



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal API # 30-015-40576

#12H 1013' FSL & 250' FWL ULL: M 10-178-31E

OH/Job #1310847

Survey: Phoneix MWD Survey

Phoenix Final Survey Report

06 August, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Phoenix Final Survey Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #12H
Wellbore: OH/Job #1310847
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #12H
TVD Reference: KB @ 3897.00usft (Capstar 114)
MD Reference: KB @ 3897.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Project: Eddy County, NM (NAD27 NME)

Map System: US State Plane 1927 (Exact solution) System Datum: Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

Site: Crow Federal

Site Position: Northing: 671,130.90 usft Latitude: 32° 50' 38.927956 N
From: Map Easting: 643,906.80 usft Longitude: 103° 51' 53.166888 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16" Grid Convergence: 0.25 °

Well: #12H

Well Position: +N/-S 0.00 usft Northing: 671,260.90 usft Latitude: 32° 50' 40.214349 N
+E/-W 0.00 usft Easting: 643,906.00 usft Longitude: 103° 51' 53.169507 W
Position Uncertainty: 0.00 usft Wellhead Elevation: usft Ground Level: 3,686.00 usft

Wellbore: OH/Job #1310847

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	04/25/12	7.66	60.69	48,868

Design: Surveys (Capstar 114)

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	89.57

Survey Program: Date: 08/06/13

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	500.00	Gyrodata Survey (OH/Job #1310847)	NS-GYRO-MS	North sensing gyrocompassing m/s
608.00	10,687.00	Phoenix MWD Survey (OH/Job #1310847)	MWD	MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
500.00	0.78	199.76	499.98	-3.48	-0.76	-0.79	0.00
Tie-on to Gyrodata							
608.00	0.80	188.40	607.97	-4.92	-1.12	-1.16	0.15
First Phoenix MWD Survey							
693.00	1.60	145.90	692.96	-6.49	-0.54	-0.59	1.35
779.00	3.00	121.20	778.89	-8.65	2.05	1.99	1.96
864.00	3.60	101.00	863.75	-10.31	6.58	6.50	1.53
950.00	4.10	85.30	949.56	-10.57	12.29	12.21	1.35
1,036.00	4.60	85.00	1,035.31	-10.02	18.79	18.71	0.58
1,121.00	5.00	86.80	1,120.01	-9.52	25.88	25.81	0.50
1,207.00	5.60	86.80	1,205.64	-9.07	33.82	33.75	0.70



Phoenix Technology Services
Phoenix Final Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #12H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3897.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3897.00usft (Capstar 114)
Well:	#12H	North Reference:	Grid
Wellbore:	OH/Job #1310847	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
1,292.00	4.10	94.10	1,290.34	-9.06	40.99	40.92	1.90
1,378.00	2.20	87.20	1,376.20	-9.20	45.70	45.63	2.25
1,463.00	2.20	83.30	1,461.14	-8.93	48.95	48.89	0.18
1,549.00	2.40	83.20	1,547.07	-8.52	52.38	52.32	0.23
1,635.00	2.40	90.20	1,632.99	-8.32	55.97	55.91	0.34
1,720.00	1.10	60.20	1,717.95	-7.92	58.46	58.40	1.82
1,805.00	0.60	331.80	1,802.95	-7.12	58.96	58.90	1.46
1,890.00	0.80	322.60	1,887.94	-6.26	58.38	58.34	0.27
1,976.00	1.00	317.90	1,973.93	-5.22	57.52	57.48	0.25
2,061.00	0.80	311.90	2,058.92	-4.28	56.58	56.54	0.26
2,147.00	0.90	331.70	2,144.91	-3.28	55.81	55.78	0.36
2,233.00	1.00	320.10	2,230.90	-2.11	55.01	54.99	0.25
2,318.00	1.10	328.80	2,315.88	-0.84	54.11	54.10	0.22
2,403.00	1.10	320.20	2,400.87	0.48	53.17	53.17	0.19
2,489.00	1.10	325.40	2,486.85	1.80	52.17	52.18	0.12
2,575.00	1.20	330.60	2,572.84	3.26	51.26	51.28	0.17
2,660.00	1.50	335.80	2,657.81	5.05	50.36	50.40	0.36
2,746.00	0.60	351.00	2,743.80	6.52	49.83	49.88	1.09
2,831.00	0.50	355.90	2,828.79	7.33	49.74	49.79	0.13
2,916.00	0.90	343.00	2,913.79	8.34	49.51	49.58	0.50
3,001.00	0.40	65.30	2,998.78	9.10	49.59	49.66	1.10
3,087.00	0.60	101.90	3,084.78	9.13	50.30	50.37	0.43
3,173.00	0.50	69.40	3,170.78	9.17	51.09	51.16	0.37
3,258.00	0.70	54.10	3,255.77	9.61	51.86	51.93	0.30
3,342.00	0.80	49.80	3,339.76	10.29	52.73	52.80	0.14
3,427.00	1.00	38.80	3,424.75	11.70	54.08	54.16	0.21
3,513.00	1.40	189.40	3,510.74	11.25	54.37	54.46	2.70
3,599.00	0.90	192.20	3,596.72	9.55	54.06	54.13	0.58
3,684.00	0.70	202.90	3,681.71	8.42	53.72	53.78	0.29
3,770.00	0.70	205.00	3,767.71	7.46	53.29	53.35	0.03
3,855.00	0.80	195.30	3,852.70	6.42	52.91	52.96	0.19
3,941.00	0.70	194.60	3,938.69	5.33	52.62	52.66	0.12
4,026.00	0.50	173.50	4,023.69	4.46	52.53	52.57	0.35
4,112.00	0.50	164.00	4,109.69	3.73	52.68	52.71	0.10
4,198.00	0.50	155.50	4,195.68	3.02	52.94	52.96	0.09
4,284.00	0.70	150.60	4,281.68	2.23	53.35	53.36	0.24
4,370.00	0.70	133.60	4,367.67	1.41	53.99	54.00	0.24
4,456.00	0.80	138.10	4,453.66	0.62	54.76	54.76	0.14
4,542.00	0.70	134.50	4,539.66	-0.20	55.53	55.53	0.13
4,628.00	0.70	138.80	4,625.65	-0.95	56.25	56.24	0.06
4,714.00	0.70	145.50	4,711.64	-1.78	56.89	56.88	0.10
4,800.00	0.80	145.60	4,797.64	-2.71	57.53	57.51	0.12
4,886.00	0.70	151.70	4,883.63	-3.66	58.11	58.08	0.15
4,972.00	1.10	308.60	4,969.63	-3.61	57.71	57.68	2.05



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MD Reference: KB @ 3897.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	D Leg (°/100usft)
5,093.00	1.30	308.80	5,090.61	-2.49	56.32	56.30	0.24
5,179.00	1.10	315.70	5,176.59	-1.29	54.99	54.98	0.29
5,264.00	1.10	323.70	5,261.57	-0.05	53.93	53.93	0.18
5,350.00	1.00	323.70	5,347.56	1.22	53.00	53.01	0.12
5,436.00	1.00	323.30	5,433.54	2.43	52.11	52.12	0.01
5,521.00	1.00	325.10	5,518.53	3.63	51.24	51.27	0.04
5,607.00	1.10	335.30	5,604.52	5.00	50.47	50.50	0.25
5,692.00	1.10	336.00	5,689.50	6.48	49.79	49.84	0.02
5,738.00	1.10	339.30	5,735.49	7.30	49.46	49.51	0.14
5,780.00	2.10	63.90	5,777.48	8.02	50.01	50.07	5.42
5,823.00	6.70	80.00	5,820.34	8.80	53.19	53.25	10.97
5,866.00	12.00	82.10	5,862.76	9.85	60.09	60.16	12.35
5,909.00	17.40	85.20	5,904.34	11.00	70.93	71.01	12.69
5,952.00	22.80	87.80	5,944.70	11.86	85.68	85.76	12.73
5,995.00	28.40	89.40	5,983.47	12.29	104.24	104.33	13.12
6,037.00	34.00	89.90	6,019.38	12.41	125.99	126.08	13.35
6,080.00	39.60	90.40	6,053.79	12.34	151.74	151.82	13.04
6,123.00	44.20	90.90	6,085.79	12.01	180.44	180.53	10.73
6,166.00	48.70	90.80	6,115.41	11.55	211.60	211.68	10.47
6,209.00	53.70	90.80	6,142.35	11.08	245.09	245.17	11.63
6,251.00	58.40	90.90	6,165.79	10.56	279.92	279.99	11.19
6,293.00	62.60	90.70	6,186.47	10.05	316.46	316.53	10.01
6,336.00	66.80	90.60	6,204.84	9.61	355.33	355.39	9.77
6,379.00	72.00	90.20	6,219.97	9.33	395.56	395.62	12.12
6,422.00	77.50	90.20	6,231.27	9.19	437.03	437.09	12.79
6,462.00	82.60	89.40	6,238.18	9.33	476.42	476.48	12.90
6,518.00	88.80	89.40	6,242.38	9.91	532.23	532.29	11.07
6,604.00	88.80	88.60	6,244.18	11.41	618.20	618.27	0.93
6,689.00	89.00	90.60	6,245.81	12.01	703.18	703.25	2.36
6,774.00	88.70	90.40	6,247.52	11.26	788.16	788.22	0.42
6,860.00	88.50	90.20	6,249.62	10.81	874.13	874.19	0.33
6,946.00	88.20	89.80	6,252.10	10.81	960.09	960.15	0.58
7,031.00	88.20	89.60	6,254.77	11.26	1,045.05	1,045.10	0.24
7,117.00	90.00	89.70	6,256.12	11.78	1,131.03	1,131.09	2.10
7,202.00	89.70	88.80	6,256.34	12.90	1,216.03	1,216.09	1.12
7,288.00	90.10	90.60	6,256.49	13.35	1,302.02	1,302.08	2.14
7,373.00	89.50	90.40	6,256.79	12.60	1,387.02	1,387.07	0.74
7,459.00	89.00	89.90	6,257.91	12.38	1,473.01	1,473.06	0.82
7,545.00	88.50	89.40	6,259.79	12.90	1,558.99	1,559.04	0.82
7,630.00	88.60	88.30	6,261.94	14.61	1,643.94	1,644.00	1.30
7,716.00	88.30	89.90	6,264.27	15.96	1,729.89	1,729.97	1.89
7,801.00	87.60	89.80	6,267.31	16.18	1,814.84	1,814.91	0.83
7,887.00	89.70	91.20	6,269.33	15.43	1,900.81	1,900.87	2.93
7,973.00	89.10	91.20	6,270.23	13.63	1,986.78	1,986.83	0.70



Phoenix Technology Services
Phoenix Final Survey Report



Company: Apache Corporation
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Site: Crow Federal
Well: #12H
Wellbore: OH/Job #1310847
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #12H
TVD Reference: KB @ 3897.00usft (Capstar 114)
MD Reference: KB @ 3897.00usft (Capstar 114)
North Reference: Ghd
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (%/100usft)
8,058.00	88.60	91.20	6,271.94	11.85	2,071.75	2,071.78	0.59
8,144.00	89.40	90.30	6,273.44	10.73	2,157.72	2,157.74	1.40
8,229.00	89.10	90.60	6,274.55	10.06	2,242.71	2,242.73	0.50
8,315.00	90.20	89.40	6,275.08	10.06	2,328.71	2,328.72	1.89
8,400.00	90.00	89.90	6,274.93	10.58	2,413.71	2,413.72	0.63
8,486.00	89.40	90.20	6,275.38	10.50	2,499.71	2,499.71	0.78
8,572.00	89.40	91.00	6,276.28	9.60	2,585.69	2,585.69	0.93
8,657.00	89.60	89.00	6,277.02	9.60	2,670.69	2,670.68	2.36
8,743.00	89.00	89.20	6,278.07	10.95	2,756.67	2,756.67	0.74
8,828.00	88.70	89.80	6,279.78	11.69	2,841.65	2,841.66	0.79
8,914.00	89.60	89.20	6,281.06	12.45	2,927.63	2,927.65	1.26
9,000.00	88.90	89.00	6,282.18	13.80	3,013.62	3,013.64	0.85
9,085.00	88.60	89.00	6,284.04	15.28	3,098.58	3,098.61	0.35
9,170.00	88.30	88.60	6,286.33	17.06	3,183.53	3,183.57	0.59
9,256.00	89.90	88.40	6,287.68	19.31	3,269.49	3,269.54	1.87
9,340.00	89.30	88.70	6,288.27	21.44	3,353.46	3,353.53	0.80
9,426.00	88.40	88.10	6,290.00	23.84	3,439.41	3,439.49	1.26
9,511.00	90.60	88.80	6,290.74	26.13	3,524.37	3,524.47	2.72
9,597.00	90.10	88.60	6,290.21	28.09	3,610.34	3,610.45	0.63
9,682.00	89.60	88.60	6,290.44	30.16	3,695.32	3,695.44	0.59
9,768.00	89.10	88.20	6,291.41	32.56	3,781.28	3,781.42	0.74
9,854.00	90.60	89.80	6,291.64	34.06	3,867.26	3,867.41	2.55
9,944.00	89.90	89.90	6,291.24	34.30	3,957.26	3,957.40	0.79
10,031.00	88.80	89.70	6,292.23	34.60	4,044.25	4,044.40	1.29
10,121.00	88.70	90.00	6,294.19	34.84	4,134.23	4,134.37	0.35
10,212.00	88.50	89.80	6,296.42	35.00	4,225.20	4,225.35	0.31
10,297.00	90.00	89.70	6,297.53	35.37	4,310.19	4,310.34	1.77
10,389.00	89.40	89.50	6,298.01	36.01	4,402.19	4,402.33	0.69
10,480.00	88.90	89.90	6,299.36	36.49	4,493.18	4,493.32	0.70
10,567.00	88.50	89.80	6,301.34	36.72	4,580.15	4,580.30	0.47
10,631.00	88.50	90.10	6,303.01	36.77	4,644.13	4,644.28	0.47
Last Phoenix MWD Survey							
10,687.00	88.50	90.10	6,304.48	36.67	4,700.11	4,700.25	0.00
Projection to TD							



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Local Co-ordinate Reference: Well #12H
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MD Reference: KB @ 3897.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	499.98	-3.48	-0.76	Tie-on to Gyrodata
608.00	607.97	-4.92	-1.12	First Phoenix MWD Survey
10,631.00	6,303.01	36.77	4,644.13	Last Phoenix MWD Survey
10,687.00	6,304.48	36.67	4,700.11	Projection to TD

Checked By: _____

Approved By: _____

Date: _____

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER

1310847

OPERATOR

Apache Corporation

WELL NAME

Grow Federal 12H

COUNTY & STATE

Eddy County, NM

API WELL NUMBER *

30-015-40576

PROPOSED DIRECTION

09:57

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
500 ft	499.98 ft	78.0	199.8 ft	3.48 S	0.76 W	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
22-Jul-13	608 ft	0.0	188.4

SURVEY INSTRUMENT

TYPE

Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
5-Aug-13	10,631 ft	88.5	90.1

TO THE BEST OF MY KNOWLEDGE I

CERTIFY THIS SURVEY DATA TO BE

TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
5-Aug-13	10,687 ft	88.5	90.1

Bernard Caldwell

PRINT YOUR NAME ABOVE

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	
	7.41
DECLINATION OR GRID	GRID

TODAY'S DATE

MWD SUPERVISOR 1

B. Caldwell/B. Hill

DIRECTIONAL DRILLER 1

Matt Boyd

MWD SUPERVISOR 2

M. Dice/M. Colvin

DIRECTIONAL DRILLER 2

Ken Smith

1805 Britmore Road

Houston, Texas 77043

(713)3370609 (Voice), (713)337-0599 (Fax)

Apache Corporation

Eddy County, NM

Crow Federal 12H

Job # 1210350

API# 30-015-40576

1013' FSL + 250' FWL

UL: M 10-178-31E

Wellbore #1

Plan 1 4-25-2012

Anticollision Report

25 April, 2012

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset, TVD Reference:	Offset Datum

Reference: Plan 1 4-25-2012

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program: Date: 04/25/12

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	10,808.05	Plan 1 4-25-2012 (Wellbore #1)	MWD	MWD - Standard

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						
Crow Federal 10H						
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,800.00	4,800.00	130.00	108.65	6.088 CC	
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,826.36	4,826.32	130.01	108.54	6.057 ES	
Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012	4,900.00	4,897.75	130.66	108.88	5.999 SF	
Crow Federal 11H						
Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012	5,446.36	5,446.36	65.00	40.74	2.680 CC	
Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012	5,500.00	5,499.48	65.19	40.70	2.662 ES, SF	
Crow Federal 13H						
Well #1 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	155.00	154.33	229.873 CC	
Well #1 - Wellbore #1 - Plan 1 4-25-2012	4,800.00	4,801.40	163.26	142.15	7.735 ES, SF	
Crow federal 14H						
Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	90.00	69.33	133.474 CC	
Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012	5,400.00	5,401.60	103.57	79.76	4.351 ES, SF	
Crow Federal 15H						
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	200.00	200.00	25.00	24.33	37.076 CC	
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	300.00	299.96	25.07	23.95	22.488 ES	
Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012	5,800.00	5,800.00	57.50	31.88	2.244 SF	

Offset Design: Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012

Survey Program: 0-MWD										Offset Site Error: 0.00 usft	Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis	Reference	Offset	Highside	Offset Wellbore Centre	Distance Between Centres	Distance Between Ellipses	Minimum Separation	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside (usft)	N/S (usft)	E/W (usft)	(usft)	(usft)	
0.00	0.00	0.00	0.00	0.00	0.00	179.65	-130.00	0.80	130.00		
100.00	100.00	100.00	100.00	0.11	0.11	179.65	-130.00	0.80	130.00	129.78	0.22 573.350
200.00	200.00	200.00	200.00	0.34	0.34	179.65	-130.00	0.80	130.00	129.33	0.67 192.797
300.00	300.00	300.00	300.00	0.56	0.56	179.65	-130.00	0.80	130.00	128.88	1.12 115.678
400.00	400.00	400.00	400.00	0.79	0.79	179.65	-130.00	0.80	130.00	128.43	1.57 82.627
500.00	500.00	500.00	500.00	1.01	1.01	179.65	-130.00	0.80	130.00	127.98	2.02 64.266
600.00	600.00	600.00	600.00	1.24	1.24	179.65	-130.00	0.80	130.00	127.53	2.47 52.581
700.00	700.00	700.00	700.00	1.46	1.46	179.65	-130.00	0.80	130.00	127.08	2.92 44.492
800.00	800.00	800.00	800.00	1.69	1.69	179.65	-130.00	0.80	130.00	126.63	3.37 38.559

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal: 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal: 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error:	0.00 usft
Survey Program: O-MWD														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)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
900.00	900.00	900.00	900.00	1.91	1.91	179.65	-130.00	0.80	130.00	126.18	3.82	34.023			
1,000.00	1,000.00	1,000.00	1,000.00	2.14	2.14	179.65	-130.00	0.80	130.00	125.73	4.27	30.442			
1,100.00	1,100.00	1,100.00	1,100.00	2.36	2.36	179.65	-130.00	0.80	130.00	125.28	4.72	27.542			
1,200.00	1,200.00	1,200.00	1,200.00	2.58	2.58	179.65	-130.00	0.80	130.00	124.83	5.17	25.147			
1,300.00	1,300.00	1,300.00	1,300.00	2.81	2.81	179.65	-130.00	0.80	130.00	124.38	5.62	23.136			
1,400.00	1,400.00	1,400.00	1,400.00	3.03	3.03	179.65	-130.00	0.80	130.00	123.93	6.07	21.422			
1,500.00	1,500.00	1,500.00	1,500.00	3.26	3.26	179.65	-130.00	0.80	130.00	123.48	6.52	19.944			
1,600.00	1,600.00	1,600.00	1,600.00	3.48	3.48	179.65	-130.00	0.80	130.00	123.03	6.97	18.658			
1,700.00	1,700.00	1,700.00	1,700.00	3.71	3.71	179.65	-130.00	0.80	130.00	122.59	7.42	17.527			
1,800.00	1,800.00	1,800.00	1,800.00	3.93	3.93	179.65	-130.00	0.80	130.00	122.14	7.87	16.525			
1,900.00	1,900.00	1,900.00	1,900.00	4.16	4.16	179.65	-130.00	0.80	130.00	121.69	8.32	15.632			
2,000.00	2,000.00	2,000.00	2,000.00	4.38	4.38	179.65	-130.00	0.80	130.00	121.24	8.77	14.831			
2,100.00	2,100.00	2,100.00	2,100.00	4.61	4.61	179.65	-130.00	0.80	130.00	120.79	9.22	14.107			
2,200.00	2,200.00	2,200.00	2,200.00	4.83	4.83	179.65	-130.00	0.80	130.00	120.34	9.68	13.451			
2,300.00	2,300.00	2,300.00	2,300.00	5.06	5.06	179.65	-130.00	0.80	130.00	119.89	10.11	12.853			
2,400.00	2,400.00	2,400.00	2,400.00	5.28	5.28	179.65	-130.00	0.80	130.00	119.44	10.56	12.306			
2,500.00	2,500.00	2,500.00	2,500.00	5.51	5.51	179.65	-130.00	0.80	130.00	118.99	11.01	11.604			
2,600.00	2,600.00	2,600.00	2,600.00	5.73	5.73	179.65	-130.00	0.80	130.00	118.54	11.46	11.341			
2,700.00	2,700.00	2,700.00	2,700.00	5.96	5.96	179.65	-130.00	0.80	130.00	118.09	11.91	10.913			
2,800.00	2,800.00	2,800.00	2,800.00	6.18	6.18	179.65	-130.00	0.80	130.00	117.64	12.36	10.516			
2,900.00	2,900.00	2,900.00	2,900.00	6.41	6.41	179.65	-130.00	0.80	130.00	117.19	12.81	10.147			
3,000.00	3,000.00	3,000.00	3,000.00	6.63	6.63	179.65	-130.00	0.80	130.00	116.74	13.26	9.803			
3,100.00	3,100.00	3,100.00	3,100.00	6.86	6.86	179.65	-130.00	0.80	130.00	116.29	13.71	9.492			
3,200.00	3,200.00	3,200.00	3,200.00	7.08	7.08	179.65	-130.00	0.80	130.00	115.84	14.16	9.181			
3,300.00	3,300.00	3,300.00	3,300.00	7.30	7.30	179.65	-130.00	0.80	130.00	115.39	14.61	8.898			
3,400.00	3,400.00	3,400.00	3,400.00	7.53	7.53	179.65	-130.00	0.80	130.00	114.94	15.06	8.633			
3,500.00	3,500.00	3,500.00	3,500.00	7.75	7.75	179.65	-130.00	0.80	130.00	114.49	15.51	8.382			
3,600.00	3,600.00	3,600.00	3,600.00	7.98	7.98	179.65	-130.00	0.80	130.00	114.04	15.96	8.146			
3,700.00	3,700.00	3,700.00	3,700.00	8.20	8.20	179.65	-130.00	0.80	130.00	113.59	16.41	7.923			
3,800.00	3,800.00	3,800.00	3,800.00	8.43	8.43	179.65	-130.00	0.80	130.00	113.15	16.86	7.712			
3,900.00	3,900.00	3,900.00	3,900.00	8.65	8.65	179.65	-130.00	0.80	130.00	112.70	17.31	7.512			
4,000.00	4,000.00	4,000.00	4,000.00	8.88	8.88	179.65	-130.00	0.80	130.00	112.25	17.76	7.321			
4,100.00	4,100.00	4,100.00	4,100.00	9.10	9.10	179.65	-130.00	0.80	130.00	111.80	18.21	7.141			
4,200.00	4,200.00	4,200.00	4,200.00	9.33	9.33	179.65	-130.00	0.80	130.00	111.35	18.66	6.969			
4,300.00	4,300.00	4,300.00	4,300.00	9.55	9.55	179.65	-130.00	0.80	130.00	110.90	19.11	6.805			
4,400.00	4,400.00	4,400.00	4,400.00	9.78	9.78	179.65	-130.00	0.80	130.00	110.45	19.55	6.648			
4,500.00	4,500.00	4,500.00	4,500.00	10.00	10.00	179.65	-130.00	0.80	130.00	110.00	20.00	6.499			
4,600.00	4,600.00	4,600.00	4,600.00	10.23	10.23	179.65	-130.00	0.80	130.00	109.55	20.45	6.356			
4,700.00	4,700.00	4,700.00	4,700.00	10.45	10.45	179.65	-130.00	0.80	130.00	109.10	20.90	6.219			
4,800.00	4,800.00	4,800.00	4,800.00	10.68	10.68	179.65	-130.00	0.80	130.00	108.65	21.35	6.083 CC			
4,826.36	4,826.36	4,826.32	4,826.30	10.74	10.73	179.20	-129.99	1.81	130.01	108.54	21.45	6.057 ES			
4,900.00	4,900.00	4,897.75	4,896.64	10.90	10.88	174.01	-129.90	13.62	130.66	108.88	21.78	5.999 SF			
5,000.00	5,000.00	4,983.99	4,976.79	11.13	11.08	160.88	-129.67	44.98	139.19	117.00	22.19	6.272			
5,100.00	5,100.00	5,053.82	5,035.23	11.35	11.30	147.32	-129.38	83.00	166.80	144.21	22.59	7.384			
5,200.00	5,200.00	5,108.11	5,075.31	11.58	11.55	137.20	-129.11	119.55	215.66	192.65	23.00	9.378			
5,300.00	5,300.00	5,150.00	5,102.45	11.80	11.79	130.40	-128.87	151.42	280.29	256.87	23.42	11.957			
5,400.00	5,400.00	5,182.48	5,121.00	12.02	12.04	125.85	-128.67	178.07	355.11	331.26	23.88	14.855			
5,500.00	5,500.00	5,209.13	5,134.01	12.25	12.26	122.70	-128.50	200.17	436.50	412.22	24.28	17.978			
5,600.00	5,600.00	5,225.00	5,141.75	12.47	12.42	120.83	-128.39	215.16	522.28	497.63	24.65	21.187			
5,700.00	5,700.00	5,250.00	5,151.98	12.70	12.69	118.32	-128.22	237.97	611.07	585.94	25.12	24.323			
5,800.00	5,800.00	5,259.39	5,155.43	12.92	12.80	117.45	-128.15	246.71	701.97	676.51	25.45	27.560			
5,888.20	5,888.20	5,276.00	5,160.69	13.12	12.98	116.10	-128.04	261.40	783.58	757.76	25.83	30.340			

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

Anticollision Report

Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference: Site Crow Federal 12H
 TVD Reference: WELL @ 3915.00usft (Original Well Elev)
 MD Reference: WELL @ 3915.00usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Compass5000
 Offset-TVD Reference: Offset Datum

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error: 0.00 usft
Survey Program: O-MWD														Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	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
5,900.00	5,900.00	5,275.00	5,160.69	13.15	12.93	24.63		-128.04	261.40	794.48	769.54	24.95	31.846	
5,925.00	5,924.94	5,275.00	5,160.69	13.20	12.93	21.44		-128.04	261.40	817.24	792.37	24.87	32.854	
5,950.00	5,949.73	5,275.00	5,160.69	13.25	12.93	18.92		-128.04	261.40	839.49	814.75	24.74	33.936	
5,975.00	5,974.25	5,275.00	5,160.69	13.30	12.93	16.92		-123.04	261.40	861.16	836.63	24.53	35.111	
6,000.00	5,998.41	5,285.56	5,163.91	13.35	13.12	15.03		-127.97	271.46	882.01	857.75	24.26	36.361	
6,025.00	6,022.09	5,289.92	5,165.15	13.41	13.18	13.66		-127.94	275.63	902.20	878.30	23.90	37.751	
6,050.00	6,045.20	5,300.00	5,167.85	13.46	13.31	12.44		-127.86	285.34	921.66	898.18	23.47	39.263	
6,075.00	6,067.64	5,300.00	5,167.85	13.53	13.31	11.58		-127.65	285.34	940.17	917.22	22.98	40.955	
6,100.00	6,089.31	5,300.00	5,167.85	13.59	13.31	10.85		-127.66	285.34	957.90	935.53	22.37	42.827	
6,125.00	6,110.12	5,309.67	5,170.20	13.67	13.44	10.13		-127.79	294.72	974.64	952.91	21.73	44.851	
6,150.00	6,129.57	5,315.09	5,171.41	13.75	13.52	9.56		-127.75	300.01	990.46	969.43	21.03	47.106	
6,175.00	6,148.60	5,325.00	5,173.43	13.85	13.66	9.05		-127.68	309.71	1,005.32	985.04	20.28	49.574	
6,200.00	6,168.50	5,325.00	5,173.43	13.96	13.66	8.67		-127.69	309.71	1,019.10	999.64	19.46	52.359	
6,225.00	6,183.01	5,325.00	5,173.43	14.08	13.66	8.34		-127.63	309.71	1,031.95	1,013.34	18.61	55.449	
6,250.00	6,198.26	5,338.21	5,175.74	14.23	13.65	8.00		-127.58	322.71	1,043.54	1,025.77	17.77	58.732	
6,275.00	6,212.19	5,350.00	5,177.41	14.39	14.03	7.72		-127.50	334.38	1,054.18	1,037.27	16.91	62.335	
6,300.00	6,224.72	5,360.00	5,177.41	14.58	14.03	7.52		-127.50	334.38	1,063.58	1,047.56	16.03	66.369	
6,325.00	6,235.81	5,350.00	5,177.41	14.80	14.03	7.34		-127.50	334.38	1,071.99	1,056.83	15.16	70.717	
6,350.00	6,245.42	5,362.98	5,178.84	15.04	14.24	7.17		-127.40	347.29	1,079.08	1,064.70	14.28	75.080	
6,375.00	6,253.49	5,375.00	5,179.77	15.30	14.43	7.04		-127.31	359.27	1,085.13	1,071.47	13.66	79.452	
6,400.00	6,260.00	5,375.00	5,179.77	15.59	14.43	6.95		-127.31	359.27	1,089.90	1,076.91	12.99	83.904	
6,425.00	6,264.92	5,390.81	5,180.59	15.91	14.70	6.87		-127.19	375.06	1,093.48	1,080.93	12.50	87.480	
6,450.00	6,269.22	5,415.72	5,181.85	16.25	15.14	6.82		-127.00	399.93	1,095.51	1,083.31	12.20	89.830	
6,475.00	6,269.90	5,440.71	5,183.12	16.61	15.61	6.81		-126.61	424.69	1,095.92	1,083.85	12.07	90.601	
6,478.39	6,270.00	5,444.11	5,183.29	16.65	15.67	6.82		-126.79	428.28	1,095.65	1,083.78	12.07	90.818	
6,497.64	6,270.50	5,463.55	5,184.27	16.95	16.03	6.82		-126.64	447.70	1,095.36	1,083.15	12.21	89.736	
6,500.00	6,270.55	5,465.71	5,184.38	16.98	16.07	6.82		-126.62	449.85	1,095.31	1,083.03	12.22	89.616	
6,600.00	6,273.09	5,565.68	5,189.45	18.66	18.07	6.83		-125.87	549.69	1,092.80	1,079.76	13.04	83.800	
6,700.00	6,275.63	5,665.64	5,194.51	20.53	20.24	6.85		-125.11	649.53	1,090.29	1,076.30	13.99	77.920	
6,800.00	6,276.17	5,765.61	5,199.57	22.67	22.55	6.87		-124.35	749.36	1,087.78	1,072.73	15.05	72.263	
6,900.00	6,280.71	5,865.58	5,204.64	24.88	24.94	6.88		-123.60	849.20	1,085.27	1,069.07	16.20	66.987	
7,000.00	6,283.25	5,965.55	5,209.70	27.20	27.40	6.90		-122.84	949.04	1,082.76	1,065.34	17.42	62.154	
7,100.00	6,285.79	6,065.52	5,214.76	29.59	29.91	6.91		-122.08	1,048.87	1,080.26	1,061.56	18.70	57.776	
7,200.00	6,288.33	6,165.48	5,219.83	32.04	32.48	6.93		-121.33	1,148.71	1,077.75	1,057.73	20.02	53.831	
7,300.00	6,290.87	6,265.45	5,224.89	34.54	35.04	6.95		-120.57	1,248.55	1,075.24	1,053.86	21.38	50.284	
7,400.00	6,293.41	6,365.42	5,229.95	37.07	37.65	6.96		-119.81	1,348.39	1,072.73	1,049.96	22.78	47.095	
7,500.00	6,295.96	6,465.39	5,235.02	39.63	40.27	6.98		-119.06	1,448.22	1,070.23	1,046.03	24.20	44.225	
7,600.00	6,298.50	6,565.36	5,240.08	42.22	42.91	7.00		-118.30	1,548.06	1,067.72	1,042.07	25.64	41.637	
7,700.00	6,301.04	6,665.32	5,245.15	44.82	45.56	7.01		-117.54	1,647.90	1,065.21	1,038.10	27.11	39.297	
7,800.00	6,303.58	6,765.29	5,250.21	47.44	48.23	7.03		-116.79	1,747.73	1,062.70	1,034.12	28.59	37.174	
7,900.00	6,306.12	6,865.26	5,255.27	50.08	50.90	7.05		-116.03	1,847.57	1,060.20	1,030.11	30.03	35.244	
8,000.00	6,308.66	6,965.23	5,260.34	52.73	53.53	7.05		-115.27	1,947.41	1,057.69	1,026.10	31.59	33.484	
8,100.00	6,311.20	7,065.20	5,265.40	55.39	56.27	7.08		-114.52	2,047.24	1,055.18	1,022.08	33.11	31.873	
8,200.00	6,313.74	7,165.16	5,270.46	58.06	58.95	7.10		-113.76	2,147.08	1,052.67	1,018.04	34.63	30.394	
8,300.00	6,316.28	7,265.13	5,275.53	60.73	61.66	7.11		-113.00	2,246.92	1,050.17	1,014.00	36.17	29.034	
8,400.00	6,318.82	7,365.10	5,280.59	63.41	64.36	7.13		-112.25	2,346.75	1,047.66	1,009.95	37.72	27.778	
8,500.00	6,321.36	7,465.07	5,285.65	66.10	67.06	7.15		-111.49	2,446.59	1,045.15	1,005.89	39.27	26.617	
8,600.00	6,323.90	7,565.04	5,290.72	68.79	69.77	7.16		-110.73	2,546.43	1,042.65	1,001.82	40.82	25.540	
8,700.00	6,326.44	7,665.00	5,295.78	71.49	72.49	7.18		-109.98	2,646.27	1,040.14	997.75	42.39	24.538	
8,800.00	6,328.98	7,764.97	5,300.85	74.19	75.20	7.20		-109.22	2,746.10	1,037.63	993.68	43.98	23.605	
8,900.00	6,331.52	7,864.94	5,305.91	76.90	77.92	7.22		-108.46	2,845.94	1,035.13	989.60	45.53	22.733	
9,000.00	6,334.06	7,964.91	5,310.97	79.61	80.64	7.23		-107.70	2,945.78	1,032.62	985.51	47.11	21.918	

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

Anticollision Report

Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:
 Output errors are at:
 Database:
 Offset TVD Reference:

Site Crow Federal 12H
 WELL @ 3915.00usft (Original Well Elev)
 WELL @ 3915.00usft (Original Well Elev)
 Grid
 Minimum Curvature
 2.00 sigma
 Compass5000
 Offset Datum

Offset Design Crow Federal 10H - Job # 1210348 - Wellbore #1 - Plan 1 4-25-2012													Offset Site Error: 0.00 usft
Survey Program: O-MWD													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)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,100.00	6,336.60	8,064.88	5,316.04	82.32	83.36	7.25	-106.95	3,045.61	1,030.12	931.42	48.70	21.154	
9,200.00	6,339.14	8,164.85	5,321.10	85.03	86.08	7.27	-106.19	3,145.45	1,027.61	977.33	50.28	20.436	
9,300.00	6,341.69	8,264.81	5,326.16	87.75	88.81	7.29	-105.43	3,245.29	1,025.10	973.23	51.88	19.760	
9,400.00	6,344.23	8,364.78	5,331.23	90.47	91.53	7.31	-104.68	3,345.12	1,022.60	969.13	53.47	19.124	
9,500.00	6,346.77	8,464.75	5,336.29	93.19	94.26	7.32	-103.92	3,444.96	1,020.09	965.02	55.07	18.523	
9,600.00	6,349.31	8,564.72	5,341.35	95.91	96.99	7.34	-103.16	3,544.80	1,017.59	960.91	56.67	17.955	
9,700.00	6,351.85	8,664.69	5,346.42	98.64	99.72	7.36	-102.41	3,644.63	1,015.08	956.80	58.28	17.417	
9,800.00	6,354.39	8,764.65	5,351.48	101.37	102.45	7.39	-101.65	3,744.47	1,012.58	952.69	59.89	16.907	
9,900.00	6,356.93	8,864.62	5,356.54	104.09	105.18	7.40	-100.89	3,844.31	1,010.07	948.57	61.50	16.423	
10,000.00	6,359.47	8,964.59	5,361.61	106.82	107.91	7.42	-100.14	3,944.14	1,007.57	944.45	63.12	15.963	
10,100.00	6,362.01	9,064.56	5,366.67	109.55	110.65	7.43	-99.38	4,043.98	1,005.06	940.32	64.74	15.526	
10,200.00	6,364.55	9,164.53	5,371.74	112.28	113.38	7.45	-99.62	4,143.82	1,002.56	936.20	66.36	15.109	
10,300.00	6,367.09	9,264.49	5,376.80	115.02	116.12	7.47	-97.87	4,243.65	1,000.05	932.07	67.93	14.711	
10,400.00	6,369.63	9,364.46	5,381.86	117.75	118.85	7.49	-97.11	4,343.49	997.55	927.94	69.61	14.331	
10,500.00	6,372.17	9,464.43	5,386.93	120.49	121.59	7.51	-96.35	4,443.33	995.04	923.81	71.24	13.968	
10,600.00	6,374.71	9,564.40	5,391.99	123.22	124.33	7.53	-95.60	4,543.17	992.54	919.67	72.87	13.621	
10,700.00	6,377.25	9,664.37	5,397.05	125.96	127.06	7.55	-94.84	4,643.00	990.03	915.53	74.50	13.289	
10,762.55	6,379.36	9,722.54	5,400.00	128.23	128.66	7.56	-94.40	4,701.10	988.28	912.61	75.65	13.063	
10,808.13	6,380.60	9,722.54	5,400.00	128.92	128.66	7.56	-94.40	4,701.10	988.59	912.73	75.85	13.033	

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset: TVD Reference:	Offset Datum

Offset Design Crow Federal 11H- Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012													Offset Site Error:
Survey Program: 0-MWD													0.00 usft
Reference	Offset	Semi Major Axis	Reference	Offset	Highside Footcage	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		Offset Well Error:
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Footcage (ft)	+N/-S (usft)	+E/-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor	0.00 usft
0.00	0.00	0.00	0.00	0.00	0.00	179.65	-65.00	0.40	65.00				
100.00	100.00	100.00	100.00	0.11	0.11	179.65	-65.00	0.40	65.00	64.78	0.22	289.195	
200.00	200.00	200.00	200.00	0.34	0.34	179.65	-65.00	0.40	65.00	64.33	0.67	96.398	
300.00	300.00	300.00	300.00	0.56	0.56	179.65	-65.00	0.40	65.00	63.88	1.12	67.839	
400.00	400.00	400.00	400.00	0.79	0.79	179.65	-65.00	0.40	65.00	63.43	1.57	41.314	
500.00	500.00	500.00	500.00	1.01	1.01	179.65	-65.00	0.40	65.00	62.88	2.02	32.133	
600.00	600.00	600.00	600.00	1.24	1.24	179.65	-65.00	0.40	65.00	62.63	2.47	26.290	
700.00	700.00	700.00	700.00	1.48	1.48	179.65	-65.00	0.40	65.00	62.08	2.92	22.246	
800.00	800.00	800.00	800.00	1.69	1.69	179.65	-65.00	0.40	65.00	61.63	3.37	19.260	
900.00	900.00	900.00	900.00	1.91	1.91	179.65	-65.00	0.40	65.00	61.18	3.82	17.011	
1,000.00	1,000.00	1,000.00	1,000.00	2.14	2.14	179.65	-65.00	0.40	65.00	60.73	4.27	15.221	
1,100.00	1,100.00	1,100.00	1,100.00	2.36	2.36	179.65	-65.00	0.40	65.00	60.28	4.72	13.771	
1,200.00	1,200.00	1,200.00	1,200.00	2.58	2.58	179.65	-65.00	0.40	65.00	59.83	5.17	12.574	
1,300.00	1,300.00	1,300.00	1,300.00	2.81	2.81	179.65	-65.00	0.40	65.00	59.38	5.62	11.588	
1,400.00	1,400.00	1,400.00	1,400.00	3.03	3.03	179.65	-65.00	0.40	65.00	58.93	6.07	10.711	
1,500.00	1,500.00	1,500.00	1,500.00	3.26	3.26	179.65	-65.00	0.40	65.00	58.48	6.52	9.972	
1,600.00	1,600.00	1,600.00	1,600.00	3.48	3.48	179.65	-65.00	0.40	65.00	58.03	6.97	9.329	
1,700.00	1,700.00	1,700.00	1,700.00	3.71	3.71	179.65	-65.00	0.40	65.00	57.58	7.42	8.763	
1,800.00	1,800.00	1,800.00	1,800.00	3.93	3.93	179.65	-65.00	0.40	65.00	57.13	7.87	8.263	
1,900.00	1,900.00	1,900.00	1,900.00	4.16	4.16	179.65	-65.00	0.40	65.00	56.68	8.32	7.816	
2,000.00	2,000.00	2,000.00	2,000.00	4.38	4.38	179.65	-65.00	0.40	65.00	56.24	8.77	7.415	
2,100.00	2,100.00	2,100.00	2,100.00	4.61	4.61	179.65	-65.00	0.40	65.00	55.79	9.22	7.054	
2,200.00	2,200.00	2,200.00	2,200.00	4.83	4.83	179.65	-65.00	0.40	65.00	55.34	9.66	6.725	
2,300.00	2,300.00	2,300.00	2,300.00	5.06	5.06	179.65	-65.00	0.40	65.00	54.89	10.11	6.427	
2,400.00	2,400.00	2,400.00	2,400.00	5.28	5.28	179.65	-65.00	0.40	65.00	54.44	10.56	6.153	
2,500.00	2,500.00	2,500.00	2,500.00	5.51	5.51	179.65	-65.00	0.40	65.00	53.99	11.01	5.902	
2,600.00	2,600.00	2,600.00	2,600.00	5.73	5.73	179.65	-65.00	0.40	65.00	53.54	11.46	5.670	
2,700.00	2,700.00	2,700.00	2,700.00	5.96	5.96	179.65	-65.00	0.40	65.00	53.09	11.91	5.457	
2,800.00	2,800.00	2,800.00	2,800.00	6.18	6.18	179.65	-65.00	0.40	65.00	52.64	12.36	5.258	
2,900.00	2,900.00	2,900.00	2,900.00	6.41	6.41	179.65	-65.00	0.40	65.00	52.19	12.81	5.074	
3,000.00	3,000.00	3,000.00	3,000.00	6.63	6.63	179.65	-65.00	0.40	65.00	51.74	13.26	4.902	
3,100.00	3,100.00	3,100.00	3,100.00	6.86	6.86	179.65	-65.00	0.40	65.00	51.29	13.71	4.741	
3,200.00	3,200.00	3,200.00	3,200.00	7.08	7.08	179.65	-65.00	0.40	65.00	50.84	14.16	4.590	
3,300.00	3,300.00	3,300.00	3,300.00	7.30	7.30	179.65	-65.00	0.40	65.00	50.39	14.61	4.449	
3,400.00	3,400.00	3,400.00	3,400.00	7.53	7.53	179.65	-65.00	0.40	65.00	49.94	15.06	4.316	
3,500.00	3,500.00	3,500.00	3,500.00	7.75	7.75	179.65	-65.00	0.40	65.00	49.49	15.51	4.191	
3,600.00	3,600.00	3,600.00	3,600.00	7.98	7.98	179.65	-65.00	0.40	65.00	49.04	15.96	4.073	
3,700.00	3,700.00	3,700.00	3,700.00	8.20	8.20	179.65	-65.00	0.40	65.00	48.59	16.41	3.962	
3,800.00	3,800.00	3,800.00	3,800.00	8.43	8.43	179.65	-65.00	0.40	65.00	48.14	16.86	3.856	
3,900.00	3,900.00	3,900.00	3,900.00	8.65	8.65	179.65	-65.00	0.40	65.00	47.69	17.31	3.756	
4,000.00	4,000.00	4,000.00	4,000.00	8.88	8.88	179.65	-65.00	0.40	65.00	47.24	17.76	3.661	
4,100.00	4,100.00	4,100.00	4,100.00	9.10	9.10	179.65	-65.00	0.40	65.00	46.80	18.21	3.570	
4,200.00	4,200.00	4,200.00	4,200.00	9.33	9.33	179.65	-65.00	0.40	65.00	46.35	18.66	3.484	
4,300.00	4,300.00	4,300.00	4,300.00	9.55	9.55	179.65	-65.00	0.40	65.00	45.90	19.11	3.402	
4,400.00	4,400.00	4,400.00	4,400.00	9.78	9.78	179.65	-65.00	0.40	65.00	45.45	19.55	3.324	
4,500.00	4,500.00	4,500.00	4,500.00	10.00	10.00	179.65	-65.00	0.40	65.00	45.00	20.00	3.249	
4,600.00	4,600.00	4,600.00	4,600.00	10.23	10.23	179.65	-65.00	0.40	65.00	44.55	20.45	3.178	
4,700.00	4,700.00	4,700.00	4,700.00	10.45	10.45	179.65	-65.00	0.40	65.00	44.10	20.90	3.110	
4,800.00	4,800.00	4,800.00	4,800.00	10.68	10.68	179.65	-65.00	0.40	65.00	43.65	21.35	3.044	
4,900.00	4,900.00	4,900.00	4,900.00	10.90	10.90	179.65	-65.00	0.40	65.00	43.20	21.80	2.981	
5,000.00	5,000.00	5,000.00	5,000.00	11.13	11.13	179.65	-65.00	0.40	65.00	42.75	22.25	2.921	
5,100.00	5,100.00	5,100.00	5,100.00	11.35	11.35	179.65	-65.00	0.40	65.00	42.30	22.70	2.853	

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

Anticollision Report

Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference: Site Crow Federal 12H
 TVD Reference: WELL @ 3915.00usft (Original Well Elev)
 MD Reference: WELL @ 3915.00usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Compass5000
 Offset TVD Reference: Offset Datum

Offset Design Crow Federal 11H - Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error: 0.00 usft
Survey Program: C-MWD														Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis												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	5,200.00	5,200.00	11.58	11.58	179.65	-65.00	0.40	65.00	41.85	23.15	2.808		
5,300.00	5,300.00	5,300.00	5,300.00	11.80	11.80	179.65	-65.00	0.40	65.00	41.40	23.60	2.754		
5,400.00	5,400.00	5,400.00	5,400.00	12.02	12.02	179.65	-65.00	0.40	65.00	40.95	24.05	2.703		
5,446.36	5,446.36	5,446.36	5,446.36	12.13	12.13	179.57	-65.00	0.49	65.00	40.74	24.26	2.680 CC		
5,500.00	5,500.00	5,499.48	5,499.21	12.25	12.24	175.30	-64.96	5.34	65.19	40.70	24.49	2.662 ES, SF		
5,600.00	5,600.00	5,591.25	5,587.17	12.47	12.43	154.62	-64.77	30.73	72.83	47.92	24.91	2.924		
5,700.00	5,700.00	5,667.70	5,654.10	12.70	12.64	133.74	-64.50	67.39	103.96	78.65	25.31	4.107		
5,800.00	5,800.00	5,725.00	5,698.76	12.92	12.85	121.89	-64.23	103.22	153.21	132.48	25.73	6.149		
5,888.20	5,888.20	5,769.31	5,729.32	13.12	13.07	115.31	-63.99	135.28	218.26	192.13	26.13	8.352		
5,900.00	5,900.00	5,775.00	5,732.96	13.15	13.10	24.28	-63.95	139.64	228.80	200.83	25.97	8.733		
5,925.00	5,924.94	5,784.55	5,739.13	13.20	13.16	21.83	-63.90	147.33	244.54	218.58	25.96	9.421		
5,950.00	5,949.73	5,800.00	5,748.21	13.25	13.25	19.41	-63.81	159.45	261.81	235.94	25.87	10.122		
5,975.00	5,974.25	5,805.34	5,751.87	13.30	13.29	17.97	-63.77	164.63	275.39	252.71	25.67	10.843		
6,000.00	5,998.41	5,817.22	5,757.94	13.35	13.37	16.49	-63.70	173.65	284.41	269.00	25.40	11.589		
6,025.00	6,022.09	5,825.00	5,782.13	13.41	13.43	15.35	-63.65	180.21	309.81	284.77	25.04	12.371		
6,050.00	6,045.20	5,839.19	5,789.42	13.46	13.54	14.17	-63.56	192.39	324.49	299.88	24.61	13.185		
6,075.00	6,067.64	5,850.00	5,774.66	13.53	13.63	13.26	-63.49	201.84	338.50	314.40	24.09	14.049		
6,100.00	6,089.31	5,861.41	5,779.90	13.59	13.73	12.45	-63.41	211.98	351.79	328.28	23.50	14.963		
6,125.00	6,110.12	5,875.00	5,785.75	13.67	13.85	11.74	-63.32	224.24	364.35	341.50	22.85	15.947		
6,150.00	6,129.97	5,883.83	5,789.31	13.75	13.94	11.20	-63.26	232.32	376.12	354.00	22.12	17.003		
6,175.00	6,148.80	5,900.00	5,795.35	13.85	14.11	10.62	-63.15	247.32	387.20	365.84	21.35	18.133		
6,200.00	6,166.50	5,906.40	5,797.56	13.96	14.18	10.25	-63.10	253.32	397.36	376.84	20.52	19.362		
6,225.00	6,183.01	5,917.73	5,801.23	14.08	14.31	9.86	-63.02	264.04	406.78	387.11	19.66	20.688		
6,250.00	6,198.26	5,925.00	5,803.42	14.23	14.39	9.57	-62.97	270.97	415.42	398.65	18.78	22.126		
6,275.00	6,212.19	5,940.47	5,807.63	14.39	14.58	9.25	-62.86	285.66	423.16	405.26	17.89	23.648		
6,300.00	6,224.72	5,950.00	5,809.92	14.58	14.70	9.02	-62.79	295.11	430.10	413.10	17.01	25.286		
6,325.00	6,235.81	5,963.30	5,812.74	14.80	14.88	8.80	-62.69	308.10	436.19	420.03	16.16	26.999		
6,350.00	6,245.42	5,975.00	5,814.84	15.04	15.03	8.63	-62.60	319.61	441.43	426.08	15.35	28.760		
6,375.00	6,253.49	5,986.19	5,816.51	15.30	15.19	8.49	-62.62	330.67	445.61	431.19	14.61	30.507		
6,400.00	6,260.00	6,000.00	5,818.14	15.59	15.39	8.38	-62.42	344.39	449.34	435.35	13.99	32.130		
6,425.00	6,264.92	6,009.11	5,818.94	15.91	15.53	8.30	-62.35	353.47	451.97	438.50	13.47	33.552		
6,450.00	6,268.22	6,025.00	5,819.81	16.25	15.77	8.24	-62.23	369.33	453.79	440.66	13.13	34.963		
6,475.00	6,269.90	6,032.83	5,820.00	16.61	15.89	8.22	-62.17	377.16	454.64	441.70	12.94	35.143		
6,478.39	6,270.00	6,034.55	5,820.02	16.65	15.92	8.22	-62.16	378.88	454.69	441.76	12.93	35.173		
6,497.84	6,270.50	6,054.01	5,820.29	16.95	16.24	8.22	-62.01	398.34	454.91	441.86	13.06	34.838		
6,500.00	6,270.55	6,056.17	5,820.32	16.98	16.27	8.22	-62.00	400.49	454.94	441.87	13.07	34.800		
6,600.00	6,273.09	6,156.19	5,821.71	18.66	18.06	8.19	-61.24	500.50	456.08	442.25	13.83	32.968		
6,700.00	6,276.63	6,256.19	5,823.10	20.58	20.04	8.17	-60.48	600.48	457.22	442.49	14.73	31.035		
6,800.00	6,278.17	6,356.18	5,824.48	22.67	22.20	8.15	-59.72	700.47	458.36	442.61	15.75	29.101		
6,900.00	6,280.71	6,456.17	5,825.87	24.88	24.47	8.13	-58.97	800.45	459.51	442.84	16.87	27.245		
7,000.00	6,283.25	6,556.17	5,827.26	27.20	26.84	8.11	-58.21	900.43	460.65	442.59	18.06	25.508		
7,100.00	6,285.79	6,656.16	5,828.65	29.59	29.27	8.09	-57.45	1,000.41	461.79	442.47	19.32	23.907		
7,200.00	6,288.33	6,756.15	5,830.03	32.04	31.76	8.07	-56.69	1,100.39	462.93	442.30	20.63	22.445		
7,300.00	6,290.87	6,856.15	5,831.42	34.54	34.29	8.05	-55.93	1,200.37	464.07	442.10	21.98	21.117		
7,400.00	6,293.41	6,956.14	5,832.81	37.07	36.85	8.03	-55.18	1,300.35	465.21	441.85	23.36	19.914		
7,500.00	6,295.95	7,056.13	5,834.20	39.63	39.44	8.01	-54.42	1,400.33	466.35	441.58	24.78	18.823		
7,600.00	6,299.50	7,156.13	5,835.58	42.22	42.04	7.99	-53.66	1,500.31	467.50	441.28	26.21	17.835		
7,700.00	6,301.04	7,256.12	5,836.97	44.82	44.67	7.97	-52.90	1,600.29	468.64	440.97	27.67	16.937		
7,800.00	6,303.58	7,356.11	5,838.36	47.44	47.31	7.95	-52.15	1,700.27	469.78	440.64	29.14	16.120		
7,900.00	6,306.12	7,456.11	5,839.75	50.08	49.96	7.93	-51.39	1,800.25	470.92	440.29	30.63	15.374		
8,000.00	6,308.66	7,556.10	5,841.13	52.73	52.63	7.92	-50.63	1,900.24	472.07	439.94	32.13	14.693		
8,100.00	6,311.20	7,656.09	5,842.52	55.39	55.30	7.90	-49.87	2,000.22	473.21	439.57	33.64	14.063		

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1: 4-25-2012	Offset-TVD Reference:	Offset Datum

Offset Design Crow Federal 11H - Job # 1210349 - Wellbore #1 - Plan 1 4-25-2012										Offset Site Error: 0.00 usft			
Survey Program: 0-MWD										Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)	Between Centres (usft)	Between Ellipses (usft)			
8,200.00	6,313.74	7,756.09	5,843.91	58.06	57.93	7.88	-49.11	2,100.20	474.35	439.19	35.16	13.493	
8,300.00	6,316.28	7,856.08	5,845.30	60.73	60.67	7.65	-48.36	2,200.18	475.49	438.81	36.68	12.963	
8,400.00	6,318.82	7,956.07	5,846.68	63.41	63.36	7.84	-47.60	2,300.16	476.63	438.42	38.21	12.474	
8,500.00	6,321.36	8,056.07	5,848.07	66.10	66.06	7.82	-46.84	2,400.14	477.78	438.03	39.75	12.021	
8,600.00	6,323.90	8,156.06	5,849.46	68.79	68.76	7.80	-46.08	2,500.12	478.92	437.63	41.29	11.600	
8,700.00	6,326.44	8,256.05	5,850.85	71.49	71.46	7.78	-45.32	2,600.10	480.06	437.23	42.83	11.208	
8,800.00	6,328.98	8,356.05	5,852.23	74.19	74.17	7.76	-44.57	2,700.08	481.20	436.82	44.38	10.843	
8,900.00	6,331.52	8,456.04	5,853.62	76.90	76.89	7.75	-43.81	2,800.06	482.35	436.42	45.93	10.502	
9,000.00	6,334.06	8,556.03	5,855.01	79.61	79.60	7.73	-43.05	2,900.04	483.49	436.01	47.48	10.182	
9,100.00	6,336.60	8,656.03	5,856.40	82.32	82.32	7.71	-42.29	3,000.02	484.63	435.59	49.04	9.882	
9,200.00	6,339.14	8,756.02	5,857.78	85.03	85.04	7.69	-41.53	3,100.01	485.78	435.18	50.60	9.601	
9,300.00	6,341.69	8,856.02	5,859.17	87.75	87.76	7.67	-40.78	3,199.99	486.92	434.76	52.16	9.336	
9,400.00	6,344.23	8,956.01	5,860.56	90.47	90.49	7.65	-40.02	3,299.97	488.06	434.34	53.72	9.086	
9,500.00	6,346.77	9,056.00	5,861.95	93.19	93.21	7.64	-39.26	3,399.95	489.20	433.93	55.28	8.850	
9,600.00	6,349.31	9,156.00	5,863.33	95.91	95.94	7.62	-38.50	3,499.93	490.35	433.51	56.84	8.627	
9,700.00	6,351.85	9,255.99	5,864.72	98.64	98.67	7.60	-37.75	3,599.91	491.49	433.09	58.40	8.415	
9,800.00	6,354.39	9,355.98	5,866.11	101.37	101.40	7.58	-36.99	3,699.89	492.63	432.66	59.97	8.215	
9,900.00	6,356.93	9,455.98	5,867.50	104.09	104.13	7.56	-36.23	3,799.87	493.78	432.24	61.53	8.025	
10,000.00	6,359.47	9,555.97	5,868.88	106.82	106.87	7.55	-35.47	3,899.85	494.92	431.82	63.10	7.844	
10,100.00	6,362.01	9,655.96	5,870.27	109.55	109.60	7.53	-34.71	3,999.83	496.06	431.40	64.66	7.672	
10,200.00	6,364.55	9,755.95	5,871.66	112.28	112.34	7.51	-33.96	4,099.81	497.21	430.98	66.23	7.509	
10,300.00	6,367.09	9,855.95	5,873.05	115.02	115.07	7.50	-33.20	4,199.80	498.35	430.56	67.79	7.351	
10,400.00	6,369.63	9,955.94	5,874.43	117.75	117.81	7.48	-32.44	4,299.78	499.49	430.13	69.36	7.202	
10,500.00	6,372.17	10,055.94	5,875.82	120.49	120.55	7.46	-31.68	4,399.76	500.64	429.71	70.92	7.059	
10,600.00	6,374.71	10,155.93	5,877.21	123.22	123.28	7.44	-30.92	4,499.74	501.78	429.29	72.49	6.922	
10,700.00	6,377.25	10,255.92	5,878.60	125.96	126.02	7.43	-30.17	4,599.72	502.92	428.87	74.05	6.791	
10,808.13	6,380.00	10,357.45	5,880.01	128.92	128.80	7.41	-29.40	4,701.23	504.20	428.49	75.71	6.660	

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error:	0.00 usft
Survey Program: O.M.V.D														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface	Offset Wellbore Centre		Distance		Minimum Separation	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)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	179.67	-155.00	0.90	155.00						
100.00	100.00	100.00	100.00	0.11	0.11	179.67	-155.00	0.90	155.00	154.78	0.22	689.618			
200.00	200.00	200.00	200.00	0.34	0.34	179.67	-155.00	0.90	155.00	154.33	0.67	229.873 CC			
223.90	223.90	223.69	223.69	0.39	0.39	179.70	-155.00	0.80	155.00	154.22	0.78	198.839			
300.00	300.00	299.96	299.94	0.56	0.55	-179.69	-155.01	-0.84	155.01	153.90	1.11	139.072			
400.00	400.00	399.87	399.51	0.79	0.78	-177.77	-155.04	-0.05	155.16	153.60	1.56	99.318			
500.00	500.00	499.42	499.02	1.01	1.01	-175.21	-155.09	-13.01	155.64	153.63	2.01	77.435			
600.00	600.00	599.18	598.53	1.24	1.26	-172.67	-155.13	-19.97	156.42	153.97	2.46	63.700			
700.00	700.00	698.94	698.05	1.46	1.51	-170.16	-155.18	-26.93	157.51	154.61	2.91	54.214			
800.00	800.00	798.69	797.56	1.69	1.76	-167.69	-155.22	-33.88	158.90	155.54	3.36	47.316			
900.00	900.00	898.45	897.07	1.91	2.01	-165.26	-155.27	-40.84	160.58	156.78	3.81	42.103			
1,000.00	1,000.00	899.46	897.91	2.14	2.24	-163.30	-155.31	-46.60	162.16	157.51	4.25	38.180			
1,100.00	1,100.00	1,100.72	1,099.12	2.36	2.43	-162.26	-155.33	-49.89	163.03	158.42	4.66	35.005			
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-162.07	-155.33	-50.26	163.26	158.18	5.09	32.135			
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-162.07	-155.33	-50.26	163.26	157.75	5.51	29.613			
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-162.07	-155.33	-50.26	163.26	157.31	5.95	27.447			
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-162.07	-155.33	-50.26	163.26	156.87	6.39	25.568			
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-162.07	-155.33	-50.26	163.26	156.43	6.82	23.924			
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-162.07	-155.33	-50.26	163.26	155.99	7.26	22.475			
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.86	-162.07	-155.33	-50.26	163.26	155.55	7.71	21.188			
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-162.07	-155.33	-50.26	163.26	155.11	8.15	20.038			
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-162.07	-155.33	-50.26	163.26	154.67	8.59	19.005			
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-162.07	-155.33	-50.26	163.26	154.22	9.03	18.072			
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-162.07	-155.33	-50.26	163.26	153.78	9.48	17.225			
2,300.00	2,300.00	2,301.60	2,300.00	5.06	4.94	-162.07	-155.33	-50.26	163.26	153.34	9.92	16.453			
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-162.07	-155.33	-50.26	163.26	152.89	10.37	15.747			
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-162.07	-155.33	-50.26	163.26	152.45	10.81	15.098			
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-162.07	-155.33	-50.26	163.26	152.00	11.26	14.501			
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-162.07	-155.33	-50.26	163.26	151.55	11.70	13.948			
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-162.07	-155.33	-50.26	163.26	151.11	12.15	13.438			
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.25	-162.07	-155.33	-50.26	163.26	150.66	12.60	12.959			
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-162.07	-155.33	-50.26	163.26	150.21	13.04	12.516			
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-162.07	-155.33	-50.26	163.26	149.77	13.49	12.101			
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-162.07	-155.33	-50.26	163.26	149.32	13.94	11.713			
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-162.07	-155.33	-50.26	163.26	148.87	14.39	11.349			
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-162.07	-155.33	-50.26	163.26	148.43	14.83	11.005			
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.58	-162.07	-155.33	-50.26	163.26	147.98	15.28	10.684			
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-162.07	-155.33	-50.26	163.26	147.53	15.73	10.380			
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-162.07	-155.33	-50.26	163.26	147.08	16.18	10.093			
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-162.07	-155.33	-50.26	163.26	146.63	16.62	9.821			
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-162.07	-155.33	-50.26	163.26	146.19	17.07	9.563			
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-162.07	-155.33	-50.26	163.26	145.74	17.52	9.319			
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-162.07	-155.33	-50.26	163.26	145.29	17.97	9.086			
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-162.07	-155.33	-50.26	163.26	144.84	18.42	8.865			
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-162.07	-155.33	-50.26	163.26	144.39	18.86	8.654			
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-162.07	-155.33	-50.26	163.26	143.95	19.31	8.453			
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-162.07	-155.33	-50.26	163.26	143.50	19.76	8.262			
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-162.07	-155.33	-50.26	163.26	143.05	20.21	8.078			
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-162.07	-155.33	-50.26	163.26	142.60	20.66	7.903			
4,765.09	4,765.09	4,767.69	4,765.09	10.60	10.40	-162.07	-155.33	-50.26	163.26	142.30	20.95	7.791			
4,800.00	4,800.00	4,801.40	4,799.80	10.68	10.48	-162.07	-155.33	-50.26	163.26	142.15	21.11	7.735 ES; SF			
4,900.00	4,900.00	4,887.97	4,885.59	10.90	10.67	-158.77	-155.40	-60.37	167.33	145.81	21.52	7.774			

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1, 4-25-2012	Offset TVD Reference:	Offset Datum

Offset Design Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1, 4-25-2012														Offset Site Error:	0.00 usft
Survey Program: O-MWD														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (ft)	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	
5,000.00	5,000.00	4,966.33	4,959.52	11.13	10.89	-151.08		-155.56	-85.95	182.28	160.33	21.95	8.305		
5,100.00	5,100.00	5,032.26	5,016.58	11.35	11.14	-142.67		-155.77	-118.78	212.91	190.54	22.37	9.617		
5,200.00	5,200.00	5,065.47	5,058.00	11.58	11.40	-135.72		-155.99	-152.13	260.08	237.27	22.81	11.403		
5,300.00	5,300.00	5,125.00	5,095.54	11.80	11.64	-130.87		-158.17	-180.46	320.85	297.62	23.24	13.809		
5,400.00	5,400.00	5,161.52	5,108.27	12.02	11.92	-126.80		-155.36	-209.03	391.47	367.77	23.70	16.516		
5,500.00	5,500.00	5,183.60	5,123.30	12.25	12.16	-124.05		-156.50	-231.58	469.06	444.91	24.14	19.428		
5,600.00	5,600.00	5,210.63	5,134.32	12.47	12.38	-122.00		-156.62	-250.62	551.54	526.97	24.57	22.449		
5,700.00	5,700.00	5,225.00	5,140.91	12.70	12.53	-120.76		-156.71	-263.39	637.58	612.64	24.93	25.570		
5,800.00	5,800.00	5,250.00	5,151.22	12.92	12.82	-118.73		-156.85	-266.16	726.22	700.79	25.43	28.554		
5,883.20	5,883.20	5,250.00	5,151.22	13.12	12.82	-118.73		-156.85	-266.16	805.99	780.36	25.63	31.445		
5,900.00	5,900.00	5,250.00	5,151.22	13.15	12.82	-118.73		-156.85	-266.16	816.88	791.99	24.87	32.844		
5,925.00	5,924.94	5,259.13	5,154.61	13.20	12.94	-145.14		-156.91	-294.63	840.17	815.16	25.01	33.594		
5,950.00	5,949.73	5,260.99	5,155.27	13.25	12.96	-137.79		-156.92	-296.35	864.07	838.88	25.19	34.303		
5,975.00	5,974.25	5,262.24	5,155.72	13.30	12.98	-126.91		-156.93	-297.54	888.32	862.81	25.52	34.812		
6,000.00	5,969.41	5,262.99	5,155.98	13.35	12.99	-110.92		-156.93	-298.24	912.83	886.79	26.04	35.061		
6,025.00	6,022.09	5,263.23	5,156.07	13.41	12.99	-89.69		-156.93	-298.47	937.46	911.08	26.40	35.514		
6,050.00	6,045.20	5,262.99	5,155.98	13.48	12.99	-68.22		-156.93	-299.24	962.10	936.12	25.98	37.030		
6,075.00	6,067.64	5,262.30	5,155.74	13.53	12.98	-51.02		-156.93	-297.60	956.67	961.74	24.93	39.534		
6,100.00	6,039.31	5,261.19	5,155.35	13.59	12.96	-39.15		-156.92	-296.56	1,011.05	937.30	23.74	42.580		
6,125.00	6,110.12	5,259.68	5,154.81	13.67	12.95	-31.14		-156.91	-295.15	1,035.15	1,012.51	22.63	45.737		
6,150.00	6,129.97	5,250.00	5,151.22	13.75	12.82	-25.09		-156.85	-286.16	1,058.99	1,037.47	21.52	49.202		
6,175.00	6,149.80	5,250.00	5,151.22	13.85	12.82	-21.36		-156.85	-286.16	1,092.23	1,061.67	20.58	52.650		
6,200.00	6,158.50	5,250.00	5,151.22	13.98	12.82	-18.57		-156.85	-286.16	1,104.96	1,085.36	19.59	56.362		
6,225.00	6,183.01	5,250.00	5,151.22	14.09	12.82	-16.41		-156.85	-286.16	1,127.12	1,108.48	18.63	60.488		
6,250.00	6,198.26	5,250.00	5,151.22	14.23	12.82	-14.70		-156.85	-286.16	1,148.64	1,130.96	17.68	64.981		
6,275.00	6,212.19	5,250.00	5,151.22	14.39	12.82	-13.33		-156.85	-286.16	1,169.48	1,152.75	16.73	69.912		
6,300.00	6,224.72	5,239.99	5,147.28	14.58	12.70	-12.03		-156.79	-276.95	1,189.41	1,173.63	15.78	75.360		
6,325.00	6,235.81	5,236.14	5,145.69	14.80	12.66	-11.14		-156.77	-273.45	1,208.57	1,193.68	14.89	81.171		
6,350.00	6,245.42	5,225.00	5,140.91	15.04	12.53	-10.29		-156.71	-263.39	1,226.92	1,212.88	14.04	87.372		
6,375.00	6,253.49	5,225.00	5,140.91	15.30	12.53	-9.67		-156.71	-263.39	1,244.19	1,230.90	13.29	93.616		
6,400.00	6,260.00	5,225.00	5,140.91	15.59	12.53	-9.14		-156.71	-263.39	1,260.53	1,247.88	12.64	99.701		
6,425.00	6,264.92	5,225.00	5,140.91	15.91	12.53	-8.69		-156.71	-263.39	1,275.92	1,263.79	12.13	105.197		
6,450.00	6,268.22	5,214.11	5,135.97	16.25	12.42	-8.25		-156.64	-253.69	1,290.12	1,278.38	11.70	109.688		
6,475.00	6,269.90	5,200.00	5,129.14	16.61	12.27	-7.87		-156.56	-241.34	1,303.45	1,291.88	11.57	112.685		
6,478.39	6,270.00	5,200.00	5,129.14	16.65	12.27	-7.83		-156.56	-241.34	1,305.13	1,293.57	11.56	112.925		
6,497.84	6,270.50	5,209.00	5,129.14	16.95	12.27	-7.83		-156.56	-241.34	1,314.83	1,303.21	11.62	113.187		
6,500.00	6,270.55	5,200.00	5,129.14	16.99	12.27	-7.83		-156.56	-241.34	1,315.92	1,304.30	11.62	113.215		
6,600.00	6,273.09	5,185.53	5,121.67	18.66	12.13	-7.73		-156.48	-228.95	1,368.84	1,359.87	11.95	114.435		
6,700.00	6,275.63	5,175.00	5,115.95	20.58	12.03	-7.74		-156.43	-220.11	1,425.85	1,413.48	12.37	115.228		
6,800.00	6,278.17	5,150.00	5,101.40	22.67	11.82	-7.64		-156.30	-199.79	1,486.33	1,473.50	12.83	115.822		
6,900.00	6,280.71	5,135.79	5,092.54	24.83	11.72	-7.58		-156.22	-188.68	1,550.16	1,536.81	13.35	116.058		
7,000.00	6,283.25	5,125.00	5,085.54	27.20	11.64	-7.54		-156.17	-180.46	1,616.99	1,603.08	13.91	116.218		
7,100.00	6,285.79	5,100.00	5,068.46	29.89	11.48	-7.43		-156.05	-162.21	1,685.58	1,672.06	14.49	116.359		
7,200.00	6,288.33	5,100.00	5,068.46	32.04	11.48	-7.43		-156.05	-162.21	1,768.40	1,743.28	15.13	116.255		
7,300.00	6,290.87	5,075.00	5,050.23	34.54	11.34	-7.31		-155.94	-145.12	1,832.57	1,816.82	15.75	116.335		
7,400.00	6,293.41	5,075.00	5,050.23	37.07	11.34	-7.31		-155.94	-145.12	1,908.54	1,892.11	16.42	116.206		
7,500.00	6,295.95	5,062.20	5,040.46	39.63	11.27	-7.25		-155.89	-135.84	1,986.37	1,969.28	17.10	116.193		
7,600.00	6,298.50	5,050.00	5,030.91	42.22	11.21	-7.20		-155.84	-129.26	2,065.84	2,048.07	17.78	116.199		
7,700.00	6,301.04	5,050.00	5,030.91	44.82	11.21	-7.20		-155.84	-129.26	2,148.82	2,128.33	18.49	116.115		
7,800.00	6,303.58	5,025.00	5,010.60	47.44	11.10	-7.08		-155.75	-114.69	2,229.16	2,209.99	19.17	116.280		
7,900.00	6,306.12	5,025.00	5,010.60	50.08	11.10	-7.08		-155.75	-114.69	2,312.45	2,292.56	19.90	116.224		
8,000.00	6,308.66	5,025.00	5,010.60	52.73	11.10	-7.08		-155.75	-114.69	2,397.03	2,376.40	20.63	116.194		

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Offset Design Crow Federal 13H - Well #1 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error:	0.00 usft
Survey Program														Offset Well Error:	0.00 usft
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Semi Major Axis	Reference	Offset	Highside Footcandle	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(')	(usft)	(usft)	(usft)	(usft)	(usft)			
8,100.00	6,311.20	5,012.84	5,000.38	55.39	11.09	7.02		-155.70	-108.09	2,482.53	2,461.18	21.35	116.296		
8,200.00	6,313.74	5,000.00	4,939.37	58.06	11.01	6.96		-155.66	-101.49	2,569.03	2,546.97	22.07	116.425		
8,300.00	6,318.28	5,000.00	4,939.37	60.73	11.01	6.96		-155.66	-101.49	2,656.26	2,633.44	22.81	116.434		
8,400.00	6,318.82	5,000.00	4,939.37	63.41	11.01	6.96		-155.66	-101.49	2,744.35	2,720.79	23.57	116.458		
8,500.00	6,321.36	4,988.68	4,979.49	66.10	10.97	6.91		-155.63	-95.97	2,833.05	2,808.75	24.30	116.610		
8,600.00	6,323.90	4,975.00	4,967.33	68.79	10.92	6.84		-155.59	-89.70	2,922.54	2,897.52	25.02	116.603		
8,700.00	6,326.44	4,975.00	4,967.33	71.49	10.92	6.84		-155.59	-89.70	3,012.44	2,986.66	25.78	116.649		
8,800.00	6,328.98	4,975.00	4,967.33	74.19	10.92	6.84		-155.59	-89.70	3,102.95	3,076.41	26.54	116.903		
8,900.00	6,331.52	4,975.00	4,967.33	76.90	10.92	6.84		-155.59	-89.70	3,194.03	3,166.72	27.31	116.965		
9,000.00	6,334.06	4,975.00	4,967.33	79.61	10.92	6.84		-155.59	-89.70	3,285.63	3,257.55	28.07	117.033		
9,100.00	6,336.60	4,950.00	4,944.57	82.32	10.84	6.73		-155.52	-79.37	3,377.60	3,348.83	28.77	117.392		
9,200.00	6,339.14	4,950.00	4,944.57	85.03	10.84	6.73		-155.52	-79.37	3,469.84	3,440.30	29.54	117.461		
9,300.00	6,341.69	4,950.00	4,944.57	87.75	10.84	6.73		-155.52	-79.37	3,562.49	3,532.18	30.31	117.534		
9,400.00	6,344.23	4,950.00	4,944.57	90.47	10.84	6.73		-155.52	-79.37	3,655.53	3,624.45	31.08	117.611		
9,500.00	6,346.77	4,950.00	4,944.57	93.19	10.84	6.73		-155.52	-79.37	3,748.93	3,717.08	31.85	117.689		
9,600.00	6,349.31	4,950.00	4,944.57	95.91	10.84	6.73		-155.52	-79.37	3,842.66	3,810.04	32.63	117.770		
9,700.00	6,351.85	4,950.00	4,944.57	98.64	10.84	6.73		-155.52	-79.37	3,936.70	3,903.30	33.40	117.853		
9,800.00	6,354.39	4,937.65	4,933.08	101.37	10.81	6.67		-155.49	-74.83	4,030.81	3,996.68	34.14	118.081		
9,900.00	6,356.93	4,925.00	4,921.18	104.09	10.77	6.61		-155.46	-70.56	4,125.44	4,090.67	34.87	118.319		
10,000.00	6,359.47	4,925.00	4,921.18	106.82	10.77	6.61		-155.46	-70.56	4,220.09	4,184.45	35.64	118.399		
10,100.00	6,362.01	4,925.00	4,921.18	109.55	10.77	6.61		-155.46	-70.56	4,314.99	4,278.57	36.42	118.479		
10,200.00	6,364.55	4,925.00	4,921.18	112.28	10.77	6.61		-155.46	-70.56	4,410.11	4,372.91	37.20	118.560		
10,300.00	6,367.09	4,925.00	4,921.18	115.02	10.77	6.61		-155.46	-70.56	4,505.44	4,467.46	37.98	118.640		
10,400.00	6,369.63	4,925.00	4,921.18	117.75	10.77	6.61		-155.46	-70.56	4,600.97	4,562.21	38.75	118.721		
10,500.00	6,372.17	4,925.00	4,921.18	120.49	10.77	6.61		-155.46	-70.56	4,696.68	4,657.15	39.53	118.801		
10,600.00	6,374.71	4,925.00	4,921.18	123.22	10.77	6.61		-155.46	-70.56	4,792.57	4,752.26	40.31	118.881		
10,700.00	6,377.25	4,925.00	4,921.18	125.96	10.77	6.61		-155.46	-70.56	4,888.63	4,847.53	41.09	118.960		
10,808.13	6,380.00	4,925.00	4,921.18	128.92	10.77	6.61		-155.46	-70.56	4,984.67	4,950.73	41.94	119.045		

Anticollision Report

Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan#1. 4-25-2012

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:
 Output errors are at
 Database:
 Offset TVD Reference:

Site Crow Federal 12H
 WELL @ 3915.00usft (Original Well Elev)
 WELL @ 3915.00usft (Original Well Elev)
 Grid
 Minimum Curvature
 2.00 sigma
 Compass5000
 Offset Datum

Offset Design Crow federal 14H - Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012											Offset Site Error: 0.00 usft	
Survey Program: 0-MVD											Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre N/S (usft)	Offset Wellbore Centre E/W (usft)				Between Centres (usft)
0.00	0.00	0.00	0.00	0.00	0.00	179.68	-90.00	0.50	90.00			
100.00	100.00	100.00	100.00	0.11	0.11	179.68	-90.00	0.50	90.00	69.78	0.22 400.423	
200.00	200.00	200.00	200.00	0.34	0.34	179.68	-90.00	0.50	90.00	89.33	0.67 133.474 CC	
224.65	224.65	224.65	224.65	0.39	0.39	179.75	-90.00	0.39	90.00	89.22	0.76 114.967	
300.00	300.00	299.98	299.94	0.56	0.55	-179.21	-90.01	-1.24	90.02	88.91	1.11 80.762	
400.00	400.00	399.67	399.51	0.79	0.78	-175.80	-90.04	-6.45	90.28	88.71	1.56 57.784	
500.00	500.00	499.43	499.02	1.01	1.01	-171.53	-90.09	-13.41	91.09	89.03	2.01 45.309	
600.00	600.00	599.18	598.54	1.24	1.26	-167.27	-90.13	-20.37	92.42	89.93	2.46 37.605	
700.00	700.00	698.94	698.05	1.46	1.51	-163.14	-90.18	-27.33	94.25	91.34	2.91 32.384	
800.00	800.00	798.70	797.58	1.69	1.76	-159.19	-90.22	-34.28	96.55	93.18	3.37 28.667	
900.00	900.00	898.45	897.08	1.91	2.01	-155.45	-90.27	-41.24	99.29	95.46	3.83 25.923	
1,000.00	1,000.00	999.46	997.91	2.14	2.24	-152.51	-90.31	-47.00	101.83	97.55	4.27 23.853	
1,100.00	1,100.00	1,100.72	1,099.13	2.36	2.43	-150.99	-90.33	-50.09	103.29	98.61	4.69 22.050	
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-150.72	-90.33	-50.66	103.57	98.45	5.10 20.297	
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-150.72	-90.33	-50.66	103.57	98.03	5.53 18.716	
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-150.72	-90.33	-50.66	103.57	97.60	5.97 17.355	
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-150.72	-90.33	-50.66	103.57	97.18	6.40 16.173	
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-150.72	-90.33	-50.66	103.57	96.72	6.84 15.138	
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-150.72	-90.33	-50.66	103.57	96.23	7.28 14.225	
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.86	-150.72	-90.33	-50.66	103.57	95.84	7.72 13.413	
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-150.72	-90.33	-50.66	103.57	95.40	8.16 12.659	
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-150.72	-90.33	-50.66	103.57	94.96	8.60 12.036	
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-150.72	-90.33	-50.66	103.57	94.52	9.05 11.447	
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-150.72	-90.33	-50.66	103.57	94.07	9.49 10.912	
2,300.00	2,300.00	2,301.60	2,300.00	5.06	4.94	-150.72	-90.33	-50.66	103.57	93.63	9.94 10.424	
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-150.72	-90.33	-50.66	103.57	93.19	10.38 9.977	
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-150.72	-90.33	-50.66	103.57	92.74	10.83 9.567	
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-150.72	-90.33	-50.66	103.57	92.29	11.27 9.189	
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-150.72	-90.33	-50.66	103.57	91.85	11.72 8.839	
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-150.72	-90.33	-50.66	103.57	91.40	12.16 8.515	
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.26	-150.72	-90.33	-50.66	103.57	90.96	12.61 8.214	
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-150.72	-90.33	-50.66	103.57	90.51	13.05 7.933	
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-150.72	-90.33	-50.66	103.57	90.06	13.50 7.671	
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-150.72	-90.33	-50.66	103.57	89.62	13.95 7.425	
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-150.72	-90.33	-50.66	103.57	89.17	14.40 7.194	
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-150.72	-90.33	-50.66	103.57	88.72	14.84 6.978	
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.58	-150.72	-90.33	-50.66	103.57	88.28	15.29 6.773	
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-150.72	-90.33	-50.66	103.57	87.83	15.74 6.581	
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-150.72	-90.33	-50.66	103.57	87.38	16.19 6.399	
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-150.72	-90.33	-50.66	103.57	86.93	16.63 6.227	
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-150.72	-90.33	-50.66	103.57	86.48	17.08 6.063	
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-150.72	-90.33	-50.66	103.57	86.04	17.53 5.908	
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-150.72	-90.33	-50.66	103.57	85.59	17.99 5.761	
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-150.72	-90.33	-50.66	103.57	85.14	18.42 5.621	
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-150.72	-90.33	-50.66	103.57	84.69	18.87 5.488	
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-150.72	-90.33	-50.66	103.57	84.24	19.32 5.360	
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-150.72	-90.33	-50.66	103.57	83.80	19.77 5.239	
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-150.72	-90.33	-50.66	103.57	83.35	20.22 5.123	
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-150.72	-90.33	-50.66	103.57	82.90	20.67 5.011	
4,800.00	4,800.00	4,801.60	4,800.00	10.68	10.48	-150.72	-90.33	-50.66	103.57	82.45	21.11 4.905	
4,900.00	4,900.00	4,901.60	4,900.00	10.90	10.70	-150.72	-90.33	-50.66	103.57	82.00	21.56 4.803	
5,000.00	5,000.00	5,001.60	5,000.00	11.13	10.92	-150.72	-90.33	-50.66	103.57	81.55	22.01 4.705	

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

Anticollision Report

Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:
 Output errors are at
 Database:
 Offset TVD Reference:

Site Crow Federal 12H
 WELL @ 3915.00usft (Original Well Elev)
 WELL @ 3915.00usft (Original Well Elev)
 Grid
 Minimum Curvature
 2.00 sigma
 Compass5000
 Offset Datum

Offset Design Crow federal 14H- Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error: 0.00 usft
Survey Program: O-MWD														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		
5,100.00	5,100.00	5,101.60	5,100.00	11.35	11.15	-150.72	-90.33	-50.66	103.57	81.11	22.46	4.611		
5,200.00	5,200.00	5,201.60	5,200.00	11.58	11.37	-150.72	-90.33	-50.66	103.57	80.66	22.91	4.521		
5,300.00	5,300.00	5,301.60	5,300.00	11.80	11.59	-150.72	-90.33	-50.66	103.57	80.21	23.36	4.434		
5,400.00	5,400.00	5,401.60	5,400.00	12.02	11.82	-150.72	-90.33	-50.66	103.57	79.76	23.81	4.351 ES, SF		
5,500.00	5,500.00	5,488.77	5,486.50	12.25	12.01	-146.49	-90.39	-59.85	109.25	85.02	24.22	4.510		
5,600.00	5,600.00	5,567.67	5,561.19	12.47	12.23	-136.56	-90.55	-84.86	130.03	105.38	24.85	5.274		
5,700.00	5,700.00	5,634.24	5,619.09	12.70	12.45	-127.63	-90.76	-117.52	169.10	144.01	25.09	6.739		
5,800.00	5,800.00	5,665.65	5,661.20	12.92	12.70	-121.03	-90.98	-150.95	224.34	198.80	25.54	8.783		
5,889.20	5,889.20	5,725.00	5,687.20	13.12	12.90	-117.22	-91.15	-177.19	283.03	257.09	25.94	10.911		
5,900.00	5,900.00	5,730.60	5,691.04	13.16	12.94	-152.94	-91.18	-181.53	291.54	265.82	25.71	11.338		
5,925.00	5,924.94	5,739.34	5,696.59	13.20	13.00	-151.82	-91.22	-188.03	310.63	284.91	25.72	12.076		
5,950.00	5,949.73	5,750.00	5,703.30	13.25	13.07	-150.94	-91.27	-196.31	331.04	305.36	25.68	12.893		
5,975.00	5,974.25	5,750.00	5,703.30	13.30	13.07	-147.41	-91.27	-196.31	352.49	326.91	25.58	13.780		
6,000.00	5,998.41	5,757.75	5,709.03	13.35	13.13	-144.58	-91.31	-202.44	374.84	349.37	25.48	14.713		
6,025.00	6,022.09	5,761.67	5,710.37	13.41	13.16	-139.89	-91.33	-205.58	397.95	372.63	25.42	15.658		
6,050.00	6,045.20	5,764.59	5,712.10	13.46	13.18	-133.10	-91.35	-207.94	421.62	396.14	25.49	16.542		
6,075.00	6,067.64	5,765.60	5,713.28	13.53	13.19	-123.15	-91.36	-209.56	445.73	419.91	25.82	17.284		
6,100.00	6,089.31	5,767.75	5,713.95	13.59	13.20	-108.78	-91.38	-210.50	470.11	443.68	26.43	17.769		
6,125.00	6,110.12	5,776.00	5,718.11	13.67	13.26	-94.32	-91.40	-216.44	494.77	467.85	26.90	18.392		
6,150.00	6,129.97	5,767.75	5,713.95	13.75	13.20	-69.77	-91.36	-210.51	519.24	492.91	26.34	19.716		
6,175.00	6,148.80	5,766.75	5,713.35	13.85	13.19	-52.77	-91.35	-209.69	543.77	518.91	24.85	21.881		
6,200.00	6,166.50	5,765.13	5,712.42	13.96	13.18	-40.46	-91.35	-208.37	568.13	545.01	23.11	24.580		
6,225.00	6,183.01	5,762.96	5,711.14	14.08	13.17	-31.94	-91.34	-205.62	592.23	570.74	21.50	27.551		
6,250.00	6,198.26	5,760.28	5,709.55	14.23	13.15	-25.95	-91.32	-204.47	616.00	595.95	20.05	30.719		
6,275.00	6,212.19	5,750.00	5,703.30	14.39	13.07	-21.14	-91.27	-196.31	639.47	620.81	18.66	34.267		
6,300.00	6,224.72	5,750.00	5,703.30	14.58	13.07	-16.33	-91.27	-196.31	662.26	644.73	17.53	37.772		
6,325.00	6,235.81	5,750.00	5,703.30	14.80	13.07	-16.13	-91.27	-196.31	684.56	668.03	16.48	41.533		
6,350.00	6,245.42	5,750.00	5,703.30	15.04	13.07	-14.39	-91.27	-196.31	706.33	690.81	15.52	45.523		
6,375.00	6,253.49	5,740.74	5,697.49	15.30	13.01	-12.73	-91.22	-189.10	727.34	712.73	14.61	49.790		
6,400.00	6,260.00	5,735.83	5,694.33	15.59	12.97	-11.52	-91.20	-185.34	747.68	733.83	13.85	53.982		
6,425.00	6,264.92	5,725.00	5,687.20	15.91	12.90	-10.43	-91.15	-177.19	767.33	754.10	13.22	58.024		
6,450.00	6,268.22	5,725.00	5,687.20	16.25	12.90	-9.69	-91.15	-177.19	786.04	773.24	12.80	61.424		
6,475.00	6,269.90	5,725.00	5,687.20	16.61	12.90	-9.05	-91.15	-177.19	804.02	791.47	12.55	64.047		
6,478.39	6,270.00	5,725.00	5,687.20	16.65	12.90	-8.98	-91.15	-177.19	806.41	793.87	12.54	64.330		
6,497.84	6,270.50	5,714.38	5,679.99	16.95	12.84	-8.86	-91.10	-169.39	819.93	807.35	12.58	65.194		
6,500.00	6,270.55	5,713.89	5,679.65	16.98	12.84	-8.85	-91.09	-169.04	821.45	808.86	12.58	65.282		
6,600.00	6,273.09	5,700.00	5,669.88	18.66	12.78	-8.71	-91.03	-159.16	893.94	881.01	12.92	69.166		
6,700.00	6,275.63	5,675.00	5,651.43	20.55	12.63	-8.44	-90.92	-142.30	969.77	956.46	13.31	72.647		
6,800.00	6,278.17	5,650.00	5,631.91	22.67	12.52	-8.18	-90.82	-126.69	1,048.76	1,035.00	13.75	76.249		
6,900.00	6,280.71	5,650.00	5,631.91	24.88	12.52	-8.18	-90.82	-126.69	1,130.19	1,115.90	14.30	79.053		
7,000.00	6,283.25	5,625.00	5,611.41	27.20	12.42	-7.92	-90.73	-112.39	1,213.63	1,193.82	14.82	81.908		
7,100.00	6,285.79	5,625.00	5,611.41	29.59	12.42	-7.92	-90.73	-112.39	1,299.07	1,283.64	15.43	84.193		
7,200.00	6,288.33	5,600.00	5,590.02	32.04	12.33	-7.66	-90.65	-99.46	1,385.88	1,369.83	16.00	86.624		
7,300.00	6,290.87	5,600.00	5,590.02	34.54	12.33	-7.66	-90.65	-99.46	1,474.07	1,457.41	16.66	88.493		
7,400.00	6,293.41	5,588.62	5,578.24	37.07	12.28	-7.53	-90.60	-93.12	1,563.39	1,546.10	17.29	90.410		
7,500.00	6,295.95	5,575.00	5,567.83	39.63	12.25	-7.42	-90.57	-87.95	1,653.75	1,635.81	17.94	92.157		
7,600.00	6,298.50	5,575.00	5,567.83	42.22	12.25	-7.42	-90.57	-87.95	1,744.97	1,726.32	18.65	93.576		
7,700.00	6,301.04	5,564.10	5,557.92	44.82	12.21	-7.31	-90.54	-83.40	1,836.91	1,817.59	19.32	95.072		
7,800.00	6,303.58	5,550.00	5,544.93	47.44	12.17	-7.18	-90.51	-77.92	1,929.65	1,909.66	19.99	95.533		
7,900.00	6,306.12	5,550.00	5,544.93	50.08	12.17	-7.18	-90.51	-77.92	2,022.79	2,002.07	20.72	97.638		
8,000.00	6,308.66	5,550.00	5,544.93	52.73	12.17	-7.18	-90.51	-77.92	2,116.56	2,095.11	21.45	98.663		
8,100.00	6,311.20	5,550.00	5,544.93	55.39	12.17	-7.18	-90.51	-77.92	2,210.87	2,188.68	22.19	99.617		

CC: Min centre to center distance or convergent point; SF: min separation factor; ES: min ellipse separation

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Offset Design Crow federal 14H - Job # 1210352 - Wellbore #1 - Plan 1 4-25-2012												Offset Site Error:	0.00 usft
Survey Program: O-MWD												Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Distance	Between	Between	Minimum	Separation	Warning
Measured	Depth	Measured	Depth	Reference	Offset	Toolface	N/S	E/W	Centres	Ellipses	Separation	Factor	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
8,200.00	6,313.74	5,536.53	5,532.71	58.06	12.14	7.06	-90.48	-73.28	2,305.40	2,262.52	22.88	100.754	
8,300.00	6,316.28	5,525.00	5,521.43	60.73	12.10	6.95	-90.45	-69.42	2,400.51	2,376.93	23.58	101.818	
8,400.00	6,318.82	5,525.00	5,521.43	63.41	12.10	6.95	-90.45	-69.42	2,495.80	2,471.47	24.33	102.590	
8,500.00	6,321.36	5,525.00	5,521.43	66.10	12.10	6.95	-90.45	-69.42	2,591.44	2,566.38	25.03	103.313	
8,600.00	6,323.90	5,525.00	5,521.43	68.79	12.10	6.95	-90.45	-69.42	2,687.40	2,661.56	25.84	103.994	
8,700.00	6,326.44	5,525.00	5,521.43	71.49	12.10	6.95	-90.45	-69.42	2,783.64	2,757.04	26.60	104.635	
8,800.00	6,328.98	5,525.00	5,521.43	74.19	12.10	6.95	-90.45	-69.42	2,880.14	2,852.77	27.37	105.239	
8,900.00	6,331.52	5,511.82	5,503.83	76.90	12.07	6.84	-90.43	-65.55	2,976.62	2,948.56	28.06	106.075	
9,000.00	6,334.06	5,500.00	5,497.42	79.61	12.04	6.74	-90.41	-62.46	3,073.56	3,044.80	28.78	106.859	
9,100.00	6,336.60	5,500.00	5,497.42	82.32	12.04	6.74	-90.41	-62.46	3,170.50	3,140.97	29.53	107.387	
9,200.00	6,339.14	5,500.00	5,497.42	85.03	12.04	6.74	-90.41	-62.46	3,267.62	3,237.32	30.30	107.849	
9,300.00	6,341.69	5,500.00	5,497.42	87.75	12.04	6.74	-90.41	-62.46	3,364.91	3,333.84	31.07	108.307	
9,400.00	6,344.23	5,500.00	5,497.42	90.47	12.04	6.74	-90.41	-62.46	3,462.36	3,430.52	31.84	108.743	
9,500.00	6,346.77	5,500.00	5,497.42	93.19	12.04	6.74	-90.41	-62.46	3,559.94	3,527.33	32.61	109.158	
9,600.00	6,349.31	5,500.00	5,497.42	95.91	12.04	6.74	-90.41	-62.46	3,657.66	3,624.27	33.39	109.554	
9,700.00	6,351.85	5,500.00	5,497.42	98.64	12.04	6.74	-90.41	-62.46	3,755.50	3,721.34	34.16	109.931	
9,800.00	6,354.39	5,500.00	5,497.42	101.37	12.04	6.74	-90.41	-62.46	3,853.45	3,818.51	34.94	110.292	
9,900.00	6,356.93	5,500.00	5,497.42	104.09	12.04	6.74	-90.41	-62.46	3,951.50	3,915.78	35.72	110.637	
10,000.00	6,359.47	5,487.90	5,485.65	106.82	12.01	6.63	-90.39	-59.66	4,049.44	4,013.03	36.41	111.220	
10,100.00	6,362.01	5,475.00	5,473.01	109.55	11.98	6.53	-90.37	-57.09	4,147.79	4,110.70	37.10	111.809	
10,200.00	6,364.55	5,475.00	5,473.01	112.28	11.93	6.53	-90.37	-57.09	4,246.00	4,208.13	37.87	112.111	
10,300.00	6,367.09	5,475.00	5,473.01	115.02	11.93	6.53	-90.37	-57.09	4,344.29	4,305.84	38.65	112.491	
10,400.00	6,369.63	5,475.00	5,473.01	117.75	11.93	6.53	-90.37	-57.09	4,442.66	4,403.23	39.43	112.679	
10,500.00	6,372.17	5,475.00	5,473.01	120.49	11.93	6.53	-90.37	-57.09	4,541.09	4,500.89	40.21	112.947	
10,600.00	6,374.71	5,475.00	5,473.01	123.22	11.93	6.53	-90.37	-57.09	4,639.60	4,598.61	40.98	113.204	
10,700.00	6,377.25	5,475.00	5,473.01	125.96	11.93	6.53	-90.37	-57.09	4,738.17	4,696.40	41.76	113.452	
10,803.13	6,380.00	5,475.00	5,473.01	128.92	11.93	6.53	-90.37	-57.09	4,844.61	4,802.21	42.61	113.710	

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset-TVD Reference:	Offset Datum

Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012													Offset Site Error:	0.00 usft
Survey Program: O-MWD													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	
0.00	0.00	0.00	0.00	0.00	0.00	179.77	-25.00	0.10	25.00					
100.00	100.00	100.00	100.00	0.11	0.11	179.77	-25.00	0.10	25.00	24.78	0.22	111.228		
200.00	200.00	200.00	200.00	0.34	0.34	179.77	-25.00	0.10	25.00	24.33	0.67	37.076 CC		
225.32	225.32	225.31	225.31	0.39	0.39	-179.97	-25.00	-0.01	25.00	24.21	0.79	31.816		
300.00	300.00	299.96	299.94	0.58	0.55	-176.24	-25.01	-1.64	25.07	23.95	1.11	22.488 ES		
400.00	400.00	399.67	399.51	0.79	0.78	-164.70	-25.04	-6.85	25.97	24.41	1.56	16.622		
500.00	500.00	499.43	499.02	1.01	1.01	-151.17	-25.09	-13.81	26.66	26.64	2.01	14.228		
600.00	600.00	599.18	598.54	1.24	1.26	-140.44	-25.13	-20.77	32.64	30.16	2.47	13.191		
700.00	700.00	699.94	698.05	1.46	1.51	-132.25	-25.18	-27.73	37.50	34.66	2.94	12.737		
800.00	800.00	798.70	797.56	1.69	1.76	-126.03	-25.22	-34.69	42.96	39.53	3.42	12.559		
900.00	900.00	898.45	897.03	1.91	2.01	-121.25	-25.27	-41.64	48.60	44.90	3.90	12.512		
1,000.00	1,000.00	999.46	997.52	2.14	2.24	-118.10	-25.31	-47.40	53.77	49.42	4.35	12.363		
1,100.00	1,100.00	1,100.72	1,099.13	2.36	2.43	-116.64	-25.33	-50.49	56.49	51.73	4.76	11.858		
1,200.00	1,200.00	1,201.60	1,200.00	2.58	2.62	-116.39	-25.33	-51.06	57.00	51.82	5.18	11.004		
1,300.00	1,300.00	1,301.60	1,300.00	2.81	2.82	-116.39	-25.33	-51.06	57.00	51.39	5.61	10.167		
1,400.00	1,400.00	1,401.60	1,400.00	3.03	3.02	-116.39	-25.33	-51.06	57.00	50.96	6.04	9.443		
1,500.00	1,500.00	1,501.60	1,500.00	3.26	3.23	-116.39	-25.33	-51.06	57.00	50.53	6.47	8.811		
1,600.00	1,600.00	1,601.60	1,600.00	3.48	3.44	-116.39	-25.33	-51.06	57.00	50.09	6.90	8.257		
1,700.00	1,700.00	1,701.60	1,700.00	3.71	3.65	-116.39	-25.33	-51.06	57.00	49.66	7.34	7.765		
1,800.00	1,800.00	1,801.60	1,800.00	3.93	3.66	-116.39	-25.33	-51.06	57.00	49.22	7.78	7.328		
1,900.00	1,900.00	1,901.60	1,900.00	4.16	4.07	-116.39	-25.33	-51.06	57.00	48.78	8.22	6.937		
2,000.00	2,000.00	2,001.60	2,000.00	4.38	4.29	-116.39	-25.33	-51.06	57.00	48.34	8.66	6.594		
2,100.00	2,100.00	2,101.60	2,100.00	4.61	4.51	-116.39	-25.33	-51.06	57.00	47.90	9.10	6.265		
2,200.00	2,200.00	2,201.60	2,200.00	4.83	4.72	-116.39	-25.33	-51.06	57.00	47.46	9.54	5.975		
2,300.00	2,300.00	2,301.60	2,300.00	5.05	4.94	-116.39	-25.33	-51.06	57.00	47.01	9.98	5.710		
2,400.00	2,400.00	2,401.60	2,400.00	5.28	5.16	-116.39	-25.33	-51.06	57.00	46.57	10.43	5.467		
2,500.00	2,500.00	2,501.60	2,500.00	5.51	5.38	-116.39	-25.33	-51.06	57.00	46.13	10.87	5.244		
2,600.00	2,600.00	2,601.60	2,600.00	5.73	5.60	-116.39	-25.33	-51.06	57.00	45.68	11.31	5.038		
2,700.00	2,700.00	2,701.60	2,700.00	5.96	5.81	-116.39	-25.33	-51.06	57.00	45.24	11.76	4.847		
2,800.00	2,800.00	2,801.60	2,800.00	6.18	6.03	-116.39	-25.33	-51.06	57.00	44.79	12.20	4.671		
2,900.00	2,900.00	2,901.60	2,900.00	6.41	6.26	-116.39	-25.33	-51.06	57.00	44.35	12.65	4.508		
3,000.00	3,000.00	3,001.60	3,000.00	6.63	6.48	-116.39	-25.33	-51.06	57.00	43.90	13.09	4.353		
3,100.00	3,100.00	3,101.60	3,100.00	6.86	6.70	-116.39	-25.33	-51.06	57.00	43.45	13.54	4.209		
3,200.00	3,200.00	3,201.60	3,200.00	7.08	6.92	-116.39	-25.33	-51.06	57.00	43.01	13.99	4.075		
3,300.00	3,300.00	3,301.60	3,300.00	7.30	7.14	-116.39	-25.33	-51.06	57.00	42.56	14.43	3.949		
3,400.00	3,400.00	3,401.60	3,400.00	7.53	7.36	-116.39	-25.33	-51.06	57.00	42.12	14.88	3.831		
3,500.00	3,500.00	3,501.60	3,500.00	7.75	7.59	-116.39	-25.33	-51.06	57.00	41.67	15.33	3.719		
3,600.00	3,600.00	3,601.60	3,600.00	7.98	7.80	-116.39	-25.33	-51.06	57.00	41.22	15.77	3.614		
3,700.00	3,700.00	3,701.60	3,700.00	8.20	8.03	-116.39	-25.33	-51.06	57.00	40.78	16.22	3.514		
3,800.00	3,800.00	3,801.60	3,800.00	8.43	8.25	-116.39	-25.33	-51.06	57.00	40.33	16.67	3.420		
3,900.00	3,900.00	3,901.60	3,900.00	8.65	8.47	-116.39	-25.33	-51.06	57.00	39.88	17.11	3.330		
4,000.00	4,000.00	4,001.60	4,000.00	8.88	8.69	-116.39	-25.33	-51.06	57.00	39.43	17.56	3.246		
4,100.00	4,100.00	4,101.60	4,100.00	9.10	8.92	-116.39	-25.33	-51.06	57.00	38.99	18.01	3.165		
4,200.00	4,200.00	4,201.60	4,200.00	9.33	9.14	-116.39	-25.33	-51.06	57.00	38.54	18.46	3.089		
4,300.00	4,300.00	4,301.60	4,300.00	9.55	9.36	-116.39	-25.33	-51.06	57.00	38.09	18.90	3.015		
4,400.00	4,400.00	4,401.60	4,400.00	9.78	9.58	-116.39	-25.33	-51.06	57.00	37.64	19.35	2.945		
4,500.00	4,500.00	4,501.60	4,500.00	10.00	9.81	-116.39	-25.33	-51.06	57.00	37.20	19.80	2.879		
4,600.00	4,600.00	4,601.60	4,600.00	10.23	10.03	-116.39	-25.33	-51.06	57.00	36.75	20.25	2.815		
4,700.00	4,700.00	4,701.60	4,700.00	10.45	10.25	-116.39	-25.33	-51.06	57.00	36.30	20.70	2.754		
4,800.00	4,800.00	4,801.60	4,800.00	10.68	10.48	-116.39	-25.33	-51.06	57.00	35.85	21.14	2.696		
4,900.00	4,900.00	4,901.60	4,900.00	10.90	10.70	-116.39	-25.33	-51.06	57.00	35.40	21.59	2.640		
5,000.00	5,000.00	5,001.60	5,000.00	11.13	10.92	-116.39	-25.33	-51.06	57.00	34.96	22.04	2.586		

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012														Offset Site Error:	0.00 usft
Survey Program: 0-MVD														Offset Well Error:	0.00 usft
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		
5,100.00	5,100.00	5,101.60	5,100.00	11.35	11.15	-116.39	-25.33	-51.06	57.00	34.51	22.49	2.535			
5,200.00	5,200.00	5,201.60	5,200.00	11.58	11.37	-116.39	-25.33	-51.06	57.00	34.06	22.94	2.485			
5,300.00	5,300.00	5,301.60	5,300.00	11.80	11.59	-116.39	-25.33	-51.06	57.00	33.61	23.38	2.437			
5,400.00	5,400.00	5,401.60	5,400.00	12.02	11.82	-116.39	-25.33	-51.06	57.00	33.16	23.83	2.391			
5,500.00	5,500.00	5,501.60	5,500.00	12.25	12.04	-116.39	-25.33	-51.06	57.00	32.71	24.28	2.347			
5,600.00	5,600.00	5,601.60	5,600.00	12.47	12.26	-116.39	-25.33	-51.06	57.00	32.27	24.73	2.305			
5,700.00	5,700.00	5,701.60	5,700.00	12.70	12.49	-116.39	-25.33	-51.06	57.00	31.82	25.18	2.264			
5,747.91	5,747.91	5,749.51	5,747.91	12.81	12.60	-116.39	-25.33	-51.06	57.00	31.60	25.39	2.245			
5,800.00	5,800.00	5,800.00	5,793.39	12.92	12.71	-116.15	-25.33	-51.59	57.50	31.88	25.62	2.244 SF			
5,888.20	5,888.20	5,875.00	5,872.42	13.12	12.88	-112.01	-25.41	-52.66	69.61	43.62	25.99	2.678			
5,900.00	5,900.00	5,884.45	5,881.54	13.15	12.90	159.04	-25.42	-53.31	72.63	46.65	25.99	2.795			
5,925.00	5,924.94	5,904.03	5,900.30	13.20	12.95	160.49	-25.46	-71.10	81.04	55.03	26.00	3.116			
5,950.00	5,949.73	5,922.31	5,917.43	13.25	13.00	161.50	-25.50	-77.34	92.05	66.12	25.93	3.550			
5,975.00	5,974.25	5,938.93	5,932.77	13.30	13.05	163.10	-25.54	-83.74	105.50	79.73	25.77	4.034			
6,000.00	5,993.41	5,953.81	5,946.25	13.35	13.09	164.00	-25.58	-90.02	121.13	95.61	25.52	4.746			
6,025.00	6,022.09	5,966.89	5,957.90	13.41	13.13	164.58	-25.62	-95.98	138.70	113.51	25.19	5.507			
6,050.00	6,045.20	5,975.00	5,965.01	13.46	13.16	164.38	-25.65	-99.87	157.98	133.21	24.77	6.377			
6,075.00	6,067.64	5,987.77	5,976.04	13.53	13.20	164.62	-25.69	-105.30	178.58	154.29	24.29	7.352			
6,100.00	6,069.31	5,995.71	5,982.79	13.59	13.23	163.88	-25.71	-110.48	200.40	176.64	23.75	8.437			
6,125.00	6,110.12	6,000.00	5,986.40	13.67	13.25	162.29	-25.73	-112.60	223.18	199.98	23.20	9.618			
6,150.00	6,129.97	6,007.15	5,992.36	13.75	13.27	160.49	-25.75	-116.75	246.63	224.03	22.66	10.888			
6,175.00	6,148.60	6,010.88	5,995.44	13.85	13.29	156.60	-25.77	-118.88	270.77	248.50	22.27	12.156			
6,200.00	6,166.50	6,013.43	5,997.53	13.96	13.30	149.27	-25.78	-120.32	295.28	272.89	22.39	13.188			
6,225.00	6,183.01	6,014.93	5,998.75	14.08	13.30	133.22	-25.76	-121.18	320.05	296.02	24.03	13.320			
6,250.00	6,198.23	6,015.46	5,999.19	14.23	13.31	95.10	-25.79	-121.49	344.95	317.47	27.48	12.553			
6,275.00	6,212.19	6,015.13	5,998.92	14.39	13.31	49.24	-25.78	-121.30	369.88	345.99	23.89	15.483			
6,300.00	6,224.72	6,014.01	5,998.00	14.58	13.30	27.68	-25.78	-120.65	394.72	375.11	19.61	20.123			
6,325.00	6,235.81	6,012.19	5,996.51	14.80	13.29	16.23	-25.77	-119.61	419.39	402.04	17.35	24.175			
6,350.00	6,245.42	6,009.73	5,994.49	15.04	13.28	13.27	-25.76	-118.21	443.79	427.89	15.90	27.913			
6,375.00	6,253.49	6,000.00	5,986.40	15.30	13.25	9.63	-25.73	-112.80	467.95	453.19	14.76	31.704			
6,400.00	6,260.00	6,000.00	5,986.40	15.59	13.25	8.18	-25.73	-112.80	491.52	477.56	13.95	35.224			
6,425.00	6,264.92	6,000.00	5,986.40	15.91	13.25	6.97	-25.73	-112.80	514.67	501.34	13.32	38.625			
6,450.00	6,268.22	6,000.00	5,986.40	16.25	13.25	6.05	-25.73	-112.80	537.36	524.48	12.88	41.716			
6,475.00	6,269.90	5,989.85	5,977.83	16.61	13.21	5.18	-25.69	-107.38	559.34	549.72	12.62	44.329			
6,478.39	6,270.00	5,989.17	5,977.24	16.65	13.21	5.07	-25.69	-107.03	562.28	549.68	12.60	44.625			
6,497.84	6,270.50	5,995.31	5,973.94	16.95	13.20	5.00	-25.68	-105.03	579.17	566.52	12.65	45.798			
6,500.00	6,270.55	5,984.89	5,973.59	16.98	13.19	5.00	-25.63	-104.82	581.05	568.39	12.65	45.927			
6,600.00	6,273.09	5,975.00	5,965.01	18.66	13.16	4.85	-25.65	-99.87	669.44	656.49	12.95	51.675			
6,700.00	6,275.63	5,950.00	5,942.82	20.58	13.03	4.51	-25.57	-88.36	759.53	746.24	13.29	57.131			
6,800.00	6,278.17	5,939.28	5,933.09	22.67	13.05	4.37	-25.54	-83.88	851.25	837.53	13.71	62.078			
6,900.00	6,280.71	5,925.00	5,919.93	24.88	13.01	4.20	-25.51	-78.33	944.19	930.02	14.17	66.638			
7,000.00	6,283.25	5,925.00	5,919.93	27.20	13.01	4.20	-25.51	-78.33	1,038.13	1,023.43	14.69	70.666			
7,100.00	6,285.79	5,910.34	5,906.21	29.59	12.97	4.04	-25.47	-73.15	1,132.72	1,117.51	15.21	74.450			
7,200.00	6,288.33	5,900.00	5,896.43	32.04	12.94	3.93	-25.45	-69.82	1,228.06	1,212.29	15.77	77.876			
7,300.00	6,290.87	5,900.00	5,896.43	34.54	12.94	3.93	-25.45	-69.82	1,323.92	1,307.55	16.37	80.874			
7,400.00	6,293.41	5,900.00	5,896.43	37.07	12.94	3.93	-25.45	-69.82	1,420.35	1,403.36	16.99	83.600			
7,500.00	6,295.96	5,885.28	5,882.35	39.63	12.90	3.78	-25.42	-65.53	1,516.55	1,499.30	17.59	86.246			
7,600.00	6,298.50	5,875.00	5,872.42	42.22	12.88	3.69	-25.41	-62.86	1,613.95	1,595.74	18.21	88.633			
7,700.00	6,301.04	5,875.00	5,872.42	44.82	12.88	3.69	-25.41	-62.86	1,711.20	1,692.33	18.87	90.697			
7,800.00	6,303.58	5,875.00	5,872.42	47.44	12.88	3.69	-25.41	-62.86	1,808.74	1,789.21	19.53	92.592			
7,900.00	6,306.12	5,875.00	5,872.42	50.03	12.88	3.69	-25.41	-62.86	1,906.55	1,886.34	20.21	94.335			
8,000.00	6,308.66	5,875.00	5,872.42	52.73	12.88	3.69	-25.41	-62.86	2,004.56	1,983.67	20.89	95.943			

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

Anticollision Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Site: Crow Federal 12H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3915.00usft (Original Well Elev)
Reference Site:	Crow Federal 12H	MD Reference:	WELL @ 3915.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Job # 1210350	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass5000
Reference Design:	Plan 1 4-25-2012	Offset TVD Reference:	Offset Datum

Offset Design Crow Federal 15H - Job # 1210353 - Wellbore #1 - Plan 1 4-25-2012													Offset Site Error:	0.00 usft
Survey Program: O-MWD													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,100.00	6,311.20	5,862.38	5,860.14	55.39	12.85	3.57		-25.39	-59.95	2,102.52	2,030.93	21.54	97.538	
8,200.00	6,313.74	5,850.00	5,848.01	58.06	12.82	3.47		-25.37	-57.49	2,200.91	2,178.71	22.20	99.130	
8,300.00	6,316.28	5,850.00	5,848.01	60.73	12.82	3.47		-25.37	-57.49	2,299.22	2,276.32	22.90	100.404	
8,400.00	6,318.82	5,850.00	5,848.01	63.41	12.82	3.47		-25.37	-57.49	2,397.67	2,374.07	23.60	101.590	
8,500.00	6,321.35	5,850.00	5,848.01	66.10	12.82	3.47		-25.37	-57.49	2,496.25	2,471.94	24.31	102.697	
8,600.00	6,323.90	5,850.00	5,848.01	68.79	12.82	3.47		-25.37	-57.49	2,594.93	2,569.92	25.02	103.732	
8,700.00	6,326.44	5,850.00	5,848.01	71.49	12.82	3.47		-25.37	-57.49	2,693.71	2,667.98	25.73	104.701	
8,800.00	6,328.98	5,850.00	5,848.01	74.19	12.82	3.47		-25.37	-57.49	2,792.58	2,766.14	26.44	105.611	
8,900.00	6,331.52	5,850.00	5,848.01	76.90	12.82	3.47		-25.37	-57.49	2,891.52	2,864.36	27.16	106.466	
9,000.00	6,334.05	5,850.00	5,848.01	79.61	12.82	3.47		-25.37	-57.49	2,990.54	2,962.66	27.88	107.271	
9,100.00	6,336.60	5,850.00	5,848.01	82.32	12.82	3.47		-25.37	-57.49	3,089.62	3,061.02	28.60	108.031	
9,200.00	6,339.14	5,850.00	5,848.01	85.03	12.82	3.47		-25.37	-57.49	3,188.75	3,159.43	29.32	108.748	
9,300.00	6,341.69	5,838.67	5,836.84	87.75	12.79	3.38		-25.36	-55.59	3,287.75	3,257.75	30.00	109.578	
9,400.00	6,344.23	5,837.37	5,835.56	90.47	12.79	3.37		-25.36	-55.39	3,386.95	3,356.22	30.72	110.238	
9,500.00	6,346.77	5,825.00	5,823.30	93.19	12.76	3.27		-25.35	-53.73	3,486.36	3,454.95	31.40	111.016	
9,600.00	6,349.31	5,825.00	5,823.30	95.91	12.76	3.27		-25.35	-53.73	3,585.59	3,553.46	32.13	111.593	
9,700.00	6,351.85	5,825.00	5,823.30	98.64	12.76	3.27		-25.35	-53.73	3,684.87	3,652.01	32.86	112.142	
9,800.00	6,354.39	5,825.00	5,823.30	101.37	12.76	3.27		-25.35	-53.73	3,784.18	3,750.60	33.59	112.665	
9,900.00	6,356.93	5,825.00	5,823.30	104.09	12.76	3.27		-25.35	-53.73	3,883.53	3,849.22	34.32	113.164	
10,000.00	6,359.47	5,825.00	5,823.30	106.82	12.76	3.27		-25.35	-53.73	3,982.92	3,947.87	35.05	113.640	
10,100.00	6,362.01	5,825.00	5,823.30	109.55	12.76	3.27		-25.35	-53.73	4,082.33	4,046.55	35.78	114.094	
10,200.00	6,364.55	5,825.00	5,823.30	112.28	12.76	3.27		-25.35	-53.73	4,181.77	4,145.26	36.51	114.529	
10,300.00	6,367.09	5,825.00	5,823.30	115.02	12.76	3.27		-25.35	-53.73	4,281.24	4,243.99	37.25	114.945	
10,400.00	6,369.63	5,825.00	5,823.30	117.75	12.76	3.27		-25.35	-53.73	4,380.73	4,342.76	37.98	115.343	
10,500.00	6,372.17	5,825.00	5,823.30	120.49	12.76	3.27		-25.35	-53.73	4,480.24	4,441.53	38.71	115.725	
10,600.00	6,374.71	5,825.00	5,823.30	123.22	12.76	3.27		-25.35	-53.73	4,579.78	4,540.33	39.45	116.092	
10,700.00	6,377.25	5,825.00	5,823.30	125.96	12.76	3.27		-25.35	-53.73	4,679.33	4,639.15	40.19	116.444	
10,808.13	6,380.00	5,825.00	5,823.30	128.92	12.76	3.27		-25.35	-53.73	4,787.00	4,746.02	40.98	116.810	

Anticollision Report

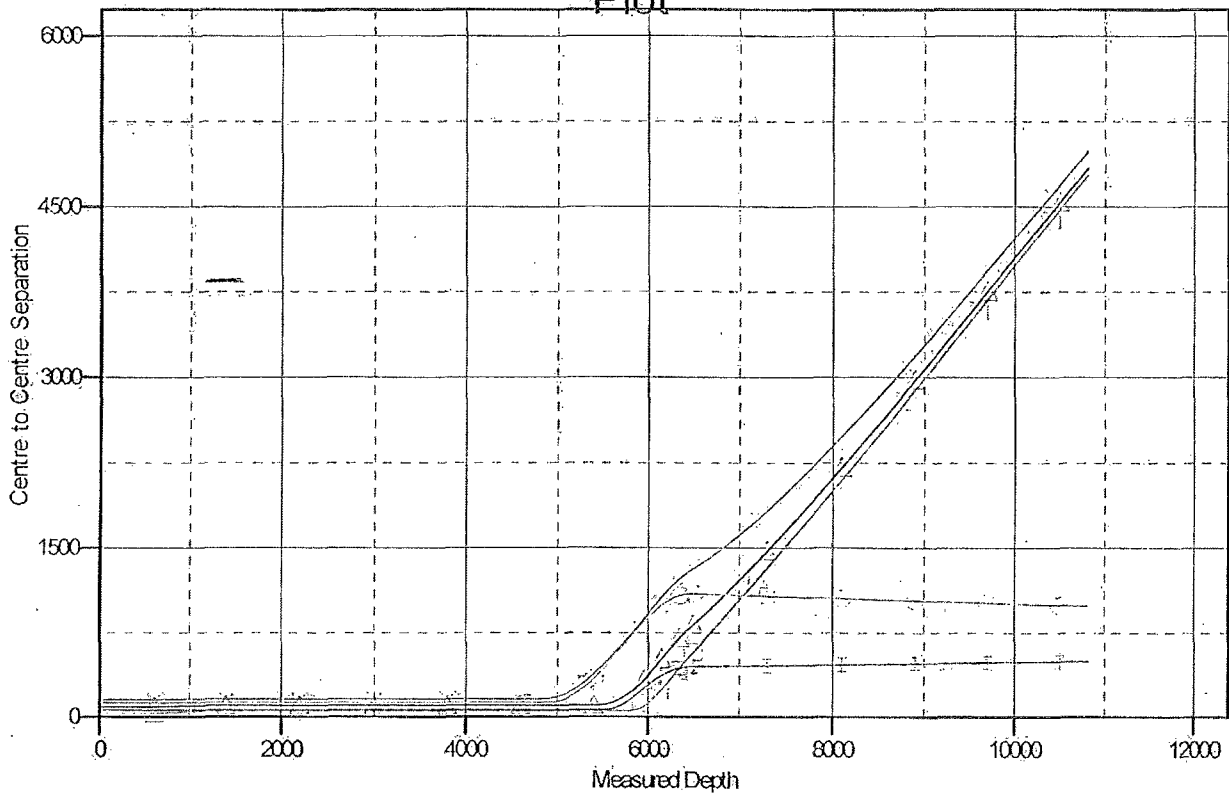
Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference: Site Crow Federal 12H
 TVD Reference: WELL @ 3915.00usft (Original Well Elev)
 MD Reference: WELL @ 3915.00usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Compass5000
 Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 3915.00usft (Original Well E
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.0000 W

Coordinates are relative to: Crow Federal 12H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.25°

Ladder Plot



LEGEND

Job # 1210353, Wellbore #1, Plan 1 4-25-2012 V0 ✕ Well #1, Wellbore #1, Plan 1 4-25-2012 V0 ⊕ Job # 1210348, Wellbore #1, Plan 1 4-25-2012 V0
 Job # 1210352, Wellbore #1, Plan 1 4-25-2012 V0 ✕ Job # 1210349, Wellbore #1, Plan 1 4-25-2012 V0

Anticollision Report

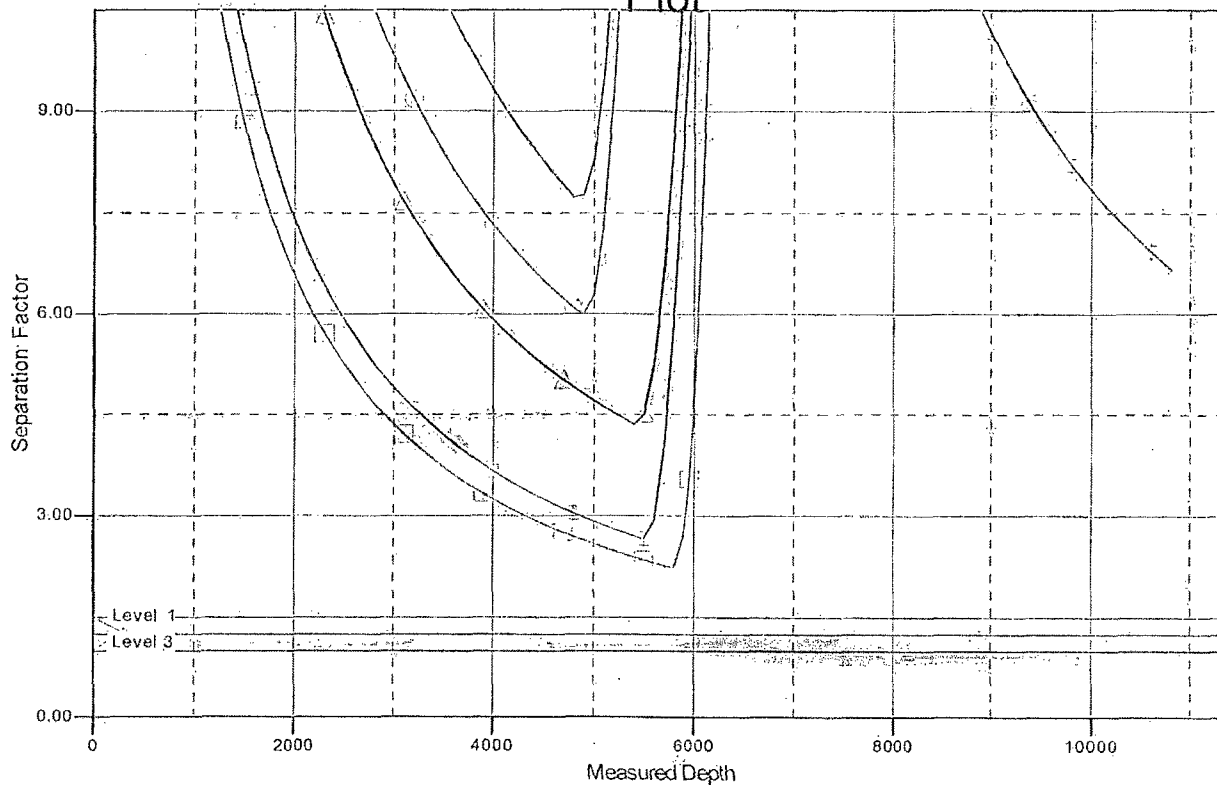
Company: Apache Corporation
 Project: Eddy County, NM
 Reference Site: Crow Federal 12H
 Site Error: 0.00 usft
 Reference Well: Job # 1210350
 Well Error: 0.00 usft
 Reference Wellbore: Wellbore #1
 Reference Design: Plan 1 4-25-2012

Local Co-ordinate Reference: Site Crow Federal 12H
 TVD Reference: WELL @ 3915.00usft (Original Well Elev)
 MD Reference: WELL @ 3915.00usft (Original Well Elev)
 North Reference: Grid:
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Compass5000
 Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 3915.00usft (Original Well E
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.0000 W

Coordinates are relative to: Crow Federal 12H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.25°

Separation Factor Plot



LEGEND

Job # 1210353, Wellbore #1, Plan 1 4-25-2012 V0 Well #1, Wellbore #1, Plan 1 4-25-2012 V0 Job # 1210348, Wellbore #1, Plan 1 4-25-2012 V0
 Job # 1210352, Wellbore #1, Plan 1 4-25-2012 V0 Job # 1210349, Wellbore #1, Plan 1 4-25-2012 V0

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 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

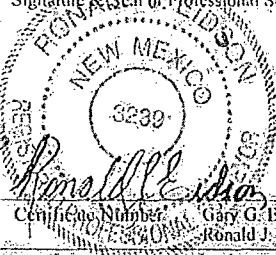
State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

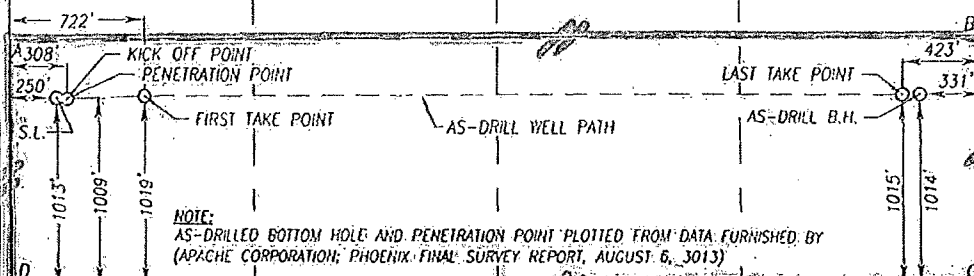
Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-15-40576		Pool Code 26770		Pool Name FREN; GLORIETA-YESO					
Property Code 308711		Property Name CROW FEDERAL						Well Number 12H	
OGRID No. 873		Operator Name APACHE CORPORATION						Elevation 3885'	
Surface Location									
UL or lot No. M	Section 10	Township 17-S	Range 31-E	Lot Idn 	Feet from the 1013	North/South line SOUTH	Feet from the 250	East/West line WEST	County EDDY
As-Drill Bottom Hole Location If Different From Surface									
UL or lot No. P	Section 10	Township 17-S	Range 31-E	Lot Idn 	Feet from the 1014	North/South line SOUTH	Feet from the 331	East/West line EAST	County EDDY
Penetration Point Location									
UL or lot No. M	Section 10	Township 17-S	Range 31-E	Lot Idn 	Feet from the 1009	North/South line SOUTH	Feet from the 308	East/West line WEST	County EDDY
Dedicated Acres 160		Joint or Infill 		Consolidation Code 		Order No. 			

GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=671260.9 N X=643906.0 E LAT.=32.844504° N LONG.=103.864769° W LAT.=32° 50' 40" N LONG.=103° 51' 53" W	GEODETIC COORDINATES NAD 27 NME FIRST TAKE POINT Y=671270.2 N X=644377.4 E LAT.=32.844524° N LONG.=103.863234° W LAT.=32° 50' 40" N LONG.=103° 51' 48" W	GEODETIC COORDINATES NAD 27 NME PENETRATION POINT Y=671257.3 N X=643963.7 E LAT.=32.844493° N LONG.=103.864581° W LAT.=32° 50' 40" N LONG.=103° 51' 52" W	GEODETIC COORDINATES NAD 27 NME LAST TAKE POINT Y=671297.6 N X=648513.1 E LAT.=32.844548° N LONG.=103.849768° W LAT.=32° 50' 40" N LONG.=103° 50' 59" W	OPERATOR CERTIFICATION I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.  12/18/2013 Signature Date Fatima Vasquez Printed Name Fatima.Vasquez@apachecorp.com Email Address	
GEODETIC COORDINATES NAD 27 NME KICK OFF POINT Y=671258.9 N X=643963.0 E LAT.=32.844498° N LONG.=103.864584° W LAT.=32° 50' 40" N LONG.=103° 51' 53" W	CORNER COORDINATES TABLE A - Y=671532.5 N, X=638373.2 E B - Y=671576.8 N, X=644974.3 E C - Y=670256.5 N, X=644981.6 E D - Y=670212.4 N, X=638380.7 E			GEODETIC COORDINATES NAD 27 NME BOTTOM HOLE LOCATION Y=671297.5 N X=648605.0 E LAT.=32.844546° N LONG.=103.849469° W LAT.=32° 50' 40" N LONG.=103° 50' 58" W	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. MARCH 27, 2012 Date of Survey Signature & Seal of Professional Surveyor:  Ronald J. Eidson 12/17/2013 Certificate Number Gary G. Eidson 12641 Ronald J. Eidson 3239 BKL JWSC W.O. 13.13.1111

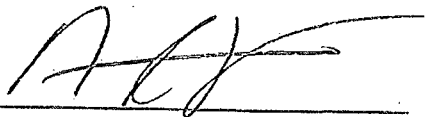


NOTE:
AS-DRILLED BOTTOM HOLE AND PENETRATION POINT PLOTTED FROM DATA FURNISHED BY
(APACHE CORPORATION; PHOENIX. FINAL SURVEY REPORT, AUGUST 6, 2013)

Apache Corporation
303 Veterans Airpark Lane, #3000
Midland, TX 79705

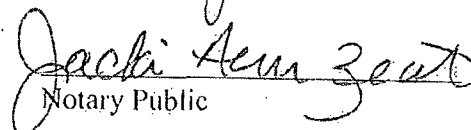
Crow Federal #011 H API #30-015-40575
Eddy County, New Mexico 948' FSL & 250' FWL, M-10-17S-31E

185	1.85	0.25	0.44	0.81	0.81
393	3.93	0.50	0.88	3.44	3.44
597	5.97	0.50	0.88	5.22	5.22



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 8th day of July, 2013 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public

