

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTNMOCD
HobbsFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**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.***SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		8. Well Name and No. BLACK & TAN 27 FEDERAL COM 307H
2. Name of Operator APACHE CORPORATION		9. API Well No. 30-025-44044
3a. Address 303 VETERANS AIRPARK LN #1000 MIDLAND, TX 79705		10. Field and Pool or Exploratory Area LEA, BONESPRING, S
3b. Phone No. (include area code) Ph: 432-818-1167		11. County or Parish, State LEA COUNTY, NM
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 27 T20S R34E Mer NMP SESE 215FSL 782FEL 32.537436 N Lat, 103.542035 W Lon		

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

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 recompleat 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 must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must 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 NMB-000736 NATIONWIDE

APACHE RESPECTFULLY REQUEST TO CHANGE BHL IN ORDER TO ACCOMODATE FUTURE WELL DEVELOPMENT. CSG/CMT WILL REMAIN AS APPROVED ON APD. REVISED C-102 ATTACHED.

APPROVED BHL: 280' FNL & 1025' FEL
NEW BHL: 280' FNL & 1284' FEL

SHL will remain same as on approved APD of 215' FSL & 782' FEL.

***New C102 attached

Original COAs Still Stand.

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #394107 verified by the BLM Well Information System For APACHE CORPORATION, sent to the Hobbs Committed to AFMSS for processing by JENNIFER SANCHEZ on 11/08/2017 ()	
Name (Printed/Typed) SORINA FLORES	Title SUBMITTING CONTACT
Signature (Electronic Submission)	Date 11/06/2017
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
NOV 8 2017	
BUREAU OF LAND MANAGEMENT CARLSBAD FIELD OFFICE	
Approved By _____	Title _____
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.	

(Instructions on page 2)

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

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025-44044		² Pool Code 37580		³ Pool Name LEA; BONESPRING, S.					
⁴ Property Code 319397		⁵ Property Name BLACK & TAN 27 FEDERAL COM						⁶ Well Number 307H	
⁷ GRID NO. 873		⁸ Operator Name APACHE CORPORATION						⁹ Elevation 3715'	
¹⁰ Surface Location									
UL or lot no. P	Section 27	Township 20S	Range 34E	Lot Idn	Feet from the 215	North/South line SOUTH	Feet From the 782	East/West line EAST	County LEA
¹¹ Bottom Hole Location If Different From Surface									
UL or lot no. A	Section 27	Township 20S	Range 34E	Lot Idn	Feet from the 280	North/South line NORTH	Feet from the 1284	East/West line EAST	County LEA
¹² Dedicated Acres 160		¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.			

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

¹⁶ GEODETIC DATA NAD 83 GRID - NM EAST SURFACE LOCATION (SL) N: 560155.8 - E: 785192.0 LAT: 32.5374366° N LONG: 103.5420357° W FIRST TAKE POINT (FTP) N: 560270.7 - E: 785179.1 LAT: 32.5374366° N LONG: 103.5420750° W LAST TAKE POINT (LTP) N: 564890.2 - E: 784658.4 LAT: 32.5504599° N LONG: 103.5436533° W BOTTOM HOLE (BH) N: 564940.2 - E: 784652.8 LAT: 32.5505973° N LONG: 103.5436704° W CORNER DATA NAD 83 GRID - NM EAST A: FOUND BRASS CAP "1912" N 559906.6 - E 780684.6 B: FOUND BRASS CAP "1912" N 562546.2 - E 780666.1 C: FOUND BRASS CAP ILLEGABLE N 565185.2 - E 780647.6 D: FOUND BRASS CAP "1912" N 565208.2 - E 783290.2 E: FOUND BRASS CAP "1912" N 565231.3 - E 785934.3 F: FOUND BRASS CAP "1912" N 562589.8 - E 785953.8 G: FOUND 1/2" REBAR N 559946.7 - E 785975.6 H: FOUND BRASS CAP "1912" N 559927.1 - E 783330.5 1: CALCULATED POINT N 559936.9 - E 784653.0 2: CALCULATED POINT N 565219.8 - E 784612.3		DETAIL "A" 3711.2' 680' 3713.2' 600' O.S.L. 3716.2' 3716.1' SEE DETAIL "A"		17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Sorina L Flores</i> 11/6/2017 Signature Date SORINA L. FLORES Printed Name sorina.flores@apachecorp.com E-mail Address 18 SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. 2-27-2017 Date of Survey Signature and Seal of Professional Surveyor 19680 Certificate Number 10/24/17 ADDED FTP/LTP	
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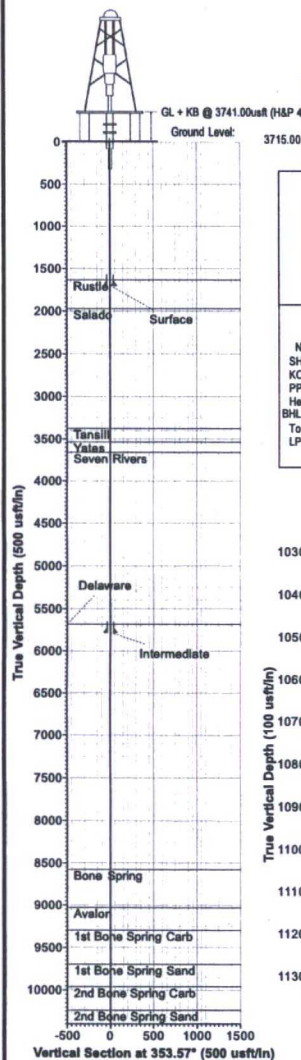
Job No.: LS1702127D

Project: Lea County, NM (NAD83 NME)
Site: Black & Tan 27 Federal Com
Well: 307H
Wellbore: OH
Design: Plan 2 09-08-17
Rig: H&P 482

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone
Local Origin: Well 307H, Grid North
Latitude: 32° 32' 14.77130 N
Longitude: 103° 32' 31.32896 W



Azimuths to Grid North
True North: -0.43°
Magnetic North: 6.32°
Magnetic Field
Strength: 48303.3anT
Dip Angle: 60.52°
Date: 8/19/2017
Model: HDGM



WELL DETAILS									
Ground Level:	3715.00								
+N-S	0.00	+E-W	0.00	Northing	560155.80	Easting	785192.00	Latitude	32° 32' 14.77130 N
								Longitude	103° 32' 31.32896 W

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	10433.50	0.00	0.00	10433.50	0.00	0.00	0.00	0.00	0.00
3	10808.50	45.00	284.40	10771.12	-13.65	-139.18	12.00	264.40	2.02
4	11594.76	91.00	359.56	11126.41	465.89	-505.72	12.00	92.94	519.59
5	15914.06	91.00	359.56	11051.00	4784.40	-539.20	0.00	0.00	4814.89

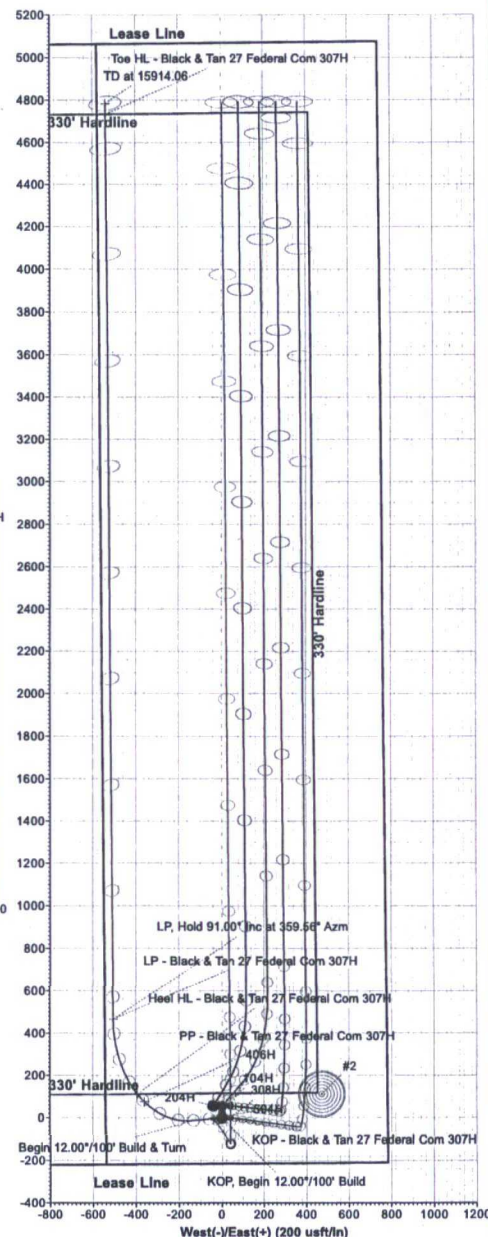
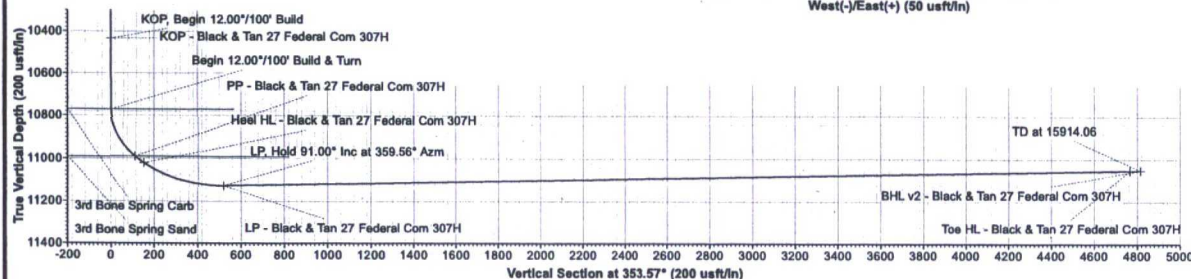
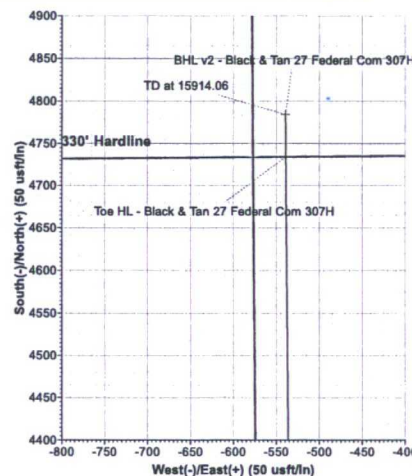
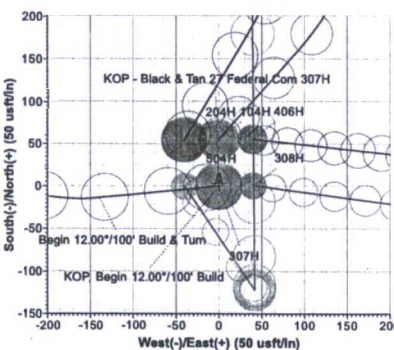
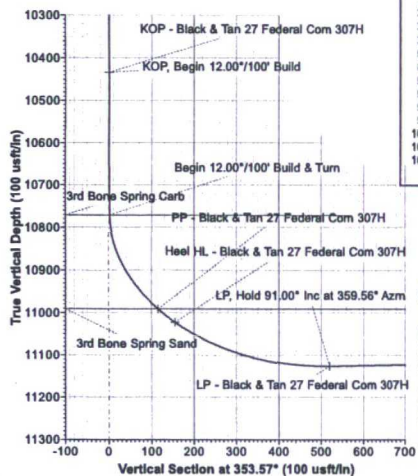
DESIGN TARGET DETAILS									
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude		
KOP - Black & Tan 27 Federal Com 307H	0.00	0.00	0.00	560155.80	785192.00	32° 32' 14.77130 N	103° 32' 31.32896 W		
KOP - Black & Tan 27 Federal Com 307H	10433.50	0.00	0.00	560155.80	785192.00	32° 32' 14.77130 N	103° 32' 31.32896 W		
PP - Black & Tan 27 Federal Com 307H	10991.00	75.36	-360.79	560231.16	784831.21	32° 32' 15.54346 N	103° 32' 35.63678 W		
Heel HL - Black & Tan 27 Federal Com 307H	11022.41	112.19	-393.06	560267.99	784798.94	32° 32' 15.91025 N	103° 32' 35.91053 W		
BHL v2 - Black & Tan 27 Federal Com 307H	11051.00	4784.40	-539.20	564940.20	784652.80	32° 33' 2.15070 N	103° 32' 37.21293 W		
Toe HL - Black & Tan 27 Federal Com 307H	11051.88	4734.30	-538.81	564890.10	784653.19	32° 33' 1.65496 N	103° 32' 37.21271 W		
LP - Black & Tan 27 Federal Com 307H	11126.41	465.89	-505.72	560621.69	784686.28	32° 32' 19.41824 N	103° 32' 37.19588 W		

FORMATION TOP DETAILS					
TVDPath	MDPath	Formation	DipAngle	DipDir	
1636.00	1636.00	Rustler			
1671.00	1671.00	Salado			
3376.00	3376.00	Tanall			
3536.00	3536.00	Yates			
3661.00	3661.00	Seven Rivers			
5681.00	5681.00	Delaware			
8576.00	8576.00	Bone Spring			
9031.00	9031.00	Avalon			
9296.00	9296.00	1st Bone Spring Carb			
9696.00	9696.00	1st Bone Spring Sand			
9961.00	9961.00	2nd Bone Spring Carb			
10236.00	10236.00	2nd Bone Spring Sand			
10771.00	10771.00	3rd Bone Spring Carb			
10991.00	11139.73	3rd Bone Spring Sand			

Geomagnetic Model: HDGM
Sample Date: 19-Aug-17
Magnetic Declination: 6.75°
Dip Angle from Horizontal: 60.52°
Magnetic Field Strength: 48303
To convert a Magnetic Direction to a Grid Direction, Add 6.32°
To convert a Magnetic Direction to a True Direction, Add 6.75° East
To convert a True Direction to a Grid Direction, Subtract 0.43°

LEGEND

- 104H, OH, Plan 1 09-08-17 V0
- 204H, OH, Plan 1 09-08-17 V0
- 308H, OH, Plan 2 09-08-17 V0
- 406H, OH, Plan 1 09-08-17 V0
- 504H, OH, Plan 1 09-08-17 V0
- #2, OH, OH V0
- Plan 2 09-08-17





Apache Corporation

**Lea County, NM (NAD83 NME)
Black & Tan 27 Federal Com
307H**

OH

Plan: Plan 2 09-08-17

Standard Planning Report

08 September, 2017



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well 307H
Company:	Apache Corporation	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Project:	Lea County, NM (NAD83 NME)	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site:	Black & Tan 27 Federal Com	North Reference:	Grid
Well:	307H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 2 09-08-17		

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Black & Tan 27 Federal Com		
Site Position:		Northing:	560,131.70 usft
From:	Map	Easting:	781,352.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 32' 14.81280 N
		Longitude:	103° 33' 16.17520 W
		Grid Convergence:	0.42 °

Well	307H		
Well Position	+N/-S	24.10 usft	Northing: 560,155.80 usft
	+E/-W	3,839.10 usft	Easting: 785,192.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 32' 14.77130 N
		Longitude:	103° 32' 31.32896 W
		Ground Level:	3,715.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	8/19/2017	6.75
			Dip Angle (°)
			60.52
			Field Strength (nT)
			48,303

Design	Plan 2 09-08-17		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			353.57

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,433.50	0.00	0.00	10,433.50	0.00	0.00	0.00	0.00	0.00	0.00	
10,808.50	45.00	264.40	10,771.12	-13.65	-139.18	12.00	12.00	0.00	264.40	
11,594.77	91.00	359.56	11,126.41	465.89	-505.72	12.00	5.85	12.10	92.94	
15,914.06	91.00	359.56	11,051.00	4,784.40	-539.20	0.00	0.00	0.00	0.00	BHL v2 - Black & T:

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well 307H
Company:	Apache Corporation	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Project:	Lea County, NM (NAD83 NME)	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site:	Black & Tan 27 Federal Com	North Reference:	Grid
Well:	307H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 2 09-08-17		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10,433.50	0.00	0.00	10,433.50	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 12.00°/100' Build									
10,500.00	7.98	264.40	10,499.79	-0.45	-4.60	0.07	12.00	12.00	0.00
10,600.00	19.98	264.40	10,596.65	-2.80	-28.60	0.42	12.00	12.00	0.00
10,700.00	31.98	264.40	10,686.38	-7.07	-72.12	1.05	12.00	12.00	0.00
10,800.00	43.98	264.40	10,765.06	-13.07	-133.25	1.94	12.00	12.00	0.00
10,808.50	45.00	264.40	10,771.12	-13.65	-139.18	2.02	12.00	12.00	0.00
Begin 12.00°/100' Build & Turn									
10,900.00	45.49	279.87	10,835.74	-11.20	-203.71	11.68	12.00	0.53	16.91
11,000.00	48.31	295.88	10,904.30	11.29	-272.68	41.75	12.00	2.82	16.01
11,100.00	53.12	310.11	10,967.80	53.50	-337.10	90.91	12.00	4.81	14.23
11,200.00	59.41	322.42	11,023.46	113.59	-394.14	157.01	12.00	6.29	12.31
11,300.00	66.70	333.12	11,068.85	188.94	-441.32	237.17	12.00	7.30	10.70
11,400.00	74.65	342.67	11,101.99	276.25	-476.58	327.88	12.00	7.94	9.54
11,500.00	82.97	351.49	11,121.42	371.70	-498.37	425.17	12.00	8.32	8.82
11,594.76	91.00	359.56	11,126.41	465.89	-505.72	519.59	12.00	8.48	8.51
LP, Hold 91.00° Inc at 359.56° Azm									
11,600.00	91.00	359.56	11,126.32	471.13	-505.76	524.80	0.01	0.01	0.01
11,700.00	91.00	359.56	11,124.57	571.11	-506.54	624.24	0.00	0.00	0.00
11,800.00	91.00	359.56	11,122.83	671.09	-507.31	723.68	0.00	0.00	0.00
11,900.00	91.00	359.56	11,121.08	771.07	-508.09	823.12	0.00	0.00	0.00
12,000.00	91.00	359.56	11,119.34	871.05	-508.86	922.56	0.00	0.00	0.00
12,100.00	91.00	359.56	11,117.59	971.03	-509.64	1,022.00	0.00	0.00	0.00
12,200.00	91.00	359.56	11,115.84	1,071.02	-510.41	1,121.44	0.00	0.00	0.00
12,300.00	91.00	359.56	11,114.10	1,171.00	-511.19	1,220.88	0.00	0.00	0.00
12,400.00	91.00	359.56	11,112.35	1,270.98	-511.96	1,320.32	0.00	0.00	0.00
12,500.00	91.00	359.56	11,110.61	1,370.96	-512.74	1,419.75	0.00	0.00	0.00
12,600.00	91.00	359.56	11,108.86	1,470.94	-513.51	1,519.19	0.00	0.00	0.00
12,700.00	91.00	359.56	11,107.12	1,570.92	-514.29	1,618.63	0.00	0.00	0.00
12,800.00	91.00	359.56	11,105.37	1,670.91	-515.06	1,718.07	0.00	0.00	0.00
12,900.00	91.00	359.56	11,103.62	1,770.89	-515.84	1,817.51	0.00	0.00	0.00
13,000.00	91.00	359.56	11,101.88	1,870.87	-516.61	1,916.95	0.00	0.00	0.00
13,100.00	91.00	359.56	11,100.13	1,970.85	-517.39	2,016.39	0.00	0.00	0.00
13,200.00	91.00	359.56	11,098.39	2,070.83	-518.16	2,115.83	0.00	0.00	0.00
13,300.00	91.00	359.56	11,096.64	2,170.82	-518.94	2,215.27	0.00	0.00	0.00
13,400.00	91.00	359.56	11,094.89	2,270.80	-519.71	2,314.71	0.00	0.00	0.00
13,500.00	91.00	359.56	11,093.15	2,370.78	-520.49	2,414.15	0.00	0.00	0.00
13,600.00	91.00	359.56	11,091.40	2,470.76	-521.26	2,513.59	0.00	0.00	0.00
13,700.00	91.00	359.56	11,089.66	2,570.74	-522.04	2,613.03	0.00	0.00	0.00
13,800.00	91.00	359.56	11,087.91	2,670.72	-522.81	2,712.47	0.00	0.00	0.00
13,900.00	91.00	359.56	11,086.16	2,770.71	-523.59	2,811.91	0.00	0.00	0.00
14,000.00	91.00	359.56	11,084.42	2,870.69	-524.36	2,911.35	0.00	0.00	0.00
14,100.00	91.00	359.56	11,082.67	2,970.67	-525.14	3,010.79	0.00	0.00	0.00
14,200.00	91.00	359.56	11,080.93	3,070.65	-525.91	3,110.23	0.00	0.00	0.00
14,300.00	91.00	359.56	11,079.18	3,170.63	-526.69	3,209.67	0.00	0.00	0.00
14,400.00	91.00	359.56	11,077.43	3,270.61	-527.46	3,309.11	0.00	0.00	0.00
14,500.00	91.00	359.56	11,075.69	3,370.60	-528.24	3,408.55	0.00	0.00	0.00
14,600.00	91.00	359.56	11,073.94	3,470.58	-529.01	3,507.99	0.00	0.00	0.00
14,700.00	91.00	359.56	11,072.20	3,570.56	-529.79	3,607.43	0.00	0.00	0.00
14,800.00	91.00	359.56	11,070.45	3,670.54	-530.56	3,706.87	0.00	0.00	0.00
14,900.00	91.00	359.56	11,068.70	3,770.52	-531.34	3,806.31	0.00	0.00	0.00
15,000.00	91.00	359.56	11,066.96	3,870.51	-532.12	3,905.75	0.00	0.00	0.00

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well 307H
Company:	Apache Corporation	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Project:	Lea County, NM (NAD83 NME)	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site:	Black & Tan 27 Federal Com	North Reference:	Grid
Well:	307H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 2 09-08-17		

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)
15,100.00	91.00	359.56	11,065.21	3,970.49	-532.89	4,005.19	0.00	0.00	0.00
15,200.00	91.00	359.56	11,063.47	4,070.47	-533.67	4,104.63	0.00	0.00	0.00
15,300.00	91.00	359.56	11,061.72	4,170.45	-534.44	4,204.07	0.00	0.00	0.00
15,400.00	91.00	359.56	11,059.98	4,270.43	-535.22	4,303.51	0.00	0.00	0.00
15,500.00	91.00	359.56	11,058.23	4,370.41	-535.99	4,402.95	0.00	0.00	0.00
15,600.00	91.00	359.56	11,056.48	4,470.40	-536.77	4,502.39	0.00	0.00	0.00
15,700.00	91.00	359.56	11,054.74	4,570.38	-537.54	4,601.83	0.00	0.00	0.00
15,800.00	91.00	359.56	11,052.99	4,670.36	-538.32	4,701.27	0.00	0.00	0.00
15,900.00	91.00	359.56	11,051.25	4,770.34	-539.09	4,800.71	0.00	0.00	0.00
15,914.06	91.00	359.56	11,051.00	4,784.40	-539.20	4,814.69	0.00	0.00	0.00
TD at 15914.06									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL - Black & Tan 27	0.00	0.00	0.00	0.00	0.00	560,155.80	785,192.00	32° 32' 14.77130 N 03° 32' 31.32896 W	
- plan hits target center									
- Point									
KOP - Black & Tan 27	0.00	0.00	10,433.50	0.00	0.00	560,155.80	785,192.00	32° 32' 14.77130 N 03° 32' 31.32896 W	
- plan hits target center									
- Point									
PP - Black & Tan 27 F	0.00	0.00	10,991.00	75.36	-360.79	560,231.16	784,831.21	32° 32' 15.54346 N 03° 32' 35.53678 W	
- plan misses target center by 0.02usft at 11139.71usft MD (10990.99 TVD, 75.35 N, -360.78 E)									
- Point									
Heel HL - Black & Tan	0.00	0.00	11,022.41	112.19	-393.06	560,267.99	784,798.94	32° 32' 15.91025 N 03° 32' 35.91053 W	
- plan misses target center by 0.01usft at 11197.94usft MD (11022.42 TVD, 112.19 N, -393.06 E)									
- Point									
BHL v2 - Black & Tan	0.00	0.00	11,051.00	4,784.40	-539.20	564,940.20	784,652.80	32° 33' 2.15070 N 03° 32' 37.21293 W	
- plan hits target center									
- Point									
Toe HL - Black & Tan	0.00	0.00	11,051.88	4,734.30	-538.81	564,890.10	784,653.19	32° 33' 1.65496 N 03° 32' 37.21271 W	
- plan hits target center									
- Point									
LP - Black & Tan 27 F	0.00	0.00	11,126.41	465.89	-505.72	560,621.69	784,686.28	32° 32' 19.41824 N 03° 32' 37.19588 W	
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,700.00	1,700.00	Surface	13-3/8	17-1/2
5,780.00	5,780.00	Intermediate	9-5/8	12-1/4

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well 307H
Company:	Apache Corporation	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Project:	Lea County, NM (NAD83 NME)	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site:	Black & Tan 27 Federal Com	North Reference:	Grid
Well:	307H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 2 09-08-17		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,636.00	1,636.00	Rustler			
1,971.00	1,971.00	Salado			
3,376.00	3,376.00	Tansill			
3,536.00	3,536.00	Yates			
3,661.00	3,661.00	Seven Rivers			
5,681.00	5,681.00	Delaware			
8,576.00	8,576.00	Bone Spring			
9,031.00	9,031.00	Avalon			
9,296.00	9,296.00	1st Bone Spring Carb			
9,696.00	9,696.00	1st Bone Spring Sand			
9,961.00	9,961.00	2nd Bone Spring Carb			
10,236.00	10,236.00	2nd Bone Spring Sand			
10,808.33	10,771.00	3rd Bone Spring Carb			
11,139.73	10,991.00	3rd Bone Spring Sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,433.50	10,433.50	0.00	0.00	KOP, Begin 12.00°/100' Build
10,808.50	10,771.12	-13.65	-139.18	Begin 12.00°/100' Build & Turn
11,594.76	11,126.41	465.89	-505.72	LP, Hold 91.00° Inc at 359.56° Azm
15,914.06	11,051.00	4,784.40	-539.20	TD at 15914.06



Apache Corporation

**Lea County, NM (NAD83 NME)
Black & Tan 27 Federal Com
307H**

**OH
Plan 2 09-08-17**

Anticollision Report

08 September, 2017



Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Reference	Plan 2 09-08-17		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCSWA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 u	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 9/8/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	10,433.50	Plan 2 09-08-17 (OH)	NS-GYRO-MS	North sensing gyrocompassing m/s
10,433.50	15,914.06	Plan 2 09-08-17 (OH)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Black & Tan 27 Federal Com						
104H - OH - Plan 1 09-08-17	9,148.87	9,148.87	55.10	6.86	1.142	Level 2, CC, ES, SF
204H - OH - Plan 1 09-08-17	10,014.42	10,014.42	68.20	15.37	1.291	Level 3, CC, ES, SF
308H - OH - Plan 2 09-08-17	5,857.81	5,858.81	40.00	9.24	1.300	Level 3, CC
308H - OH - Plan 2 09-08-17	5,900.00	5,900.86	40.04	9.07	1.293	Level 3, ES, SF
406H - OH - Plan 1 09-08-17	6,500.00	6,500.00	67.97	33.80	1.989	CC
406H - OH - Plan 1 09-08-17	6,600.00	6,599.41	68.40	33.78	1.976	ES, SF
504H - OH - Plan 1 09-08-17	6,384.88	6,385.54	33.40	1.14	1.035	Level 2, CC
504H - OH - Plan 1 09-08-17	6,400.00	6,400.59	33.42	1.13	1.035	Level 2, ES, SF
Fletcher A De Federal						
#2 - OH - OH	3,700.00	3,672.71	484.27	366.06	4.097	CC, ES
#2 - OH - OH	3,800.00	3,705.00	488.98	369.54	4.094	SF

Offset Design											
Black & Tan 27 Federal Com - 104H - OH - Plan 1 09-08-17											
Survey Program: 0-NS-GYRO-MS, 9165-MWD+HDGM											
Reference	Offset	Semi Major Axis		Distance							
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)
0.00	0.00	0.00	0.00	0.00	0.00	-0.63	55.10	-0.61	55.10		
100.00	100.00	100.00	100.00	0.10	0.10	-0.63	55.10	-0.61	55.10	54.90	0.20
200.00	200.00	200.00	200.00	0.36	0.36	-0.63	55.10	-0.61	55.10	54.37	0.73
300.00	300.00	300.00	300.00	0.63	0.63	-0.63	55.10	-0.61	55.10	53.84	1.26
400.00	400.00	400.00	400.00	0.89	0.89	-0.63	55.10	-0.61	55.10	53.31	1.79
500.00	500.00	500.00	500.00	1.16	1.16	-0.63	55.10	-0.61	55.10	52.78	2.32
600.00	600.00	600.00	600.00	1.43	1.43	-0.63	55.10	-0.61	55.10	52.25	2.85
700.00	700.00	700.00	700.00	1.69	1.69	-0.63	55.10	-0.61	55.10	51.72	3.38
800.00	800.00	800.00	800.00	1.96	1.96	-0.63	55.10	-0.61	55.10	51.19	3.91
900.00	900.00	900.00	900.00	2.22	2.22	-0.63	55.10	-0.61	55.10	50.66	4.44
1,000.00	1,000.00	1,000.00	1,000.00	2.49	2.49	-0.63	55.10	-0.61	55.10	50.13	4.97
1,100.00	1,100.00	1,100.00	1,100.00	2.75	2.75	-0.63	55.10	-0.61	55.10	49.59	5.51
1,200.00	1,200.00	1,200.00	1,200.00	3.02	3.02	-0.63	55.10	-0.61	55.10	49.06	6.04
1,300.00	1,300.00	1,300.00	1,300.00	3.28	3.28	-0.63	55.10	-0.61	55.10	48.53	6.57
1,400.00	1,400.00	1,400.00	1,400.00	3.55	3.55	-0.63	55.10	-0.61	55.10	48.00	7.10

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 104H - OH - Plan 1 09-08-17													Offset Site Error: 0.00 usft
Survey Program: 0-NS-GYRO-MS, 9165-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,500.00	1,500.00	1,500.00	1,500.00	3.81	3.81	-0.63	55.10	-0.61	55.10	47.47	7.63	7.222	
1,600.00	1,600.00	1,600.00	1,600.00	4.08	4.08	-0.63	55.10	-0.61	55.10	46.94	8.16	6.753	
1,700.00	1,700.00	1,700.00	1,700.00	4.35	4.35	-0.63	55.10	-0.61	55.10	46.41	8.69	6.340	
1,800.00	1,800.00	1,800.00	1,800.00	4.61	4.61	-0.63	55.10	-0.61	55.10	45.88	9.22	5.975	
1,900.00	1,900.00	1,900.00	1,900.00	4.88	4.88	-0.63	55.10	-0.61	55.10	45.35	9.75	5.650	
2,000.00	2,000.00	2,000.00	2,000.00	5.14	5.14	-0.63	55.10	-0.61	55.10	44.82	10.28	5.358	
2,100.00	2,100.00	2,100.00	2,100.00	5.41	5.41	-0.63	55.10	-0.61	55.10	44.29	10.81	5.095	
2,200.00	2,200.00	2,200.00	2,200.00	5.67	5.67	-0.63	55.10	-0.61	55.10	43.75	11.35	4.857	
2,300.00	2,300.00	2,300.00	2,300.00	5.94	5.94	-0.63	55.10	-0.61	55.10	43.22	11.88	4.640	
2,400.00	2,400.00	2,400.00	2,400.00	6.20	6.20	-0.63	55.10	-0.61	55.10	42.69	12.41	4.441	
2,500.00	2,500.00	2,500.00	2,500.00	6.47	6.47	-0.63	55.10	-0.61	55.10	42.16	12.94	4.259	
2,600.00	2,600.00	2,600.00	2,600.00	6.73	6.73	-0.63	55.10	-0.61	55.10	41.63	13.47	4.091	
2,700.00	2,700.00	2,700.00	2,700.00	7.00	7.00	-0.63	55.10	-0.61	55.10	41.10	14.00	3.936	
2,800.00	2,800.00	2,800.00	2,800.00	7.27	7.27	-0.63	55.10	-0.61	55.10	40.57	14.53	3.792	
2,900.00	2,900.00	2,900.00	2,900.00	7.53	7.53	-0.63	55.10	-0.61	55.10	40.04	15.06	3.658	
3,000.00	3,000.00	3,000.00	3,000.00	7.80	7.80	-0.63	55.10	-0.61	55.10	39.51	15.59	3.534	
3,100.00	3,100.00	3,100.00	3,100.00	8.06	8.06	-0.63	55.10	-0.61	55.10	38.98	16.12	3.417	
3,200.00	3,200.00	3,200.00	3,200.00	8.33	8.33	-0.63	55.10	-0.61	55.10	38.45	16.65	3.308	
3,300.00	3,300.00	3,300.00	3,300.00	8.59	8.59	-0.63	55.10	-0.61	55.10	37.91	17.18	3.206	
3,400.00	3,400.00	3,400.00	3,400.00	8.86	8.86	-0.63	55.10	-0.61	55.10	37.38	17.72	3.110	
3,500.00	3,500.00	3,500.00	3,500.00	9.12	9.12	-0.63	55.10	-0.61	55.10	36.85	18.25	3.020	
3,600.00	3,600.00	3,600.00	3,600.00	9.39	9.39	-0.63	55.10	-0.61	55.10	36.32	18.78	2.934	
3,700.00	3,700.00	3,700.00	3,700.00	9.65	9.65	-0.63	55.10	-0.61	55.10	35.79	19.31	2.854	
3,800.00	3,800.00	3,800.00	3,800.00	9.92	9.92	-0.63	55.10	-0.61	55.10	35.26	19.84	2.777	
3,900.00	3,900.00	3,900.00	3,900.00	10.19	10.19	-0.63	55.10	-0.61	55.10	34.73	20.37	2.705	
4,000.00	4,000.00	4,000.00	4,000.00	10.45	10.45	-0.63	55.10	-0.61	55.10	34.20	20.90	2.636	
4,100.00	4,100.00	4,100.00	4,100.00	10.72	10.72	-0.63	55.10	-0.61	55.10	33.67	21.43	2.571	
4,200.00	4,200.00	4,200.00	4,200.00	10.98	10.98	-0.63	55.10	-0.61	55.10	33.14	21.96	2.509	
4,300.00	4,300.00	4,300.00	4,300.00	11.25	11.25	-0.63	55.10	-0.61	55.10	32.61	22.49	2.450	
4,400.00	4,400.00	4,400.00	4,400.00	11.51	11.51	-0.63	55.10	-0.61	55.10	32.08	23.02	2.393	
4,500.00	4,500.00	4,500.00	4,500.00	11.78	11.78	-0.63	55.10	-0.61	55.10	31.54	23.56	2.339	
4,600.00	4,600.00	4,600.00	4,600.00	12.04	12.04	-0.63	55.10	-0.61	55.10	31.01	24.09	2.288	
4,700.00	4,700.00	4,700.00	4,700.00	12.31	12.31	-0.63	55.10	-0.61	55.10	30.48	24.62	2.238	
4,800.00	4,800.00	4,800.00	4,800.00	12.57	12.57	-0.63	55.10	-0.61	55.10	29.95	25.15	2.191	
4,900.00	4,900.00	4,900.00	4,900.00	12.84	12.84	-0.63	55.10	-0.61	55.10	29.42	25.68	2.146	
5,000.00	5,000.00	5,000.00	5,000.00	13.11	13.11	-0.63	55.10	-0.61	55.10	28.89	26.21	2.102	
5,100.00	5,100.00	5,100.00	5,100.00	13.37	13.37	-0.63	55.10	-0.61	55.10	28.36	26.74	2.060	
5,200.00	5,200.00	5,200.00	5,200.00	13.64	13.64	-0.63	55.10	-0.61	55.10	27.83	27.27	2.020	
5,300.00	5,300.00	5,300.00	5,300.00	13.90	13.90	-0.63	55.10	-0.61	55.10	27.30	27.80	1.982	
5,400.00	5,400.00	5,400.00	5,400.00	14.17	14.17	-0.63	55.10	-0.61	55.10	26.77	28.33	1.945	
5,500.00	5,500.00	5,500.00	5,500.00	14.43	14.43	-0.63	55.10	-0.61	55.10	26.24	28.86	1.909	
5,600.00	5,600.00	5,600.00	5,600.00	14.70	14.70	-0.63	55.10	-0.61	55.10	25.70	29.40	1.874	
5,700.00	5,700.00	5,700.00	5,700.00	14.96	14.96	-0.63	55.10	-0.61	55.10	25.17	29.93	1.841	
5,800.00	5,800.00	5,800.00	5,800.00	15.23	15.23	-0.63	55.10	-0.61	55.10	24.64	30.46	1.809	
5,900.00	5,900.00	5,900.00	5,900.00	15.49	15.49	-0.63	55.10	-0.61	55.10	24.11	30.99	1.778	
6,000.00	6,000.00	6,000.00	6,000.00	15.76	15.76	-0.63	55.10	-0.61	55.10	23.58	31.52	1.748	
6,100.00	6,100.00	6,100.00	6,100.00	16.02	16.02	-0.63	55.10	-0.61	55.10	23.05	32.05	1.719	
6,200.00	6,200.00	6,200.00	6,200.00	16.29	16.29	-0.63	55.10	-0.61	55.10	22.52	32.58	1.691	
6,300.00	6,300.00	6,300.00	6,300.00	16.56	16.56	-0.63	55.10	-0.61	55.10	21.99	33.11	1.664	
6,400.00	6,400.00	6,400.00	6,400.00	16.82	16.82	-0.63	55.10	-0.61	55.10	21.46	33.64	1.638	
6,500.00	6,500.00	6,500.00	6,500.00	17.09	17.09	-0.63	55.10	-0.61	55.10	20.93	34.17	1.612	
6,600.00	6,600.00	6,600.00	6,600.00	17.35	17.35	-0.63	55.10	-0.61	55.10	20.40	34.70	1.588	

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 104H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9165-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 +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,700.00	6,700.00	6,700.00	6,700.00	17.62	17.62	-0.63	55.10	-0.61	55.10	19.86	35.24	1.564		
6,800.00	6,800.00	6,800.00	6,800.00	17.88	17.88	-0.63	55.10	-0.61	55.10	19.33	35.77	1.541		
6,900.00	6,900.00	6,900.00	6,900.00	18.15	18.15	-0.63	55.10	-0.61	55.10	18.80	36.30	1.518		
7,000.00	7,000.00	7,000.00	7,000.00	18.41	18.41	-0.63	55.10	-0.61	55.10	18.27	36.83	1.496 Level 3		
7,100.00	7,100.00	7,100.00	7,100.00	18.68	18.68	-0.63	55.10	-0.61	55.10	17.74	37.36	1.475 Level 3		
7,200.00	7,200.00	7,200.00	7,200.00	18.94	18.94	-0.63	55.10	-0.61	55.10	17.21	37.89	1.454 Level 3		
7,300.00	7,300.00	7,300.00	7,300.00	19.21	19.21	-0.63	55.10	-0.61	55.10	16.68	38.42	1.434 Level 3		
7,400.00	7,400.00	7,400.00	7,400.00	19.48	19.48	-0.63	55.10	-0.61	55.10	16.15	38.95	1.415 Level 3		
7,500.00	7,500.00	7,500.00	7,500.00	19.74	19.74	-0.63	55.10	-0.61	55.10	15.62	39.48	1.396 Level 3		
7,600.00	7,600.00	7,600.00	7,600.00	20.01	20.01	-0.63	55.10	-0.61	55.10	15.09	40.01	1.377 Level 3		
7,700.00	7,700.00	7,700.00	7,700.00	20.27	20.27	-0.63	55.10	-0.61	55.10	14.56	40.54	1.359 Level 3		
7,800.00	7,800.00	7,800.00	7,800.00	20.54	20.54	-0.63	55.10	-0.61	55.10	14.02	41.08	1.341 Level 3		
7,900.00	7,900.00	7,900.00	7,900.00	20.80	20.80	-0.63	55.10	-0.61	55.10	13.49	41.61	1.324 Level 3		
8,000.00	8,000.00	8,000.00	8,000.00	21.07	21.07	-0.63	55.10	-0.61	55.10	12.96	42.14	1.308 Level 3		
8,100.00	8,100.00	8,100.00	8,100.00	21.33	21.33	-0.63	55.10	-0.61	55.10	12.43	42.67	1.291 Level 3		
8,200.00	8,200.00	8,200.00	8,200.00	21.60	21.60	-0.63	55.10	-0.61	55.10	11.90	43.20	1.275 Level 3		
8,300.00	8,300.00	8,300.00	8,300.00	21.86	21.86	-0.63	55.10	-0.61	55.10	11.37	43.73	1.260 Level 3		
8,400.00	8,400.00	8,400.00	8,400.00	22.13	22.13	-0.63	55.10	-0.61	55.10	10.84	44.26	1.245 Level 2		
8,500.00	8,500.00	8,500.00	8,500.00	22.40	22.40	-0.63	55.10	-0.61	55.10	10.31	44.79	1.230 Level 2		
8,600.00	8,600.00	8,600.00	8,600.00	22.66	22.66	-0.63	55.10	-0.61	55.10	9.78	45.32	1.216 Level 2		
8,700.00	8,700.00	8,700.00	8,700.00	22.93	22.93	-0.63	55.10	-0.61	55.10	9.25	45.85	1.202 Level 2		
8,800.00	8,800.00	8,800.00	8,800.00	23.19	23.19	-0.63	55.10	-0.61	55.10	8.72	46.38	1.188 Level 2		
8,900.00	8,900.00	8,900.00	8,900.00	23.46	23.46	-0.63	55.10	-0.61	55.10	8.18	46.91	1.174 Level 2		
9,000.00	9,000.00	9,000.00	9,000.00	23.72	23.72	-0.63	55.10	-0.61	55.10	7.65	47.45	1.161 Level 2		
9,100.00	9,100.00	9,100.00	9,100.00	23.99	23.99	-0.63	55.10	-0.61	55.10	7.12	47.98	1.148 Level 2		
9,148.87	9,148.87	9,148.87	9,148.87	24.12	24.12	-0.63	55.10	-0.61	55.10	6.86	48.24	1.142 Level 2, CC, ES, SF		
9,200.00	9,200.00	9,197.20	9,197.18	24.25	24.18	0.12	55.91	0.12	55.98	7.55	48.43	1.156 Level 2		
9,300.00	9,300.00	9,286.68	9,285.37	24.52	24.19	8.25	66.61	9.65	68.88	20.18	48.70	1.414 Level 3		
9,400.00	9,400.00	9,368.28	9,362.20	24.78	24.21	17.71	86.92	27.75	98.76	49.79	48.98	2.017		
9,500.00	9,500.00	9,439.01	9,424.22	25.05	24.23	24.14	112.21	50.28	144.44	95.17	49.27	2.932		
9,600.00	9,600.00	9,500.00	9,473.18	25.32	24.26	28.11	139.30	74.42	202.55	152.98	49.57	4.086		
9,700.00	9,700.00	9,548.44	9,508.55	25.58	24.30	30.44	164.03	96.37	269.90	220.01	49.88	5.410		
9,800.00	9,800.00	9,594.82	9,539.92	25.85	24.37	31.53	191.06	117.23	343.35	293.14	50.21	6.838		
9,900.00	9,900.00	9,635.03	9,565.24	26.11	24.43	31.67	217.36	134.06	421.05	370.51	50.54	8.331		
10,000.00	10,000.00	9,675.00	9,588.50	26.38	24.51	31.30	245.94	149.51	502.17	451.29	50.88	9.869		
10,100.00	10,100.00	9,700.00	9,602.00	26.64	24.56	30.88	264.97	158.48	585.94	534.74	51.20	11.444		
10,200.00	10,200.00	9,725.00	9,614.66	26.91	24.61	30.37	284.82	166.88	672.00	620.48	51.52	13.043		
10,300.00	10,300.00	9,750.00	9,626.44	27.17	24.67	29.77	305.43	174.69	759.93	708.08	51.85	14.657		
10,400.00	10,400.00	9,775.00	9,637.31	27.44	24.74	29.10	326.76	181.90	849.45	797.27	52.18	16.280		
10,500.00	10,499.79	9,784.68	9,641.26	27.55	24.76	107.52	335.20	184.52	941.00	889.03	51.98	18.104		
10,600.00	10,596.65	9,800.00	9,647.23	27.57	24.80	74.83	348.74	188.47	1,035.42	983.37	52.05	19.892		
10,700.00	10,686.38	9,800.00	9,647.23	27.60	24.80	47.53	348.74	188.47	1,128.87	1,079.23	49.64	22.742		
10,800.00	10,765.06	9,800.00	9,647.23	27.67	24.80	32.28	348.74	188.47	1,218.17	1,173.38	44.79	27.196		
10,900.00	10,835.74	9,810.74	9,651.20	27.82	24.83	35.01	358.38	191.10	1,302.16	1,257.17	44.98	28.947		
11,000.00	10,904.30	9,825.00	9,656.18	28.05	24.88	34.89	371.32	194.39	1,380.43	1,336.11	44.32	31.148		
11,100.00	10,967.80	9,837.29	9,660.22	28.33	24.91	32.70	382.61	197.06	1,450.32	1,407.72	42.60	34.044		
11,200.00	11,023.46	9,859.35	9,666.85	28.65	24.98	30.53	403.19	201.45	1,509.63	1,469.27	40.37	37.399		
11,300.00	11,068.85	9,886.59	9,673.95	29.01	25.06	28.76	429.07	206.13	1,566.48	1,518.51	37.97	40.992		
11,400.00	11,101.99	9,925.00	9,681.84	29.38	25.19	27.62	466.29	211.32	1,589.39	1,553.44	35.94	44.221		
11,500.00	11,121.42	9,950.00	9,685.63	29.74	25.28	26.84	490.87	213.79	1,607.14	1,572.52	34.62	46.424		
11,600.00	11,126.32	9,990.07	9,689.45	30.08	25.42	26.71	530.67	216.27	1,609.18	1,574.65	34.53	46.604		
11,700.00	11,124.57	10,027.57	9,690.50	30.42	25.56	26.77	568.14	216.90	1,606.22	1,571.30	34.92	46.000		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 104H - OH - Plan 1 09-08-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 9165-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 +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
11,800.00	11,122.83	10,123.64	9,689.67	30.83	25.96	26.78	664.20	216.16	1,605.43	1,569.88	35.54	45.166			
11,900.00	11,121.08	10,223.63	9,688.80	31.30	26.45	26.80	764.19	215.39	1,604.65	1,568.39	36.26	44.256			
12,000.00	11,119.34	10,323.63	9,687.93	31.83	27.00	26.81	864.18	214.62	1,603.87	1,566.80	37.07	43.269			
12,100.00	11,117.59	10,423.63	9,687.06	32.42	27.62	26.83	964.17	213.85	1,603.09	1,565.13	37.96	42.236			
12,200.00	11,115.84	10,523.62	9,686.20	33.07	28.30	26.84	1,064.16	213.08	1,602.31	1,563.39	38.92	41.171			
12,300.00	11,114.10	10,623.62	9,685.33	33.76	29.04	26.85	1,164.15	212.31	1,601.53	1,561.58	39.95	40.087			
12,400.00	11,112.35	10,723.62	9,684.46	34.51	29.83	26.87	1,264.14	211.54	1,600.75	1,559.70	41.05	38.997			
12,500.00	11,110.61	10,823.61	9,683.59	35.31	30.67	26.88	1,364.13	210.77	1,599.97	1,557.76	42.20	37.910			
12,600.00	11,108.86	10,923.61	9,682.72	36.14	31.55	26.90	1,464.12	210.00	1,599.19	1,555.77	43.41	36.835			
12,700.00	11,107.12	11,023.60	9,681.85	37.01	32.48	26.91	1,564.11	209.23	1,598.41	1,553.73	44.68	35.778			
12,800.00	11,105.37	11,123.60	9,680.98	37.93	33.44	26.93	1,664.10	208.46	1,597.63	1,551.65	45.98	34.744			
12,900.00	11,103.62	11,223.60	9,680.11	38.87	34.43	26.94	1,764.08	207.69	1,596.85	1,549.52	47.33	33.737			
13,000.00	11,101.88	11,323.59	9,679.24	39.84	35.46	26.95	1,864.07	206.92	1,596.07	1,547.35	48.72	32.760			
13,100.00	11,100.13	11,423.59	9,678.37	40.85	36.51	26.97	1,964.06	206.15	1,595.29	1,545.15	50.14	31.815			
13,200.00	11,098.39	11,523.58	9,677.50	41.88	37.59	26.98	2,064.05	205.38	1,594.51	1,542.91	51.60	30.902			
13,300.00	11,096.64	11,623.58	9,676.63	42.93	38.69	27.00	2,164.04	204.61	1,593.73	1,540.65	53.09	30.022			
13,400.00	11,094.89	11,723.58	9,675.76	44.01	39.82	27.01	2,264.03	203.84	1,592.96	1,538.35	54.60	29.175			
13,500.00	11,093.15	11,823.57	9,674.90	45.10	40.97	27.03	2,364.02	203.07	1,592.18	1,536.04	56.14	28.361			
13,600.00	11,091.40	11,923.57	9,674.03	46.22	42.13	27.04	2,464.01	202.30	1,591.40	1,533.69	57.70	27.579			
13,700.00	11,089.66	12,023.57	9,673.16	47.36	43.31	27.06	2,564.00	201.53	1,590.62	1,531.33	59.29	26.828			
13,800.00	11,087.91	12,123.56	9,672.29	48.51	44.51	27.07	2,663.99	200.76	1,589.84	1,528.95	60.89	26.108			
13,900.00	11,086.16	12,223.56	9,671.42	49.67	45.72	27.09	2,763.98	199.99	1,589.06	1,526.54	62.52	25.418			
14,000.00	11,084.42	12,323.55	9,670.55	50.86	46.95	27.10	2,863.97	199.22	1,588.29	1,524.13	64.16	24.755			
14,100.00	11,082.67	12,423.55	9,669.68	52.05	48.18	27.11	2,963.96	198.45	1,587.51	1,521.69	65.82	24.120			
14,200.00	11,080.93	12,523.55	9,668.81	53.26	49.43	27.13	3,063.95	197.68	1,586.73	1,519.24	67.49	23.511			
14,300.00	11,079.18	12,623.54	9,667.94	54.48	50.69	27.14	3,163.94	196.91	1,585.95	1,516.78	69.18	22.926			
14,400.00	11,077.43	12,723.54	9,667.07	55.71	51.96	27.16	3,263.93	196.14	1,585.17	1,514.30	70.87	22.366			
14,500.00	11,075.69	12,823.53	9,666.20	56.95	53.24	27.17	3,363.92	195.37	1,584.40	1,511.81	72.59	21.828			
14,600.00	11,073.94	12,923.53	9,665.33	58.20	54.52	27.19	3,463.90	194.60	1,583.62	1,509.31	74.31	21.311			
14,700.00	11,072.20	13,023.53	9,664.46	59.46	55.81	27.20	3,563.89	193.83	1,582.84	1,506.80	76.04	20.815			
14,800.00	11,070.45	13,123.52	9,663.60	60.73	57.12	27.22	3,663.88	193.06	1,582.06	1,504.28	77.79	20.339			
14,900.00	11,068.70	13,223.52	9,662.73	62.00	58.42	27.23	3,763.87	192.29	1,581.29	1,501.75	79.54	19.881			
15,000.00	11,066.96	13,323.52	9,661.86	63.28	59.74	27.25	3,863.86	191.52	1,580.51	1,499.21	81.30	19.440			
15,100.00	11,065.21	13,423.51	9,660.99	64.57	61.06	27.26	3,963.85	190.75	1,579.73	1,496.66	83.07	19.017			
15,200.00	11,063.47	13,523.51	9,660.12	65.87	62.38	27.28	4,063.84	189.98	1,578.96	1,494.11	84.85	18.609			
15,300.00	11,061.72	13,623.50	9,659.25	67.17	63.71	27.29	4,163.83	189.21	1,578.18	1,491.55	86.63	18.217			
15,400.00	11,059.98	13,723.50	9,658.38	68.48	65.05	27.31	4,263.82	188.44	1,577.40	1,488.98	88.43	17.839			
15,500.00	11,058.23	13,823.50	9,657.51	69.79	66.39	27.32	4,363.81	187.67	1,576.63	1,486.40	90.22	17.475			
15,600.00	11,056.48	13,923.49	9,656.64	71.11	67.74	27.34	4,463.80	186.90	1,575.85	1,483.82	92.03	17.123			
15,700.00	11,054.74	14,023.49	9,655.77	72.44	69.08	27.35	4,563.79	186.13	1,575.07	1,481.23	93.84	16.785			
15,800.00	11,052.99	14,123.48	9,654.90	73.76	70.44	27.36	4,663.78	185.36	1,574.30	1,478.64	95.66	16.458			
15,900.00	11,051.25	14,223.48	9,654.03	75.10	71.79	27.38	4,763.77	184.59	1,573.52	1,476.04	97.48	16.142			
15,914.57	11,050.99	14,238.05	9,653.91	75.32	71.99	27.38	4,778.34	184.48	1,573.41	1,475.66	97.74	16.097			

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 204H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10036-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 +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-36.54	54.80	-40.60	68.20					
100.00	100.00	100.00	100.00	0.10	0.10	-36.54	54.80	-40.60	68.20	68.01	0.20	347.216		
200.00	200.00	200.00	200.00	0.36	0.36	-36.54	54.80	-40.60	68.20	67.48	0.73	93.774		
300.00	300.00	300.00	300.00	0.63	0.63	-36.54	54.80	-40.60	68.20	66.95	1.26	54.207		
400.00	400.00	400.00	400.00	0.89	0.89	-36.54	54.80	-40.60	68.20	66.41	1.79	38.122		
500.00	500.00	500.00	500.00	1.16	1.16	-36.54	54.80	-40.60	68.20	65.88	2.32	29.398		
600.00	600.00	600.00	600.00	1.43	1.43	-36.54	54.80	-40.60	68.20	65.35	2.85	23.924		
700.00	700.00	700.00	700.00	1.69	1.69	-36.54	54.80	-40.60	68.20	64.82	3.38	20.168		
800.00	800.00	800.00	800.00	1.96	1.96	-36.54	54.80	-40.60	68.20	64.29	3.91	17.432		
900.00	900.00	900.00	900.00	2.22	2.22	-36.54	54.80	-40.60	68.20	63.76	4.44	15.349		
1,000.00	1,000.00	1,000.00	1,000.00	2.49	2.49	-36.54	54.80	-40.60	68.20	63.23	4.97	13.711		
1,100.00	1,100.00	1,100.00	1,100.00	2.75	2.75	-36.54	54.80	-40.60	68.20	62.70	5.51	12.389		
1,200.00	1,200.00	1,200.00	1,200.00	3.02	3.02	-36.54	54.80	-40.60	68.20	62.17	6.04	11.299		
1,300.00	1,300.00	1,300.00	1,300.00	3.28	3.28	-36.54	54.80	-40.60	68.20	61.64	6.57	10.386		
1,400.00	1,400.00	1,400.00	1,400.00	3.55	3.55	-36.54	54.80	-40.60	68.20	61.11	7.10	9.609		
1,500.00	1,500.00	1,500.00	1,500.00	3.81	3.81	-36.54	54.80	-40.60	68.20	60.57	7.63	8.940		
1,600.00	1,600.00	1,600.00	1,600.00	4.08	4.08	-36.54	54.80	-40.60	68.20	60.04	8.16	8.359		
1,700.00	1,700.00	1,700.00	1,700.00	4.35	4.35	-36.54	54.80	-40.60	68.20	59.51	8.69	7.848		
1,800.00	1,800.00	1,800.00	1,800.00	4.61	4.61	-36.54	54.80	-40.60	68.20	58.98	9.22	7.396		
1,900.00	1,900.00	1,900.00	1,900.00	4.88	4.88	-36.54	54.80	-40.60	68.20	58.45	9.75	6.993		
2,000.00	2,000.00	2,000.00	2,000.00	5.14	5.14	-36.54	54.80	-40.60	68.20	57.92	10.28	6.632		
2,100.00	2,100.00	2,100.00	2,100.00	5.41	5.41	-36.54	54.80	-40.60	68.20	57.39	10.81	6.307		
2,200.00	2,200.00	2,200.00	2,200.00	5.67	5.67	-36.54	54.80	-40.60	68.20	56.86	11.35	6.012		
2,300.00	2,300.00	2,300.00	2,300.00	5.94	5.94	-36.54	54.80	-40.60	68.20	56.33	11.88	5.743		
2,400.00	2,400.00	2,400.00	2,400.00	6.20	6.20	-36.54	54.80	-40.60	68.20	55.80	12.41	5.497		
2,500.00	2,500.00	2,500.00	2,500.00	6.47	6.47	-36.54	54.80	-40.60	68.20	55.27	12.94	5.272		
2,600.00	2,600.00	2,600.00	2,600.00	6.73	6.73	-36.54	54.80	-40.60	68.20	54.74	13.47	5.064		
2,700.00	2,700.00	2,700.00	2,700.00	7.00	7.00	-36.54	54.80	-40.60	68.20	54.20	14.00	4.872		
2,800.00	2,800.00	2,800.00	2,800.00	7.27	7.27	-36.54	54.80	-40.60	68.20	53.67	14.53	4.694		
2,900.00	2,900.00	2,900.00	2,900.00	7.53	7.53	-36.54	54.80	-40.60	68.20	53.14	15.06	4.528		
3,000.00	3,000.00	3,000.00	3,000.00	7.80	7.80	-36.54	54.80	-40.60	68.20	52.61	15.59	4.374		
3,100.00	3,100.00	3,100.00	3,100.00	8.06	8.06	-36.54	54.80	-40.60	68.20	52.08	16.12	4.230		
3,200.00	3,200.00	3,200.00	3,200.00	8.33	8.33	-36.54	54.80	-40.60	68.20	51.55	16.65	4.095		
3,300.00	3,300.00	3,300.00	3,300.00	8.59	8.59	-36.54	54.80	-40.60	68.20	51.02	17.18	3.969		
3,400.00	3,400.00	3,400.00	3,400.00	8.86	8.86	-36.54	54.80	-40.60	68.20	50.49	17.72	3.850		
3,500.00	3,500.00	3,500.00	3,500.00	9.12	9.12	-36.54	54.80	-40.60	68.20	49.96	18.25	3.738		
3,600.00	3,600.00	3,600.00	3,600.00	9.39	9.39	-36.54	54.80	-40.60	68.20	49.43	18.78	3.632		
3,700.00	3,700.00	3,700.00	3,700.00	9.65	9.65	-36.54	54.80	-40.60	68.20	48.90	19.31	3.532		
3,800.00	3,800.00	3,800.00	3,800.00	9.92	9.92	-36.54	54.80	-40.60	68.20	48.36	19.84	3.438		
3,900.00	3,900.00	3,900.00	3,900.00	10.19	10.19	-36.54	54.80	-40.60	68.20	47.83	20.37	3.348		
4,000.00	4,000.00	4,000.00	4,000.00	10.45	10.45	-36.54	54.80	-40.60	68.20	47.30	20.90	3.263		
4,100.00	4,100.00	4,100.00	4,100.00	10.72	10.72	-36.54	54.80	-40.60	68.20	46.77	21.43	3.182		
4,200.00	4,200.00	4,200.00	4,200.00	10.98	10.98	-36.54	54.80	-40.60	68.20	46.24	21.96	3.105		
4,300.00	4,300.00	4,300.00	4,300.00	11.25	11.25	-36.54	54.80	-40.60	68.20	45.71	22.49	3.032		
4,400.00	4,400.00	4,400.00	4,400.00	11.51	11.51	-36.54	54.80	-40.60	68.20	45.18	23.02	2.962		
4,500.00	4,500.00	4,500.00	4,500.00	11.78	11.78	-36.54	54.80	-40.60	68.20	44.65	23.56	2.895		
4,600.00	4,600.00	4,600.00	4,600.00	12.04	12.04	-36.54	54.80	-40.60	68.20	44.12	24.09	2.832		
4,700.00	4,700.00	4,700.00	4,700.00	12.31	12.31	-36.54	54.80	-40.60	68.20	43.59	24.62	2.771		
4,800.00	4,800.00	4,800.00	4,800.00	12.57	12.57	-36.54	54.80	-40.60	68.20	43.06	25.15	2.712		
4,900.00	4,900.00	4,900.00	4,900.00	12.84	12.84	-36.54	54.80	-40.60	68.20	42.52	25.68	2.656		
5,000.00	5,000.00	5,000.00	5,000.00	13.11	13.11	-36.54	54.80	-40.60	68.20	41.99	26.21	2.602		
5,100.00	5,100.00	5,100.00	5,100.00	13.37	13.37	-36.54	54.80	-40.60	68.20	41.46	26.74	2.551		

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



Phoenix Technology Services LP

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 204H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10036-MWD-HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.00	5,200.00	5,200.00	5,200.00	13.64	13.64	-36.54	54.80	-40.60	68.20	40.93	27.27	2.501		
5,300.00	5,300.00	5,300.00	5,300.00	13.90	13.90	-36.54	54.80	-40.60	68.20	40.40	27.80	2.453		
5,400.00	5,400.00	5,400.00	5,400.00	14.17	14.17	-36.54	54.80	-40.60	68.20	39.87	28.33	2.407		
5,500.00	5,500.00	5,500.00	5,500.00	14.43	14.43	-36.54	54.80	-40.60	68.20	39.34	28.86	2.363		
5,600.00	5,600.00	5,600.00	5,600.00	14.70	14.70	-36.54	54.80	-40.60	68.20	38.81	29.40	2.320		
5,700.00	5,700.00	5,700.00	5,700.00	14.96	14.96	-36.54	54.80	-40.60	68.20	38.28	29.93	2.279		
5,800.00	5,800.00	5,800.00	5,800.00	15.23	15.23	-36.54	54.80	-40.60	68.20	37.75	30.46	2.239		
5,900.00	5,900.00	5,900.00	5,900.00	15.49	15.49	-36.54	54.80	-40.60	68.20	37.22	30.99	2.201		
6,000.00	6,000.00	6,000.00	6,000.00	15.76	15.76	-36.54	54.80	-40.60	68.20	36.68	31.52	2.164		
6,100.00	6,100.00	6,100.00	6,100.00	16.02	16.02	-36.54	54.80	-40.60	68.20	36.15	32.05	2.128		
6,200.00	6,200.00	6,200.00	6,200.00	16.29	16.29	-36.54	54.80	-40.60	68.20	35.62	32.58	2.093		
6,300.00	6,300.00	6,300.00	6,300.00	16.56	16.56	-36.54	54.80	-40.60	68.20	35.09	33.11	2.060		
6,400.00	6,400.00	6,400.00	6,400.00	16.82	16.82	-36.54	54.80	-40.60	68.20	34.56	33.64	2.027		
6,500.00	6,500.00	6,500.00	6,500.00	17.09	17.09	-36.54	54.80	-40.60	68.20	34.03	34.17	1.996		
6,600.00	6,600.00	6,600.00	6,600.00	17.35	17.35	-36.54	54.80	-40.60	68.20	33.50	34.70	1.965		
6,700.00	6,700.00	6,700.00	6,700.00	17.62	17.62	-36.54	54.80	-40.60	68.20	32.97	35.24	1.936		
6,800.00	6,800.00	6,800.00	6,800.00	17.88	17.88	-36.54	54.80	-40.60	68.20	32.44	35.77	1.907		
6,900.00	6,900.00	6,900.00	6,900.00	18.15	18.15	-36.54	54.80	-40.60	68.20	31.91	36.30	1.879		
7,000.00	7,000.00	7,000.00	7,000.00	18.41	18.41	-36.54	54.80	-40.60	68.20	31.38	36.83	1.852		
7,100.00	7,100.00	7,100.00	7,100.00	18.68	18.68	-36.54	54.80	-40.60	68.20	30.84	37.36	1.826		
7,200.00	7,200.00	7,200.00	7,200.00	18.94	18.94	-36.54	54.80	-40.60	68.20	30.31	37.89	1.800		
7,300.00	7,300.00	7,300.00	7,300.00	19.21	19.21	-36.54	54.80	-40.60	68.20	29.78	38.42	1.775		
7,400.00	7,400.00	7,400.00	7,400.00	19.48	19.48	-36.54	54.80	-40.60	68.20	29.25	38.95	1.751		
7,500.00	7,500.00	7,500.00	7,500.00	19.74	19.74	-36.54	54.80	-40.60	68.20	28.72	39.48	1.727		
7,600.00	7,600.00	7,600.00	7,600.00	20.01	20.01	-36.54	54.80	-40.60	68.20	28.19	40.01	1.705		
7,700.00	7,700.00	7,700.00	7,700.00	20.27	20.27	-36.54	54.80	-40.60	68.20	27.66	40.54	1.682		
7,800.00	7,800.00	7,800.00	7,800.00	20.54	20.54	-36.54	54.80	-40.60	68.20	27.13	41.08	1.660		
7,900.00	7,900.00	7,900.00	7,900.00	20.80	20.80	-36.54	54.80	-40.60	68.20	26.60	41.61	1.639		
8,000.00	8,000.00	8,000.00	8,000.00	21.07	21.07	-36.54	54.80	-40.60	68.20	26.07	42.14	1.619		
8,100.00	8,100.00	8,100.00	8,100.00	21.33	21.33	-36.54	54.80	-40.60	68.20	25.54	42.67	1.598		
8,200.00	8,200.00	8,200.00	8,200.00	21.60	21.60	-36.54	54.80	-40.60	68.20	25.01	43.20	1.579		
8,300.00	8,300.00	8,300.00	8,300.00	21.86	21.86	-36.54	54.80	-40.60	68.20	24.47	43.73	1.560		
8,400.00	8,400.00	8,400.00	8,400.00	22.13	22.13	-36.54	54.80	-40.60	68.20	23.94	44.26	1.541		
8,500.00	8,500.00	8,500.00	8,500.00	22.40	22.40	-36.54	54.80	-40.60	68.20	23.41	44.79	1.523		
8,600.00	8,600.00	8,600.00	8,600.00	22.66	22.66	-36.54	54.80	-40.60	68.20	22.88	45.32	1.505		
8,700.00	8,700.00	8,700.00	8,700.00	22.93	22.93	-36.54	54.80	-40.60	68.20	22.35	45.85	1.487 Level 3		
8,800.00	8,800.00	8,800.00	8,800.00	23.19	23.19	-36.54	54.80	-40.60	68.20	21.82	46.38	1.470 Level 3		
8,900.00	8,900.00	8,900.00	8,900.00	23.46	23.46	-36.54	54.80	-40.60	68.20	21.29	46.91	1.454 Level 3		
9,000.00	9,000.00	9,000.00	9,000.00	23.72	23.72	-36.54	54.80	-40.60	68.20	20.76	47.45	1.438 Level 3		
9,100.00	9,100.00	9,100.00	9,100.00	23.99	23.99	-36.54	54.80	-40.60	68.20	20.23	47.98	1.422 Level 3		
9,200.00	9,200.00	9,200.00	9,200.00	24.25	24.25	-36.54	54.80	-40.60	68.20	19.70	48.51	1.406 Level 3		
9,300.00	9,300.00	9,300.00	9,300.00	24.52	24.52	-36.54	54.80	-40.60	68.20	19.17	49.04	1.391 Level 3		
9,400.00	9,400.00	9,400.00	9,400.00	24.78	24.78	-36.54	54.80	-40.60	68.20	18.63	49.57	1.376 Level 3		
9,500.00	9,500.00	9,500.00	9,500.00	25.05	25.05	-36.54	54.80	-40.60	68.20	18.10	50.10	1.361 Level 3		
9,600.00	9,600.00	9,600.00	9,600.00	25.32	25.32	-36.54	54.80	-40.60	68.20	17.57	50.63	1.347 Level 3		
9,700.00	9,700.00	9,700.00	9,700.00	25.58	25.58	-36.54	54.80	-40.60	68.20	17.04	51.16	1.333 Level 3		
9,800.00	9,800.00	9,800.00	9,800.00	25.85	25.85	-36.54	54.80	-40.60	68.20	16.51	51.69	1.319 Level 3		
9,900.00	9,900.00	9,900.00	9,900.00	26.11	26.11	-36.54	54.80	-40.60	68.20	15.98	52.22	1.306 Level 3		
10,000.00	10,000.00	10,000.00	10,000.00	26.38	26.38	-36.54	54.80	-40.60	68.20	15.45	52.75	1.293 Level 3		
10,014.42	10,014.42	10,014.42	10,014.42	26.42	26.42	-36.54	54.80	-40.60	68.20	15.37	52.83	1.291 Level 3, CC, ES, SF		
10,100.00	10,100.00	10,096.33	10,096.17	26.64	26.49	-33.80	58.12	-38.61	69.88	16.74	53.14	1.315 Level 3		
10,200.00	10,200.00	10,186.27	10,183.77	26.91	26.51	-20.76	75.03	-28.45	81.87	28.46	53.41	1.533		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 204H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10036-MWD+HDGM													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		
10,300.00	10,300.00	10,266.44	10,257.54	27.17	26.53	-6.95	101.75	-12.40	110.95	57.25	53.69	2.066		
10,400.00	10,400.00	10,334.67	10,315.48	27.44	26.55	2.64	132.55	6.11	157.32	103.34	53.98	2.914		
10,500.00	10,499.79	10,389.85	10,358.21	27.55	26.58	98.69	162.43	24.07	217.71	163.58	54.12	4.022		
10,600.00	10,596.65	10,429.43	10,386.30	27.57	26.61	92.51	186.44	38.21	290.73	236.57	54.16	5.368		
10,700.00	10,686.38	10,456.55	10,404.44	27.60	26.64	81.19	204.30	47.54	372.14	318.08	54.06	6.884		
10,800.00	10,765.06	10,475.00	10,416.25	27.67	26.67	66.37	217.11	53.62	457.78	405.16	52.62	8.699		
10,900.00	10,835.74	10,486.01	10,423.09	27.82	26.68	62.82	224.99	57.13	542.32	490.17	52.15	10.399		
11,000.00	10,904.30	10,507.22	10,435.80	28.05	26.71	58.65	240.66	63.66	620.68	569.29	51.39	12.077		
11,100.00	10,967.80	10,536.18	10,452.13	28.33	26.76	54.20	263.05	72.05	690.82	640.68	50.14	13.779		
11,200.00	11,023.46	10,575.00	10,472.08	28.65	26.83	50.67	294.73	82.28	750.88	702.25	48.62	15.443		
11,300.00	11,068.85	10,618.10	10,491.47	29.01	26.92	48.08	331.91	92.20	799.04	751.99	47.05	16.982		
11,400.00	11,101.99	10,675.00	10,512.37	29.38	27.05	46.77	383.71	102.85	833.63	787.73	45.90	18.162		
11,500.00	11,121.42	10,730.82	10,527.42	29.74	27.20	46.21	436.88	110.48	853.10	807.80	45.31	18.830		
11,600.00	11,126.32	10,795.46	10,537.83	30.08	27.40	46.59	500.42	115.67	856.36	810.78	45.58	18.790		
11,700.00	11,124.57	10,865.98	10,540.51	30.42	27.64	46.86	570.82	116.83	854.24	808.04	46.20	18.491		
11,800.00	11,122.83	10,965.98	10,539.64	30.83	28.04	46.91	670.81	116.06	853.64	806.72	46.92	18.195		
11,900.00	11,121.08	11,065.97	10,538.77	31.30	28.51	46.95	770.80	115.29	853.05	805.31	47.74	17.869		
12,000.00	11,119.34	11,165.97	10,537.90	31.83	29.04	46.99	870.79	114.52	852.45	803.79	48.66	17.517		
12,100.00	11,117.59	11,265.96	10,537.03	32.42	29.63	47.04	970.78	113.75	851.86	802.17	49.69	17.145		
12,200.00	11,115.84	11,365.96	10,536.16	33.07	30.28	47.08	1,070.77	112.98	851.27	800.47	50.80	16.758		
12,300.00	11,114.10	11,465.96	10,535.29	33.76	30.98	47.12	1,170.76	112.22	850.68	798.68	52.00	16.359		
12,400.00	11,112.35	11,565.95	10,534.42	34.51	31.73	47.17	1,270.75	111.45	850.08	796.80	53.28	15.955		
12,500.00	11,110.61	11,665.95	10,533.55	35.31	32.54	47.21	1,370.74	110.68	849.49	794.86	54.64	15.548		
12,600.00	11,108.86	11,765.94	10,532.68	36.14	33.38	47.25	1,470.73	109.91	848.90	792.84	56.06	15.141		
12,700.00	11,107.12	11,865.94	10,531.81	37.01	34.26	47.30	1,570.72	109.14	848.31	790.76	57.56	14.739		
12,800.00	11,105.37	11,965.94	10,530.94	37.93	35.19	47.34	1,670.70	108.37	847.72	788.62	59.11	14.342		
12,900.00	11,103.62	12,065.93	10,530.07	38.87	36.14	47.39	1,770.69	107.60	847.14	786.42	60.72	13.952		
13,000.00	11,101.88	12,165.93	10,529.20	39.84	37.13	47.43	1,870.68	106.83	846.55	784.17	62.38	13.571		
13,100.00	11,100.13	12,265.93	10,528.33	40.85	38.15	47.47	1,970.67	106.07	845.96	781.87	64.09	13.201		
13,200.00	11,098.39	12,365.92	10,527.46	41.88	39.19	47.52	2,070.66	105.30	845.37	779.53	65.84	12.840		
13,300.00	11,096.64	12,465.92	10,526.60	42.93	40.26	47.56	2,170.65	104.53	844.78	777.15	67.63	12.491		
13,400.00	11,094.89	12,565.91	10,525.73	44.01	41.35	47.61	2,270.64	103.76	844.20	774.73	69.46	12.153		
13,500.00	11,093.15	12,665.91	10,524.86	45.10	42.46	47.65	2,370.63	102.99	843.61	772.28	71.33	11.827		
13,600.00	11,091.40	12,765.91	10,523.99	46.22	43.60	47.69	2,470.62	102.22	843.03	769.79	73.23	11.512		
13,700.00	11,089.66	12,865.90	10,523.12	47.36	44.75	47.74	2,570.61	101.45	842.44	767.28	75.16	11.208		
13,800.00	11,087.91	12,965.90	10,522.25	48.51	45.91	47.78	2,670.60	100.68	841.86	764.73	77.12	10.916		
13,900.00	11,086.16	13,065.89	10,521.38	49.67	47.10	47.83	2,770.59	99.92	841.27	762.16	79.11	10.634		
14,000.00	11,084.42	13,165.89	10,520.51	50.86	48.29	47.87	2,870.58	99.15	840.69	759.57	81.12	10.364		
14,100.00	11,082.67	13,265.89	10,519.64	52.05	49.50	47.92	2,970.57	98.38	840.11	756.95	83.15	10.103		
14,200.00	11,080.93	13,365.88	10,518.77	53.26	50.73	47.96	3,070.56	97.61	839.52	754.31	85.21	9.852		
14,300.00	11,079.18	13,465.88	10,517.90	54.48	51.96	48.01	3,170.55	96.84	838.94	751.66	87.29	9.611		
14,400.00	11,077.43	13,565.88	10,517.03	55.71	53.20	48.05	3,270.54	96.07	838.36	748.98	89.38	9.380		
14,500.00	11,075.69	13,665.87	10,516.16	56.95	54.46	48.10	3,370.52	95.30	837.78	746.29	91.49	9.157		
14,600.00	11,073.94	13,765.87	10,515.29	58.20	55.72	48.14	3,470.51	94.53	837.20	743.58	93.62	8.942		
14,700.00	11,072.20	13,865.86	10,514.42	59.46	57.00	48.19	3,570.50	93.77	836.62	740.85	95.77	8.736		
14,800.00	11,070.45	13,965.86	10,513.55	60.73	58.28	48.23	3,670.49	93.00	836.04	738.11	97.93	8.537		
14,900.00	11,068.70	14,065.86	10,512.68	62.00	59.56	48.28	3,770.48	92.23	835.46	735.36	100.11	8.346		
15,000.00	11,066.96	14,165.85	10,511.81	63.28	60.86	48.32	3,870.47	91.46	834.88	732.59	102.29	8.162		
15,100.00	11,065.21	14,265.85	10,510.94	64.57	62.16	48.37	3,970.46	90.69	834.31	729.81	104.50	7.984		
15,200.00	11,063.47	14,365.84	10,510.07	65.87	63.47	48.41	4,070.45	89.92	833.73	727.02	106.71	7.813		
15,300.00	11,061.72	14,465.84	10,509.21	67.17	64.78	48.46	4,170.44	89.15	833.15	724.22	108.93	7.648		
15,400.00	11,059.98	14,565.84	10,508.34	68.48	66.10	48.50	4,270.43	88.38	832.58	721.41	111.17	7.489		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 204H - OH - Plan 1 09-08-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10036-MWD+HDGM														
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,500.00	11,058.23	14,865.83	10,507.47	69.79	67.43	48.55	4,370.42	87.62	832.00	718.59	113.41	7.336		
15,600.00	11,056.48	14,765.83	10,506.60	71.11	68.76	48.59	4,470.41	86.85	831.42	715.76	115.67	7.188		
15,700.00	11,054.74	14,865.83	10,505.73	72.44	70.09	48.64	4,570.40	86.08	830.85	712.92	117.93	7.045		
15,800.00	11,052.99	14,965.82	10,504.86	73.76	71.43	48.69	4,670.39	85.31	830.28	710.07	120.21	6.907		
15,900.00	11,051.25	15,065.82	10,503.99	75.10	72.77	48.73	4,770.38	84.54	829.70	707.21	122.49	6.774		
15,914.57	11,050.99	15,080.39	10,503.86	75.32	72.97	48.74	4,784.95	84.43	829.62	706.80	122.82	6.755		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 308H - OH - Plan 2 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10584-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	1.00	0.00	0.00	0.00	89.43	0.40	40.00	40.00					
100.00	100.00	101.00	100.00	0.10	0.10	89.43	0.40	40.00	40.00	39.80	0.20	200.929		
200.00	200.00	201.00	200.00	0.36	0.37	89.43	0.40	40.00	40.00	39.27	0.73	54.799		
300.00	300.00	301.00	300.00	0.63	0.63	89.43	0.40	40.00	40.00	38.74	1.26	31.726		
400.00	400.00	401.00	400.00	0.89	0.90	89.43	0.40	40.00	40.00	38.21	1.79	22.325		
500.00	500.00	501.00	500.00	1.16	1.16	89.43	0.40	40.00	40.00	37.68	2.32	17.223		
600.00	600.00	601.00	600.00	1.43	1.43	89.43	0.40	40.00	40.00	37.15	2.85	14.018		
700.00	700.00	701.00	700.00	1.69	1.69	89.43	0.40	40.00	40.00	36.62	3.38	11.819		
800.00	800.00	801.00	800.00	1.96	1.96	89.43	0.40	40.00	40.00	36.09	3.92	10.217		
900.00	900.00	901.00	900.00	2.22	2.22	89.43	0.40	40.00	40.00	35.56	4.45	8.997		
1,000.00	1,000.00	1,001.00	1,000.00	2.49	2.49	89.43	0.40	40.00	40.00	35.02	4.98	8.037		
1,100.00	1,100.00	1,101.00	1,100.00	2.75	2.76	89.43	0.40	40.00	40.00	34.49	5.51	7.263		
1,200.00	1,200.00	1,201.00	1,200.00	3.02	3.02	89.43	0.40	40.00	40.00	33.96	6.04	6.624		
1,300.00	1,300.00	1,301.00	1,300.00	3.28	3.29	89.43	0.40	40.00	40.00	33.43	6.57	6.089		
1,400.00	1,400.00	1,401.00	1,400.00	3.55	3.55	89.43	0.40	40.00	40.00	32.90	7.10	5.634		
1,500.00	1,500.00	1,501.00	1,500.00	3.81	3.82	89.43	0.40	40.00	40.00	32.37	7.63	5.242		
1,600.00	1,600.00	1,601.00	1,600.00	4.08	4.08	89.43	0.40	40.00	40.00	31.84	8.16	4.901		
1,700.00	1,700.00	1,701.00	1,700.00	4.35	4.35	89.43	0.40	40.00	40.00	31.31	8.69	4.601		
1,800.00	1,800.00	1,801.00	1,800.00	4.61	4.61	89.43	0.40	40.00	40.00	30.78	9.22	4.337		
1,900.00	1,900.00	1,901.00	1,900.00	4.88	4.88	89.43	0.40	40.00	40.00	30.25	9.76	4.101		
2,000.00	2,000.00	2,001.00	2,000.00	5.14	5.14	89.43	0.40	40.00	40.00	29.72	10.29	3.889		
2,100.00	2,100.00	2,101.00	2,100.00	5.41	5.41	89.43	0.40	40.00	40.00	29.19	10.82	3.698		
2,200.00	2,200.00	2,201.00	2,200.00	5.67	5.68	89.43	0.40	40.00	40.00	28.65	11.35	3.525		
2,300.00	2,300.00	2,301.00	2,300.00	5.94	5.94	89.43	0.40	40.00	40.00	28.12	11.88	3.368		
2,400.00	2,400.00	2,401.00	2,400.00	6.20	6.21	89.43	0.40	40.00	40.00	27.59	12.41	3.223		
2,500.00	2,500.00	2,501.00	2,500.00	6.47	6.47	89.43	0.40	40.00	40.00	27.06	12.94	3.091		
2,600.00	2,600.00	2,601.00	2,600.00	6.73	6.74	89.43	0.40	40.00	40.00	26.53	13.47	2.969		
2,700.00	2,700.00	2,701.00	2,700.00	7.00	7.00	89.43	0.40	40.00	40.00	26.00	14.00	2.857		
2,800.00	2,800.00	2,801.00	2,800.00	7.27	7.27	89.43	0.40	40.00	40.00	25.47	14.53	2.752		
2,900.00	2,900.00	2,901.00	2,900.00	7.53	7.53	89.43	0.40	40.00	40.00	24.94	15.06	2.655		
3,000.00	3,000.00	3,001.00	3,000.00	7.80	7.80	89.43	0.40	40.00	40.00	24.41	15.59	2.565		
3,100.00	3,100.00	3,101.00	3,100.00	8.06	8.06	89.43	0.40	40.00	40.00	23.88	16.13	2.481		
3,200.00	3,200.00	3,201.00	3,200.00	8.33	8.33	89.43	0.40	40.00	40.00	23.35	16.66	2.402		
3,300.00	3,300.00	3,301.00	3,300.00	8.59	8.60	89.43	0.40	40.00	40.00	22.81	17.19	2.327		
3,400.00	3,400.00	3,401.00	3,400.00	8.86	8.86	89.43	0.40	40.00	40.00	22.28	17.72	2.258		
3,500.00	3,500.00	3,501.00	3,500.00	9.12	9.13	89.43	0.40	40.00	40.00	21.75	18.25	2.192		
3,600.00	3,600.00	3,601.00	3,600.00	9.39	9.39	89.43	0.40	40.00	40.00	21.22	18.78	2.130		
3,700.00	3,700.00	3,701.00	3,700.00	9.65	9.66	89.43	0.40	40.00	40.00	20.69	19.31	2.071		
3,800.00	3,800.00	3,801.00	3,800.00	9.92	9.92	89.43	0.40	40.00	40.00	20.16	19.84	2.016		
3,900.00	3,900.00	3,901.00	3,900.00	10.19	10.19	89.43	0.40	40.00	40.00	19.63	20.37	1.963		
4,000.00	4,000.00	4,001.00	4,000.00	10.45	10.45	89.43	0.40	40.00	40.00	19.10	20.90	1.914		
4,100.00	4,100.00	4,101.00	4,100.00	10.72	10.72	89.43	0.40	40.00	40.00	18.57	21.43	1.866		
4,200.00	4,200.00	4,201.00	4,200.00	10.98	10.98	89.43	0.40	40.00	40.00	18.04	21.97	1.821		
4,300.00	4,300.00	4,301.00	4,300.00	11.25	11.25	89.43	0.40	40.00	40.00	17.51	22.50	1.778		
4,400.00	4,400.00	4,401.00	4,400.00	11.51	11.52	89.43	0.40	40.00	40.00	16.97	23.03	1.737		
4,500.00	4,500.00	4,501.00	4,500.00	11.78	11.78	89.43	0.40	40.00	40.00	16.44	23.56	1.698		
4,600.00	4,600.00	4,601.00	4,600.00	12.04	12.05	89.43	0.40	40.00	40.00	15.91	24.09	1.661		
4,700.00	4,700.00	4,701.00	4,700.00	12.31	12.31	89.43	0.40	40.00	40.00	15.38	24.62	1.625		
4,800.00	4,800.00	4,801.00	4,800.00	12.57	12.58	89.43	0.40	40.00	40.00	14.85	25.15	1.590		
4,900.00	4,900.00	4,901.00	4,900.00	12.84	12.84	89.43	0.40	40.00	40.00	14.32	25.68	1.558		
5,000.00	5,000.00	5,001.00	5,000.00	13.11	13.11	89.43	0.40	40.00	40.00	13.79	26.21	1.526		
5,100.00	5,100.00	5,101.00	5,100.00	13.37	13.37	89.43	0.40	40.00	40.00	13.26	26.74	1.496 Level 3		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 308H - OH - Plan 2 09-08-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10584-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance									
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	5,201.00	5,200.00	13.64	13.64	89.43	0.40	40.00	40.00	12.73	27.27	1.467	Level 3		
5,300.00	5,300.00	5,301.00	5,300.00	13.90	13.90	89.43	0.40	40.00	40.00	12.20	27.81	1.439	Level 3		
5,400.00	5,400.00	5,401.00	5,400.00	14.17	14.17	89.43	0.40	40.00	40.00	11.67	28.34	1.412	Level 3		
5,500.00	5,500.00	5,501.00	5,500.00	14.43	14.43	89.43	0.40	40.00	40.00	11.13	28.87	1.386	Level 3		
5,600.00	5,600.00	5,601.00	5,600.00	14.70	14.70	89.43	0.40	40.00	40.00	10.60	29.40	1.361	Level 3		
5,700.00	5,700.00	5,701.00	5,700.00	14.96	14.97	89.43	0.40	40.00	40.00	10.07	29.93	1.337	Level 3		
5,800.00	5,800.00	5,801.00	5,800.00	15.23	15.23	89.43	0.40	40.00	40.00	9.54	30.46	1.313	Level 3		
5,857.81	5,857.81	5,858.81	5,857.81	15.38	15.38	89.43	0.40	40.00	40.00	9.24	30.77	1.300	Level 3, CC		
5,900.00	5,900.00	5,900.86	5,899.86	15.49	15.48	89.43	0.40	40.04	40.04	9.07	30.97	1.293	Level 3, ES, SF		
6,000.00	6,000.00	6,000.00	5,998.99	15.76	15.57	89.67	0.23	41.25	41.26	9.92	31.33	1.317	Level 3		
6,100.00	6,100.00	6,099.38	6,098.32	16.02	15.67	90.20	-0.15	44.16	44.19	12.49	31.70	1.394	Level 3		
6,200.00	6,200.00	6,198.47	6,197.30	16.29	15.78	90.90	-0.77	48.77	48.85	16.78	32.07	1.523			
6,300.00	6,300.00	6,297.37	6,296.00	16.56	15.89	91.67	-1.60	55.06	55.23	22.79	32.44	1.702			
6,400.00	6,400.00	6,397.08	6,395.44	16.82	16.00	92.35	-2.56	62.30	62.52	29.70	32.82	1.905			
6,500.00	6,500.00	6,496.81	6,494.91	17.09	16.11	92.90	-3.52	69.54	69.81	36.61	33.20	2.103			
6,600.00	6,600.00	6,596.54	6,594.37	17.35	16.23	93.34	-4.48	76.77	77.11	43.52	33.59	2.296			
6,700.00	6,700.00	6,696.27	6,693.83	17.62	16.36	93.71	-5.45	84.01	84.41	50.44	33.98	2.485			
6,800.00	6,800.00	6,796.01	6,793.30	17.88	16.49	94.02	-6.41	91.25	91.72	57.35	34.37	2.669			
6,900.00	6,900.00	6,895.74	6,892.76	18.15	16.62	94.28	-7.37	98.49	99.03	64.26	34.76	2.849			
7,000.00	7,000.00	6,895.47	6,892.23	18.41	16.75	94.50	-8.33	105.73	106.34	71.18	35.16	3.024			
7,100.00	7,100.00	7,095.20	7,091.69	18.68	16.89	94.70	-9.29	112.96	113.65	78.08	35.57	3.196			
7,200.00	7,200.00	7,194.93	7,191.15	18.94	17.03	94.88	-10.25	120.20	120.96	84.99	35.97	3.363			
7,300.00	7,300.00	7,294.66	7,290.62	19.21	17.17	95.03	-11.21	127.44	128.28	91.90	36.38	3.526			
7,400.00	7,400.00	7,394.40	7,390.08	19.48	17.32	95.17	-12.17	134.68	135.59	98.80	36.79	3.685			
7,500.00	7,500.00	7,494.13	7,489.55	19.74	17.47	95.29	-13.14	141.92	142.90	105.70	37.21	3.841			
7,600.00	7,600.00	7,593.86	7,589.01	20.01	17.62	95.40	-14.10	149.15	150.22	112.60	37.62	3.993			
7,700.00	7,700.00	7,693.59	7,688.47	20.27	17.77	95.50	-15.06	156.39	157.54	119.49	38.04	4.141			
7,800.00	7,800.00	7,793.32	7,787.94	20.54	17.93	95.59	-16.02	163.63	164.85	126.38	38.47	4.285			
7,900.00	7,900.00	7,893.05	7,887.40	20.80	18.09	95.68	-16.98	170.87	172.17	133.28	38.89	4.427			
8,000.00	8,000.00	7,992.78	7,986.87	21.07	18.26	95.75	-17.94	178.10	179.49	140.16	39.32	4.564			
8,100.00	8,100.00	8,092.52	8,086.33	21.33	18.42	95.82	-18.90	185.34	186.81	147.05	39.75	4.699			
8,200.00	8,200.00	8,192.25	8,185.79	21.60	18.59	95.89	-19.87	192.58	194.12	153.93	40.19	4.830			
8,300.00	8,300.00	8,291.98	8,285.26	21.86	18.76	95.95	-20.83	199.82	201.44	160.82	40.62	4.959			
8,400.00	8,400.00	8,391.71	8,384.72	22.13	18.93	96.01	-21.79	207.06	208.76	167.70	41.06	5.084			
8,500.00	8,500.00	8,491.44	8,484.19	22.40	19.11	96.06	-22.75	214.29	216.08	174.57	41.50	5.206			
8,600.00	8,600.00	8,591.17	8,583.65	22.66	19.29	96.11	-23.71	221.53	223.40	181.45	41.95	5.326			
8,700.00	8,700.00	8,690.91	8,683.11	22.93	19.47	96.16	-24.67	228.77	230.72	188.32	42.39	5.443			
8,800.00	8,800.00	8,790.64	8,782.58	23.19	19.65	96.20	-25.63	236.01	238.03	195.20	42.84	5.557			
8,900.00	8,900.00	8,890.37	8,882.04	23.46	19.83	96.24	-26.60	243.25	245.35	202.07	43.29	5.668			
9,000.00	9,000.00	8,990.10	8,981.51	23.72	20.02	96.28	-27.56	250.48	252.67	208.93	43.74	5.777			
9,100.00	9,100.00	9,089.83	9,080.97	23.99	20.21	96.31	-28.52	257.72	259.99	215.80	44.19	5.883			
9,200.00	9,200.00	9,189.56	9,180.43	24.25	20.39	96.35	-29.48	264.96	267.31	222.66	44.65	5.987			
9,300.00	9,300.00	9,289.30	9,279.90	24.52	20.59	96.38	-30.44	272.20	274.63	229.53	45.10	6.089			
9,400.00	9,400.00	9,389.03	9,379.36	24.78	20.78	96.41	-31.40	279.44	281.95	236.39	45.56	6.188			
9,500.00	9,500.00	9,488.76	9,478.83	25.05	20.97	96.44	-32.36	286.67	289.27	243.25	46.02	6.285			
9,600.00	9,600.00	9,588.49	9,578.29	25.32	21.17	96.47	-33.32	293.91	296.59	250.10	46.49	6.380			
9,700.00	9,700.00	9,688.22	9,677.75	25.58	21.37	96.50	-34.29	301.15	303.91	256.96	46.95	6.473			
9,800.00	9,800.00	9,787.95	9,777.22	25.85	21.57	96.52	-35.25	308.39	311.23	263.82	47.41	6.564			
9,900.00	9,900.00	9,887.69	9,876.68	26.11	21.77	96.54	-36.21	315.62	318.55	270.67	47.88	6.653			
10,000.00	10,000.00	9,987.42	9,976.15	26.38	21.97	96.57	-37.17	322.86	325.87	277.52	48.35	6.740			
10,100.00	10,100.00	10,087.15	10,075.61	26.64	22.18	96.59	-38.13	330.10	333.19	284.37	48.82	6.825			
10,200.00	10,200.00	10,186.88	10,175.07	26.91	22.38	96.61	-39.09	337.34	340.51	291.22	49.29	6.908			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 308H - OH - Plan 2 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10584-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,300.00	10,300.00	10,286.61	10,274.54	27.17	22.59	96.63	-40.05	344.58	347.83	298.07	49.76	6.990		
10,400.00	10,400.00	10,386.34	10,374.00	27.44	22.80	96.65	-41.02	351.81	355.15	304.91	50.24	7.069		
10,500.00	10,499.79	10,485.53	10,472.92	27.55	23.01	-167.64	-41.97	359.01	366.96	317.04	49.92	7.350		
10,600.00	10,596.65	10,580.41	10,567.55	27.57	23.12	-167.56	-42.89	365.90	397.60	349.19	48.41	8.213		
10,700.00	10,686.38	10,673.21	10,659.66	27.60	23.14	-168.71	-35.44	372.55	446.37	400.96	45.41	9.829		
10,800.00	10,765.06	10,746.55	10,730.40	27.67	23.15	-171.05	-17.00	377.57	512.01	470.67	41.35	12.384		
10,900.00	10,835.74	10,807.36	10,786.35	27.82	23.17	162.22	6.37	381.49	587.55	545.92	41.63	14.113		
11,000.00	10,904.30	10,870.92	10,841.18	28.05	23.20	137.42	38.20	385.27	661.53	616.43	45.10	14.668		
11,100.00	10,967.80	10,939.37	10,894.94	28.33	23.23	118.46	80.31	388.91	730.15	681.75	48.40	15.086		
11,200.00	11,023.46	11,014.34	10,946.29	28.65	23.27	104.89	134.73	392.30	790.50	740.00	50.50	15.653		
11,300.00	11,068.85	11,096.81	10,992.19	29.01	23.32	95.63	203.07	395.20	840.15	788.54	51.61	16.279		
11,400.00	11,101.99	11,186.65	11,028.06	29.38	23.53	89.68	285.27	397.28	877.03	824.85	52.17	16.810		
11,500.00	11,121.42	11,282.15	11,048.66	29.74	23.82	86.34	378.35	398.18	899.52	846.97	52.55	17.117		
11,600.00	11,126.32	11,380.69	11,051.33	30.08	24.22	85.25	476.76	397.74	906.63	853.65	52.98	17.113		
11,700.00	11,124.57	11,480.69	11,049.59	30.42	24.70	85.25	576.74	396.97	906.63	852.79	53.84	16.838		
11,800.00	11,122.83	11,580.69	11,047.84	30.83	25.25	85.25	676.72	396.21	906.64	851.80	54.85	16.531		
11,900.00	11,121.08	11,680.69	11,046.09	31.30	25.87	85.25	776.70	395.44	906.65	850.67	55.98	16.197		
12,000.00	11,119.34	11,780.69	11,044.35	31.83	26.55	85.26	876.68	394.67	906.66	849.42	57.23	15.841		
12,100.00	11,117.59	11,880.69	11,042.60	32.42	27.29	85.26	976.66	393.90	906.66	848.06	58.61	15.471		
12,200.00	11,115.84	11,980.69	11,040.86	33.07	28.09	85.26	1,076.65	393.13	906.67	846.59	60.08	15.090		
12,300.00	11,114.10	12,080.69	11,039.11	33.76	28.94	85.26	1,176.63	392.37	906.68	845.02	61.66	14.704		
12,400.00	11,112.35	12,180.69	11,037.37	34.51	29.84	85.26	1,276.61	391.60	906.68	843.35	63.33	14.317		
12,500.00	11,110.61	12,280.69	11,035.62	35.31	30.77	85.26	1,376.59	390.83	906.69	841.61	65.09	13.931		
12,600.00	11,108.86	12,380.69	11,033.88	36.14	31.75	85.26	1,476.57	390.06	906.70	839.78	66.92	13.549		
12,700.00	11,107.12	12,480.69	11,032.13	37.01	32.76	85.26	1,576.56	389.30	906.71	837.88	68.82	13.175		
12,800.00	11,105.37	12,580.69	11,030.39	37.93	33.80	85.26	1,676.54	388.53	906.71	835.92	70.79	12.808		
12,900.00	11,103.62	12,680.69	11,028.64	38.87	34.87	85.26	1,776.52	387.76	906.72	833.90	72.82	12.451		
13,000.00	11,101.88	12,780.69	11,026.90	39.84	35.96	85.26	1,876.50	386.99	906.73	831.82	74.91	12.104		
13,100.00	11,100.13	12,880.69	11,025.15	40.85	37.08	85.26	1,976.48	386.22	906.74	829.69	77.05	11.768		
13,200.00	11,098.39	12,980.69	11,023.41	41.88	38.23	85.26	2,076.46	385.46	906.74	827.51	79.23	11.444		
13,300.00	11,096.64	13,080.69	11,021.66	42.93	39.39	85.26	2,176.45	384.69	906.75	825.29	81.46	11.131		
13,400.00	11,094.89	13,180.69	11,019.92	44.01	40.57	85.26	2,276.43	383.92	906.76	823.03	83.73	10.829		
13,500.00	11,093.15	13,280.69	11,018.17	45.10	41.77	85.26	2,376.41	383.15	906.76	820.73	86.04	10.539		
13,600.00	11,091.40	13,380.69	11,016.43	46.22	42.98	85.26	2,476.39	382.39	906.77	818.40	88.37	10.261		
13,700.00	11,089.66	13,480.69	11,014.68	47.36	44.21	85.26	2,576.37	381.62	906.78	816.03	90.74	9.993		
13,800.00	11,087.91	13,580.69	11,012.94	48.51	45.44	85.26	2,676.36	380.85	906.79	813.64	93.14	9.735		
13,900.00	11,086.16	13,680.69	11,011.19	49.67	46.70	85.26	2,776.34	380.08	906.79	811.22	95.57	9.488		
14,000.00	11,084.42	13,780.69	11,009.44	50.86	47.96	85.26	2,876.32	379.31	906.80	808.78	98.02	9.251		
14,100.00	11,082.67	13,880.69	11,007.70	52.05	49.23	85.26	2,976.30	378.55	906.81	806.31	100.49	9.024		
14,200.00	11,080.93	13,980.69	11,005.95	53.26	50.51	85.26	3,076.28	377.78	906.81	803.83	102.99	8.805		
14,300.00	11,079.18	14,080.69	11,004.21	54.48	51.80	85.26	3,176.26	377.01	906.82	801.32	105.50	8.595		
14,400.00	11,077.43	14,180.69	11,002.46	55.71	53.10	85.26	3,276.25	376.24	906.83	798.79	108.04	8.394		
14,500.00	11,075.69	14,280.69	11,000.72	56.95	54.41	85.26	3,376.23	375.47	906.84	796.25	110.59	8.200		
14,600.00	11,073.94	14,380.69	10,998.97	58.20	55.72	85.26	3,476.21	374.71	906.84	793.69	113.15	8.014		
14,700.00	11,072.20	14,480.69	10,997.23	59.46	57.04	85.26	3,576.19	373.94	906.85	791.12	115.73	7.836		
14,800.00	11,070.45	14,580.69	10,995.48	60.73	58.36	85.26	3,676.17	373.17	906.86	788.53	118.33	7.664		
14,900.00	11,068.70	14,680.69	10,993.74	62.00	59.69	85.26	3,776.16	372.40	906.87	785.93	120.94	7.499		
15,000.00	11,066.96	14,780.69	10,991.99	63.28	61.03	85.26	3,876.14	371.64	906.87	783.32	123.56	7.340		
15,100.00	11,065.21	14,880.69	10,990.25	64.57	62.37	85.26	3,976.12	370.87	906.88	780.69	126.19	7.187		
15,200.00	11,063.47	14,980.69	10,988.50	65.87	63.71	85.26	4,076.10	370.10	906.89	778.06	128.83	7.039		
15,300.00	11,061.72	15,080.69	10,986.76	67.17	65.06	85.26	4,176.08	369.33	906.89	775.41	131.48	6.897		
15,400.00	11,059.98	15,180.69	10,985.01	68.48	66.42	85.26	4,276.06	368.56	906.90	772.76	134.14	6.761		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design											Black & Tan 27 Federal Com - 308H - OH - Plan 2 09-08-17		Offset Site Error:		0.00 usft	
Survey Program: 0-NS-GYRO-MS, 10584-MWD+HDGM													Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Distance										
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			
15,500.00	11,058.23	15,280.69	10,983.27	69.79	67.77	85.26	4,376.05	367.80	906.91	770.09	136.82	6.629				
15,600.00	11,056.48	15,380.69	10,981.52	71.11	69.14	85.26	4,476.03	367.03	906.92	767.42	139.50	6.501				
15,700.00	11,054.74	15,480.69	10,979.78	72.44	70.50	85.26	4,576.01	366.26	906.92	764.74	142.18	6.379				
15,800.00	11,052.99	15,580.69	10,978.03	73.76	71.87	85.26	4,675.99	365.49	906.93	762.05	144.88	6.260				
15,900.00	11,051.25	15,680.69	10,976.29	75.10	73.24	85.26	4,775.97	364.73	906.94	759.36	147.58	6.145				
15,914.57	11,050.99	15,695.26	10,976.03	75.32	73.44	85.26	4,790.54	364.61	906.94	758.96	147.97	6.129				

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 406H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	35.42	55.39	39.39	67.97					
100.00	100.00	100.00	100.00	0.10	0.10	35.42	55.39	39.39	67.97	67.78	0.20	346.036		
200.00	200.00	200.00	200.00	0.36	0.36	35.42	55.39	39.39	67.97	67.24	0.73	93.455		
300.00	300.00	300.00	300.00	0.63	0.63	35.42	55.39	39.39	67.97	66.71	1.26	54.023		
400.00	400.00	400.00	400.00	0.89	0.89	35.42	55.39	39.39	67.97	66.18	1.79	37.992		
500.00	500.00	500.00	500.00	1.16	1.16	35.42	55.39	39.39	67.97	65.65	2.32	29.298		
600.00	600.00	600.00	600.00	1.43	1.43	35.42	55.39	39.39	67.97	65.12	2.85	23.842		
700.00	700.00	700.00	700.00	1.69	1.69	35.42	55.39	39.39	67.97	64.59	3.38	20.099		
800.00	800.00	800.00	800.00	1.96	1.96	35.42	55.39	39.39	67.97	64.06	3.91	17.372		
900.00	900.00	900.00	900.00	2.22	2.22	35.42	55.39	39.39	67.97	63.53	4.44	15.297		
1,000.00	1,000.00	1,000.00	1,000.00	2.49	2.49	35.42	55.39	39.39	67.97	63.00	4.97	13.664		
1,100.00	1,100.00	1,100.00	1,100.00	2.75	2.75	35.42	55.39	39.39	67.97	62.47	5.51	12.347		
1,200.00	1,200.00	1,200.00	1,200.00	3.02	3.02	35.42	55.39	39.39	67.97	61.94	6.04	11.261		
1,300.00	1,300.00	1,300.00	1,300.00	3.28	3.28	35.42	55.39	39.39	67.97	61.40	6.57	10.350		
1,400.00	1,400.00	1,400.00	1,400.00	3.55	3.55	35.42	55.39	39.39	67.97	60.87	7.10	9.576		
1,500.00	1,500.00	1,500.00	1,500.00	3.81	3.81	35.42	55.39	39.39	67.97	60.34	7.63	8.910		
1,600.00	1,600.00	1,600.00	1,600.00	4.08	4.08	35.42	55.39	39.39	67.97	59.81	8.16	8.330		
1,700.00	1,700.00	1,700.00	1,700.00	4.35	4.35	35.42	55.39	39.39	67.97	59.28	8.69	7.821		
1,800.00	1,800.00	1,800.00	1,800.00	4.61	4.61	35.42	55.39	39.39	67.97	58.75	9.22	7.371		
1,900.00	1,900.00	1,900.00	1,900.00	4.88	4.88	35.42	55.39	39.39	67.97	58.22	9.75	6.970		
2,000.00	2,000.00	2,000.00	2,000.00	5.14	5.14	35.42	55.39	39.39	67.97	57.69	10.28	6.610		
2,100.00	2,100.00	2,100.00	2,100.00	5.41	5.41	35.42	55.39	39.39	67.97	57.16	10.81	6.285		
2,200.00	2,200.00	2,200.00	2,200.00	5.67	5.67	35.42	55.39	39.39	67.97	56.63	11.35	5.991		
2,300.00	2,300.00	2,300.00	2,300.00	5.94	5.94	35.42	55.39	39.39	67.97	56.10	11.88	5.723		
2,400.00	2,400.00	2,400.00	2,400.00	6.20	6.20	35.42	55.39	39.39	67.97	55.57	12.41	5.479		
2,500.00	2,500.00	2,500.00	2,500.00	6.47	6.47	35.42	55.39	39.39	67.97	55.03	12.94	5.254		
2,600.00	2,600.00	2,600.00	2,600.00	6.73	6.73	35.42	55.39	39.39	67.97	54.50	13.47	5.047		
2,700.00	2,700.00	2,700.00	2,700.00	7.00	7.00	35.42	55.39	39.39	67.97	53.97	14.00	4.855		
2,800.00	2,800.00	2,800.00	2,800.00	7.27	7.27	35.42	55.39	39.39	67.97	53.44	14.53	4.678		
2,900.00	2,900.00	2,900.00	2,900.00	7.53	7.53	35.42	55.39	39.39	67.97	52.91	15.06	4.513		
3,000.00	3,000.00	3,000.00	3,000.00	7.80	7.80	35.42	55.39	39.39	67.97	52.38	15.59	4.359		
3,100.00	3,100.00	3,100.00	3,100.00	8.06	8.06	35.42	55.39	39.39	67.97	51.85	16.12	4.216		
3,200.00	3,200.00	3,200.00	3,200.00	8.33	8.33	35.42	55.39	39.39	67.97	51.32	16.65	4.081		
3,300.00	3,300.00	3,300.00	3,300.00	8.59	8.59	35.42	55.39	39.39	67.97	50.79	17.18	3.955		
3,400.00	3,400.00	3,400.00	3,400.00	8.86	8.86	35.42	55.39	39.39	67.97	50.26	17.72	3.837		
3,500.00	3,500.00	3,500.00	3,500.00	9.12	9.12	35.42	55.39	39.39	67.97	49.73	18.25	3.725		
3,600.00	3,600.00	3,600.00	3,600.00	9.39	9.39	35.42	55.39	39.39	67.97	49.19	18.78	3.620		
3,700.00	3,700.00	3,700.00	3,700.00	9.65	9.65	35.42	55.39	39.39	67.97	48.66	19.31	3.520		
3,800.00	3,800.00	3,800.00	3,800.00	9.92	9.92	35.42	55.39	39.39	67.97	48.13	19.84	3.426		
3,900.00	3,900.00	3,900.00	3,900.00	10.19	10.19	35.42	55.39	39.39	67.97	47.60	20.37	3.337		
4,000.00	4,000.00	4,000.00	4,000.00	10.45	10.45	35.42	55.39	39.39	67.97	47.07	20.90	3.252		
4,100.00	4,100.00	4,100.00	4,100.00	10.72	10.72	35.42	55.39	39.39	67.97	46.54	21.43	3.172		
4,200.00	4,200.00	4,200.00	4,200.00	10.98	10.98	35.42	55.39	39.39	67.97	46.01	21.96	3.095		
4,300.00	4,300.00	4,300.00	4,300.00	11.25	11.25	35.42	55.39	39.39	67.97	45.48	22.49	3.022		
4,400.00	4,400.00	4,400.00	4,400.00	11.51	11.51	35.42	55.39	39.39	67.97	44.95	23.02	2.952		
4,500.00	4,500.00	4,500.00	4,500.00	11.78	11.78	35.42	55.39	39.39	67.97	44.42	23.56	2.886		
4,600.00	4,600.00	4,600.00	4,600.00	12.04	12.04	35.42	55.39	39.39	67.97	43.89	24.09	2.822		
4,700.00	4,700.00	4,700.00	4,700.00	12.31	12.31	35.42	55.39	39.39	67.97	43.35	24.62	2.761		
4,800.00	4,800.00	4,800.00	4,800.00	12.57	12.57	35.42	55.39	39.39	67.97	42.82	25.15	2.703		
4,900.00	4,900.00	4,900.00	4,900.00	12.84	12.84	35.42	55.39	39.39	67.97	42.29	25.68	2.647		
5,000.00	5,000.00	5,000.00	5,000.00	13.11	13.11	35.42	55.39	39.39	67.97	41.76	26.21	2.593		
5,100.00	5,100.00	5,100.00	5,100.00	13.37	13.37	35.42	55.39	39.39	67.97	41.23	26.74	2.542		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 406H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,200.00	5,200.00	5,200.00	5,200.00	13.64	13.64	35.42	55.39	39.39	67.97	40.70	27.27	2.492		
5,300.00	5,300.00	5,300.00	5,300.00	13.90	13.90	35.42	55.39	39.39	67.97	40.17	27.80	2.445		
5,400.00	5,400.00	5,400.00	5,400.00	14.17	14.17	35.42	55.39	39.39	67.97	39.64	28.33	2.399		
5,500.00	5,500.00	5,500.00	5,500.00	14.43	14.43	35.42	55.39	39.39	67.97	39.11	28.86	2.355		
5,600.00	5,600.00	5,600.00	5,600.00	14.70	14.70	35.42	55.39	39.39	67.97	38.58	29.40	2.312		
5,700.00	5,700.00	5,700.00	5,700.00	14.96	14.96	35.42	55.39	39.39	67.97	38.05	29.93	2.271		
5,800.00	5,800.00	5,800.00	5,800.00	15.23	15.23	35.42	55.39	39.39	67.97	37.51	30.46	2.232		
5,900.00	5,900.00	5,900.00	5,900.00	15.49	15.49	35.42	55.39	39.39	67.97	36.98	30.99	2.193		
6,000.00	6,000.00	6,000.00	6,000.00	15.76	15.76	35.42	55.39	39.39	67.97	36.45	31.52	2.157		
6,100.00	6,100.00	6,100.00	6,100.00	16.02	16.02	35.42	55.39	39.39	67.97	35.92	32.05	2.121		
6,200.00	6,200.00	6,200.00	6,200.00	16.29	16.29	35.42	55.39	39.39	67.97	35.39	32.58	2.086		
6,300.00	6,300.00	6,300.00	6,300.00	16.56	16.56	35.42	55.39	39.39	67.97	34.86	33.11	2.053		
6,400.00	6,400.00	6,400.00	6,400.00	16.82	16.82	35.42	55.39	39.39	67.97	34.33	33.64	2.020		
6,466.67	6,466.67	6,466.67	6,466.67	17.00	17.00	35.42	55.39	39.39	67.97	33.98	34.00	1.999		
6,500.00	6,500.00	6,500.00	6,500.00	17.09	17.09	35.42	55.39	39.39	67.97	33.80	34.17	1.989 CC		
6,600.00	6,600.00	6,599.41	6,599.41	17.35	17.27	36.05	55.30	40.25	68.40	33.78	34.62	1.976 ES, SF		
6,700.00	6,700.00	6,698.77	6,698.73	17.62	17.37	37.89	55.02	42.82	69.73	34.74	34.99	1.993		
6,800.00	6,800.00	6,798.00	6,797.87	17.88	17.47	40.80	54.55	47.10	72.10	36.74	35.36	2.039		
6,900.00	6,900.00	6,897.72	6,897.43	18.15	17.58	44.24	53.96	52.54	75.36	39.63	35.73	2.109		
7,000.00	7,000.00	6,997.57	6,997.13	18.41	17.69	47.40	53.36	58.02	78.88	42.77	36.11	2.185		
7,100.00	7,100.00	7,097.41	7,096.82	18.68	17.81	50.28	52.77	63.50	82.63	46.14	36.49	2.264		
7,200.00	7,200.00	7,197.26	7,196.52	18.94	17.93	52.90	52.17	68.99	86.56	49.69	36.87	2.348		
7,300.00	7,300.00	7,297.11	7,296.21	19.21	18.05	55.30	51.57	74.47	90.66	53.40	37.26	2.433		
7,400.00	7,400.00	7,396.96	7,395.91	19.48	18.18	57.48	50.97	79.95	94.91	57.26	37.65	2.521		
7,500.00	7,500.00	7,496.80	7,495.60	19.74	18.30	59.47	50.38	85.43	99.28	61.23	38.04	2.610		
7,600.00	7,600.00	7,596.65	7,595.30	20.01	18.43	61.30	49.78	90.92	103.76	65.32	38.44	2.699		
7,700.00	7,700.00	7,696.50	7,694.99	20.27	18.57	62.97	49.18	96.40	108.33	69.49	38.84	2.789		
7,800.00	7,800.00	7,796.35	7,794.69	20.54	18.71	64.50	48.59	101.88	113.00	73.75	39.24	2.879		
7,900.00	7,900.00	7,896.19	7,894.38	20.80	18.85	65.92	47.99	107.36	117.73	78.08	39.65	2.969		
8,000.00	8,000.00	7,996.04	7,994.08	21.07	18.99	67.22	47.39	112.84	122.53	82.48	40.06	3.059		
8,100.00	8,100.00	8,095.89	8,093.77	21.33	19.13	68.42	46.79	118.33	127.39	86.93	40.47	3.148		
8,200.00	8,200.00	8,195.74	8,193.47	21.60	19.28	69.54	46.20	123.81	132.31	91.43	40.88	3.236		
8,300.00	8,300.00	8,295.58	8,293.16	21.86	19.43	70.57	45.60	129.29	137.27	95.97	41.30	3.324		
8,400.00	8,400.00	8,395.43	8,392.86	22.13	19.59	71.53	45.00	134.77	142.27	100.55	41.71	3.410		
8,500.00	8,500.00	8,495.28	8,492.55	22.40	19.74	72.43	44.41	140.25	147.30	105.17	42.14	3.496		
8,600.00	8,600.00	8,595.12	8,592.25	22.66	19.90	73.27	43.81	145.74	152.38	109.82	42.56	3.580		
8,700.00	8,700.00	8,694.97	8,691.94	22.93	20.06	74.05	43.21	151.22	157.48	114.49	42.98	3.664		
8,800.00	8,800.00	8,794.82	8,791.64	23.19	20.22	74.79	42.61	156.70	162.61	119.19	43.41	3.746		
8,900.00	8,900.00	8,894.67	8,891.33	23.46	20.39	75.48	42.02	162.18	167.76	123.92	43.84	3.826		
9,000.00	9,000.00	8,994.51	8,991.03	23.72	20.55	76.12	41.42	167.66	172.94	128.66	44.28	3.906		
9,100.00	9,100.00	9,094.36	9,090.72	23.99	20.72	76.73	40.82	173.15	178.13	133.42	44.71	3.984		
9,200.00	9,200.00	9,194.21	9,190.42	24.25	20.89	77.31	40.23	178.63	183.35	138.20	45.15	4.061		
9,300.00	9,300.00	9,294.06	9,290.11	24.52	21.07	77.85	39.63	184.11	188.59	143.00	45.59	4.137		
9,400.00	9,400.00	9,393.90	9,389.81	24.78	21.24	78.37	39.03	189.59	193.84	147.81	46.03	4.211		
9,500.00	9,500.00	9,493.75	9,489.50	25.05	21.42	78.85	38.43	195.07	199.10	152.63	46.47	4.285		
9,600.00	9,600.00	9,593.60	9,589.20	25.32	21.60	79.32	37.84	200.56	204.38	157.47	46.91	4.356		
9,700.00	9,700.00	9,693.45	9,688.89	25.58	21.78	79.75	37.24	206.04	209.67	162.31	47.36	4.427		
9,800.00	9,800.00	9,793.29	9,788.59	25.85	21.96	80.17	36.64	211.52	214.97	167.16	47.81	4.497		
9,900.00	9,900.00	9,893.14	9,888.28	26.11	22.15	80.57	36.05	217.00	220.29	172.03	48.26	4.565		
10,000.00	10,000.00	9,992.99	9,987.98	26.38	22.33	80.95	35.45	222.48	225.61	176.90	48.71	4.632		
10,100.00	10,100.00	10,092.84	10,087.67	26.64	22.52	81.31	34.85	227.97	230.94	181.78	49.16	4.697		
10,200.00	10,200.00	10,192.68	10,187.37	26.91	22.71	81.65	34.25	233.45	236.29	186.67	49.62	4.762		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 406H - OH - Plan 1 09-08-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-MWD-HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance									
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		
10,300.00	10,300.00	10,292.53	10,287.06	27.17	22.90	81.98	33.66	238.93	241.64	191.56	50.08	4.825			
10,400.00	10,400.00	10,392.38	10,386.76	27.44	23.10	82.30	33.06	244.41	246.99	196.46	50.53	4.888			
10,500.00	10,499.79	10,491.76	10,485.99	27.55	23.29	178.20	32.47	249.87	256.96	206.67	50.29	5.110			
10,600.00	10,596.65	10,587.17	10,581.25	27.57	23.48	178.51	31.89	255.11	286.24	238.04	48.19	5.940			
10,700.00	10,686.38	10,674.40	10,668.35	27.60	23.65	178.77	31.37	259.90	334.72	290.35	44.37	7.544			
10,800.00	10,765.06	10,749.64	10,743.47	27.67	23.80	178.95	30.92	264.03	400.29	361.17	39.12	10.234			
10,900.00	10,835.74	10,816.34	10,810.07	27.82	23.93	158.03	30.52	267.69	473.94	433.42	40.52	11.696			
11,000.00	10,904.30	10,880.87	10,874.51	28.05	24.06	139.50	30.14	271.23	545.06	501.24	43.82	12.439			
11,100.00	10,967.80	10,940.65	10,934.20	28.33	24.18	124.98	29.79	274.52	612.99	565.87	47.12	13.008			
11,200.00	11,023.46	11,004.67	10,997.93	28.65	24.19	114.31	34.07	277.99	677.30	627.43	49.87	13.582			
11,300.00	11,068.85	11,081.54	11,072.85	29.01	24.20	107.34	50.42	281.99	736.46	685.39	51.08	14.419			
11,400.00	11,101.99	11,184.42	11,167.18	29.38	24.23	104.17	90.67	286.88	788.39	736.72	51.67	15.257			
11,500.00	11,121.42	11,341.01	11,288.80	29.74	24.30	105.02	188.02	292.86	829.34	777.57	51.76	16.022			
11,600.00	11,126.32	11,594.38	11,401.45	30.08	24.77	108.84	411.61	297.44	851.10	799.37	51.73	16.454			
11,700.00	11,124.57	11,763.20	11,410.53	30.42	25.41	109.59	579.77	296.73	852.69	800.10	52.59	16.214			
11,800.00	11,122.83	11,863.20	11,409.66	30.83	25.89	109.65	679.76	295.96	852.99	799.49	53.50	15.943			
11,900.00	11,121.08	11,963.20	11,408.79	31.30	26.44	109.70	779.75	295.19	853.29	798.76	54.54	15.646			
12,000.00	11,119.34	12,063.19	11,407.92	31.83	27.06	109.76	879.74	294.42	853.59	797.90	55.69	15.328			
12,100.00	11,117.59	12,163.19	11,407.04	32.42	27.74	109.81	979.73	293.66	853.90	796.94	56.96	14.992			
12,200.00	11,115.84	12,263.19	11,406.17	33.07	28.47	109.87	1,079.72	292.89	854.20	795.88	58.32	14.646			
12,300.00	11,114.10	12,363.18	11,405.30	33.76	29.26	109.92	1,179.71	292.12	854.50	794.72	59.79	14.292			
12,400.00	11,112.35	12,463.18	11,404.43	34.51	30.10	109.98	1,279.70	291.35	854.81	793.47	61.34	13.935			
12,500.00	11,110.61	12,563.17	11,403.55	35.31	30.98	110.03	1,379.69	290.58	855.11	792.14	62.98	13.578			
12,600.00	11,108.86	12,663.17	11,402.68	36.14	31.90	110.09	1,479.68	289.82	855.42	790.73	64.69	13.224			
12,700.00	11,107.12	12,763.17	11,401.81	37.01	32.86	110.14	1,579.67	289.05	855.73	789.26	66.47	12.874			
12,800.00	11,105.37	12,863.16	11,400.94	37.93	33.86	110.20	1,679.66	288.28	856.04	787.72	68.32	12.531			
12,900.00	11,103.62	12,963.16	11,400.06	38.87	34.89	110.25	1,779.64	287.51	856.34	786.12	70.22	12.195			
13,000.00	11,101.88	13,063.15	11,399.19	39.84	35.94	110.31	1,879.63	286.75	856.65	784.48	72.18	11.868			
13,100.00	11,100.13	13,163.15	11,398.32	40.85	37.02	110.36	1,979.62	285.98	856.96	782.78	74.19	11.551			
13,200.00	11,098.39	13,263.15	11,397.45	41.88	38.13	110.42	2,079.61	285.21	857.28	781.04	76.24	11.244			
13,300.00	11,096.64	13,363.14	11,396.57	42.93	39.26	110.47	2,179.60	284.44	857.59	779.25	78.34	10.948			
13,400.00	11,094.89	13,463.14	11,395.70	44.01	40.41	110.53	2,279.59	283.67	857.90	777.43	80.47	10.661			
13,500.00	11,093.15	13,563.14	11,394.83	45.10	41.57	110.58	2,379.58	282.91	858.21	775.58	82.64	10.385			
13,600.00	11,091.40	13,663.13	11,393.96	46.22	42.76	110.63	2,479.57	282.14	858.53	773.69	84.84	10.119			
13,700.00	11,089.66	13,763.13	11,393.08	47.36	43.96	110.69	2,579.56	281.37	858.84	771.77	87.07	9.864			
13,800.00	11,087.91	13,863.12	11,392.21	48.51	45.17	110.74	2,679.55	280.60	859.16	769.83	89.33	9.618			
13,900.00	11,086.16	13,963.12	11,391.34	49.67	46.40	110.80	2,779.54	279.83	859.48	767.86	91.61	9.382			
14,000.00	11,084.42	14,063.12	11,390.46	50.86	47.64	110.85	2,879.53	279.07	859.79	765.87	93.92	9.155			
14,100.00	11,082.67	14,163.11	11,389.59	52.05	48.89	110.91	2,979.52	278.30	860.11	763.86	96.25	8.936			
14,200.00	11,080.93	14,263.11	11,388.72	53.26	50.15	110.96	3,079.51	277.53	860.43	761.83	98.60	8.727			
14,300.00	11,079.18	14,363.11	11,387.85	54.48	51.42	111.01	3,179.50	276.76	860.75	759.78	100.96	8.525			
14,400.00	11,077.43	14,463.10	11,386.97	55.71	52.70	111.07	3,279.49	276.00	861.07	757.72	103.35	8.332			
14,500.00	11,075.69	14,563.10	11,386.10	56.95	53.99	111.12	3,379.48	275.23	861.39	755.64	105.75	8.146			
14,600.00	11,073.94	14,663.09	11,385.23	58.20	55.29	111.18	3,479.47	274.46	861.71	753.55	108.16	7.967			
14,700.00	11,072.20	14,763.09	11,384.36	59.46	56.59	111.23	3,579.45	273.69	862.04	751.44	110.59	7.795			
14,800.00	11,070.45	14,863.09	11,383.48	60.73	57.90	111.28	3,679.44	272.92	862.36	749.33	113.03	7.629			
14,900.00	11,068.70	14,963.08	11,382.61	62.00	59.21	111.34	3,779.43	272.16	862.68	747.20	115.48	7.470			
15,000.00	11,066.96	15,063.08	11,381.74	63.28	60.54	111.39	3,879.42	271.39	863.01	745.06	117.95	7.317			
15,100.00	11,065.21	15,163.07	11,380.87	64.57	61.86	111.45	3,979.41	270.62	863.33	742.91	120.42	7.169			
15,200.00	11,063.47	15,263.07	11,379.99	65.87	63.20	111.50	4,079.40	269.85	863.66	740.76	122.90	7.027			
15,300.00	11,061.72	15,363.07	11,379.12	67.17	64.54	111.55	4,179.39	269.08	863.99	738.60	125.39	6.890			
15,400.00	11,059.98	15,463.06	11,378.25	68.48	65.88	111.61	4,279.38	268.32	864.32	736.42	127.89	6.758			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design													Offset Site Error:	0.00 usft
Black & Tan 27 Federal Com - 406H - OH - Plan 1 09-08-17													Offset Well Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 10938-MWD+HDGM														
Reference		Offset		Semi Major Axis			Distance							
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	
15,500.00	11,058.23	15,563.06	11,377.38	69.79	67.22	111.66	4,379.37	267.55	864.64	734.25	130.40	6.631		
15,600.00	11,056.48	15,663.06	11,376.50	71.11	68.58	111.71	4,479.36	266.78	864.97	732.06	132.91	6.508		
15,700.00	11,054.74	15,763.05	11,375.63	72.44	69.93	111.77	4,579.35	266.01	865.30	729.87	135.43	6.389		
15,800.00	11,052.99	15,863.05	11,374.76	73.76	71.29	111.82	4,679.34	265.24	865.63	727.68	137.96	6.275		
15,900.00	11,051.25	15,963.04	11,373.88	75.10	72.65	111.87	4,779.33	264.48	865.97	725.48	140.49	6.164		
15,914.57	11,050.99	15,975.03	11,373.78	75.32	72.81	111.88	4,791.31	264.38	866.02	725.19	140.83	6.150		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 504H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11231-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-90.28	-0.20	-40.15	40.15					
100.00	100.00	100.00	100.00	0.10	0.10	-90.28	-0.20	-40.15	40.15	39.96	0.20	204.406		
200.00	200.00	200.00	200.00	0.36	0.36	-90.28	-0.20	-40.15	40.15	39.42	0.73	55.204		
300.00	300.00	300.00	300.00	0.63	0.63	-90.28	-0.20	-40.15	40.15	38.89	1.26	31.911		
400.00	400.00	400.00	400.00	0.89	0.89	-90.28	-0.20	-40.15	40.15	38.36	1.79	22.442		
500.00	500.00	500.00	500.00	1.16	1.16	-90.28	-0.20	-40.15	40.15	37.83	2.32	17.307		
600.00	600.00	600.00	600.00	1.43	1.43	-90.28	-0.20	-40.15	40.15	37.30	2.85	14.084		
700.00	700.00	700.00	700.00	1.69	1.69	-90.28	-0.20	-40.15	40.15	36.77	3.38	11.873		
800.00	800.00	800.00	800.00	1.96	1.96	-90.28	-0.20	-40.15	40.15	36.24	3.91	10.262		
900.00	900.00	900.00	900.00	2.22	2.22	-90.28	-0.20	-40.15	40.15	35.71	4.44	9.036		
1,000.00	1,000.00	1,000.00	1,000.00	2.49	2.49	-90.28	-0.20	-40.15	40.15	35.18	4.97	8.072		
1,100.00	1,100.00	1,100.00	1,100.00	2.75	2.75	-90.28	-0.20	-40.15	40.15	34.65	5.51	7.293		
1,200.00	1,200.00	1,200.00	1,200.00	3.02	3.02	-90.28	-0.20	-40.15	40.15	34.12	6.04	6.652		
1,300.00	1,300.00	1,300.00	1,300.00	3.28	3.28	-90.28	-0.20	-40.15	40.15	33.58	6.57	6.114		
1,400.00	1,400.00	1,400.00	1,400.00	3.55	3.55	-90.28	-0.20	-40.15	40.15	33.05	7.10	5.657		
1,500.00	1,500.00	1,500.00	1,500.00	3.81	3.81	-90.28	-0.20	-40.15	40.15	32.52	7.63	5.263		
1,600.00	1,600.00	1,600.00	1,600.00	4.08	4.08	-90.28	-0.20	-40.15	40.15	31.99	8.16	4.921		
1,700.00	1,700.00	1,700.00	1,700.00	4.35	4.35	-90.28	-0.20	-40.15	40.15	31.46	8.69	4.620		
1,800.00	1,800.00	1,800.00	1,800.00	4.61	4.61	-90.28	-0.20	-40.15	40.15	30.93	9.22	4.354		
1,900.00	1,900.00	1,900.00	1,900.00	4.88	4.88	-90.28	-0.20	-40.15	40.15	30.40	9.75	4.117		
2,000.00	2,000.00	2,000.00	2,000.00	5.14	5.14	-90.28	-0.20	-40.15	40.15	29.87	10.28	3.904		
2,100.00	2,100.00	2,100.00	2,100.00	5.41	5.41	-90.28	-0.20	-40.15	40.15	29.34	10.81	3.713		
2,200.00	2,200.00	2,200.00	2,200.00	5.67	5.67	-90.28	-0.20	-40.15	40.15	28.81	11.35	3.539		
2,300.00	2,300.00	2,300.00	2,300.00	5.94	5.94	-90.28	-0.20	-40.15	40.15	28.28	11.88	3.381		
2,400.00	2,400.00	2,400.00	2,400.00	6.20	6.20	-90.28	-0.20	-40.15	40.15	27.74	12.41	3.236		
2,500.00	2,500.00	2,500.00	2,500.00	6.47	6.47	-90.28	-0.20	-40.15	40.15	27.21	12.94	3.103		
2,600.00	2,600.00	2,600.00	2,600.00	6.73	6.73	-90.28	-0.20	-40.15	40.15	26.68	13.47	2.981		
2,700.00	2,700.00	2,700.00	2,700.00	7.00	7.00	-90.28	-0.20	-40.15	40.15	26.15	14.00	2.868		
2,800.00	2,800.00	2,800.00	2,800.00	7.27	7.27	-90.28	-0.20	-40.15	40.15	25.62	14.53	2.763		
2,900.00	2,900.00	2,900.00	2,900.00	7.53	7.53	-90.28	-0.20	-40.15	40.15	25.09	15.06	2.666		
3,000.00	3,000.00	3,000.00	3,000.00	7.80	7.80	-90.28	-0.20	-40.15	40.15	24.56	15.59	2.575		
3,100.00	3,100.00	3,100.00	3,100.00	8.06	8.06	-90.28	-0.20	-40.15	40.15	24.03	16.12	2.490		
3,200.00	3,200.00	3,200.00	3,200.00	8.33	8.33	-90.28	-0.20	-40.15	40.15	23.50	16.65	2.411		
3,300.00	3,300.00	3,300.00	3,300.00	8.59	8.59	-90.28	-0.20	-40.15	40.15	22.97	17.18	2.336		
3,400.00	3,400.00	3,400.00	3,400.00	8.86	8.86	-90.28	-0.20	-40.15	40.15	22.44	17.72	2.266		
3,500.00	3,500.00	3,500.00	3,500.00	9.12	9.12	-90.28	-0.20	-40.15	40.15	21.90	18.25	2.200		
3,600.00	3,600.00	3,600.00	3,600.00	9.39	9.39	-90.28	-0.20	-40.15	40.15	21.37	18.78	2.138		
3,700.00	3,700.00	3,700.00	3,700.00	9.65	9.65	-90.28	-0.20	-40.15	40.15	20.84	19.31	2.079		
3,800.00	3,800.00	3,800.00	3,800.00	9.92	9.92	-90.28	-0.20	-40.15	40.15	20.31	19.84	2.024		
3,900.00	3,900.00	3,900.00	3,900.00	10.19	10.19	-90.28	-0.20	-40.15	40.15	19.78	20.37	1.971		
4,000.00	4,000.00	4,000.00	4,000.00	10.45	10.45	-90.28	-0.20	-40.15	40.15	19.25	20.90	1.921		
4,100.00	4,100.00	4,100.00	4,100.00	10.72	10.72	-90.28	-0.20	-40.15	40.15	18.72	21.43	1.873		
4,200.00	4,200.00	4,200.00	4,200.00	10.98	10.98	-90.28	-0.20	-40.15	40.15	18.19	21.96	1.828		
4,300.00	4,300.00	4,300.00	4,300.00	11.25	11.25	-90.28	-0.20	-40.15	40.15	17.66	22.49	1.785		
4,400.00	4,400.00	4,400.00	4,400.00	11.51	11.51	-90.28	-0.20	-40.15	40.15	17.13	23.02	1.744		
4,500.00	4,500.00	4,500.00	4,500.00	11.78	11.78	-90.28	-0.20	-40.15	40.15	16.60	23.56	1.705		
4,600.00	4,600.00	4,600.00	4,600.00	12.04	12.04	-90.28	-0.20	-40.15	40.15	16.06	24.09	1.667		
4,700.00	4,700.00	4,700.00	4,700.00	12.31	12.31	-90.28	-0.20	-40.15	40.15	15.53	24.62	1.631		
4,800.00	4,800.00	4,800.00	4,800.00	12.57	12.57	-90.28	-0.20	-40.15	40.15	15.00	25.15	1.597		
4,900.00	4,900.00	4,900.00	4,900.00	12.84	12.84	-90.28	-0.20	-40.15	40.15	14.47	25.68	1.564		
5,000.00	5,000.00	5,000.00	5,000.00	13.11	13.11	-90.28	-0.20	-40.15	40.15	13.94	26.21	1.532		
5,100.00	5,100.00	5,100.00	5,100.00	13.37	13.37	-90.28	-0.20	-40.15	40.15	13.41	26.74	1.501		

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



Phoenix Technology Services LP

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 504H - OH - Plan 1 09-08-17														Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11231-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	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	Warning		
5,200.00	5,200.00	5,200.00	5,200.00	13.64	13.64	-90.28	-0.20	-40.15	40.15	12.88	27.27	1.472	Level 3		
5,300.00	5,300.00	5,300.00	5,300.00	13.90	13.90	-90.28	-0.20	-40.15	40.15	12.35	27.80	1.444	Level 3		
5,400.00	5,400.00	5,400.00	5,400.00	14.17	14.17	-90.28	-0.20	-40.15	40.15	11.82	28.33	1.417	Level 3		
5,500.00	5,500.00	5,500.00	5,500.00	14.43	14.43	-90.28	-0.20	-40.15	40.15	11.29	28.86	1.391	Level 3		
5,600.00	5,600.00	5,600.00	5,600.00	14.70	14.70	-90.28	-0.20	-40.15	40.15	10.76	29.40	1.366	Level 3		
5,700.00	5,700.00	5,700.00	5,700.00	14.96	14.96	-90.28	-0.20	-40.15	40.15	10.23	29.93	1.342	Level 3		
5,800.00	5,800.00	5,800.00	5,800.00	15.23	15.23	-90.28	-0.20	-40.15	40.15	9.69	30.46	1.318	Level 3		
5,900.00	5,900.00	5,900.08	5,900.08	15.49	15.47	-90.32	-0.23	-40.13	40.13	9.17	30.96	1.296	Level 3		
6,000.00	6,000.00	6,000.45	6,000.44	15.76	15.46	-91.81	-1.25	-39.44	39.47	8.25	31.22	1.264	Level 3		
6,100.00	6,100.00	6,100.75	6,100.70	16.02	15.46	-95.63	-3.72	-37.77	37.96	6.48	31.48	1.206	Level 2		
6,200.00	6,200.00	6,200.91	6,200.75	16.29	15.46	-102.28	-7.65	-35.13	35.96	4.21	31.75	1.133	Level 2		
6,300.00	6,300.00	6,300.88	6,300.50	16.56	15.46	-112.43	-13.01	-31.51	34.09	2.07	32.02	1.065	Level 2		
6,384.88	6,384.88	6,385.54	6,384.88	16.78	15.47	-124.00	-18.68	-27.69	33.40	1.14	32.25	1.035	Level 2, CC		
6,400.00	6,400.00	6,400.59	6,399.88	16.82	15.48	-126.31	-19.79	-26.93	33.42	1.13	32.30	1.035	Level 2, ES, SF		
6,500.00	6,500.00	6,500.03	6,498.82	17.09	15.49	-142.53	-27.95	-21.43	35.24	2.67	32.58	1.082	Level 2		
6,600.00	6,600.00	6,599.48	6,597.73	17.35	15.51	-156.88	-36.57	-15.62	39.83	6.97	32.86	1.212	Level 2		
6,700.00	6,700.00	6,698.93	6,696.64	17.62	15.54	-167.76	-45.19	-9.80	46.36	13.21	33.15	1.399	Level 3		
6,800.00	6,800.00	6,798.39	6,795.55	17.88	15.57	-175.76	-53.81	-3.99	54.14	20.69	33.45	1.619			
6,900.00	6,900.00	6,897.84	6,894.45	18.15	15.60	-178.33	-62.43	1.82	62.70	28.95	33.75	1.858			
7,000.00	7,000.00	6,997.29	6,993.36	18.41	15.64	-173.86	-71.05	7.64	71.76	37.71	34.05	2.107			
7,100.00	7,100.00	7,096.74	7,092.27	18.68	15.69	-170.42	-79.66	13.45	81.16	46.80	34.36	2.362			
7,200.00	7,200.00	7,196.19	7,191.18	18.94	15.74	-167.69	-88.28	19.26	90.79	56.11	34.68	2.618			
7,300.00	7,300.00	7,295.91	7,290.35	19.21	15.79	-165.49	-96.91	25.08	100.56	65.57	35.00	2.873			
7,400.00	7,400.00	7,397.24	7,391.23	19.48	15.85	-163.84	-104.72	30.35	109.38	74.05	35.32	3.096			
7,500.00	7,500.00	7,498.87	7,492.58	19.74	15.92	-162.68	-111.06	34.63	116.57	80.92	35.65	3.270			
7,600.00	7,600.00	7,600.74	7,594.28	20.01	15.99	-161.89	-115.93	37.91	122.10	86.12	35.99	3.393			
7,700.00	7,700.00	7,702.79	7,696.25	20.27	16.06	-161.39	-119.30	40.18	125.94	89.61	36.32	3.467			
7,800.00	7,800.00	7,804.95	7,798.38	20.54	16.14	-161.12	-121.16	41.44	128.06	91.39	36.67	3.493			
7,900.00	7,900.00	7,906.57	7,900.00	20.80	16.32	-161.06	-121.57	41.71	128.52	91.40	37.12	3.462			
8,000.00	8,000.00	8,006.57	8,000.00	21.07	16.58	-161.06	-121.57	41.71	128.52	90.89	37.64	3.415			
8,100.00	8,100.00	8,106.57	8,100.00	21.33	16.83	-161.06	-121.57	41.71	128.52	90.37	38.15	3.368			
8,200.00	8,200.00	8,206.57	8,200.00	21.60	17.08	-161.06	-121.57	41.71	128.52	89.85	38.67	3.323			
8,300.00	8,300.00	8,306.57	8,300.00	21.86	17.33	-161.06	-121.57	41.71	128.52	89.33	39.19	3.279			
8,400.00	8,400.00	8,406.57	8,400.00	22.13	17.59	-161.06	-121.57	41.71	128.52	88.82	39.71	3.237			
8,500.00	8,500.00	8,506.57	8,500.00	22.40	17.84	-161.06	-121.57	41.71	128.52	88.30	40.23	3.195			
8,600.00	8,600.00	8,606.57	8,600.00	22.66	18.09	-161.06	-121.57	41.71	128.52	87.78	40.75	3.154			
8,700.00	8,700.00	8,706.57	8,700.00	22.93	18.35	-161.06	-121.57	41.71	128.52	87.26	41.27	3.115			
8,800.00	8,800.00	8,806.57	8,800.00	23.19	18.60	-161.06	-121.57	41.71	128.52	86.74	41.79	3.076			
8,900.00	8,900.00	8,906.57	8,900.00	23.46	18.85	-161.06	-121.57	41.71	128.52	86.22	42.31	3.038			
9,000.00	9,000.00	9,006.57	9,000.00	23.72	19.11	-161.06	-121.57	41.71	128.52	85.70	42.83	3.001			
9,100.00	9,100.00	9,106.57	9,100.00	23.99	19.36	-161.06	-121.57	41.71	128.52	85.18	43.35	2.965			
9,200.00	9,200.00	9,206.57	9,200.00	24.25	19.62	-161.06	-121.57	41.71	128.52	84.66	43.87	2.930			
9,300.00	9,300.00	9,306.57	9,300.00	24.52	19.88	-161.06	-121.57	41.71	128.52	84.13	44.39	2.895			
9,400.00	9,400.00	9,406.57	9,400.00	24.78	20.13	-161.06	-121.57	41.71	128.52	83.61	44.91	2.862			
9,500.00	9,500.00	9,506.57	9,500.00	25.05	20.39	-161.06	-121.57	41.71	128.52	83.09	45.43	2.829			
9,600.00	9,600.00	9,606.57	9,600.00	25.32	20.64	-161.06	-121.57	41.71	128.52	82.57	45.95	2.797			
9,700.00	9,700.00	9,706.57	9,700.00	25.58	20.90	-161.06	-121.57	41.71	128.52	82.05	46.48	2.765			
9,800.00	9,800.00	9,806.57	9,800.00	25.85	21.16	-161.06	-121.57	41.71	128.52	81.53	47.00	2.735			
9,900.00	9,900.00	9,906.57	9,900.00	26.11	21.42	-161.06	-121.57	41.71	128.52	81.00	47.52	2.705			
10,000.00	10,000.00	10,006.57	10,000.00	26.38	21.67	-161.06	-121.57	41.71	128.52	80.48	48.04	2.675			
10,100.00	10,100.00	10,106.57	10,100.00	26.64	21.93	-161.06	-121.57	41.71	128.52	79.96	48.57	2.646			
10,200.00	10,200.00	10,206.57	10,200.00	26.91	22.19	-161.06	-121.57	41.71	128.52	79.43	49.09	2.618			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design														Black & Tan 27 Federal Com - 504H - OH - Plan 1 09-08-17		Offset Site Error: 0.00 usft	
Survey Program: 0-NS-GYRO-MS, 11231-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 +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor					
10,300.00	10,300.00	10,306.57	10,300.00	27.17	22.45	161.06	-121.57	41.71	128.52	78.91	49.61	2.591					
10,400.00	10,400.00	10,406.57	10,400.00	27.44	22.70	161.06	-121.57	41.71	128.52	78.39	50.14	2.563					
10,405.85	10,405.85	10,412.42	10,405.85	27.45	22.72	-103.35	-121.57	41.71	128.53	78.39	50.14	2.563					
10,500.00	10,499.79	10,506.36	10,499.79	27.55	22.96	-105.19	-121.57	41.71	129.67	79.21	50.46	2.570					
10,600.00	10,596.65	10,603.22	10,596.65	27.57	23.21	-113.69	-121.57	41.71	138.02	87.69	50.32	2.743					
10,700.00	10,686.38	10,692.95	10,686.38	27.60	23.44	-124.71	-121.57	41.71	161.45	112.49	48.96	3.298					
10,800.00	10,765.06	10,771.63	10,765.06	27.67	23.65	-133.26	-121.57	41.71	205.88	159.84	46.04	4.472					
10,900.00	10,835.74	10,842.32	10,835.74	27.82	23.83	-159.96	-121.57	41.71	269.10	228.60	40.50	6.644					
11,000.00	10,904.30	10,910.88	10,904.30	28.05	24.01	175.54	-121.57	41.71	341.31	303.71	37.60	9.077					
11,100.00	10,967.80	10,974.38	10,967.80	28.33	24.17	155.49	-121.57	41.71	417.31	378.81	38.49	10.841					
11,200.00	11,023.46	11,030.04	11,023.46	28.65	24.32	138.73	-121.57	41.71	495.25	453.33	41.92	11.815					
11,300.00	11,068.85	11,075.43	11,068.85	29.01	24.43	124.00	-121.57	41.71	574.23	527.91	46.32	12.396					
11,400.00	11,101.99	11,108.56	11,101.99	29.38	24.52	110.60	-121.57	41.71	653.36	603.06	50.31	12.988					
11,500.00	11,121.42	11,128.00	11,121.42	29.74	24.57	98.57	-121.57	41.71	731.44	678.67	52.77	13.862					
11,600.00	11,126.32	12,105.53	11,700.97	30.08	26.28	136.62	480.27	37.14	790.60	745.98	44.62	17.719					
11,700.00	11,124.57	12,205.53	11,700.09	30.42	26.79	136.67	580.26	36.38	791.24	745.89	45.35	17.447					
11,800.00	11,122.83	12,305.53	11,699.22	30.83	27.36	136.71	680.25	35.62	791.89	745.70	46.19	17.146					
11,900.00	11,121.08	12,405.52	11,698.35	31.30	28.00	136.75	780.23	34.86	792.53	745.42	47.12	16.821					
12,000.00	11,119.34	12,505.52	11,697.48	31.83	28.69	136.79	880.22	34.10	793.18	745.05	48.13	16.479					
12,100.00	11,117.59	12,605.51	11,696.60	32.42	29.45	136.84	980.21	33.34	793.83	744.59	49.24	16.123					
12,200.00	11,115.84	12,705.51	11,695.73	33.07	30.25	136.88	1,080.20	32.58	794.48	744.06	50.42	15.758					
12,300.00	11,114.10	12,805.51	11,694.86	33.76	31.09	136.92	1,180.19	31.82	795.12	743.46	51.67	15.389					
12,400.00	11,112.35	12,905.50	11,693.99	34.51	31.98	136.96	1,280.18	31.06	795.77	742.79	52.99	15.018					
12,500.00	11,110.61	13,005.50	11,693.11	35.31	32.91	137.01	1,380.17	30.30	796.42	742.06	54.37	14.649					
12,600.00	11,108.86	13,105.50	11,692.24	36.14	33.88	137.05	1,480.16	29.54	797.07	741.27	55.80	14.283					
12,700.00	11,107.12	13,205.49	11,691.37	37.01	34.88	137.09	1,580.15	28.78	797.72	740.43	57.29	13.923					
12,800.00	11,105.37	13,305.49	11,690.50	37.93	35.91	137.13	1,680.14	28.02	798.37	739.54	58.83	13.570					
12,900.00	11,103.62	13,405.48	11,689.62	38.87	36.97	137.17	1,780.13	27.26	799.02	738.61	60.41	13.226					
13,000.00	11,101.88	13,505.48	11,688.75	39.84	38.05	137.21	1,880.12	26.50	799.67	737.64	62.04	12.890					
13,100.00	11,100.13	13,605.48	11,687.88	40.85	39.16	137.26	1,980.11	25.74	800.33	736.63	63.70	12.565					
13,200.00	11,098.39	13,705.47	11,687.00	41.88	40.28	137.30	2,080.10	24.98	800.98	735.59	65.39	12.249					
13,300.00	11,096.64	13,805.47	11,686.13	42.93	41.43	137.34	2,180.09	24.22	801.63	734.51	67.12	11.944					
13,400.00	11,094.89	13,905.47	11,685.26	44.01	42.60	137.38	2,280.08	23.46	802.28	733.41	68.87	11.649					
13,500.00	11,093.15	14,005.46	11,684.39	45.10	43.78	137.42	2,380.07	22.70	802.94	732.28	70.65	11.364					
13,600.00	11,091.40	14,105.46	11,683.51	46.22	44.98	137.46	2,480.06	21.94	803.59	731.13	72.46	11.090					
13,700.00	11,089.66	14,205.45	11,682.64	47.36	46.19	137.50	2,580.05	21.18	804.24	729.95	74.29	10.826					
13,800.00	11,087.91	14,305.45	11,681.77	48.51	47.41	137.55	2,680.04	20.42	804.90	728.76	76.14	10.571					
13,900.00	11,086.16	14,405.45	11,680.90	49.67	48.65	137.59	2,780.02	19.66	805.55	727.54	78.01	10.327					
14,000.00	11,084.42	14,505.44	11,680.02	50.86	49.90	137.63	2,880.01	18.90	806.21	726.31	79.89	10.091					
14,100.00	11,082.67	14,605.44	11,679.15	52.05	51.16	137.67	2,980.00	18.14	806.86	725.07	81.80	9.864					
14,200.00	11,080.93	14,705.43	11,678.28	53.26	52.43	137.71	3,079.99	17.38	807.52	723.80	83.72	9.646					
14,300.00	11,079.18	14,805.43	11,677.41	54.48	53.70	137.75	3,179.98	16.62	808.18	722.53	85.65	9.436					
14,400.00	11,077.43	14,905.43	11,676.53	55.71	54.99	137.79	3,279.97	15.86	808.83	721.24	87.59	9.234					
14,500.00	11,075.69	15,005.42	11,675.66	56.95	56.28	137.83	3,379.96	15.10	809.49	719.94	89.55	9.040					
14,600.00	11,073.94	15,105.42	11,674.79	58.20	57.58	137.87	3,479.95	14.34	810.15	718.63	91.52	8.853					
14,700.00	11,072.20	15,205.42	11,673.92	59.46	58.89	137.91	3,579.94	13.58	810.81	717.31	93.49	8.672					
14,800.00	11,070.45	15,305.41	11,673.04	60.73	60.20	137.95	3,679.93	12.82	811.47	715.98	95.48	8.499					
14,900.00	11,068.70	15,405.41	11,672.17	62.00	61.52	137.99	3,779.92	12.06	812.12	714.65	97.48	8.332					
15,000.00	11,066.96	15,505.40	11,671.30	63.28	62.85	138.04	3,879.91	11.30	812.78	713.30	99.48	8.170					
15,100.00	11,065.21	15,605.40	11,670.42	64.57	64.18	138.08	3,979.90	10.54	813.44	711.95	101.49	8.015					
15,200.00	11,063.47	15,705.40	11,669.55	65.87	65.51	138.12	4,079.89	9.78	814.10	710.59	103.51	7.865					
15,300.00	11,061.72	15,805.39	11,668.68	67.17	66.85	138.16	4,179.88	9.02	814.76	709.23	105.53	7.720					

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Black & Tan 27 Federal Com - 504H - OH - Plan 1 09-08-17													Offset Site Error:	0.00 usft
Survey Program: 0-NS-GYRO-MS, 11231-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,400.00	11,059.98	15,905.39	11,667.81	68.48	68.20	138.20	4,279.87	8.26	815.43	707.86	107.56	7.581		
15,500.00	11,058.23	16,005.39	11,666.93	69.79	69.55	138.24	4,379.86	7.50	816.09	706.49	109.60	7.446		
15,600.00	11,056.48	16,105.38	11,666.06	71.11	70.90	138.28	4,479.85	6.74	816.75	705.11	111.64	7.316		
15,700.00	11,054.74	16,205.38	11,665.19	72.44	72.25	138.32	4,579.84	5.98	817.41	703.72	113.69	7.190		
15,800.00	11,052.99	16,305.37	11,664.32	73.76	73.61	138.36	4,679.83	5.22	818.07	702.33	115.74	7.068		
15,900.00	11,051.25	16,405.37	11,663.44	75.10	74.97	138.40	4,779.81	4.46	818.74	700.94	117.79	6.951		
15,914.57	11,050.99	16,414.60	11,663.36	75.32	75.10	138.40	4,789.04	4.39	818.85	700.81	118.04	6.937		

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Fletcher A De Federal - #2 - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N/-S (usft)	Offset Wellbore +E/-W (usft)						
0.00	0.00	0.00	28.00	0.00	0.00	76.61	112.12	471.11	485.08					
100.00	100.00	72.00	100.00	0.10	1.09	76.61	112.12	471.11	484.27	483.08	1.19	408.400		
200.00	200.00	172.00	200.00	0.36	3.66	76.61	112.12	471.11	484.27	480.24	4.03	120.289		
300.00	300.00	272.02	300.00	0.63	6.66	76.61	112.12	471.11	484.27	476.99	7.28	66.477		
400.00	400.00	372.04	400.00	0.89	9.65	76.61	112.12	471.11	484.27	473.72	10.55	45.919		
500.00	500.00	472.06	500.00	1.16	12.65	76.61	112.12	471.11	484.27	470.46	13.81	35.072		
600.00	600.00	572.08	600.00	1.43	15.64	76.61	112.12	471.11	484.27	467.20	17.07	28.369		
700.00	700.00	672.10	700.00	1.69	18.64	76.61	112.12	471.11	484.27	463.94	20.33	23.818		
800.00	800.00	772.12	800.00	1.96	21.64	76.61	112.12	471.11	484.27	460.68	23.59	20.524		
900.00	900.00	872.14	900.00	2.22	24.64	76.61	112.12	471.11	484.27	457.41	26.86	18.031		
1,000.00	1,000.00	972.16	1,000.00	2.49	27.63	76.61	112.12	471.11	484.27	454.15	30.12	16.078		
1,100.00	1,100.00	1,072.18	1,100.00	2.75	30.63	76.61	112.12	471.11	484.27	450.89	33.38	14.507		
1,200.00	1,200.00	1,172.20	1,200.00	3.02	33.63	76.61	112.12	471.11	484.27	447.63	36.64	13.215		
1,300.00	1,300.00	1,272.22	1,300.00	3.28	36.62	76.61	112.12	471.11	484.27	444.36	39.91	12.135		
1,400.00	1,400.00	1,372.24	1,400.00	3.55	39.62	76.61	112.12	471.11	484.27	441.10	43.17	11.218		
1,500.00	1,500.00	1,472.26	1,500.00	3.81	42.62	76.61	112.12	471.11	484.27	437.84	46.43	10.430		
1,600.00	1,600.00	1,572.28	1,600.00	4.08	45.61	76.61	112.12	471.11	484.27	434.58	49.69	9.745		
1,700.00	1,700.00	1,672.30	1,700.00	4.35	48.61	76.61	112.12	471.11	484.27	431.31	52.96	9.145		
1,800.00	1,800.00	1,772.32	1,800.00	4.61	51.61	76.61	112.12	471.11	484.27	428.05	56.22	8.614		
1,900.00	1,900.00	1,872.35	1,900.00	4.88	54.61	76.61	112.12	471.11	484.27	424.79	59.48	8.141		
2,000.00	2,000.00	1,972.37	2,000.00	5.14	57.60	76.61	112.12	471.11	484.27	421.53	62.74	7.718		
2,100.00	2,100.00	2,072.39	2,100.00	5.41	60.60	76.61	112.12	471.11	484.27	418.26	66.01	7.337		
2,200.00	2,200.00	2,172.41	2,200.00	5.67	63.60	76.61	112.12	471.11	484.27	415.00	69.27	6.991		
2,300.00	2,300.00	2,272.43	2,300.00	5.94	66.59	76.61	112.12	471.11	484.27	411.74	72.53	6.677		
2,400.00	2,400.00	2,372.45	2,400.00	6.20	69.59	76.61	112.12	471.11	484.27	408.48	75.79	6.389		
2,500.00	2,500.00	2,472.47	2,500.00	6.47	72.59	76.61	112.12	471.11	484.27	405.21	79.06	6.126		
2,600.00	2,600.00	2,572.49	2,600.00	6.73	75.59	76.61	112.12	471.11	484.27	401.95	82.32	5.883		
2,700.00	2,700.00	2,672.51	2,700.00	7.00	78.58	76.61	112.12	471.11	484.27	398.69	85.58	5.659		
2,800.00	2,800.00	2,772.53	2,800.00	7.27	81.58	76.61	112.12	471.11	484.27	395.43	88.84	5.451		
2,900.00	2,900.00	2,872.55	2,900.00	7.53	84.58	76.61	112.12	471.11	484.27	392.16	92.11	5.258		
3,000.00	3,000.00	2,972.57	3,000.00	7.80	87.57	76.61	112.12	471.11	484.27	388.90	95.37	5.078		
3,100.00	3,100.00	3,072.59	3,100.00	8.06	90.57	76.61	112.12	471.11	484.27	385.64	98.63	4.910		
3,200.00	3,200.00	3,172.61	3,200.00	8.33	93.57	76.61	112.12	471.11	484.27	382.38	101.89	4.753		
3,300.00	3,300.00	3,272.63	3,300.00	8.59	96.56	76.61	112.12	471.11	484.27	379.11	105.16	4.605		
3,400.00	3,400.00	3,372.65	3,400.00	8.86	99.56	76.61	112.12	471.11	484.27	375.85	108.42	4.467		
3,500.00	3,500.00	3,472.67	3,500.00	9.12	102.56	76.61	112.12	471.11	484.27	372.59	111.68	4.336		
3,600.00	3,600.00	3,572.69	3,600.00	9.39	105.56	76.61	112.12	471.11	484.27	369.33	114.94	4.213		
3,700.00	3,700.00	3,672.71	3,700.00	9.65	108.55	76.61	112.12	471.11	484.27	366.06	118.21	4.097 CC, ES		
3,800.00	3,800.00	3,705.00	3,732.27	9.92	109.52	76.61	112.12	471.11	488.98	369.54	119.44	4.094 SF		
3,900.00	3,900.00	3,705.00	3,732.27	10.19	109.52	76.61	112.12	471.11	512.50	392.79	119.71	4.281		
4,000.00	4,000.00	3,705.00	3,732.27	10.45	109.52	76.61	112.12	471.11	553.35	433.38	119.97	4.612		
4,100.00	4,100.00	3,705.00	3,732.27	10.72	109.52	76.61	112.12	471.11	608.07	487.83	120.24	5.057		
4,200.00	4,200.00	3,705.00	3,732.27	10.98	109.52	76.61	112.12	471.11	673.27	552.77	120.50	5.587		
4,300.00	4,300.00	3,705.00	3,732.27	11.25	109.52	76.61	112.12	471.11	746.22	625.45	120.77	6.179		
4,400.00	4,400.00	3,705.00	3,732.27	11.51	109.52	76.61	112.12	471.11	824.85	703.82	121.03	6.815		
4,500.00	4,500.00	3,705.00	3,732.27	11.78	109.52	76.61	112.12	471.11	907.71	786.41	121.30	7.483		
4,600.00	4,600.00	3,705.00	3,732.27	12.04	109.52	76.61	112.12	471.11	993.72	872.15	121.56	8.174		
4,700.00	4,700.00	3,705.00	3,732.27	12.31	109.52	76.61	112.12	471.11	1,082.14	960.31	121.83	8.882		
4,800.00	4,800.00	3,705.00	3,732.27	12.57	109.52	76.61	112.12	471.11	1,172.42	1,050.33	122.09	9.603		
4,900.00	4,900.00	3,705.00	3,732.27	12.84	109.52	76.61	112.12	471.11	1,264.17	1,141.81	122.36	10.332		
5,000.00	5,000.00	3,705.00	3,732.27	13.11	109.52	76.61	112.12	471.11	1,357.08	1,234.45	122.63	11.067		
5,100.00	5,100.00	3,705.00	3,732.27	13.37	109.52	76.61	112.12	471.11	1,450.93	1,328.04	122.89	11.807		

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Fletcher A De Federal - #2 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well														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 +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,200.00	5,200.00	3,705.00	3,732.27	13.64	109.52	76.61	112.12	471.11	1,545.56	1,422.40	123.16	12.550			
5,300.00	5,300.00	3,705.00	3,732.27	13.90	109.52	76.61	112.12	471.11	1,640.82	1,517.40	123.42	13.294			
5,400.00	5,400.00	3,705.00	3,732.27	14.17	109.52	76.61	112.12	471.11	1,736.62	1,612.93	123.69	14.040			
5,500.00	5,500.00	3,705.00	3,732.27	14.43	109.52	76.61	112.12	471.11	1,832.87	1,708.91	123.95	14.787			
5,600.00	5,600.00	3,705.00	3,732.27	14.70	109.52	76.61	112.12	471.11	1,929.49	1,805.27	124.22	15.533			
5,700.00	5,700.00	3,705.00	3,732.27	14.96	109.52	76.61	112.12	471.11	2,026.45	1,901.96	124.48	16.279			
5,800.00	5,800.00	3,705.00	3,732.27	15.23	109.52	76.61	112.12	471.11	2,123.68	1,998.93	124.75	17.024			
5,900.00	5,900.00	3,705.00	3,732.27	15.49	109.52	76.61	112.12	471.11	2,221.17	2,096.15	125.01	17.767			
6,000.00	6,000.00	3,705.00	3,732.27	15.76	109.52	76.61	112.12	471.11	2,318.86	2,193.58	125.28	18.509			
6,100.00	6,100.00	3,705.00	3,732.27	16.02	109.52	76.61	112.12	471.11	2,416.75	2,291.20	125.55	19.250			
6,200.00	6,200.00	3,705.00	3,732.27	16.29	109.52	76.61	112.12	471.11	2,514.80	2,388.99	125.81	19.989			
6,300.00	6,300.00	3,705.00	3,732.27	16.56	109.52	76.61	112.12	471.11	2,613.00	2,486.92	126.08	20.726			
6,400.00	6,400.00	3,705.00	3,732.27	16.82	109.52	76.61	112.12	471.11	2,711.33	2,584.99	126.34	21.460			
6,500.00	6,500.00	3,705.00	3,732.27	17.09	109.52	76.61	112.12	471.11	2,809.78	2,683.17	126.61	22.193			
6,600.00	6,600.00	3,705.00	3,732.27	17.35	109.52	76.61	112.12	471.11	2,908.33	2,781.46	126.87	22.923			
6,700.00	6,700.00	3,705.00	3,732.27	17.62	109.52	76.61	112.12	471.11	3,006.98	2,879.85	127.14	23.651			
6,800.00	6,800.00	3,705.00	3,732.27	17.88	109.52	76.61	112.12	471.11	3,105.72	2,978.32	127.40	24.377			
6,900.00	6,900.00	3,705.00	3,732.27	18.15	109.52	76.61	112.12	471.11	3,204.53	3,076.87	127.67	25.100			
7,000.00	7,000.00	3,705.00	3,732.27	18.41	109.52	76.61	112.12	471.11	3,303.42	3,175.49	127.93	25.821			
7,100.00	7,100.00	3,705.00	3,732.27	18.68	109.52	76.61	112.12	471.11	3,402.37	3,274.17	128.20	26.540			
7,200.00	7,200.00	3,705.00	3,732.27	18.94	109.52	76.61	112.12	471.11	3,501.38	3,372.92	128.47	27.255			
7,300.00	7,300.00	3,705.00	3,732.27	19.21	109.52	76.61	112.12	471.11	3,600.45	3,471.72	128.73	27.969			
7,400.00	7,400.00	3,705.00	3,732.27	19.48	109.52	76.61	112.12	471.11	3,699.56	3,570.57	129.00	28.680			
7,500.00	7,500.00	3,705.00	3,732.27	19.74	109.52	76.61	112.12	471.11	3,798.73	3,669.46	129.26	29.388			
7,600.00	7,600.00	3,705.00	3,732.27	20.01	109.52	76.61	112.12	471.11	3,897.93	3,768.40	129.53	30.094			
7,700.00	7,700.00	3,705.00	3,732.27	20.27	109.52	76.61	112.12	471.11	3,997.18	3,867.38	129.79	30.797			
7,800.00	7,800.00	3,705.00	3,732.27	20.54	109.52	76.61	112.12	471.11	4,096.46	3,966.40	130.06	31.497			
7,900.00	7,900.00	3,705.00	3,732.27	20.80	109.52	76.61	112.12	471.11	4,195.77	4,065.45	130.32	32.195			
8,000.00	8,000.00	3,705.00	3,732.27	21.07	109.52	76.61	112.12	471.11	4,295.12	4,164.53	130.59	32.890			
8,100.00	8,100.00	3,705.00	3,732.27	21.33	109.52	76.61	112.12	471.11	4,394.50	4,263.64	130.85	33.583			
8,200.00	8,200.00	3,705.00	3,732.27	21.60	109.52	76.61	112.12	471.11	4,493.90	4,362.78	131.12	34.273			
8,300.00	8,300.00	3,705.00	3,732.27	21.86	109.52	76.61	112.12	471.11	4,593.33	4,461.95	131.39	34.961			
8,400.00	8,400.00	3,705.00	3,732.27	22.13	109.52	76.61	112.12	471.11	4,692.79	4,561.14	131.65	35.646			
8,500.00	8,500.00	3,705.00	3,732.27	22.40	109.52	76.61	112.12	471.11	4,792.26	4,660.35	131.92	36.328			
8,600.00	8,600.00	3,705.00	3,732.27	22.66	109.52	76.61	112.12	471.11	4,891.76	4,759.58	132.18	37.008			
8,700.00	8,700.00	3,705.00	3,732.27	22.93	109.52	76.61	112.12	471.11	4,991.28	4,858.83	132.45	37.685			
8,800.00	8,800.00	3,705.00	3,732.27	23.19	109.52	76.61	112.12	471.11	5,090.82	4,958.11	132.71	38.360			
8,900.00	8,900.00	3,705.00	3,732.27	23.46	109.52	76.61	112.12	471.11	5,190.37	5,057.40	132.98	39.032			
9,000.00	9,000.00	3,705.00	3,732.27	23.72	109.52	76.61	112.12	471.11	5,289.95	5,156.70	133.24	39.701			
9,100.00	9,100.00	3,705.00	3,732.27	23.99	109.52	76.61	112.12	471.11	5,389.53	5,256.02	133.51	40.368			
9,200.00	9,200.00	3,705.00	3,732.27	24.25	109.52	76.61	112.12	471.11	5,489.14	5,355.36	133.77	41.033			
9,300.00	9,300.00	3,705.00	3,732.27	24.52	109.52	76.61	112.12	471.11	5,588.75	5,454.71	134.04	41.695			
9,400.00	9,400.00	3,705.00	3,732.27	24.78	109.52	76.61	112.12	471.11	5,688.38	5,554.08	134.31	42.354			
9,500.00	9,500.00	3,705.00	3,732.27	25.05	109.52	76.61	112.12	471.11	5,788.03	5,653.46	134.57	43.011			
9,600.00	9,600.00	3,705.00	3,732.27	25.32	109.52	76.61	112.12	471.11	5,887.68	5,752.85	134.84	43.665			
9,700.00	9,700.00	3,705.00	3,732.27	25.58	109.52	76.61	112.12	471.11	5,987.35	5,852.25	135.10	44.317			
9,800.00	9,800.00	3,705.00	3,732.27	25.85	109.52	76.61	112.12	471.11	6,087.03	5,951.66	135.37	44.967			
9,900.00	9,900.00	3,705.00	3,732.27	26.11	109.52	76.61	112.12	471.11	6,186.71	6,051.08	135.63	45.614			
10,000.00	10,000.00	3,705.00	3,732.27	26.38	109.52	76.61	112.12	471.11	6,286.41	6,150.51	135.90	46.258			
10,100.00	10,100.00	3,705.00	3,732.27	26.64	109.52	76.61	112.12	471.11	6,386.12	6,249.96	136.16	46.900			
10,200.00	10,200.00	3,705.00	3,732.27	26.91	109.52	76.61	112.12	471.11	6,485.84	6,349.41	136.43	47.540			
10,300.00	10,300.00	3,705.00	3,732.27	27.17	109.52	76.61	112.12	471.11	6,585.56	6,448.87	136.69	48.177			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Offset Design Fletcher A De Federal - #2 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-INC-ONLY-Offset Well														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)							
10,400.00	10,400.00	3,705.00	3,732.27	27.44	109.52	76.61	112.12	471.11	6,685.30	6,548.34	136.96	48.812			
10,500.00	10,499.79	3,705.00	3,732.27	27.55	109.52	8.12	112.12	471.11	6,785.15	6,649.33	135.82	49.958			
10,600.00	10,596.65	3,705.00	3,732.27	27.57	109.52	2.01	112.12	471.11	6,883.50	6,754.30	129.20	53.279			
10,700.00	10,686.38	3,705.00	3,732.27	27.60	109.52	1.17	112.12	471.11	6,976.31	6,859.01	117.30	59.473			
10,800.00	10,765.06	3,705.00	3,732.27	27.67	109.52	0.85	112.12	471.11	7,059.82	6,959.06	100.75	70.070			
10,900.00	10,835.74	3,705.00	3,732.27	27.82	109.52	2.94	112.12	471.11	7,136.52	7,037.95	98.57	72.402			
11,000.00	10,904.30	3,705.00	3,732.27	28.05	109.52	4.81	112.12	471.11	7,211.21	7,116.82	94.39	76.400			
11,100.00	10,967.80	3,705.00	3,732.27	28.33	109.52	5.94	112.12	471.11	7,280.77	7,194.05	86.72	83.961			
11,200.00	11,023.46	3,705.00	3,732.27	28.65	109.52	6.50	112.12	471.11	7,342.36	7,266.38	75.98	96.636			
11,300.00	11,068.85	3,705.00	3,732.27	29.01	109.52	6.79	112.12	471.11	7,393.51	7,330.61	62.90	117.553			
11,400.00	11,101.99	3,705.00	3,732.27	29.38	109.52	6.98	112.12	471.11	7,432.22	7,383.62	48.59	152.946			
11,500.00	11,121.42	3,705.00	3,732.27	29.74	109.52	7.20	112.12	471.11	7,457.00	7,421.62	35.38	210.789			
11,600.00	11,126.32	3,705.00	3,732.27	30.08	109.52	7.50	112.12	471.11	7,466.94	7,436.21	30.73	242.993			
11,700.00	11,124.57	3,705.00	3,732.27	30.42	109.52	7.50	112.12	471.11	7,470.79	7,439.80	30.99	241.092			
11,800.00	11,122.83	3,705.00	3,732.27	30.83	109.52	7.50	112.12	471.11	7,475.97	7,444.69	31.28	239.002			
11,900.00	11,121.08	3,705.00	3,732.27	31.30	109.52	7.50	112.12	471.11	7,482.49	7,450.88	31.61	236.747			
12,000.00	11,119.34	3,705.00	3,732.27	31.83	109.52	7.50	112.12	471.11	7,490.33	7,458.37	31.96	234.354			
12,100.00	11,117.59	3,705.00	3,732.27	32.42	109.52	7.50	112.12	471.11	7,499.51	7,467.16	32.35	231.846			
12,200.00	11,115.84	3,705.00	3,732.27	33.07	109.52	7.50	112.12	471.11	7,510.00	7,477.24	32.76	229.248			
12,300.00	11,114.10	3,705.00	3,732.27	33.76	109.52	7.50	112.12	471.11	7,521.81	7,488.61	33.20	226.580			
12,400.00	11,112.35	3,705.00	3,732.27	34.51	109.52	7.50	112.12	471.11	7,534.92	7,501.26	33.66	223.864			
12,500.00	11,110.61	3,705.00	3,732.27	35.31	109.52	7.50	112.12	471.11	7,549.34	7,515.20	34.14	221.118			
12,600.00	11,108.86	3,705.00	3,732.27	36.14	109.52	7.50	112.12	471.11	7,565.05	7,530.41	34.65	218.357			
12,700.00	11,107.12	3,705.00	3,732.27	37.01	109.52	7.50	112.12	471.11	7,582.05	7,546.88	35.17	215.596			
12,800.00	11,105.37	3,705.00	3,732.27	37.93	109.52	7.50	112.12	471.11	7,600.33	7,564.62	35.71	212.848			
12,900.00	11,103.62	3,705.00	3,732.27	38.87	109.52	7.50	112.12	471.11	7,619.87	7,583.61	36.26	210.123			
13,000.00	11,101.88	3,705.00	3,732.27	39.84	109.52	7.50	112.12	471.11	7,640.68	7,603.84	36.83	207.430			
13,100.00	11,100.13	3,705.00	3,732.27	40.85	109.52	7.50	112.12	471.11	7,662.73	7,625.31	37.42	204.778			
13,200.00	11,098.39	3,705.00	3,732.27	41.88	109.52	7.50	112.12	471.11	7,686.02	7,648.00	38.02	202.172			
13,300.00	11,096.64	3,705.00	3,732.27	42.93	109.52	7.50	112.12	471.11	7,710.54	7,671.91	38.63	199.616			
13,400.00	11,094.89	3,705.00	3,732.27	44.01	109.52	7.50	112.12	471.11	7,736.27	7,697.02	39.25	197.117			
13,500.00	11,093.15	3,705.00	3,732.27	45.10	109.52	7.50	112.12	471.11	7,763.21	7,723.33	39.88	194.676			
13,600.00	11,091.40	3,705.00	3,732.27	46.22	109.52	7.50	112.12	471.11	7,791.33	7,750.81	40.52	192.295			
13,700.00	11,089.66	3,705.00	3,732.27	47.36	109.52	7.50	112.12	471.11	7,820.64	7,779.47	41.17	189.977			
13,800.00	11,087.91	3,705.00	3,732.27	48.51	109.52	7.50	112.12	471.11	7,851.10	7,809.28	41.82	187.722			
13,900.00	11,086.16	3,705.00	3,732.27	49.67	109.52	7.50	112.12	471.11	7,882.72	7,840.23	42.49	185.531			
14,000.00	11,084.42	3,705.00	3,732.27	50.86	109.52	7.50	112.12	471.11	7,915.48	7,872.32	43.16	183.405			
14,100.00	11,082.67	3,705.00	3,732.27	52.05	109.52	7.50	112.12	471.11	7,949.36	7,905.52	43.84	181.342			
14,200.00	11,080.93	3,705.00	3,732.27	53.26	109.52	7.50	112.12	471.11	7,984.34	7,939.82	44.52	179.342			
14,300.00	11,079.18	3,705.00	3,732.27	54.48	109.52	7.50	112.12	471.11	8,020.43	7,975.22	45.21	177.405			
14,400.00	11,077.43	3,705.00	3,732.27	55.71	109.52	7.50	112.12	471.11	8,057.59	8,011.68	45.90	175.529			
14,500.00	11,075.69	3,705.00	3,732.27	56.95	109.52	7.50	112.12	471.11	8,095.81	8,049.21	46.60	173.714			
14,600.00	11,073.94	3,705.00	3,732.27	58.20	109.52	7.50	112.12	471.11	8,135.09	8,087.78	47.31	171.957			
14,700.00	11,072.20	3,705.00	3,732.27	59.46	109.52	7.50	112.12	471.11	8,175.40	8,127.38	48.02	170.259			
14,800.00	11,070.45	3,705.00	3,732.27	60.73	109.52	7.50	112.12	471.11	8,216.73	8,168.00	48.73	168.616			
14,900.00	11,068.70	3,705.00	3,732.27	62.00	109.52	7.50	112.12	471.11	8,259.06	8,209.62	49.45	167.028			
15,000.00	11,066.96	3,705.00	3,732.27	63.28	109.52	7.50	112.12	471.11	8,302.39	8,252.22	50.17	165.494			
15,100.00	11,065.21	3,705.00	3,732.27	64.57	109.52	7.50	112.12	471.11	8,346.68	8,295.79	50.89	164.011			
15,200.00	11,063.47	3,705.00	3,732.27	65.87	109.52	7.50	112.12	471.11	8,391.94	8,340.32	51.62	162.579			
15,300.00	11,061.72	3,705.00	3,732.27	67.17	109.52	7.50	112.12	471.11	8,438.13	8,385.79	52.35	161.195			
15,400.00	11,059.98	3,705.00	3,732.27	68.48	109.52	7.50	112.12	471.11	8,485.26	8,432.18	53.08	159.858			
15,500.00	11,058.23	3,705.00	3,732.27	69.79	109.52	7.50	112.12	471.11	8,533.29	8,479.48	53.82	158.566			

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

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

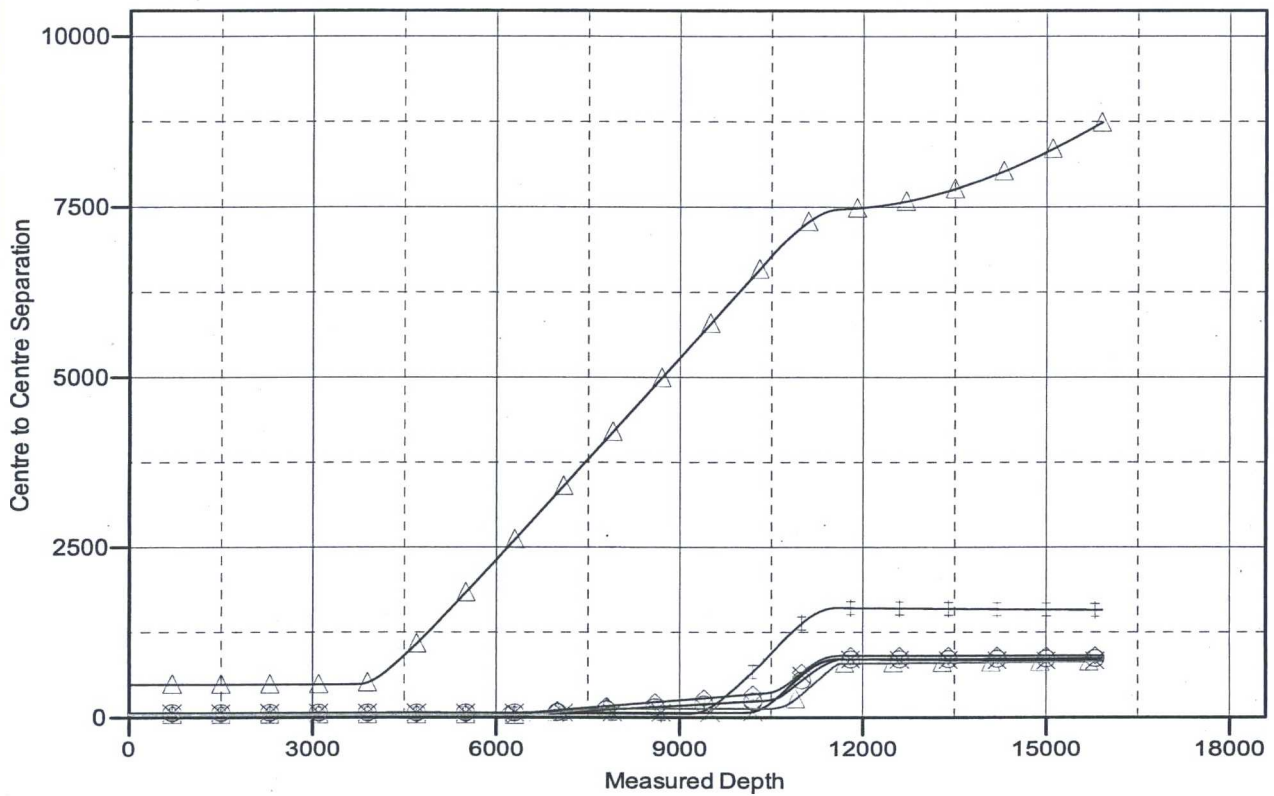
Offset Design Fletcher A De Federal - #2 - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-INC-ONLY-Offset Well													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
15,600.00	11,056.48	3,705.00	3,732.27	71.11	109.52	7.50	112.12	471.11	8,582.22	8,527.67	54.55	157.319	
15,700.00	11,054.74	3,705.00	3,732.27	72.44	109.52	7.50	112.12	471.11	8,632.03	8,576.74	55.29	156.114	
15,800.00	11,052.99	3,705.00	3,732.27	73.76	109.52	7.50	112.12	471.11	8,682.71	8,626.68	56.04	154.950	
15,900.00	11,051.25	3,705.00	3,732.27	75.10	109.52	7.50	112.12	471.11	8,734.24	8,677.46	56.78	153.825	
15,914.57	11,050.99	3,705.00	3,732.27	75.32	109.52	7.50	112.12	471.11	8,741.82	8,684.93	56.89	153.670	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 307H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	GL + KB @ 3741.00usft (H&P 482)
Reference Site:	Black & Tan 27 Federal Com	MD Reference:	GL + KB @ 3741.00usft (H&P 482)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	307H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Compass 5000 GCR
Reference Design:	Plan 2 09-08-17	Offset TVD Reference:	Reference Datum

Reference Depths are relative to GL + KB @ 3741.00usft (H&P 482)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 307H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.43°

Ladder Plot



LEGEND

- +— 104H, OH, Plan 1 09-08-17 V0
- ◆— 308H, OH, Plan 2 09-08-17 V0
- ▲— 504H, OH, Plan 1 09-08-17 V0
- x— 204H, OH, Plan 1 09-08-17 V0
- 406H, OH, Plan 1 09-08-17 V0
- ▲— #2, OH, OH V0

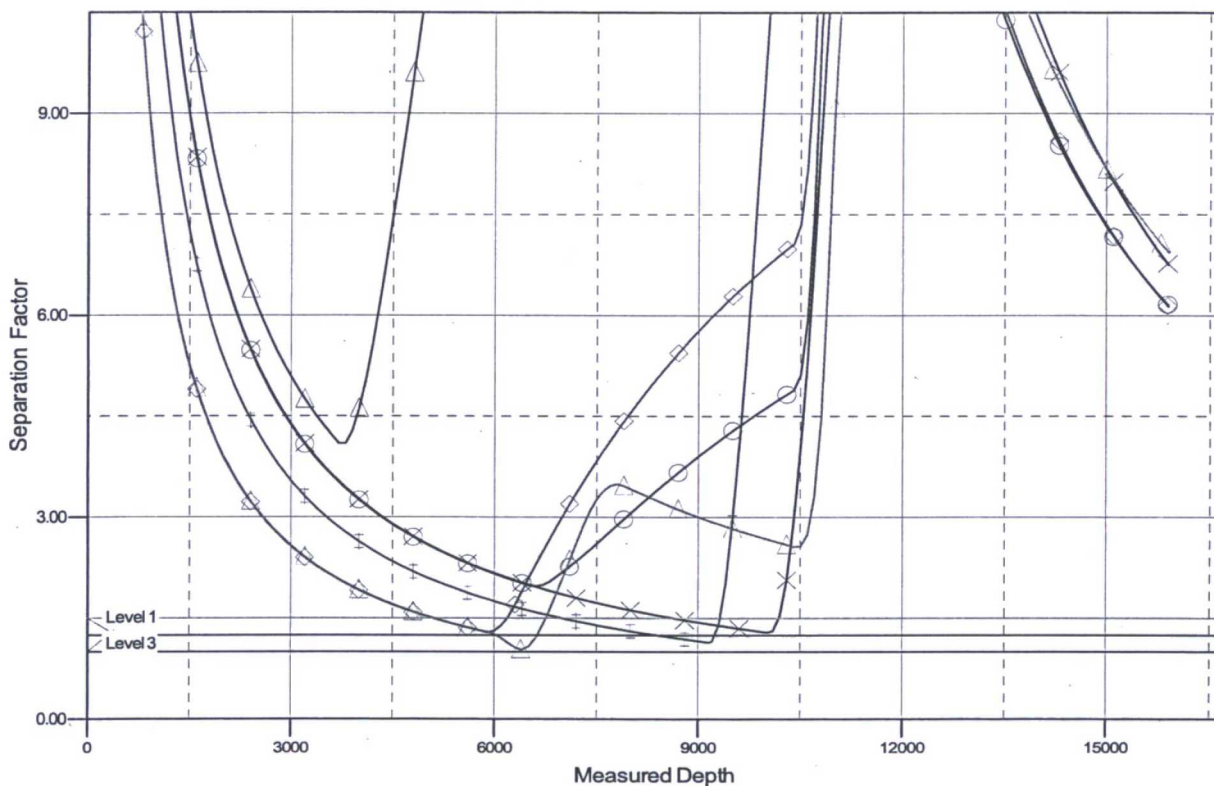
Company: Apache Corporation
Project: Lea County, NM (NAD83 NME)
Reference Site: Black & Tan 27 Federal Com
Site Error: 0.00 usft
Reference Well: 307H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 2 09-08-17

Local Co-ordinate Reference: Well 307H
TVD Reference: GL + KB @ 3741.00usft (H&P 482)
MD Reference: GL + KB @ 3741.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL + KB @ 3741.00usft (H&P 482)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 307H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.43°

Separation Factor Plot



LEGEND

+ 104H, OH, Plan 1 09-08-17 V0 ♦ 308H, OH, Plan 2 09-08-17 V0 ▲ 504H, OH, Plan 1 09-08-17 V0
 × 204H, OH, Plan 1 09-08-17 V0 ● 406H, OH, Plan 1 09-08-17 V0 ▲ #2, OH, OH V0

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