5,427.49                    | 72.73               | 71.92            | 11.16                       | -181.43                | 2,490.04      | 1,033.41                     | 986.98                        | 46.42                           | 22.260               |                              |
| 8,800.00                                                              | 6,444.25                    | 7,794.17                    | 5,428.36                    | 75.48               | 74.69            | 11.15                       | -180.69                | 2,590.03      | 1,033.45                     | 985.18                        | 48.28                           | 21.407               |                              |
| 8,900.00                                                              | 6,445.17                    | 7,894.17                    | 5,429.23                    | 78.21               | 77.48            | 11.15                       | -179.95                | 2,690.02      | 1,033.50                     | 983.37                        | 50.13                           | 20.616               |                              |
| 9,000.00                                                              | 6,446.08                    | 7,994.17                    | 5,430.10                    | 80.97               | 80.27            | 11.15                       | -179.20                | 2,790.02      | 1,033.54                     | 981.55                        | 51.99                           | 19.880               |                              |
| 9,100.00                                                              | 6,446.99                    | 8,094.17                    | 5,430.97                    | 83.73               | 83.06            | 11.15                       | -178.46                | 2,890.01      | 1,033.58                     | 979.74                        | 53.85                           | 19.195               |                              |
| 9,200.00                                                              | 6,447.91                    | 8,194.17                    | 5,431.84                    | 86.50               | 85.86            | 11.15                       | -177.72                | 2,990.00      | 1,033.63                     | 977.92                        | 55.71                           | 18.554               |                              |
| 9,300.00                                                              | 6,448.82                    | 8,294.17                    | 5,432.70                    | 89.28               | 88.67            | 11.15                       | -176.98                | 3,090.00      | 1,033.67                     | 976.10                        | 57.57                           | 17.954               |                              |
| 9,400.00                                                              | 6,449.73                    | 8,394.17                    | 5,433.57                    | 92.06               | 91.48            | 11.15                       | -176.23                | 3,189.99      | 1,033.72                     | 974.28                        | 59.44                           | 17.391               |                              |
| 9,500.00                                                              | 6,450.65                    | 8,494.17                    | 5,434.44                    | 94.85               | 94.29            | 11.15                       | -175.49                | 3,289.98      | 1,033.76                     | 972.46                        | 61.31                           | 16.881               |                              |
| 9,600.00                                                              | 6,451.56                    | 8,594.17                    | 5,435.31                    | 97.65               | 97.11            | 11.15                       | -174.75                | 3,389.98      | 1,033.81                     | 970.63                        | 63.18                           | 16.363               |                              |
| 9,700.00                                                              | 6,452.47                    | 8,694.17                    | 5,436.18                    | 100.45              | 99.93            | 11.15                       | -174.01                | 3,489.97      | 1,033.85                     | 968.80                        | 65.05                           | 15.893               |                              |
| 9,800.00                                                              | 6,453.39                    | 8,794.17                    | 5,437.04                    | 103.25              | 102.76           | 11.15                       | -173.27                | 3,589.97      | 1,033.90                     | 966.98                        | 66.92                           | 15.449               |                              |
| 9,900.00                                                              | 6,454.30                    | 8,894.17                    | 5,437.91                    | 106.06              | 105.59           | 11.15                       | -172.52                | 3,689.96      | 1,033.94                     | 965.15                        | 68.80                           | 15.029               |                              |
| 10,000.00                                                             | 6,455.21                    | 8,994.17                    | 5,438.78                    | 108.87              | 108.42           | 11.15                       | -171.78                | 3,789.95      | 1,033.99                     | 963.32                        | 70.67                           | 14.631               |                              |
| 10,100.00                                                             | 6,456.13                    | 9,094.17                    | 5,439.65                    | 111.68              | 111.25           | 11.15                       | -171.04                | 3,889.95      | 1,034.03                     | 961.49                        | 72.55                           | 14.254               |                              |
| 10,200.00                                                             | 6,457.04                    | 9,194.17                    | 5,440.52                    | 114.50              | 114.08           | 11.15                       | -170.30                | 3,989.94      | 1,034.08                     | 959.66                        | 74.42                           | 13.895               |                              |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| <b>Offset Design:</b> Hummingbird Federal Com - #18H - OH - Plan #2 12-11-15 |                       |                       |                       |           |        |                       |                                     |              |                        |                         |                           |                   | <b>Offset Site Error:</b> 0.00 usft |
|------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------|--------|-----------------------|-------------------------------------|--------------|------------------------|-------------------------|---------------------------|-------------------|-------------------------------------|
| <b>Survey Program:</b> 0-PHX-MWD-HDGM                                        |                       |                       |                       |           |        |                       |                                     |              |                        |                         |                           |                   | <b>Offset Well Error:</b> 0.00 usft |
| Reference                                                                    | Offset                | Semi Major Axis       |                       | Distance  |        | Warning               |                                     |              |                        |                         |                           |                   |                                     |
| Measured Depth (usft)                                                        | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference | Offset | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | +E/-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor |                                     |
| 10,300.00                                                                    | 6,457.95              | 9,294.17              | 5,441.38              | 117.32    | 116.92 | 11.15                 | -169.56                             | 4,089.93     | 1,034.12               | 957.82                  | 76.30                     | 13.554            |                                     |
| 10,400.00                                                                    | 6,458.87              | 9,394.17              | 5,442.25              | 120.14    | 119.76 | 11.15                 | -168.81                             | 4,189.93     | 1,034.17               | 955.99                  | 78.18                     | 13.229            |                                     |
| 10,500.00                                                                    | 6,459.78              | 9,494.17              | 5,443.12              | 122.97    | 122.60 | 11.15                 | -168.07                             | 4,289.92     | 1,034.21               | 954.16                  | 80.06                     | 12.919            |                                     |
| 10,600.00                                                                    | 6,460.70              | 9,594.17              | 5,443.99              | 125.80    | 125.44 | 11.15                 | -167.33                             | 4,389.91     | 1,034.26               | 952.32                  | 81.94                     | 12.623            |                                     |
| 10,700.00                                                                    | 6,461.61              | 9,694.17              | 5,444.86              | 128.63    | 128.29 | 11.15                 | -166.59                             | 4,489.91     | 1,034.30               | 950.49                  | 83.82                     | 12.340            |                                     |
| 10,800.00                                                                    | 6,462.52              | 9,794.17              | 5,445.72              | 131.46    | 131.13 | 11.15                 | -165.85                             | 4,589.90     | 1,034.35               | 948.65                  | 85.70                     | 12.070            |                                     |
| 10,900.00                                                                    | 6,463.44              | 9,894.17              | 5,446.59              | 134.29    | 133.98 | 11.15                 | -165.10                             | 4,689.89     | 1,034.39               | 946.82                  | 87.58                     | 11.811            |                                     |
| 11,000.00                                                                    | 6,464.35              | 9,994.17              | 5,447.46              | 137.13    | 136.82 | 11.15                 | -164.36                             | 4,789.89     | 1,034.44               | 944.98                  | 89.46                     | 11.583            |                                     |
| 11,036.10                                                                    | 6,464.88              | 10,030.26             | 5,447.77              | 138.15    | 137.85 | 11.15                 | -164.09                             | 4,825.98     | 1,034.45               | 944.32                  | 90.14                     | 11.476            |                                     |
| 11,071.22                                                                    | 6,465.00              | 10,056.38             | 5,448.00              | 139.15    | 138.60 | 11.14                 | -163.90                             | 4,852.10     | 1,034.51               | 943.79                  | 90.71                     | 11.404            |                                     |

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at</b>         | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Offset Design: Hummingbird Federal Com - #17H - OH - Plan #3 12-11-15 |                   |                 |              |              |                        |                 |                  |                    |                   |       | Offset Site Error: |
|-----------------------------------------------------------------------|-------------------|-----------------|--------------|--------------|------------------------|-----------------|------------------|--------------------|-------------------|-------|--------------------|
| Survey Program: 0-PHX-MWD-HDGM                                        |                   |                 |              |              |                        |                 |                  |                    |                   |       | 0.00 usft          |
| Reference                                                             | Offset            | Semi Major Axis |              | Distance     |                        | Warning         |                  |                    |                   |       |                    |
| Measured Vertical                                                     | Measured Vertical | Reference       | Offset       | Highside     | Offset Wellbore Centre | Between Centres | Between Ellipses | Minimum Separation | Separation Factor |       |                    |
| Depth (usft)                                                          | Depth (usft)      | Depth (usft)    | Depth (usft) | Toolface (°) | +N/-S (usft)           | +E/-W (usft)    | (usft)           | (usft)             | (usft)            |       |                    |
| 0.00                                                                  | 0.00              | 0.00            | 0.00         | 0.00         | 0.00                   | 179.66          | -99.90           | 0.60               | 99.91             |       |                    |
| 100.00                                                                | 100.00            | 99.00           | 99.00        | 0.16         | 0.16                   | 179.66          | -99.90           | 0.60               | 99.90             | 99.58 | 0.32 314.706       |
| 200.00                                                                | 200.00            | 199.00          | 199.00       | 0.52         | 0.51                   | 179.66          | -99.90           | 0.60               | 99.90             | 98.87 | 1.03 96.767        |
| 300.00                                                                | 300.00            | 299.00          | 299.00       | 0.88         | 0.87                   | 179.66          | -99.90           | 0.60               | 99.90             | 98.15 | 1.75 57.108        |
| 400.00                                                                | 400.00            | 399.00          | 399.00       | 1.23         | 1.23                   | 179.66          | -99.90           | 0.60               | 99.90             | 97.44 | 2.47 40.507        |
| 500.00                                                                | 500.00            | 499.00          | 499.00       | 1.59         | 1.59                   | 179.66          | -99.90           | 0.60               | 99.90             | 96.72 | 3.18 31.384        |
| 600.00                                                                | 600.00            | 599.00          | 599.00       | 1.95         | 1.95                   | 179.66          | -99.90           | 0.60               | 99.90             | 96.00 | 3.90 25.615        |
| 700.00                                                                | 700.00            | 699.00          | 699.00       | 2.31         | 2.31                   | 179.66          | -99.90           | 0.60               | 99.90             | 95.28 | 4.62 21.637        |
| 800.00                                                                | 800.00            | 799.00          | 799.00       | 2.67         | 2.67                   | 179.66          | -99.90           | 0.60               | 99.90             | 94.57 | 5.33 18.729        |
| 900.00                                                                | 900.00            | 899.00          | 899.00       | 3.03         | 3.02                   | 179.66          | -99.90           | 0.60               | 99.90             | 93.85 | 6.05 16.510        |
| 1,000.00                                                              | 1,000.00          | 999.00          | 999.00       | 3.39         | 3.38                   | 179.66          | -99.90           | 0.60               | 99.90             | 93.13 | 6.77 14.761        |
| 1,100.00                                                              | 1,100.00          | 1,099.00        | 1,099.00     | 3.74         | 3.74                   | 179.66          | -99.90           | 0.60               | 99.90             | 92.42 | 7.48 13.347        |
| 1,200.00                                                              | 1,200.00          | 1,199.00        | 1,199.00     | 4.10         | 4.10                   | 179.66          | -99.90           | 0.60               | 99.90             | 91.70 | 8.20 12.180        |
| 1,300.00                                                              | 1,300.00          | 1,299.00        | 1,299.00     | 4.46         | 4.46                   | 179.66          | -99.90           | 0.60               | 99.90             | 90.98 | 8.92 11.201        |
| 1,400.00                                                              | 1,400.00          | 1,399.00        | 1,399.00     | 4.82         | 4.82                   | 179.66          | -99.90           | 0.60               | 99.90             | 90.27 | 9.64 10.368        |
| 1,500.00                                                              | 1,500.00          | 1,499.00        | 1,499.00     | 5.18         | 5.17                   | 179.66          | -99.90           | 0.60               | 99.90             | 89.55 | 10.35 9.650        |
| 1,600.00                                                              | 1,600.00          | 1,599.00        | 1,599.00     | 5.54         | 5.53                   | 179.66          | -99.90           | 0.60               | 99.90             | 88.83 | 11.07 9.025        |
| 1,700.00                                                              | 1,700.00          | 1,699.00        | 1,699.00     | 5.90         | 5.89                   | 179.66          | -99.90           | 0.60               | 99.90             | 88.12 | 11.79 8.476        |
| 1,800.00                                                              | 1,800.00          | 1,799.00        | 1,799.00     | 6.25         | 6.25                   | 179.66          | -99.90           | 0.60               | 99.90             | 87.40 | 12.50 7.990        |
| 1,900.00                                                              | 1,900.00          | 1,899.00        | 1,899.00     | 6.61         | 6.61                   | 179.66          | -99.90           | 0.60               | 99.90             | 86.68 | 13.22 7.557        |
| 2,000.00                                                              | 2,000.00          | 1,999.00        | 1,999.00     | 6.97         | 6.97                   | 179.66          | -99.90           | 0.60               | 99.90             | 85.96 | 13.94 7.168        |
| 2,100.00                                                              | 2,100.00          | 2,099.00        | 2,099.00     | 7.33         | 7.33                   | 179.66          | -99.90           | 0.60               | 99.90             | 85.25 | 14.65 6.817        |
| 2,200.00                                                              | 2,200.00          | 2,199.00        | 2,199.00     | 7.69         | 7.68                   | 179.66          | -99.90           | 0.60               | 99.90             | 84.53 | 15.37 6.499        |
| 2,300.00                                                              | 2,300.00          | 2,299.00        | 2,299.00     | 8.05         | 8.04                   | 179.66          | -99.90           | 0.60               | 99.90             | 83.81 | 16.09 6.210        |
| 2,400.00                                                              | 2,400.00          | 2,399.00        | 2,399.00     | 8.40         | 8.40                   | 179.66          | -99.90           | 0.60               | 99.90             | 83.10 | 16.81 5.945        |
| 2,500.00                                                              | 2,500.00          | 2,499.00        | 2,499.00     | 8.76         | 8.76                   | 179.66          | -99.90           | 0.60               | 99.90             | 82.38 | 17.52 5.701        |
| 2,600.00                                                              | 2,600.00          | 2,599.00        | 2,599.00     | 9.12         | 9.12                   | 179.66          | -99.90           | 0.60               | 99.90             | 81.66 | 18.24 5.477        |
| 2,700.00                                                              | 2,700.00          | 2,699.00        | 2,699.00     | 9.48         | 9.48                   | 179.66          | -99.90           | 0.60               | 99.90             | 80.95 | 18.96 5.270        |
| 2,800.00                                                              | 2,800.00          | 2,799.00        | 2,799.00     | 9.84         | 9.83                   | 179.66          | -99.90           | 0.60               | 99.90             | 80.23 | 19.67 5.078        |
| 2,900.00                                                              | 2,900.00          | 2,899.00        | 2,899.00     | 10.20        | 10.19                  | 179.66          | -99.90           | 0.60               | 99.90             | 79.51 | 20.39 4.900        |
| 3,000.00                                                              | 3,000.00          | 2,899.00        | 2,899.00     | 10.56        | 10.55                  | 179.66          | -99.90           | 0.60               | 99.90             | 78.80 | 21.11 4.733        |
| 3,100.00                                                              | 3,100.00          | 3,099.00        | 3,099.00     | 10.91        | 10.91                  | 179.66          | -99.90           | 0.60               | 99.90             | 78.08 | 21.82 4.578        |
| 3,200.00                                                              | 3,200.00          | 3,199.00        | 3,199.00     | 11.27        | 11.27                  | 179.66          | -99.90           | 0.60               | 99.90             | 77.36 | 22.54 4.432        |
| 3,300.00                                                              | 3,300.00          | 3,299.00        | 3,299.00     | 11.63        | 11.63                  | 179.66          | -99.90           | 0.60               | 99.90             | 76.64 | 23.26 4.295        |
| 3,400.00                                                              | 3,400.00          | 3,399.00        | 3,399.00     | 11.99        | 11.99                  | 179.66          | -99.90           | 0.60               | 99.90             | 75.93 | 23.97 4.167        |
| 3,500.00                                                              | 3,500.00          | 3,499.00        | 3,499.00     | 12.35        | 12.34                  | 179.66          | -99.90           | 0.60               | 99.90             | 75.21 | 24.69 4.046        |
| 3,600.00                                                              | 3,600.00          | 3,599.00        | 3,599.00     | 12.71        | 12.70                  | 179.66          | -99.90           | 0.60               | 99.90             | 74.49 | 25.41 3.932        |
| 3,700.00                                                              | 3,700.00          | 3,699.00        | 3,699.00     | 13.06        | 13.06                  | 179.66          | -99.90           | 0.60               | 99.90             | 73.78 | 26.13 3.824        |
| 3,800.00                                                              | 3,800.00          | 3,799.00        | 3,799.00     | 13.42        | 13.42                  | 179.66          | -99.90           | 0.60               | 99.90             | 73.06 | 26.84 3.722        |
| 3,900.00                                                              | 3,900.00          | 3,899.00        | 3,899.00     | 13.78        | 13.78                  | 179.66          | -99.90           | 0.60               | 99.90             | 72.34 | 27.56 3.625        |
| 4,000.00                                                              | 4,000.00          | 3,899.00        | 3,899.00     | 14.14        | 14.14                  | 179.66          | -99.90           | 0.60               | 99.90             | 71.63 | 28.28 3.533        |
| 4,100.00                                                              | 4,100.00          | 4,099.00        | 4,099.00     | 14.50        | 14.49                  | 179.66          | -99.90           | 0.60               | 99.90             | 70.91 | 28.99 3.446        |
| 4,200.00                                                              | 4,200.00          | 4,199.00        | 4,199.00     | 14.86        | 14.85                  | 179.66          | -99.90           | 0.60               | 99.90             | 70.19 | 29.71 3.363        |
| 4,300.00                                                              | 4,300.00          | 4,299.00        | 4,299.00     | 15.22        | 15.21                  | 179.66          | -99.90           | 0.60               | 99.90             | 69.47 | 30.43 3.283        |
| 4,400.00                                                              | 4,400.00          | 4,399.00        | 4,399.00     | 15.57        | 15.57                  | 179.66          | -99.90           | 0.60               | 99.90             | 68.76 | 31.14 3.208        |
| 4,500.00                                                              | 4,500.00          | 4,499.00        | 4,499.00     | 15.93        | 15.93                  | 179.66          | -99.90           | 0.60               | 99.90             | 68.04 | 31.86 3.136        |
| 4,600.00                                                              | 4,600.00          | 4,599.00        | 4,599.00     | 16.29        | 16.29                  | 179.66          | -99.90           | 0.60               | 99.90             | 67.32 | 32.58 3.067        |
| 4,700.00                                                              | 4,700.00          | 4,699.00        | 4,699.00     | 16.65        | 16.65                  | 179.66          | -99.90           | 0.60               | 99.90             | 66.61 | 33.29 3.001        |
| 4,800.00                                                              | 4,800.00          | 4,799.00        | 4,799.00     | 17.01        | 17.00                  | 179.66          | -99.90           | 0.60               | 99.90             | 65.89 | 34.01 2.937        |
| 4,900.00                                                              | 4,900.00          | 4,899.00        | 4,899.00     | 17.37        | 17.36                  | 179.66          | -99.90           | 0.60               | 99.90             | 65.17 | 34.73 2.877        |
| 5,000.00                                                              | 5,000.00          | 4,999.00        | 4,999.00     | 17.72        | 17.72                  | 179.66          | -99.90           | 0.60               | 99.90             | 64.46 | 35.45 2.818        |
| 5,100.00                                                              | 5,100.00          | 5,099.00        | 5,099.00     | 18.08        | 18.08                  | 179.66          | -99.90           | 0.60               | 99.90             | 63.74 | 36.16 2.763        |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| Hummingbird Federal Com - #17H - OH - Plan #3 12-11-15 |                       |                       |                       |                  |               |                       |                                    |             |                        |                         |                           |                   | Offset Site Error: |
|--------------------------------------------------------|-----------------------|-----------------------|-----------------------|------------------|---------------|-----------------------|------------------------------------|-------------|------------------------|-------------------------|---------------------------|-------------------|--------------------|
| Survey Program: (0-PHX-MWD-HDGM)                       |                       |                       |                       |                  |               |                       |                                    |             |                        |                         |                           |                   | Offset Well Error: |
| Reference                                              | Offset                | Semi Major Axis       |                       | Distance         |               | Minimum Separation    |                                    | Warning     |                        |                         |                           |                   |                    |
| Measured Depth (usft)                                  | Vertical Depth (usft) | Measured Depth (usft) | Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N-S (usft) | +E-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning            |
| 5,200.00                                               | 5,200.00              | 5,199.00              | 5,199.00              | 18.44            | 18.44         | 179.66                | -99.90                             | 0.60        | 99.90                  | 63.02                   | 36.88                     | 2.709             |                    |
| 5,300.00                                               | 5,300.00              | 5,299.00              | 5,299.00              | 18.80            | 18.80         | 179.66                | -99.90                             | 0.60        | 99.90                  | 62.31                   | 37.60                     | 2.657             |                    |
| 5,366.07                                               | 5,366.07              | 5,365.07              | 5,365.07              | 19.04            | 19.03         | 179.66                | -99.90                             | 0.60        | 99.90                  | 61.83                   | 38.07                     | 2.624 CC          |                    |
| 5,400.00                                               | 5,400.00              | 5,399.00              | 5,398.99              | 19.16            | 19.15         | 179.47                | -99.90                             | 0.92        | 99.90                  | 61.59                   | 38.31                     | 2.608             |                    |
| 5,412.28                                               | 5,412.28              | 5,411.25              | 5,411.23              | 19.20            | 19.20         | 179.13                | -99.89                             | 1.52        | 99.89                  | 61.51                   | 38.40                     | 2.602 ES          |                    |
| 5,500.00                                               | 5,500.00              | 5,496.75              | 5,495.63              | 19.52            | 19.49         | 171.77                | -99.80                             | 14.43       | 100.89                 | 61.89                   | 39.00                     | 2.587 SF          |                    |
| 5,600.00                                               | 5,600.00              | 5,585.65              | 5,579.49              | 19.88            | 19.79         | 156.37                | -99.58                             | 43.56       | 110.43                 | 70.78                   | 39.65                     | 2.785             |                    |
| 5,700.00                                               | 5,700.00              | 5,661.77              | 5,645.96              | 20.23            | 20.07         | 140.97                | -99.31                             | 80.49       | 136.40                 | 98.14                   | 40.26                     | 3.438             |                    |
| 5,800.00                                               | 5,800.00              | 5,725.00              | 5,696.14              | 20.59            | 20.31         | 129.79                | -99.02                             | 118.88      | 165.79                 | 144.95                  | 40.84                     | 4.549             |                    |
| 5,900.00                                               | 5,900.00              | 5,775.00              | 5,731.96              | 20.95            | 20.54         | 122.72                | -98.76                             | 153.73      | 247.57                 | 206.15                  | 41.41                     | 5.978             |                    |
| 6,000.00                                               | 5,999.89              | 5,818.70              | 5,760.14              | 21.30            | 20.77         | 25.60                 | -98.52                             | 187.11      | 317.26                 | 275.70                  | 41.56                     | 7.633             |                    |
| 6,100.00                                               | 6,097.42              | 5,861.78              | 5,784.82              | 21.64            | 21.04         | 19.29                 | -98.25                             | 222.41      | 382.23                 | 341.81                  | 40.42                     | 9.456             |                    |
| 6,200.00                                               | 6,188.40              | 5,900.00              | 5,803.97              | 21.99            | 21.30         | 15.63                 | -98.01                             | 255.47      | 439.24                 | 401.64                  | 37.59                     | 11.684            |                    |
| 6,300.00                                               | 6,268.86              | 5,950.00              | 5,824.92              | 22.37            | 21.72         | 13.14                 | -97.67                             | 300.84      | 486.92                 | 453.68                  | 33.24                     | 14.650            |                    |
| 6,400.00                                               | 6,335.27              | 6,000.00              | 5,841.01              | 22.85            | 22.20         | 11.59                 | -97.32                             | 348.15      | 524.76                 | 497.12                  | 27.64                     | 18.987            |                    |
| 6,500.00                                               | 6,384.73              | 6,041.26              | 5,850.51              | 23.52            | 22.66         | 10.69                 | -97.02                             | 388.29      | 552.02                 | 530.73                  | 21.29                     | 25.926            |                    |
| 6,600.00                                               | 6,415.09              | 6,086.96              | 5,856.94              | 24.45            | 23.22         | 10.18                 | -96.69                             | 433.51      | 568.44                 | 553.17                  | 15.26                     | 37.241            |                    |
| 6,700.00                                               | 6,425.07              | 6,139.69              | 5,859.13              | 25.63            | 23.93         | 10.03                 | -96.30                             | 486.18      | 573.73                 | 561.51                  | 12.22                     | 46.959            |                    |
| 6,800.00                                               | 6,425.98              | 6,239.69              | 5,860.11              | 27.04            | 25.47         | 10.03                 | -95.55                             | 586.17      | 573.66                 | 560.28                  | 13.38                     | 42.866            |                    |
| 6,900.00                                               | 6,426.89              | 6,339.69              | 5,861.09              | 28.67            | 27.21         | 10.03                 | -94.81                             | 686.17      | 573.60                 | 558.92                  | 14.88                     | 39.072            |                    |
| 7,000.00                                               | 6,427.81              | 6,439.69              | 5,862.07              | 30.49            | 29.13         | 10.03                 | -94.07                             | 786.16      | 573.53                 | 557.45                  | 16.08                     | 35.658            |                    |
| 7,100.00                                               | 6,428.72              | 6,539.69              | 5,863.06              | 32.46            | 31.20         | 10.03                 | -93.33                             | 886.15      | 573.46                 | 555.90                  | 17.57                     | 32.643            |                    |
| 7,200.00                                               | 6,429.63              | 6,639.69              | 5,864.04              | 34.56            | 33.39         | 10.03                 | -92.59                             | 986.14      | 573.40                 | 554.28                  | 19.11                     | 30.000            |                    |
| 7,300.00                                               | 6,430.55              | 6,739.69              | 5,865.02              | 36.76            | 35.68         | 10.04                 | -91.84                             | 1,086.14    | 573.33                 | 552.62                  | 20.71                     | 27.688            |                    |
| 7,400.00                                               | 6,431.46              | 6,839.69              | 5,866.00              | 39.05            | 38.04         | 10.04                 | -91.10                             | 1,186.13    | 573.26                 | 550.92                  | 22.34                     | 25.663            |                    |
| 7,500.00                                               | 6,432.38              | 6,939.69              | 5,866.98              | 41.41            | 40.48         | 10.04                 | -90.36                             | 1,286.12    | 573.19                 | 549.19                  | 24.00                     | 23.884            |                    |
| 7,600.00                                               | 6,433.29              | 7,039.69              | 5,867.97              | 43.84            | 42.97         | 10.04                 | -89.62                             | 1,386.11    | 573.13                 | 547.44                  | 25.69                     | 22.314            |                    |
| 7,700.00                                               | 6,434.20              | 7,139.69              | 5,868.95              | 46.32            | 45.50         | 10.04                 | -88.88                             | 1,486.10    | 573.06                 | 545.67                  | 27.39                     | 20.922            |                    |
| 7,800.00                                               | 6,435.12              | 7,239.69              | 5,869.93              | 48.84            | 48.07         | 10.04                 | -88.13                             | 1,586.10    | 572.99                 | 543.88                  | 29.11                     | 19.682            |                    |
| 7,900.00                                               | 6,436.03              | 7,339.69              | 5,870.91              | 51.40            | 50.68         | 10.04                 | -87.39                             | 1,686.09    | 572.92                 | 542.08                  | 30.85                     | 18.573            |                    |
| 8,000.00                                               | 6,436.94              | 7,439.69              | 5,871.89              | 53.99            | 53.31         | 10.05                 | -86.65                             | 1,786.08    | 572.86                 | 540.26                  | 32.59                     | 17.575            |                    |
| 8,100.00                                               | 6,437.86              | 7,539.69              | 5,872.88              | 56.61            | 55.97         | 10.05                 | -85.91                             | 1,886.07    | 572.79                 | 538.44                  | 34.35                     | 16.674            |                    |
| 8,200.00                                               | 6,438.77              | 7,639.69              | 5,873.86              | 59.25            | 58.65         | 10.05                 | -85.17                             | 1,986.07    | 572.72                 | 536.61                  | 36.12                     | 15.858            |                    |
| 8,300.00                                               | 6,439.68              | 7,739.69              | 5,874.84              | 61.91            | 61.35         | 10.05                 | -84.42                             | 2,086.06    | 572.66                 | 534.77                  | 37.89                     | 15.114            |                    |
| 8,400.00                                               | 6,440.60              | 7,839.69              | 5,875.82              | 64.59            | 64.06         | 10.05                 | -83.68                             | 2,186.05    | 572.59                 | 532.92                  | 39.67                     | 14.435            |                    |
| 8,500.00                                               | 6,441.51              | 7,939.69              | 5,876.80              | 67.29            | 66.79         | 10.05                 | -82.94                             | 2,286.04    | 572.52                 | 531.07                  | 41.45                     | 13.812            |                    |
| 8,600.00                                               | 6,442.42              | 8,039.69              | 5,877.79              | 70.00            | 69.52         | 10.05                 | -82.20                             | 2,386.04    | 572.45                 | 529.21                  | 43.24                     | 13.239            |                    |
| 8,700.00                                               | 6,443.34              | 8,139.69              | 5,878.77              | 72.73            | 72.27         | 10.05                 | -81.45                             | 2,486.03    | 572.39                 | 527.35                  | 45.03                     | 12.710            |                    |
| 8,800.00                                               | 6,444.25              | 8,239.69              | 5,879.75              | 75.46            | 75.03         | 10.06                 | -80.71                             | 2,586.02    | 572.32                 | 525.49                  | 46.83                     | 12.221            |                    |
| 8,900.00                                               | 6,445.17              | 8,339.69              | 5,880.73              | 78.21            | 77.80         | 10.06                 | -79.97                             | 2,686.01    | 572.25                 | 523.62                  | 48.63                     | 11.767            |                    |
| 9,000.00                                               | 6,446.08              | 8,439.69              | 5,881.71              | 80.97            | 80.57         | 10.06                 | -79.23                             | 2,786.01    | 572.19                 | 521.75                  | 50.43                     | 11.345            |                    |
| 9,100.00                                               | 6,446.99              | 8,539.69              | 5,882.70              | 83.73            | 83.36         | 10.06                 | -78.49                             | 2,886.00    | 572.12                 | 519.88                  | 52.24                     | 10.952            |                    |
| 9,200.00                                               | 6,447.91              | 8,639.69              | 5,883.68              | 86.50            | 86.14         | 10.06                 | -77.74                             | 2,985.99    | 572.05                 | 518.00                  | 54.05                     | 10.584            |                    |
| 9,300.00                                               | 6,448.82              | 8,739.69              | 5,884.66              | 89.28            | 88.94         | 10.06                 | -77.00                             | 3,085.98    | 571.98                 | 516.12                  | 55.86                     | 10.240            |                    |
| 9,400.00                                               | 6,449.73              | 8,839.69              | 5,885.64              | 92.06            | 91.74         | 10.06                 | -76.26                             | 3,185.98    | 571.92                 | 514.24                  | 57.67                     | 9.917             |                    |
| 9,500.00                                               | 6,450.65              | 8,939.69              | 5,886.62              | 94.85            | 94.54         | 10.06                 | -75.52                             | 3,285.97    | 571.85                 | 512.36                  | 59.49                     | 9.613             |                    |
| 9,600.00                                               | 6,451.56              | 9,039.69              | 5,887.61              | 97.65            | 97.35         | 10.07                 | -74.78                             | 3,385.96    | 571.78                 | 510.48                  | 61.30                     | 9.327             |                    |
| 9,700.00                                               | 6,452.47              | 9,139.69              | 5,888.59              | 100.45           | 100.16        | 10.07                 | -74.03                             | 3,485.95    | 571.71                 | 508.59                  | 63.12                     | 9.057             |                    |
| 9,800.00                                               | 6,453.39              | 9,239.69              | 5,889.57              | 103.25           | 102.98        | 10.07                 | -73.29                             | 3,585.95    | 571.65                 | 506.71                  | 64.94                     | 8.803             |                    |
| 9,900.00                                               | 6,454.30              | 9,339.69              | 5,890.55              | 106.06           | 105.80        | 10.07                 | -72.55                             | 3,685.94    | 571.58                 | 504.82                  | 66.76                     | 8.561             |                    |
| 10,000.00                                              | 6,455.21              | 9,439.69              | 5,891.54              | 108.87           | 108.62        | 10.07                 | -71.81                             | 3,785.93    | 571.51                 | 502.93                  | 68.58                     | 8.333             |                    |
| 10,100.00                                              | 6,456.13              | 9,539.69              | 5,892.52              | 111.68           | 111.44        | 10.07                 | -71.07                             | 3,885.92    | 571.45                 | 501.04                  | 70.41                     | 8.116             |                    |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

| <b>Offset Design:</b> Hummingbird Federal Com - #17H - OH - Plan #3 12-11-15 |                                |                  |               |                       |                                    |                                    |                        |                         |                           |                   |       | <b>Offset Site Error:</b> 0.00 usft |
|------------------------------------------------------------------------------|--------------------------------|------------------|---------------|-----------------------|------------------------------------|------------------------------------|------------------------|-------------------------|---------------------------|-------------------|-------|-------------------------------------|
| <b>Survey Program:</b> 0-PHX-MWD-HDGM                                        |                                |                  |               |                       |                                    |                                    |                        |                         |                           |                   |       | <b>Offset Well Error:</b> 0.00 usft |
| Reference                                                                    | Offset                         | Semi Major Axis  |               | Distance              |                                    | Minimum Separation                 |                        | Warning                 |                           |                   |       |                                     |
| Measured Vertical Depth (usft)                                               | Measured Vertical Depth (usft) | Reference (usft) | Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N-S (usft) | Offset Wellbore Centre +E-W (usft) | Between Centres (usft) | Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor |       |                                     |
| 10,200.00                                                                    | 6,457.04                       | 9,639.69         | 5,893.50      | 114.50                | 114.27                             | 10.07                              | -70.32                 | 3,985.91                | 571.38                    | 499.15            | 72.23 | 7.910                               |
| 10,300.00                                                                    | 6,457.95                       | 9,739.69         | 5,894.48      | 117.32                | 117.10                             | 10.08                              | -69.58                 | 4,085.91                | 571.31                    | 497.25            | 74.06 | 7.714                               |
| 10,400.00                                                                    | 6,458.87                       | 9,839.69         | 5,895.46      | 120.14                | 119.93                             | 10.08                              | -68.84                 | 4,185.90                | 571.24                    | 495.36            | 75.88 | 7.528                               |
| 10,500.00                                                                    | 6,459.78                       | 9,939.69         | 5,896.45      | 122.97                | 122.77                             | 10.08                              | -68.10                 | 4,285.89                | 571.18                    | 493.47            | 77.71 | 7.350                               |
| 10,600.00                                                                    | 6,460.70                       | 10,039.69        | 5,897.43      | 125.80                | 125.60                             | 10.08                              | -67.36                 | 4,385.88                | 571.11                    | 491.57            | 79.54 | 7.180                               |
| 10,700.00                                                                    | 6,461.61                       | 10,139.69        | 5,898.41      | 128.63                | 128.44                             | 10.08                              | -66.61                 | 4,485.88                | 571.04                    | 489.67            | 81.37 | 7.018                               |
| 10,800.00                                                                    | 6,462.52                       | 10,239.69        | 5,899.39      | 131.46                | 131.28                             | 10.08                              | -65.87                 | 4,585.87                | 570.97                    | 487.78            | 83.20 | 6.863                               |
| 10,900.00                                                                    | 6,463.44                       | 10,339.69        | 5,900.37      | 134.29                | 134.12                             | 10.08                              | -65.13                 | 4,685.86                | 570.91                    | 485.88            | 85.03 | 6.714                               |
| 11,000.00                                                                    | 6,464.35                       | 10,439.69        | 5,901.36      | 137.13                | 136.96                             | 10.08                              | -64.39                 | 4,785.85                | 570.84                    | 483.98            | 86.86 | 6.572                               |
| 11,053.14                                                                    | 6,464.83                       | 10,492.82        | 5,901.88      | 138.64                | 138.47                             | 10.08                              | -63.99                 | 4,838.99                | 570.80                    | 482.97            | 87.83 | 6.499                               |
| 11,071.22                                                                    | 6,465.00                       | 10,505.34        | 5,902.00      | 139.15                | 138.83                             | 10.09                              | -63.90                 | 4,851.50                | 570.82                    | 482.71            | 88.11 | 6.478                               |

|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at</b>         | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

Reference Depths are relative to KB: 11' @ 4050.00usft (TBD)

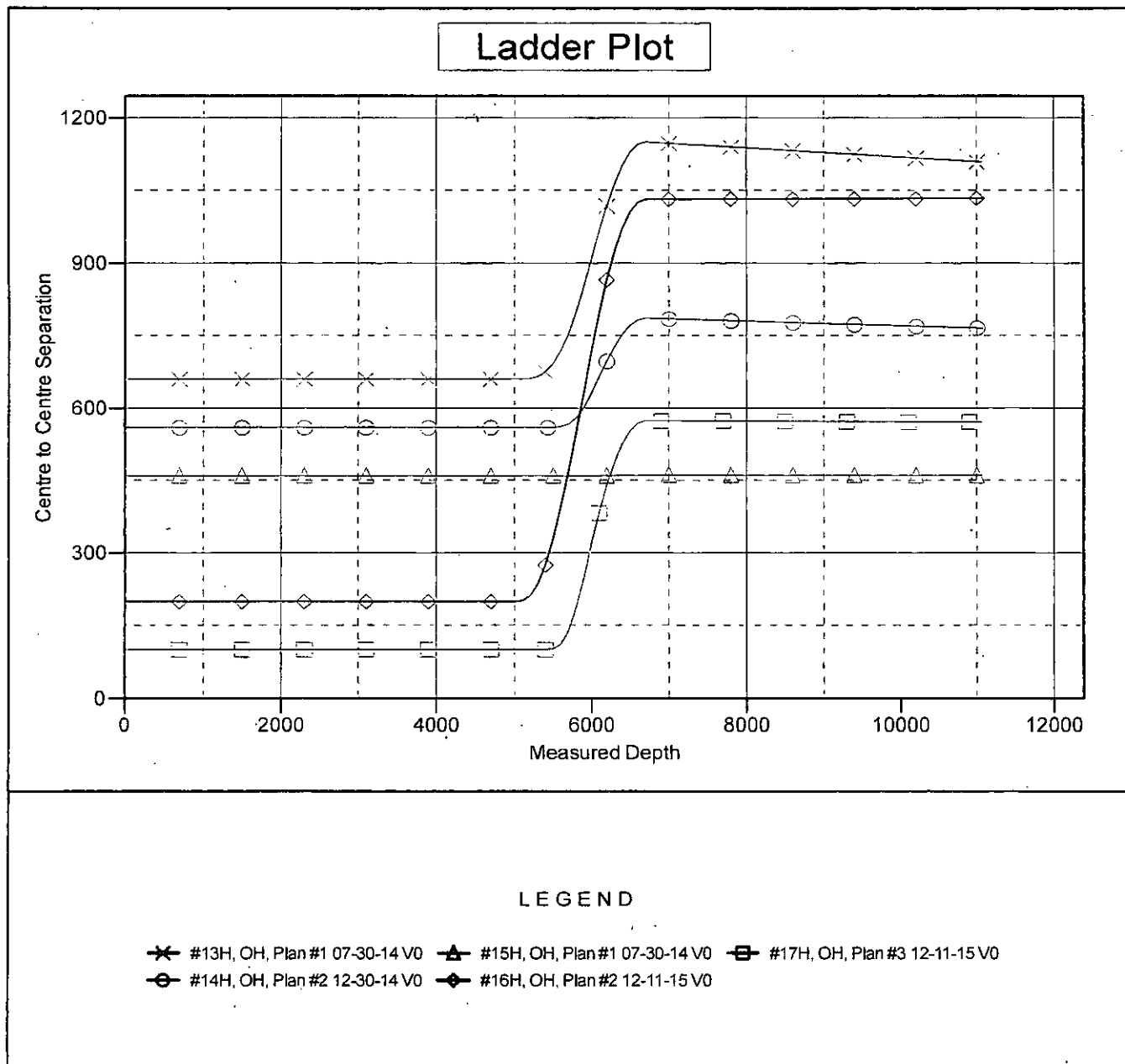
Offset Depths are relative to Offset Datum

Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #18H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.27°



|                            |                             |                                     |                             |
|----------------------------|-----------------------------|-------------------------------------|-----------------------------|
| <b>Company:</b>            | Apache Corporation          | <b>Local Co-ordinate Reference:</b> | Well #18H                   |
| <b>Project:</b>            | Eddy County, NM (NAD27 NME) | <b>TVD Reference:</b>               | KB: 11' @ 4050.00usft (TBD) |
| <b>Reference Site:</b>     | Hummingbird Federal Com     | <b>MD Reference:</b>                | KB: 11' @ 4050.00usft (TBD) |
| <b>Site Error:</b>         | 0.00 usft                   | <b>North Reference:</b>             | Grid                        |
| <b>Reference Well:</b>     | #18H                        | <b>Survey Calculation Method:</b>   | Minimum Curvature           |
| <b>Well Error:</b>         | 0.00 usft                   | <b>Output errors are at:</b>        | 2.00 sigma                  |
| <b>Reference Wellbore:</b> | OH                          | <b>Database:</b>                    | Compass 5000 GCR            |
| <b>Reference Design:</b>   | Plan #2 12-15-15            | <b>Offset TVD Reference:</b>        | Offset Datum                |

Reference Depths are relative to KB: 11' @ 4050.00usft (TBD)

Offset Depths are relative to Offset Datum

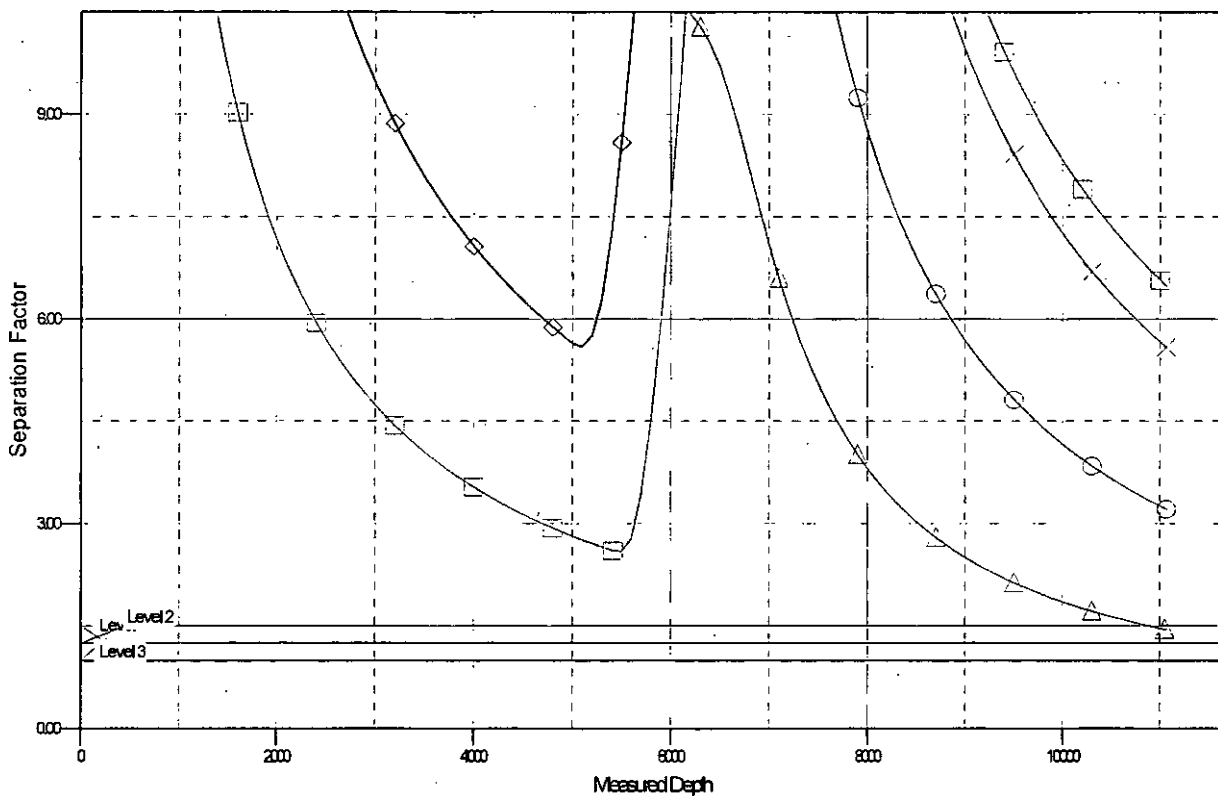
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #18H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.27°

## Separation Factor Plot



### LEGEND

- ✕ #13H, OH, Plan #1 07-30-14 V0
- △ #15H, OH, Plan #1 07-30-14 V0
- #17H, OH, Plan #3 12-11-15 V0
- #14H, OH, Plan #2 12-30-14 V0
- ◇ #16H, OH, Plan #2 12-11-15 V0