



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#10H AP#30-015-40574

OH / Job #1310298

Survey: Phoenix MWD Surveys

Standard Survey Report

07 May, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Well:	#10H	North Reference:	Grid
Wellbore:	OH / Job #1310298	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	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	#10H					
Well Position	+N/-S:	0.00 usft	Northing:	671,130.90 usft	Latitude:	32° 50' 38.927956 N
	+E/-W:	0.00 usft	Easting:	643,906.80 usft	Longitude:	103° 51' 53.166888 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,915.00 usft	

Wellbore	OH / Job #1310298				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010_14	03/08/13	(°) 7.56	(°) 60.67	(nT) 48,780

Design		Surveys (Capstar 114)						
Audit Notes:								
Version:		1.0	Phase:		ACTUAL	Tie On Depth:		0.00
Vertical Section:		Depth From (TVD)		+N/-S	+E/-W	Direction		
		(usft)		(usft)	(usft)	(°)		
		0.00		0.00	0.00	89.57		

Survey Program		Date	05/07/13		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
629.00	9,765.00	Phoenix MWD Surveys (OH / Job #131029	MWD	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
629.00	0.40	233.40	628.99	-1.31	-1.76	-1.77	0.06	0.06	0.00
Phoenix First MWD Survey									
715.00	0.40	228.90	714.99	-1.69	-2.23	-2.24	0.04	0.00	-5.23
800.00	0.40	242.70	799.99	-2.02	-2.72	-2.73	0.11	0.00	16.24
886.00	0.50	228.80	885.99	-2.40	-3.27	-3.28	0.17	0.12	-16.16
972.00	0.70	218.30	971.98	-3.06	-3.87	-3.90	0.26	0.23	-12.21
1,057.00	0.60	208.20	1,056.98	-3.86	-4.41	-4.44	0.18	-0.12	-11.88
1,143.00	0.70	223.30	1,142.97	-4.64	-4.98	-5.01	0.23	0.12	17.56
1,228.00	1.10	238.00	1,227.96	-5.45	-6.03	-6.07	0.54	0.47	17.29
1,314.00	1.00	236.20	1,313.95	-6.30	-7.35	-7.40	0.12	-0.12	-2.09



Phoenix Technology Services

Survey Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #10H
Wellbore: OH / Job #1310298
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,399.00	1.20	266.90	1,398.93	-6.77	-8.86	-8.91	0.72	0.24	36.12
1,485.00	1.10	286.20	1,484.92	-6.58	-10.55	-10.60	0.46	-0.12	22.44
1,570.00	1.10	289.20	1,569.90	-6.09	-12.10	-12.15	0.07	0.00	3.53
1,656.00	1.10	303.70	1,655.88	-5.36	-13.57	-13.61	0.32	0.00	16.86
1,742.00	1.20	294.40	1,741.87	-4.53	-15.08	-15.11	0.25	-0.12	-10.81
1,827.00	1.50	293.10	1,826.84	-3.72	-16.91	-16.94	0.35	0.35	-1.53
1,913.00	1.50	300.80	1,912.81	-2.71	-18.91	-18.93	0.23	0.00	8.95
1,998.00	1.00	277.20	1,997.79	-2.04	-20.60	-20.62	0.83	-0.59	-27.76
2,084.00	0.50	263.50	2,083.79	-1.99	-21.72	-21.73	0.61	-0.58	-15.93
2,169.00	0.80	263.00	2,168.78	-2.11	-22.68	-22.69	0.35	0.35	-0.59
2,255.00	0.70	293.20	2,254.77	-1.97	-23.76	-23.77	0.47	-0.12	35.12
2,341.00	0.40	312.60	2,340.77	-1.56	-24.46	-24.47	0.41	-0.35	22.56
2,426.00	0.60	16.30	2,425.77	-0.93	-24.55	-24.56	0.65	0.24	74.94
2,512.00	0.70	33.80	2,511.76	-0.07	-24.14	-24.13	0.26	0.12	20.35
2,597.00	1.10	29.40	2,596.75	1.08	-23.45	-23.44	0.48	0.47	-5.18
2,683.00	1.40	8.30	2,682.73	2.84	-22.89	-22.87	0.63	0.35	-24.53
2,768.00	1.20	27.20	2,767.71	4.65	-22.33	-22.30	0.55	-0.24	22.24
2,854.00	1.00	32.00	2,853.69	6.09	-21.52	-21.48	0.26	-0.23	5.58
2,940.00	1.30	14.70	2,939.68	7.67	-20.88	-20.82	0.53	0.35	-20.12
3,025.00	1.60	13.20	3,024.65	9.76	-20.36	-20.29	0.36	0.35	-1.76
3,111.00	1.80	10.50	3,110.61	12.26	-19.84	-19.75	0.25	0.23	-3.14
3,197.00	1.50	347.40	3,196.58	14.68	-19.84	-19.73	0.84	-0.35	-26.86
3,281.00	1.20	329.90	3,280.55	16.52	-20.52	-20.40	0.60	-0.36	-20.83
3,367.00	1.20	315.10	3,366.53	17.93	-21.61	-21.47	0.36	0.00	-17.21
3,418.00	1.10	301.70	3,417.52	18.57	-22.40	-22.26	0.56	-0.20	-26.27
3,551.00	1.20	314.90	3,550.50	20.22	-24.48	-24.32	0.21	0.08	9.92
3,637.00	0.70	93.20	3,636.49	20.83	-24.59	-24.43	2.07	-0.58	160.81
3,723.00	0.70	93.20	3,722.49	20.77	-23.54	-23.38	0.00	0.00	0.00
3,808.00	1.90	117.50	3,807.46	20.09	-21.77	-21.62	1.52	1.41	28.59
3,893.00	2.20	125.10	3,892.41	18.50	-19.19	-19.05	0.48	0.35	8.94
3,979.00	0.60	154.80	3,978.38	17.15	-17.64	-17.52	1.98	-1.86	34.53
4,065.00	0.30	185.40	4,064.38	16.51	-17.47	-17.35	0.44	-0.35	35.58
4,150.00	1.00	135.30	4,149.37	15.77	-16.97	-16.85	0.99	0.82	-58.94
4,236.00	1.50	129.50	4,235.35	14.52	-15.58	-15.47	0.60	0.58	-6.74
4,321.00	1.90	129.30	4,320.31	12.92	-13.63	-13.53	0.47	0.47	-0.24
4,407.00	2.50	132.50	4,406.25	10.75	-11.14	-11.06	0.71	0.70	3.72
4,493.00	1.40	149.20	4,492.20	8.58	-9.22	-9.16	1.43	-1.28	19.42
4,578.00	1.20	174.00	4,577.18	6.80	-8.60	-8.54	0.70	-0.24	29.18
4,664.00	0.40	84.90	4,663.17	5.93	-8.20	-8.16	1.46	-0.93	-103.60
4,729.00	1.00	44.80	4,728.17	6.35	-7.58	-7.53	1.14	0.92	-61.69
4,797.00	1.20	51.10	4,796.15	7.22	-6.60	-6.55	0.34	0.29	-9.26
4,829.00	1.40	61.40	4,828.15	7.62	-6.00	-5.94	0.96	0.63	32.19
4,861.00	3.10	84.40	4,860.12	7.89	-4.80	-4.74	5.91	5.31	71.88



Phoenix Technology Services

Survey Report



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Well: #10H
Wellbore: OH / Job #1310298
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #10H
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MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,893.00	9.00	91.70	4,891.93	7.90	-1.43	-1.37	18.56	18.44	22.81
4,925.00	14.10	93.00	4,923.27	7.62	4.97	5.03	15.96	15.94	4.06
4,957.00	20.40	91.00	4,953.82	7.32	14.45	14.50	19.77	19.69	-6.25
4,989.00	24.20	91.60	4,983.42	7.04	26.58	26.64	11.90	11.88	1.88
5,021.00	28.80	92.30	5,012.05	6.55	40.85	40.90	14.41	14.38	2.19
5,053.00	32.90	92.80	5,039.51	5.81	57.24	57.28	12.84	12.81	1.56
5,085.00	36.20	92.80	5,065.87	4.93	75.36	75.40	10.31	10.31	0.00
5,117.00	41.50	92.40	5,090.78	4.02	95.41	95.44	16.58	16.56	-1.25
5,149.00	46.30	90.70	5,113.83	3.43	117.58	117.60	15.44	15.00	-5.31
5,181.00	51.30	90.40	5,134.90	3.21	141.65	141.67	15.64	15.63	-0.94
5,213.00	56.30	89.40	5,153.80	3.26	167.46	167.48	15.83	15.63	-3.13
5,245.00	60.60	90.10	5,170.54	3.37	194.73	194.75	13.57	13.44	2.19
5,277.00	64.50	91.20	5,185.28	3.05	223.12	223.13	12.56	12.19	3.44
5,309.00	68.80	91.00	5,197.97	2.48	252.48	252.49	13.45	13.44	-0.63
5,341.00	72.20	90.50	5,208.65	2.09	282.64	282.65	10.73	10.63	-1.56
5,373.00	74.20	90.20	5,217.89	1.90	313.27	313.28	6.31	6.25	-0.94
5,405.00	74.90	89.70	5,226.42	1.93	344.12	344.12	2.66	2.19	-1.56
5,437.00	74.90	89.50	5,234.75	2.15	375.01	375.01	0.60	0.00	-0.63
5,469.00	77.50	88.60	5,242.39	2.66	406.08	406.09	8.57	8.13	-2.81
5,495.00	80.80	89.00	5,247.28	3.20	431.60	431.62	12.78	12.69	1.54
5,518.00	83.40	88.10	5,250.44	3.77	454.38	454.39	11.95	11.30	-3.91
5,550.00	85.30	88.50	5,253.59	4.72	486.21	486.23	6.07	5.94	1.25
5,646.00	90.20	88.10	5,257.36	7.56	582.06	582.10	5.12	5.10	-0.42
5,742.00	89.80	88.10	5,257.36	10.75	678.01	678.07	0.42	-0.42	0.00
5,838.00	89.30	89.00	5,258.11	13.18	773.97	774.05	1.07	-0.52	0.94
5,934.00	89.30	89.30	5,259.29	14.60	869.95	870.04	0.31	0.00	0.31
6,030.00	89.60	89.10	5,260.21	15.94	965.94	966.03	0.38	0.31	-0.21
6,126.00	89.50	90.70	5,260.96	16.11	1,061.93	1,062.03	1.67	-0.10	1.67
6,222.00	89.70	92.20	5,261.63	13.68	1,157.90	1,157.97	1.58	0.21	1.56
6,318.00	88.40	90.20	5,263.22	11.67	1,253.86	1,253.91	2.48	-1.35	-2.08
6,413.00	86.90	88.70	5,267.12	12.58	1,348.77	1,348.82	2.23	-1.58	-1.58
6,508.00	88.80	87.10	5,270.68	16.06	1,443.63	1,443.71	2.61	2.00	-1.68
6,603.00	89.10	89.60	5,272.43	18.79	1,538.57	1,538.66	2.65	0.32	2.63
6,699.00	88.70	90.00	5,274.27	19.13	1,634.55	1,634.65	0.59	-0.42	0.42
6,794.00	88.20	90.00	5,276.84	19.13	1,729.51	1,729.61	0.53	-0.53	0.00
6,890.00	87.40	89.60	5,280.52	19.46	1,825.44	1,825.53	0.93	-0.83	-0.42
6,986.00	89.00	89.20	5,283.54	20.47	1,921.38	1,921.48	1.72	1.67	-0.42
7,082.00	88.30	88.20	5,285.80	22.64	2,017.33	2,017.44	1.27	-0.73	-1.04
7,178.00	89.20	88.80	5,287.89	25.16	2,113.27	2,113.40	1.13	0.94	0.63
7,274.00	89.90	89.30	5,288.65	26.75	2,209.26	2,209.40	0.90	0.73	0.52
7,370.00	89.60	89.40	5,289.07	27.84	2,305.25	2,305.39	0.33	-0.31	0.10
7,464.00	89.50	89.10	5,289.81	29.07	2,399.24	2,399.39	0.34	-0.11	-0.32
7,560.00	90.20	91.00	5,290.06	28.98	2,495.23	2,495.38	2.11	0.73	1.98



Phoenix Technology Services
Survey Report



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Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #10H
Wellbore: OH / Job #1310298
Design: Surveys (Capstar 114)

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,656.00	89.80	90.80	5,290.06	27.48	2,591.22	2,591.35	0.47	-0.42	-0.21
7,752.00	89.80	90.30	5,290.39	26.55	2,687.22	2,687.34	0.52	0.00	-0.52
7,849.00	89.60	90.50	5,290.90	25.88	2,784.21	2,784.33	0.29	-0.21	0.21
7,945.00	89.00	88.60	5,292.07	26.63	2,880.20	2,880.32	2.08	-0.63	-1.98
8,041.00	89.20	89.30	5,293.58	28.39	2,976.17	2,976.30	0.76	0.21	0.73
8,137.00	89.50	89.40	5,294.67	29.48	3,072.16	3,072.29	0.33	0.31	0.10
8,232.00	90.50	90.20	5,294.67	29.81	3,167.15	3,167.29	1.35	1.05	0.84
8,328.00	90.90	90.90	5,293.50	28.89	3,263.14	3,263.27	0.84	0.42	0.73
8,424.00	89.60	90.60	5,293.08	27.63	3,359.13	3,359.24	1.39	-1.35	-0.31
8,521.00	88.50	91.00	5,294.69	26.28	3,456.11	3,456.21	1.21	-1.13	0.41
8,617.00	87.80	91.40	5,297.79	24.27	3,552.03	3,552.12	0.84	-0.73	0.42
8,713.00	88.00	90.50	5,301.30	22.68	3,647.95	3,648.02	0.96	0.21	-0.94
8,809.00	88.40	89.60	5,304.32	22.60	3,743.91	3,743.97	1.03	0.42	-0.94
8,905.00	88.90	89.80	5,306.58	23.10	3,839.88	3,839.94	0.56	0.52	0.21
9,001.00	88.30	89.30	5,308.93	23.85	3,935.85	3,935.91	0.81	-0.63	-0.52
9,098.00	89.20	88.80	5,311.04	25.46	4,032.81	4,032.89	1.06	0.93	-0.52
9,194.00	88.70	87.80	5,312.80	28.31	4,128.75	4,128.84	1.16	-0.52	-1.04
9,290.00	89.20	88.80	5,314.56	31.15	4,224.69	4,224.80	1.16	0.52	1.04
9,386.00	89.70	88.80	5,315.48	33.16	4,320.66	4,320.79	0.52	0.52	0.00
9,482.00	88.70	88.50	5,316.82	35.43	4,416.62	4,416.77	1.09	-1.04	-0.31
9,578.00	87.80	88.90	5,319.75	37.60	4,512.55	4,512.71	1.03	-0.94	0.42
9,674.00	86.80	89.10	5,324.28	39.28	4,608.43	4,608.60	1.06	-1.04	0.21
9,710.00	86.50	88.90	5,326.38	39.90	4,644.36	4,644.53	1.00	-0.83	-0.56
Phoenix Last MWD Survey									
9,765.00	86.50	88.90	5,329.74	40.96	4,699.25	4,699.43	0.00	0.00	0.00
Projection to TD									

Survey Annotations:				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
629.00	628.99	-1.31	-1.76	Phoenix First MWD Survey
9,710.00	5,326.38	39.90	4,644.36	Phoenix Last MWD Survey
9,765.00	5,329.74	40.96	4,699.25	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1310298

OPERATOR Apache Corp

WELL NAME Grow Federal #10H

COUNTY & STATE

Eddy, NM

API WELL NUMBER 30-015-40574

PROPOSED DIRECTION 89:57

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
ft	.00 ft	.0 ft	.0 ft	.00 ft	.00 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
19-Apr-13	629 ft	0.4	233.4

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
6-May-13	9,710 ft	86.5	88.9

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
6-May-13	9,765 ft	86.5	88.9

Brad Hill

PRINT YOUR NAME ABOVE

Brad Hill

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.55
DECLINATION OR GRID	GRID

5/6/2013

TODAY'S DATE

MWD SUPERVISOR 1

Brad Hill

DIRECTIONAL DRILLER 1

Tim Owens

MWD SUPERVISOR 2

Matt Dice

DIRECTIONAL DRILLER 2

Ken Smith

1805 Brittmore Road Houston, Texas 77043 (713)3370609 (Voice), (713)337-0599 (Fax)



Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#10H API #30-015-40574

OH / Job #1310298

Survey: Phoenix MWD Surveys

Anticollision Report

07 May, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Reference:	Survey: Phoenix MWD Surveys		
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 Program		Date: 05/07/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
629.00	9,765.00	Phoenix MWD Surveys (OH / Job #131029	MWD	MWD - Standard

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning
Offset Well: Wellbore - Design:						
Crow Federal						
#11H - Wellbore #1 / Job #1210349 - Plan 1 4-25-2012	3,794.37	3,783.84	49.73	34.04	3.170	CC
#11H - Wellbore #1 / Job #1210349 - Plan 1 4-25-2012	3,808.00	3,797.46	49.73	33.99	3.159	ES
#11H - Wellbore #1 / Job #1210349 - Plan 1 4-25-2012	4,893.00	4,881.93	57.11	36.67	2.794	SF
#12H - Wellbore #1 / Job #1210350 - Plan 1 4-25-2012	3,737.04	3,728.52	111.56	96.12	7.227	CC, ES
#12H - Wellbore #1 / Job #1210350 - Plan 1 4-25-2012	4,925.00	4,913.27	122.51	101.94	5.956	SF
#13H - OH / Job #1310316 - Surveys (Capstar 114)	629.00	597.82	25.80	24.44	19.000	CC
#13H - OH / Job #1310316 - Surveys (Capstar 114)	715.00	683.81	28.09	24.39	15.319	ES
#13H - OH / Job #1310316 - Surveys (Capstar 114)	4,684.00	4,635.14	48.74	30.57	2.682	SF
#14H - Wellbore #1 / Job #1210352 - Plan 1 4-25-2012	3,608.30	3,599.39	32.67	18.01	2.229	CC, ES
#14H - Wellbore #1 / Job #1210352 - Plan 1 4-25-2012	3,637.00	3,628.09	32.82	18.04	2.221	SF
#15H - OH / Job #1310461 - Plan #2 04-18-13	3,744.85	3,717.33	87.24	71.82	5.658	CC
#15H - OH / Job #1310461 - Plan #2 04-18-13	3,808.00	3,780.46	87.48	71.79	5.576	ES
#15H - OH / Job #1310461 - Plan #2 04-18-13	4,925.00	4,896.27	97.54	77.03	4.754	SF

Crow Federal - #11H - Wellbore #1 / Job #1210349 - Plan 1 4-25-2012												Offset Site Error:	0.00 usft
Survey Program: Q-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum		Separation
Depth	Depth	Depth	Depth			Toolface	N-S	E-W	Centres	Ellipses	Separation		Factor
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
0.00	0.00	0.00	0.00	0.00	0.00	-0.35	65.00	-0.40	65.77				
629.00	628.99	618.99	618.99	0.70	1.28	127.78	65.00	-0.40	66.32	64.35	1.98	33.574	
715.00	714.99	704.99	704.99	0.88	1.47	132.67	65.00	-0.40	66.71	64.36	2.35	28.384	
800.00	799.99	789.99	789.99	1.05	1.86	119.28	65.00	-0.40	67.08	64.35	2.71	24.740	
886.00	885.99	875.99	875.99	1.23	1.86	133.63	65.00	-0.40	67.46	64.38	3.08	21.877	
972.00	971.98	961.98	961.98	1.42	2.05	144.82	65.00	-0.40	68.15	64.68	3.47	19.661	
1,057.00	1,056.98	1,046.98	1,046.98	1.59	2.24	155.13	65.00	-0.40	68.98	65.15	3.83	18.002	
1,143.00	1,142.97	1,132.97	1,132.97	1.77	2.43	140.46	65.00	-0.40	69.79	65.59	4.20	16.619	
1,228.00	1,227.96	1,217.96	1,217.96	1.95	2.63	126.56	65.00	-0.40	70.67	66.10	4.57	15.449	
1,314.00	1,313.95	1,303.95	1,303.95	2.13	2.82	129.36	65.00	-0.40	71.64	66.70	4.94	14.488	
1,399.00	1,398.93	1,388.93	1,388.93	2.30	3.01	99.82	65.00	-0.40	72.26	66.96	5.31	13.619	
1,485.00	1,484.92	1,474.92	1,474.92	2.47	3.20	81.87	65.00	-0.40	72.30	66.63	5.67	12.744	
1,570.00	1,569.90	1,559.90	1,559.90	2.65	3.39	80.15	65.00	-0.40	72.04	66.01	6.04	11.937	
1,656.00	1,655.88	1,645.88	1,645.88	2.82	3.59	66.90	65.00	-0.40	71.58	65.18	6.40	11.177	
1,742.00	1,741.87	1,731.87	1,731.87	3.00	3.78	77.52	65.00	-0.40	71.06	64.28	6.78	10.482	

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



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Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Crow Federal - #11H - Wellbore #1 / Job #1210349 - 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			Distance		Minimum		Separation		Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Separation	Factor				
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)				
1,827.00	1,828.84	1,816.84	1,816.84	3.19	3.97	80.41	65.00	-0.40	70.68	63.52	7.16	9.878			
1,913.00	1,912.81	1,902.81	1,902.81	3.37	4.16	74.50	65.00	-0.40	70.19	62.66	7.53	9.321			
1,972.54	1,972.34	1,962.34	1,962.34	3.49	4.30	90.00	65.00	-0.40	69.98	62.20	7.79	8.986			
1,998.00	1,997.79	1,987.79	1,987.79	3.55	4.38	99.57	65.00	-0.40	70.02	62.12	7.90	8.865			
2,084.00	2,083.79	2,073.79	2,073.79	3.72	4.55	114.15	65.00	-0.40	70.30	62.03	8.27	8.502			
2,169.00	2,168.78	2,158.78	2,158.78	3.90	4.74	115.36	65.00	-0.40	70.71	62.07	8.64	8.185			
2,255.00	2,254.77	2,244.77	2,244.77	4.08	4.93	86.03	65.00	-0.40	70.93	61.92	9.01	7.870			
2,341.00	2,340.77	2,330.77	2,330.77	4.26	5.13	67.27	65.00	-0.40	70.78	61.39	9.38	7.543			
2,426.00	2,425.77	2,415.77	2,415.77	4.43	5.32	3.82	65.00	-0.40	70.22	60.47	9.75	7.203			
2,512.00	2,511.76	2,501.76	2,501.76	4.61	5.51	-13.76	65.00	-0.40	69.26	59.14	10.12	6.844			
2,597.00	2,596.75	2,586.75	2,586.75	4.79	5.70	-9.58	65.00	-0.40	67.95	57.47	10.49	6.480			
2,683.00	2,682.73	2,672.73	2,672.73	4.97	5.90	11.59	65.00	-0.40	66.11	55.25	10.86	6.088			
2,768.00	2,767.71	2,757.71	2,757.71	5.14	6.09	-7.23	65.00	-0.40	64.21	52.98	11.23	5.719			
2,854.00	2,853.69	2,843.69	2,843.69	5.32	6.28	-12.28	65.00	-0.40	62.58	50.98	11.60	5.395			
2,940.00	2,939.68	2,929.68	2,929.68	5.50	6.47	4.96	65.00	-0.40	60.88	48.90	11.97	5.085			
3,025.00	3,024.65	3,014.65	3,014.65	5.68	6.66	6.67	65.00	-0.40	58.74	46.40	12.34	4.760			
3,111.00	3,110.61	3,100.61	3,100.61	5.86	6.86	9.74	65.00	-0.40	56.21	43.50	12.71	4.421			
3,197.00	3,196.58	3,186.58	3,186.58	6.04	7.05	33.73	65.00	-0.40	53.94	40.85	13.09	4.120			
3,281.00	3,280.55	3,270.55	3,270.55	6.22	7.24	52.65	65.00	-0.40	52.49	39.03	13.46	3.900			
3,367.00	3,366.53	3,356.53	3,356.53	6.40	7.43	69.16	65.00	-0.40	51.62	37.79	13.83	3.732			
3,418.00	3,417.52	3,407.52	3,407.52	6.51	7.55	83.66	65.00	-0.40	51.38	37.32	14.06	3.655			
3,551.00	3,550.50	3,540.50	3,540.50	6.79	7.85	73.37	65.00	-0.40	50.84	36.20	14.64	3.473			
3,637.00	3,636.49	3,626.49	3,626.49	6.97	8.04	-64.50	65.00	-0.40	50.36	35.35	15.01	3.355			
3,723.00	3,722.49	3,712.49	3,712.49	7.15	8.23	-65.58	65.00	-0.40	49.92	34.54	15.38	3.246			
3,794.37	3,793.84	3,783.84	3,783.84	7.29	8.39	-90.00	65.00	-0.40	49.73	34.04	15.69	3.170 CC			
3,808.00	3,807.46	3,797.46	3,797.46	7.32	8.42	-92.05	65.00	-0.40	49.73	33.99	15.74	3.159 ES			
3,893.00	3,892.41	3,882.41	3,882.41	7.50	8.61	-103.09	65.00	-0.40	50.15	34.04	16.11	3.113			
3,979.00	3,978.38	3,968.38	3,968.38	7.67	8.81	-134.98	65.00	-0.40	50.87	34.39	16.48	3.087			
4,065.00	4,064.38	4,054.38	4,054.38	7.85	9.00	-166.00	65.00	-0.40	51.40	34.65	16.85	3.050			
4,150.00	4,149.37	4,139.37	4,139.37	8.03	9.19	-116.69	65.00	-0.40	51.95	34.73	17.22	3.017			
4,236.00	4,235.35	4,225.35	4,225.35	8.21	9.38	-112.76	65.00	-0.40	52.72	35.12	17.59	2.997			
4,321.00	4,320.31	4,310.31	4,310.31	8.39	9.58	-115.04	65.00	-0.40	53.74	35.78	17.96	2.992			
4,407.00	4,406.25	4,396.25	4,396.25	8.57	9.77	-121.28	65.00	-0.40	55.31	36.98	18.33	3.018			
4,493.00	4,492.20	4,482.20	4,482.20	8.74	9.96	-140.31	65.00	-0.40	57.11	38.41	18.70	3.054			
4,578.00	4,577.18	4,567.18	4,567.18	8.92	10.15	-165.98	65.00	-0.40	58.77	39.71	19.07	3.082			
4,664.00	4,663.17	4,653.17	4,653.17	9.10	10.35	-77.38	65.00	-0.40	59.58	40.14	19.45	3.064			
4,729.00	4,728.17	4,718.17	4,718.17	9.24	10.49	-37.83	65.00	-0.40	59.08	39.36	19.73	2.995			
4,797.00	4,796.15	4,786.15	4,786.15	9.38	10.65	-44.98	65.00	-0.40	58.11	38.09	20.02	2.903			
4,829.00	4,828.15	4,818.15	4,818.15	9.45	10.72	-55.83	65.00	-0.40	57.65	37.49	20.18	2.860			
4,861.00	4,860.12	4,850.12	4,850.12	9.51	10.79	-80.01	65.00	-0.40	57.28	36.98	20.30	2.822			
4,890.17	4,889.14	4,879.14	4,879.14	9.58	10.85	-90.00	65.00	-0.40	57.11	36.68	20.43	2.796			
4,893.00	4,891.93	4,881.93	4,881.93	9.58	10.86	-90.66	65.00	-0.40	57.11	36.67	20.44	2.794 SF			
4,925.00	4,923.27	4,913.27	4,913.27	9.66	10.93	-98.10	65.00	-0.40	57.63	37.08	20.57	2.802			
4,957.00	4,955.82	4,945.82	4,945.82	9.73	11.00	-104.51	65.00	-0.40	59.58	38.91	20.65	2.885			
4,989.00	4,987.42	4,977.42	4,977.42	9.81	11.07	-114.52	65.00	-0.40	63.93	43.33	20.60	3.103			
5,021.00	5,012.05	5,002.05	5,002.05	9.88	11.13	-123.93	65.00	-0.40	71.54	51.18	20.36	3.513			
5,053.00	5,039.51	5,029.51	5,029.51	9.98	11.19	-132.04	65.00	-0.40	82.62	62.65	19.96	4.138			
5,085.00	5,065.87	5,055.87	5,055.87	10.07	11.25	-138.41	65.00	-0.40	96.69	77.17	19.52	4.954			
5,117.00	5,090.78	5,080.78	5,080.78	10.21	11.31	-142.29	65.00	-0.40	113.57	94.68	18.89	6.012			
5,149.00	5,113.83	5,103.83	5,103.83	10.37	11.36	-143.76	65.00	-0.40	133.08	114.70	18.38	7.241			
5,181.00	5,134.90	5,124.90	5,124.90	10.57	11.41	-145.69	65.00	-0.40	154.91	137.17	17.74	8.734			
5,213.00	5,153.80	5,143.80	5,143.80	10.81	11.45	-145.61	65.00	-0.40	178.86	161.58	17.30	10.341			

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Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #11H - Wellbore #1 / Job #1210348 - Plan 1 4-25-2012												Offset Site Error:	0.00 usft
Survey Program: D-MWD												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highslide Toolface (°)	Offset Wellbore Centre (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,245.00	5,170.54	5,160.54	5,160.54	11.10	11.48	-147.40	65.00	-0.40	204.63	187.93	16.70	12.253	
5,277.00	5,185.28	5,175.28	5,175.28	11.45	11.52	-149.39	65.00	-0.40	231.94	215.84	16.10	14.403	
5,309.00	5,197.87	5,187.87	5,187.87	11.84	11.55	-147.68	65.00	-0.40	280.50	244.35	16.15	16.135	
5,341.00	5,208.65	5,198.65	5,198.65	12.28	11.57	-145.12	65.00	-0.40	289.95	273.35	16.60	17.466	
5,373.00	5,217.89	5,207.89	5,207.89	12.76	11.59	-144.04	65.00	-0.40	319.95	302.99	16.97	18.856	
5,405.00	5,226.42	5,216.42	5,216.42	13.28	11.81	-144.11	65.00	-0.40	350.24	333.03	17.21	20.351	
5,437.00	5,234.75	5,224.75	5,224.75	13.82	11.63	-145.89	65.00	-0.40	380.63	363.53	17.10	22.254	
5,469.00	5,242.39	5,232.39	5,232.39	14.40	11.65	-140.49	65.00	-0.40	411.23	392.59	18.64	22.060	
5,495.00	5,247.28	5,237.28	5,237.28	14.80	11.86	-134.81	65.00	-0.40	436.40	416.10	20.31	21.492	
5,518.00	5,250.44	5,240.44	5,240.44	15.35	11.67	-124.29	65.00	-0.40	458.88	435.79	23.09	19.873	
5,550.00	5,253.59	5,243.59	5,243.59	16.01	11.67	-118.56	65.00	-0.40	490.33	465.50	24.82	19.754	
5,646.00	5,257.36	5,230.11	5,822.73	18.08	19.50	-173.85	69.32	573.61	578.74	565.95	12.79	45.250	
5,742.00	5,257.36	5,326.07	5,824.07	20.28	21.53	-174.10	70.05	699.55	579.81	566.08	13.73	42.221	
5,838.00	5,258.11	5,422.05	5,825.40	22.57	23.68	-174.29	70.78	765.52	580.21	565.44	14.77	39.279	
5,934.00	5,259.29	5,518.05	5,826.73	24.84	25.93	-174.38	71.50	861.51	580.30	564.42	15.88	36.545	
6,030.00	5,260.21	5,614.04	5,828.06	27.36	28.24	-174.42	72.23	957.49	580.65	563.62	17.03	34.095	
6,126.00	5,260.96	5,710.04	5,829.39	29.82	30.61	-174.40	72.96	1,053.48	581.28	563.02	18.26	31.827	
6,222.00	5,261.63	5,805.98	5,830.73	32.31	33.01	-174.12	73.69	1,149.41	582.26	562.65	19.60	29.701	
6,318.00	5,263.22	5,901.93	5,832.06	34.82	35.46	-173.82	74.41	1,245.35	582.29	561.19	21.09	27.606	
6,413.00	5,267.12	5,996.89	5,833.37	37.32	37.90	-173.78	75.13	1,340.30	579.70	557.23	22.48	25.791	
6,508.00	5,270.68	7,091.82	5,834.69	39.82	40.36	-174.02	75.85	1,435.21	577.18	553.55	23.63	24.427	
6,603.00	5,272.43	7,186.79	5,836.01	42.35	42.85	-174.24	76.57	1,530.17	576.55	551.87	24.88	23.176	
6,699.00	5,274.27	7,282.79	5,837.34	44.91	45.37	-174.20	77.30	1,626.15	576.08	549.79	26.29	21.913	
6,794.00	5,276.84	7,377.77	5,838.66	47.46	47.88	-174.12	78.02	1,721.13	574.91	547.18	27.73	20.732	
6,890.00	5,280.52	7,473.74	5,839.99	50.04	50.43	-174.05	78.75	1,817.09	572.81	543.41	29.20	19.611	
6,986.00	5,283.54	7,569.72	5,841.32	52.62	52.99	-174.06	79.47	1,913.06	570.90	540.37	30.54	18.695	
7,082.00	5,285.80	7,665.71	5,842.66	55.21	55.56	-174.18	80.20	2,009.03	569.83	537.94	31.89	17.867	
7,178.00	5,287.89	7,761.69	5,843.99	57.80	58.13	-174.36	80.93	2,104.99	568.89	535.71	33.18	17.145	
7,188.29	5,288.03	7,771.98	5,844.13	58.08	58.41	-174.37	81.01	2,115.29	568.89	535.56	33.32	17.072	
7,274.00	5,288.65	7,857.68	5,845.32	60.40	60.71	-174.46	81.68	2,200.98	569.38	534.87	34.52	16.497	
7,370.00	5,289.07	7,953.67	5,846.65	63.01	63.29	-174.50	82.38	2,296.96	570.26	534.34	35.92	15.875	
7,464.00	5,289.81	8,047.67	5,847.98	65.56	65.83	-174.56	83.10	2,390.94	570.77	533.48	37.29	15.307	
7,560.00	5,290.06	8,143.66	5,849.29	68.17	68.42	-174.51	83.82	2,486.92	571.93	533.21	38.71	14.774	
7,656.00	5,290.06	8,239.62	5,850.62	70.79	71.02	-174.30	84.55	2,582.87	573.47	533.13	40.34	14.216	
7,752.00	5,290.39	8,335.60	5,851.95	73.40	73.62	-174.14	85.28	2,678.84	574.63	532.71	41.92	13.707	
7,849.00	5,290.90	8,432.59	5,853.30	76.05	76.25	-174.01	86.01	2,775.81	575.61	532.09	43.52	13.228	
7,945.00	5,292.07	8,528.58	5,854.63	78.67	78.85	-173.99	86.74	2,871.80	575.76	530.76	45.01	12.792	
8,041.00	5,293.58	8,624.58	5,855.96	81.29	81.46	-174.10	87.47	2,967.78	575.48	529.11	46.37	12.410	
8,051.01	5,293.72	8,634.59	5,856.10	81.56	81.74	-174.10	87.54	2,977.79	575.48	528.96	46.52	12.370	
8,137.00	5,294.67	8,720.58	5,857.29	83.91	84.07	-174.14	88.20	3,063.76	575.69	527.80	47.79	12.046	
8,232.00	5,294.67	8,815.56	5,858.61	86.51	86.66	-174.12	88.92	3,158.74	577.04	527.84	49.20	11.728	
8,328.00	5,293.50	8,911.52	5,859.94	89.14	89.27	-174.00	89.64	3,254.68	579.70	528.94	50.76	11.421	
8,424.00	5,293.08	9,007.48	5,861.27	91.76	91.89	-173.82	90.37	3,350.63	581.65	529.13	52.52	11.075	
8,521.00	5,294.69	9,104.45	5,862.62	94.42	94.53	-173.62	91.11	3,447.59	581.62	527.30	54.32	10.708	
8,617.00	5,297.79	9,200.40	5,863.95	97.05	97.15	-173.33	91.83	3,543.53	580.18	523.97	56.20	10.323	
8,713.00	5,301.30	9,296.34	5,865.28	99.68	99.77	-173.07	92.58	3,639.46	578.28	520.27	58.01	9.969	
8,809.00	5,304.32	9,392.32	5,866.61	102.31	102.39	-172.95	93.29	3,735.43	576.71	517.09	59.62	9.673	
8,905.00	5,306.58	9,488.32	5,867.95	104.94	105.02	-172.92	94.02	3,831.41	575.81	514.64	61.17	9.413	
9,001.00	5,308.93	9,584.31	5,869.28	107.57	107.64	-172.80	94.74	3,927.39	574.80	512.09	62.71	9.166	
9,098.00	5,311.04	9,681.30	5,870.62	110.23	110.29	-172.98	95.48	4,024.37	573.93	509.82	64.11	8.952	
9,194.00	5,312.80	9,777.28	5,871.96	112.85	112.92	-173.17	96.21	4,120.33	573.25	507.94	65.31	8.777	
9,290.00	5,314.56	9,873.25	5,873.29	115.48	115.54	-173.39	96.93	4,216.30	572.58	506.05	66.53	8.606	

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



Phoenix Technology Services

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Offset Design: Crow Federal - #11H - Wellbore #1 / Job #1210349 - 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		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
9,307.91	5,314.80	9,891.16	5,873.54	115.97	116.04	-173.41	97.07	4,234.21	572.57	505.79	66.77	8.575	
9,386.00	5,315.48	9,969.24	5,874.62	118.11	118.17	-173.52	97.66	4,312.27	572.84	505.01	67.83	8.445	
9,482.00	5,316.82	10,065.23	5,875.95	120.74	120.80	-173.67	98.39	4,408.25	572.66	503.55	69.11	8.288	
9,578.00	5,319.75	10,161.20	5,877.28	123.37	123.43	-173.80	99.12	4,504.21	570.91	500.48	70.43	8.106	
9,674.00	5,324.28	10,257.14	5,878.61	125.99	126.06	-173.88	99.84	4,600.14	567.64	495.80	71.84	7.902	
9,710.00	5,326.38	10,293.11	5,879.11	126.98	127.04	-173.87	100.12	4,636.10	566.01	493.66	72.35	7.823	
9,765.00	5,329.74	10,348.04	5,879.88	128.48	128.55	-173.91	100.53	4,691.03	563.36	490.21	73.15	7.702	



Phoenix Technology Services Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #12H - Wellbore #1 / Job #1210350 - 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		Distance		Warning									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre (usft)	NE-S (usft)	EW-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-0.35	130.00	-0.80	130.39						
629.00	628.99	618.99	618.99	0.70	1.28	127.02	130.00	-0.80	131.31	129.34	1.98	66.472			
715.00	714.99	704.99	704.99	0.88	1.47	131.72	130.00	-0.80	131.69	129.34	2.35	56.031			
800.00	799.99	789.99	789.99	1.05	1.66	118.13	130.00	-0.80	132.03	129.32	2.71	48.710			
886.00	885.99	875.99	875.99	1.23	1.86	132.27	130.00	-0.80	132.42	129.34	3.08	42.943			
972.00	971.98	961.98	961.98	1.42	2.05	143.02	130.00	-0.80	133.10	129.63	3.47	38.397			
1,057.00	1,056.96	1,046.96	1,046.96	1.59	2.24	153.34	130.00	-0.80	133.91	130.08	3.83	34.947			
1,143.00	1,142.97	1,132.97	1,132.97	1.77	2.43	138.48	130.00	-0.80	134.70	130.51	4.20	32.076			
1,228.00	1,227.96	1,217.96	1,217.96	1.95	2.63	124.21	130.00	-0.80	135.55	130.98	4.57	29.629			
1,314.00	1,313.95	1,303.95	1,303.95	2.13	2.82	126.55	130.00	-0.80	136.46	131.52	4.95	27.595			
1,399.00	1,398.93	1,388.93	1,388.93	2.30	3.01	96.47	130.00	-0.80	137.00	131.70	5.31	25.819			
1,485.00	1,484.92	1,474.92	1,474.92	2.47	3.20	77.88	130.00	-0.80	136.93	131.26	5.67	24.133			
1,570.00	1,569.90	1,559.90	1,559.90	2.65	3.39	75.55	130.00	-0.80	136.56	130.52	6.04	22.623			
1,656.00	1,655.88	1,645.88	1,645.88	2.82	3.59	61.69	130.00	-0.80	135.96	129.55	6.41	21.227			
1,742.00	1,741.87	1,731.87	1,731.87	3.00	3.78	71.66	130.00	-0.80	135.28	128.50	6.78	19.953			
1,827.00	1,826.84	1,816.84	1,816.84	3.19	3.97	73.77	130.00	-0.80	134.69	127.54	7.16	18.822			
1,913.00	1,912.81	1,902.81	1,902.81	3.37	4.16	66.98	130.00	-0.80	133.94	128.40	7.53	17.783			
1,994.73	1,994.52	1,984.52	1,984.52	3.54	4.35	90.00	130.00	-0.80	133.52	125.63	7.89	16.932			
1,998.00	1,997.79	1,987.79	1,987.79	3.55	4.36	91.33	130.00	-0.80	133.52	125.62	7.90	16.902			
2,084.00	2,083.79	2,073.79	2,073.79	3.72	4.55	105.51	130.00	-0.80	133.64	125.37	8.27	16.159			
2,169.00	2,168.78	2,158.78	2,158.78	3.90	4.74	106.40	130.00	-0.80	133.91	125.27	8.64	15.498			
2,255.00	2,254.77	2,244.77	2,244.77	4.08	4.93	76.87	130.00	-0.80	133.95	124.94	9.01	14.859			
2,341.00	2,340.77	2,330.77	2,330.77	4.26	5.13	57.60	130.00	-0.80	133.67	124.29	9.39	14.243			
2,426.00	2,425.77	2,415.77	2,415.77	4.43	5.32	-6.02	130.00	-0.80	133.07	123.32	9.75	13.648			
2,512.00	2,511.76	2,501.76	2,501.76	4.61	5.51	-23.63	130.00	-0.80	132.14	122.02	10.12	13.057			
2,597.00	2,596.75	2,586.75	2,586.75	4.79	5.70	-19.44	130.00	-0.80	130.90	120.41	10.49	12.482			
2,683.00	2,682.73	2,672.73	2,672.73	4.97	5.90	1.55	130.00	-0.80	129.07	118.21	10.86	11.886			
2,768.00	2,767.71	2,757.71	2,757.71	5.14	6.09	-17.46	130.00	-0.80	127.18	115.95	11.23	11.327			
2,854.00	2,853.69	2,843.69	2,843.69	5.32	6.28	-22.51	130.00	-0.80	125.63	114.03	11.60	10.830			
2,940.00	2,939.68	2,929.68	2,929.68	5.50	6.47	-5.38	130.00	-0.80	123.96	111.99	11.97	10.355			
3,025.00	3,024.65	3,014.65	3,014.65	5.68	6.66	-3.96	130.00	-0.80	121.82	109.48	12.34	9.873			
3,111.00	3,110.61	3,100.61	3,100.61	5.86	6.86	-1.31	130.00	-0.80	119.27	106.56	12.71	9.382			
3,197.00	3,196.58	3,186.58	3,186.58	6.04	7.05	21.98	130.00	-0.80	116.88	103.79	13.09	8.929			
3,281.00	3,280.55	3,270.55	3,270.55	6.22	7.24	39.97	130.00	-0.80	115.18	101.73	13.46	8.560			
3,367.00	3,366.53	3,356.53	3,356.53	6.40	7.43	55.43	130.00	-0.80	113.98	100.15	13.83	8.241			
3,418.00	3,417.52	3,407.52	3,407.52	6.51	7.55	69.28	130.00	-0.80	113.51	99.45	14.05	8.076			
3,551.00	3,550.50	3,540.50	3,540.50	6.79	7.85	57.28	130.00	-0.80	112.30	97.67	14.63	7.674			
3,637.00	3,636.49	3,626.49	3,626.49	6.97	8.04	-80.91	130.00	-0.80	111.73	96.73	15.01	7.446			
3,723.00	3,722.49	3,712.49	3,712.49	7.15	8.23	-81.44	130.00	-0.80	111.57	96.19	15.38	7.256			
3,737.00	3,736.52	3,726.52	3,726.52	7.18	8.26	-89.98	130.00	-0.80	111.56	96.12	15.44	7.227 CC, ES			
3,808.00	3,807.46	3,797.46	3,797.46	7.32	8.42	-106.69	130.00	-0.80	111.89	96.15	15.74	7.108			
3,893.00	3,892.41	3,882.41	3,882.41	7.50	8.61	-115.72	130.00	-0.80	113.00	96.90	16.10	7.017			
3,979.00	3,978.38	3,968.38	3,968.38	7.67	8.81	-146.31	130.00	-0.80	114.10	97.63	16.48	6.925			
4,065.00	4,064.38	4,054.38	4,054.38	7.85	9.00	-177.04	130.00	-0.80	114.70	97.85	16.85	6.807			
4,150.00	4,149.37	4,139.37	4,139.37	8.03	9.19	-127.24	130.00	-0.80	115.37	98.15	17.22	6.700			
4,236.00	4,235.35	4,225.35	4,225.35	8.21	9.38	-122.20	130.00	-0.80	116.43	98.83	17.59	6.619			
4,321.00	4,320.31	4,310.31	4,310.31	8.39	9.58	-123.03	130.00	-0.80	117.78	99.83	17.96	6.559			
4,407.00	4,406.25	4,396.25	4,396.25	8.57	9.77	-127.52	130.00	-0.80	119.70	101.38	18.33	6.532			
4,493.00	4,492.20	4,482.20	4,482.20	8.74	9.96	-145.22	130.00	-0.80	121.72	103.01	18.70	6.509			
4,578.00	4,577.18	4,567.18	4,567.18	8.92	10.15	-170.38	130.00	-0.80	123.45	104.38	19.07	6.474			
4,664.00	4,663.17	4,653.17	4,653.17	9.10	10.35	-81.49	130.00	-0.80	124.29	104.84	19.45	6.392			
4,729.00	4,728.17	4,718.17	4,718.17	9.24	10.49	-41.67	130.00	-0.80	123.83	104.11	19.73	6.278			

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



Phoenix Technology Services Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Output errors are at:
Database:
Offset: TVD Reference:
Well #10H
KB @ 3925.00usft (Capstar 114)
KB @ 3925.00usft (Capstar 114)
Grid
Minimum Curvature
2.00 sigma
GCR DB
Offset Datum

Offset Design: Crow Federal - #12H - Wellbore #1 / Job #1210350 - 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		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 (usft)	EWJ (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,797.00	4,796.15	4,786.15	4,786.15	9.38	10.65	-48.40	130.00	-0.80	122.92	102.89	20.02	6.139		
4,829.00	4,828.15	4,818.15	4,818.15	9.45	10.72	-58.97	130.00	-0.80	122.49	102.33	20.16	6.076		
4,861.00	4,860.12	4,850.12	4,850.12	9.51	10.79	-82.54	130.00	-0.80	122.17	101.88	20.30	6.018		
4,884.36	4,883.38	4,873.38	4,873.38	9.56	10.84	-90.00	130.00	-0.80	122.09	101.68	20.40	5.984		
4,893.00	4,891.93	4,881.93	4,881.93	9.58	10.86	-91.39	130.00	-0.80	122.10	101.66	20.44	5.974		
4,925.00	4,923.27	4,913.27	4,913.27	9.66	10.93	-95.53	130.00	-0.80	122.51	101.94	20.57	5.956 SF		
4,957.00	4,953.82	4,943.82	4,943.82	9.73	11.00	-97.58	130.00	-0.80	123.62	102.93	20.69	5.974		
4,989.00	4,983.42	4,973.42	4,973.42	9.81	11.07	-102.95	130.00	-0.80	125.97	105.19	20.78	6.062		
5,021.00	5,012.05	5,002.05	5,002.05	9.88	11.13	-108.54	130.00	-0.80	130.29	109.49	20.79	6.266		
5,053.00	5,039.51	5,029.51	5,029.51	9.95	11.19	-113.92	130.00	-0.80	137.08	116.35	20.73	6.614		
5,085.00	5,065.87	5,055.87	5,055.87	10.07	11.25	-118.69	130.00	-0.80	146.44	125.84	20.60	7.109		
5,117.00	5,090.78	5,080.78	5,080.78	10.21	11.31	-121.94	130.00	-0.80	158.51	138.13	20.38	7.777		
5,149.00	5,113.83	5,103.83	5,103.83	10.37	11.36	-123.51	130.00	-0.80	173.30	153.08	20.22	8.569		
5,181.00	5,134.90	5,124.90	5,124.90	10.57	11.41	-125.47	130.00	-0.80	190.71	170.71	19.99	9.539		
5,213.00	5,153.80	5,143.80	5,143.80	10.81	11.45	-125.78	130.00	-0.80	210.66	190.74	19.92	10.577		
5,245.00	5,170.54	5,160.54	5,160.54	11.10	11.49	-127.27	130.00	-0.80	232.95	213.19	19.78	11.788		
5,277.00	5,185.28	5,175.28	5,175.28	11.45	11.52	-128.58	130.00	-0.80	257.40	237.74	19.66	13.093		
5,309.00	5,197.97	5,187.97	5,187.97	11.84	11.55	-128.89	130.00	-0.80	283.57	263.52	20.06	14.139		
5,341.00	5,208.65	5,198.65	5,198.65	12.28	11.57	-124.74	130.00	-0.80	310.96	290.30	20.68	15.049		
5,373.00	5,217.89	5,207.89	5,207.89	12.76	11.59	-123.99	130.00	-0.80	339.19	318.05	21.14	16.042		
5,405.00	5,226.42	5,216.42	5,216.42	13.28	11.61	-124.62	130.00	-0.80	367.92	346.48	21.45	17.155		
5,437.00	5,234.75	5,224.75	5,224.75	13.82	11.63	-126.66	130.00	-0.80	396.96	375.46	21.51	18.457		
5,469.00	5,242.39	5,232.39	5,232.39	14.40	11.65	-122.48	130.00	-0.80	426.34	403.59	22.75	18.743		
5,495.00	5,247.28	5,237.28	5,237.28	14.90	11.66	-117.11	130.00	-0.80	450.61	426.48	24.13	18.675		
5,518.00	5,250.44	5,240.44	5,240.44	15.35	11.67	-110.14	130.00	-0.80	472.35	446.74	25.61	18.444		
5,550.00	5,253.59	5,243.59	5,243.59	16.01	11.67	-108.02	130.00	-0.80	502.86	476.11	26.75	18.797		
5,586.00	5,257.36	5,247.36	5,247.36	18.08	11.68	-89.18	130.00	-0.80	595.58	565.83	29.75	20.018		
5,742.00	5,257.36	5,247.36	5,247.36	20.28	11.68	-90.55	130.00	-0.80	689.20	657.25	31.95	21.572		
5,838.00	5,258.11	5,248.11	5,248.11	22.57	11.68	-94.14	130.00	-0.80	783.53	749.36	34.17	22.928		
5,934.00	5,259.29	5,249.29	5,249.29	24.94	11.69	-94.82	130.00	-0.80	878.37	841.86	36.51	24.058		
6,030.00	5,260.21	5,250.21	5,250.21	27.36	11.69	-92.98	130.00	-0.80	973.45	934.45	39.00	24.961		
6,126.00	5,260.98	5,250.98	5,250.98	29.82	30.62	-173.32	137.82	1,034.68	1,043.38	1,024.43	18.95	55.054		
6,222.00	5,261.63	5,251.63	5,251.63	32.31	32.99	-173.20	138.55	1,130.58	1,045.51	1,025.26	20.25	51.638		
6,318.00	5,263.22	5,253.22	5,253.22	34.82	35.39	-173.00	139.27	1,226.50	1,046.68	1,024.97	21.70	48.224		
6,413.00	5,267.12	5,257.12	5,257.12	37.32	37.81	-172.96	139.99	1,321.45	1,045.18	1,022.09	23.09	45.259		
6,508.00	5,270.68	5,260.68	5,260.68	39.82	40.24	-173.07	140.71	1,416.36	1,043.70	1,019.40	24.30	42.946		
6,514.61	5,270.82	5,260.82	5,260.82	40.00	40.41	-173.09	140.76	1,422.96	1,043.70	1,019.31	24.39	42.785		
6,603.00	5,272.43	5,262.43	5,262.43	42.35	42.70	-173.24	141.43	1,511.29	1,044.13	1,018.55	25.58	40.821		
6,699.00	5,274.27	5,264.27	5,264.27	44.91	45.21	-173.24	142.16	1,607.26	1,044.77	1,017.78	26.99	38.709		
6,794.00	5,276.84	5,266.84	5,266.84	47.46	47.70	-173.20	142.88	1,702.22	1,044.70	1,016.28	28.43	36.753		
6,890.00	5,280.52	5,270.52	5,270.52	50.04	50.23	-173.16	143.61	1,798.18	1,043.51	1,015.62	29.89	34.908		
6,960.52	5,283.00	5,273.00	5,273.00	51.94	52.10	-173.15	144.14	1,868.67	1,042.81	1,011.92	30.89	33.756		
6,986.00	5,283.54	5,273.54	5,273.54	52.62	52.77	-173.16	144.33	1,894.14	1,042.90	1,011.65	31.25	33.371		
7,082.00	5,285.80	5,275.80	5,275.80	55.21	55.33	-173.21	145.06	1,990.09	1,042.91	1,010.25	32.66	31.936		
7,122.06	5,286.86	5,276.86	5,276.86	56.29	56.39	-173.27	145.37	2,030.13	1,042.77	1,009.55	33.22	31.394		
7,178.00	5,287.89	5,277.89	5,277.89	57.80	57.89	-173.33	145.79	2,086.04	1,043.04	1,009.04	34.00	30.678		
7,274.00	5,288.85	5,278.85	5,278.85	60.40	60.45	-173.40	146.52	2,181.98	1,044.62	1,009.25	35.37	29.535		
7,370.00	5,289.07	5,279.07	5,279.07	63.01	63.03	-173.43	147.24	2,277.93	1,046.58	1,009.78	36.80	28.437		
7,464.00	5,289.81	5,279.81	5,279.81	65.56	65.55	-173.46	147.96	2,371.88	1,048.16	1,009.96	38.21	27.435		
7,560.00	5,290.06	5,280.06	5,280.06	68.17	68.14	-173.48	148.68	2,467.81	1,050.43	1,010.82	39.60	26.523		
7,656.00	5,290.06	5,280.06	5,280.06	70.79	70.72	-173.37	149.41	2,563.72	1,053.11	1,011.91	41.19	25.566		
7,752.00	5,290.39	5,280.39	5,280.39	73.40	73.31	-173.28	150.14	2,659.65	1,055.39	1,012.64	42.75	24.690		

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



Phoenix Technology Services
Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #12H - Wellbore #1 / Job #1210350 - 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		Reference		Offset	Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor		
7,849.00	5,290.90	8,864.44	6,330.62	76.05	75.94	-173.22		150.87	2,756.59	1,057.50	1,013.19	44.30	23.869		
7,945.00	5,292.07	8,960.42	6,333.06	78.67	78.54	-173.19		151.60	2,852.54	1,058.75	1,012.92	45.83	23.100		
8,041.00	5,293.58	9,056.41	6,335.50	81.29	81.14	-173.26		152.33	2,948.50	1,059.55	1,012.31	47.24	22.429		
8,137.00	5,294.67	9,152.40	6,337.94	83.91	83.74	-173.29		153.05	3,044.45	1,060.85	1,012.17	48.68	21.791		
8,232.00	5,294.67	9,247.37	6,340.35	86.51	86.32	-173.31		153.77	3,139.38	1,063.29	1,013.21	50.09	21.229		
8,328.00	5,293.50	9,343.29	6,342.78	89.14	88.93	-173.25		154.50	3,235.27	1,067.07	1,015.49	51.58	20.688		
8,424.00	5,293.08	9,439.22	6,345.22	91.76	91.54	-173.17		155.23	3,331.17	1,070.15	1,016.88	53.28	20.084		
8,521.00	5,294.69	9,536.19	6,347.69	94.42	94.18	-173.07		155.96	3,428.11	1,071.25	1,016.26	54.99	19.482		
8,617.00	5,297.79	9,632.15	6,350.12	97.05	96.79	-172.94		156.69	3,524.03	1,070.93	1,014.20	56.73	18.879		
8,713.00	5,301.30	9,728.11	6,352.56	99.68	99.41	-172.78		157.42	3,619.96	1,070.14	1,011.75	58.40	18.326		
8,809.00	5,304.32	9,824.11	6,355.00	102.31	102.02	-172.71		158.14	3,715.92	1,069.67	1,009.71	59.96	17.839		
8,834.54	5,305.00	9,849.65	6,355.65	103.01	102.72	-172.71		158.34	3,741.45	1,069.64	1,009.28	60.36	17.720		
8,905.00	5,306.58	9,920.11	6,357.44	104.94	104.64	-172.70		158.87	3,811.89	1,069.88	1,008.40	61.48	17.402		
9,001.00	5,308.93	10,016.11	6,359.88	107.57	107.26	-172.69		159.60	3,907.85	1,069.97	1,006.95	63.02	16.979		
9,033.28	5,309.80	10,048.39	6,360.70	108.45	108.14	-172.70		159.84	3,940.13	1,069.89	1,006.38	63.51	16.846		
9,098.00	5,311.04	10,113.10	6,362.34	110.23	109.91	-172.73		160.33	4,004.81	1,070.20	1,005.73	64.47	16.800		
9,194.00	5,312.80	10,209.07	6,364.78	112.85	112.53	-172.82		161.06	4,100.75	1,070.61	1,004.79	65.82	16.268		
9,204.03	5,313.02	10,219.10	6,365.04	113.13	112.81	-172.84		161.14	4,110.77	1,070.61	1,004.65	65.95	16.233		
9,290.00	5,314.58	10,305.05	6,367.22	115.48	115.16	-172.96		161.79	4,196.69	1,071.02	1,003.87	67.15	15.949		
9,386.00	5,315.48	10,401.03	6,369.66	118.11	117.78	-173.04		162.52	4,292.64	1,072.37	1,003.84	68.54	15.647		
9,482.00	5,316.82	10,497.01	6,372.10	120.74	120.40	-173.12		163.24	4,388.58	1,073.28	1,003.35	69.93	15.349		
9,578.00	5,319.75	10,592.99	6,374.53	123.37	123.03	-173.21		163.97	4,484.54	1,072.62	1,001.30	71.32	15.039		
9,674.00	5,324.28	10,688.96	6,376.97	125.99	125.65	-173.25		164.70	4,580.47	1,070.44	997.68	72.78	14.709		
9,710.00	5,326.38	10,724.94	6,377.89	126.98	126.64	-173.25		164.87	4,616.44	1,069.21	995.91	73.31	14.585		
9,765.00	5,329.74	10,779.90	6,379.28	128.48	128.14	-173.27		165.39	4,671.38	1,067.19	993.05	74.14	14.395		



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #13H - OH / Job #1310316 - Surveys (Capstar 114)														Offset Site Error:	0.00 usft
Survey Program: 613-MWD														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis 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	39.82						
628.00	628.99	597.82	597.82	0.70	0.66	-58.09	-27.02	0.35	25.80	24.44	1.36	19.000	CC		
715.00	714.99	683.81	683.80	0.88	0.83	-53.57	-27.89	-0.11	26.09	24.39	1.70	15.319	ES		
800.00	799.99	768.68	768.59	1.05	1.01	-61.13	-28.61	-3.44	26.61	24.56	2.05	12.974			
886.00	885.99	854.25	853.85	1.23	1.20	-33.97	-29.95	-10.56	28.52	26.11	2.42	11.809			
972.00	971.98	940.34	939.60	1.42	1.39	-11.51	-31.26	-18.11	31.62	28.83	2.79	11.332			
1,057.00	1,056.98	1,025.75	1,024.80	1.59	1.58	7.61	-31.13	-24.08	33.65	30.51	3.14	10.711			
1,143.00	1,142.97	1,111.19	1,110.01	1.77	1.77	0.74	-30.85	-30.32	36.51	33.01	3.50	10.439			
1,228.00	1,227.96	1,195.15	1,193.65	1.95	1.98	-7.15	-31.16	-37.60	40.85	36.98	3.87	10.560			
1,314.00	1,313.95	1,280.93	1,279.01	2.13	2.20	0.19	-32.02	-46.04	46.62	42.39	4.23	11.017			
1,399.00	1,398.93	1,366.75	1,364.50	2.30	2.41	-26.90	-32.55	-53.47	51.64	47.06	4.58	11.281			
1,485.00	1,484.92	1,453.95	1,451.55	2.47	2.61	-45.03	-33.09	-58.65	54.97	50.04	4.93	11.145			
1,570.00	1,569.90	1,539.86	1,537.40	2.65	2.79	-47.92	-33.36	-61.85	56.75	51.47	5.28	10.745			
1,656.00	1,655.88	1,627.10	1,624.62	2.82	2.97	-62.93	-33.29	-63.48	67.20	51.56	5.64	10.145			
1,742.00	1,741.87	1,713.68	1,711.20	3.00	3.14	-55.08	-33.18	-63.40	66.18	50.18	6.00	9.360			
1,827.00	1,826.84	1,799.18	1,796.69	3.19	3.31	-55.68	-32.85	-62.54	54.14	47.77	6.37	8.503			
1,913.00	1,912.81	1,885.40	1,882.90	3.37	3.48	-66.28	-32.53	-60.81	51.44	44.70	6.73	7.640			
1,998.00	1,997.79	1,970.33	1,967.79	3.55	3.64	-45.49	-32.20	-58.83	48.70	41.61	7.09	6.873			
2,084.00	2,083.79	2,055.81	2,053.26	3.72	3.80	-33.20	-31.68	-57.48	46.48	39.04	7.43	6.262			
2,169.00	2,168.78	2,140.60	2,138.05	3.90	3.96	-34.03	-31.66	-56.64	45.03	37.24	7.79	5.782			
2,255.00	2,254.77	2,226.40	2,223.85	4.08	4.13	-65.89	-31.78	-56.08	43.97	35.83	8.14	5.399			
2,341.00	2,340.77	2,312.51	2,309.96	4.28	4.31	-86.48	-31.73	-55.83	43.52	35.02	8.50	5.121			
2,379.31	2,379.07	2,350.80	2,348.24	4.34	4.38	-122.25	-31.56	-55.75	43.41	34.76	8.65	5.016			
2,426.00	2,425.77	2,397.41	2,394.86	4.43	4.48	-150.61	-31.38	-55.74	43.58	34.73	8.85	4.927			
2,512.00	2,511.76	2,483.42	2,480.86	4.61	4.65	-167.98	-30.96	-55.92	44.32	35.12	9.20	4.818			
2,597.00	2,596.75	2,568.68	2,566.12	4.79	4.82	-162.94	-30.06	-56.21	45.20	35.65	9.55	4.733			
2,683.00	2,682.73	2,654.56	2,651.98	4.97	5.00	-141.08	-28.52	-56.77	46.16	36.25	9.91	4.658			
2,768.00	2,767.71	2,739.34	2,736.74	5.14	5.18	-158.77	-26.89	-57.90	47.54	37.27	10.27	4.631			
2,854.00	2,853.69	2,825.36	2,822.75	5.32	5.36	-162.52	-25.78	-58.82	49.06	38.43	10.63	4.617			
2,940.00	2,939.69	2,911.29	2,908.67	5.50	5.54	-144.91	-24.94	-59.45	50.51	39.53	10.99	4.598			
3,025.00	3,024.65	2,995.88	2,993.25	5.68	5.72	-143.23	-24.05	-60.58	52.54	41.20	11.34	4.632			
3,111.00	3,110.61	3,081.65	3,079.00	5.86	5.90	-140.08	-23.05	-62.51	55.38	43.67	11.71	4.730			
3,197.00	3,196.59	3,167.56	3,164.88	6.04	6.09	-117.01	-22.27	-64.46	57.93	45.85	12.08	4.796			
3,281.00	3,280.55	3,251.48	3,248.78	6.22	6.27	-100.06	-21.95	-66.08	59.63	47.20	12.44	4.794			
3,367.00	3,366.53	3,337.84	3,335.14	6.40	6.45	-86.90	-22.48	-66.80	60.63	47.82	12.80	4.735			
3,418.00	3,417.52	3,388.87	3,386.16	6.51	6.55	-74.80	-22.95	-66.77	60.77	47.75	13.02	4.667			
3,551.00	3,550.50	3,522.13	3,519.41	6.79	6.83	-91.57	-24.23	-68.42	61.12	47.53	13.58	4.500			
3,637.00	3,636.49	3,608.86	3,606.14	6.97	7.00	129.00	-24.51	-65.69	61.20	47.26	13.94	4.391			
3,723.00	3,722.49	3,695.21	3,692.46	7.15	7.18	128.12	-24.68	-63.48	60.51	46.22	14.29	4.234			
3,808.00	3,807.46	3,780.04	3,777.26	7.32	7.35	103.83	-24.90	-61.31	59.90	45.28	14.64	4.092			
3,893.00	3,892.41	3,865.03	3,862.23	7.50	7.52	97.49	-25.21	-59.33	59.36	44.37	14.99	3.961			
3,979.00	3,978.38	3,951.07	3,948.24	7.67	7.69	68.05	-25.48	-57.18	58.14	42.80	15.34	3.790			
4,065.00	4,064.38	4,037.20	4,034.34	7.85	7.86	38.46	-25.54	-55.15	56.47	40.77	15.70	3.598			
4,150.00	4,149.37	4,122.14	4,119.26	8.03	8.04	85.93	-25.41	-53.03	54.74	38.69	16.05	3.411			
4,236.00	4,235.35	4,207.98	4,205.08	8.21	8.21	92.33	-25.34	-51.23	53.48	37.07	16.40	3.261			
4,321.00	4,320.31	4,292.78	4,289.87	8.39	8.39	94.01	-25.34	-49.66	52.56	35.80	16.75	3.137			
4,407.00	4,406.25	4,378.76	4,375.84	8.57	8.56	93.38	-25.42	-48.38	51.91	34.80	17.11	3.034			
4,493.00	4,492.20	4,464.76	4,461.83	8.74	8.74	78.94	-25.30	-47.00	50.74	33.28	17.46	2.905			
4,578.00	4,577.18	4,549.41	4,546.47	8.92	8.91	55.80	-24.95	-46.16	49.18	31.37	17.81	2.751			
4,640.73	4,639.90	4,611.89	4,608.95	9.05	9.04	98.26	-24.83	-46.03	48.68	30.60	18.07	2.693			
4,664.00	4,663.17	4,635.14	4,632.20	9.10	9.09	145.99	-24.81	-46.02	48.74	30.57	18.17	2.682	SF		
4,729.00	4,728.17	4,700.09	4,697.15	9.24	9.23	-173.82	-24.80	-46.02	49.48	31.04	18.44	2.683			

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



Phoenix Technology Services Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #13H - OH / Job #1310316 - Surveys (Capstar 114)														Offset Site Error:	0.00 usft
Survey Program: 613 MWD														Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre -N-S (usft)	-E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
4,797.00	4,798.15	4,767.89	4,764.95	9.38	9.37	179.77	-24.92	-48.11	50.93	32.21	18.72	2.720			
4,829.00	4,828.15	4,799.87	4,796.93	9.45	9.44	169.55	-26.01	-46.23	51.80	32.94	18.86	2.747			
4,861.00	4,860.12	4,830.20	4,827.25	9.51	9.50	147.43	-24.91	-46.67	53.22	34.25	18.98	2.805			
4,893.00	4,891.93	4,857.11	4,854.04	9.58	9.56	142.76	-24.96	-49.15	58.34	39.35	19.00	3.071			
4,925.00	4,923.27	4,883.00	4,879.48	9.66	9.62	145.67	-25.09	-54.02	68.66	49.73	18.93	3.627			
4,957.00	4,953.82	4,903.48	4,899.16	9.73	9.68	150.88	-25.14	-59.57	84.21	65.57	18.64	4.518			
4,989.00	4,983.42	4,922.13	4,916.74	9.81	9.73	153.23	-25.09	-65.80	104.12	85.69	18.42	5.651			
5,021.00	5,012.05	4,938.02	4,931.43	9.88	9.77	153.90	-25.05	-71.88	127.15	109.07	18.09	7.029			
5,053.00	5,039.51	4,951.20	4,943.38	9.96	9.81	153.89	-25.04	-77.41	152.72	134.97	17.76	8.600			
5,085.00	5,065.87	4,962.25	4,953.27	10.07	9.85	154.16	-25.06	-82.38	180.09	162.63	17.46	10.312			
5,117.00	5,090.78	4,970.87	4,960.88	10.21	9.87	152.18	-25.11	-88.39	208.99	191.98	17.02	12.280			
5,149.00	5,113.83	4,978.00	4,967.99	10.37	9.90	152.70	-25.18	-90.33	239.24	222.76	16.48	14.519			
5,181.00	5,134.90	4,979.00	4,967.99	10.57	9.90	142.32	-25.18	-90.33	270.36	253.40	16.96	15.941			
5,213.00	5,153.80	4,983.96	4,972.30	10.81	9.92	128.91	-25.24	-92.80	301.99	283.50	18.49	16.335			
5,245.00	5,170.54	4,984.66	4,972.82	11.10	9.92	82.22	-25.24	-93.10	333.85	312.95	20.90	15.973			
5,277.00	5,185.28	4,979.00	4,967.99	11.45	9.90	46.09	-25.18	-90.33	365.72	348.19	17.53	20.860			
5,309.00	5,197.97	4,979.00	4,967.99	11.84	9.90	28.59	-25.18	-90.33	397.34	382.87	14.47	27.484			
5,341.00	5,208.65	4,979.00	4,967.99	12.28	9.90	19.61	-25.18	-90.33	428.73	415.99	12.73	33.668			
5,373.00	5,217.89	4,979.00	4,967.99	12.76	9.90	15.79	-25.18	-90.33	459.95	447.90	12.04	38.190			
5,405.00	5,226.42	4,979.00	4,967.99	13.28	9.90	13.15	-25.18	-90.33	491.13	479.41	11.72	41.923			
5,437.00	5,234.75	4,967.84	4,958.22	13.82	9.88	11.21	-25.09	-84.95	522.11	510.52	11.59	45.042			
5,469.00	5,242.39	4,964.45	4,955.22	14.40	9.85	6.25	-25.07	-83.37	553.13	542.28	10.87	50.901			
5,495.00	5,247.28	4,961.30	4,952.42	14.90	9.84	6.17	-25.06	-81.92	578.04	567.43	10.60	54.519			
5,518.00	5,250.44	4,958.18	4,949.64	15.35	9.83	3.07	-25.05	-80.50	599.77	589.52	10.25	58.539			
5,550.00	5,253.59	4,946.00	4,938.69	16.01	9.79	3.64	-25.04	-75.18	629.79	619.52	10.27	61.332			
5,582.00	5,257.36	4,946.00	4,938.69	16.08	9.79	2.13	-25.04	-75.18	718.18	707.78	10.40	69.032			
5,742.00	5,257.36	4,928.22	4,922.40	20.28	9.74	2.10	-25.07	-68.05	808.40	795.51	10.89	74.062			
5,838.00	5,258.11	4,915.00	4,910.07	22.57	9.70	4.41	-25.12	-63.29	896.10	884.50	11.60	77.223			
5,934.00	5,259.29	4,915.00	4,910.07	24.94	9.70	5.27	-25.12	-63.29	986.81	974.52	12.29	80.324			
6,030.00	5,260.21	4,915.00	4,910.07	27.38	9.70	4.56	-25.12	-63.29	1,078.36	1,065.58	12.78	84.388			
6,126.00	5,260.96	4,898.20	4,894.12	29.82	9.66	9.56	-25.14	-58.01	1,169.94	1,155.46	14.48	80.790			
6,222.00	5,261.63	4,883.00	4,879.46	32.31	9.62	13.89	-25.09	-54.02	1,262.37	1,245.68	16.70	75.612			
6,318.00	5,263.22	4,883.00	4,879.46	34.82	9.62	7.45	-25.09	-54.02	1,355.12	1,339.78	15.34	88.346			
6,413.00	5,267.12	4,883.00	4,879.46	37.32	9.62	1.19	-25.09	-54.02	1,447.91	1,432.90	15.01	96.431			
6,508.00	5,270.68	4,883.00	4,879.46	39.82	9.62	-8.02	-25.09	-54.02	1,540.92	1,524.54	16.38	94.082			
6,603.00	5,272.43	4,883.00	4,879.46	42.35	9.62	5.55	-25.09	-54.02	1,633.80	1,616.91	16.89	96.759			
6,699.00	5,274.27	4,883.00	4,879.46	44.91	9.62	7.74	-25.09	-54.02	1,727.89	1,709.62	18.27	94.591			
6,794.00	5,276.84	4,883.00	4,879.46	47.46	9.62	8.11	-25.09	-54.02	1,821.32	1,802.16	19.15	95.092			
6,890.00	5,280.52	4,883.00	4,879.46	50.04	9.62	6.31	-25.09	-54.02	1,918.07	1,896.81	19.26	99.486			
6,986.00	5,283.54	4,883.00	4,879.46	52.62	9.62	3.04	-25.09	-54.02	2,010.85	1,991.77	19.08	105.412			
7,082.00	5,285.80	4,883.00	4,879.46	55.21	9.62	-3.17	-25.09	-54.02	2,105.63	2,085.79	19.84	106.110			
7,178.00	5,287.89	4,867.38	4,864.18	57.80	9.59	0.76	-25.01	-50.78	2,199.97	2,179.81	20.16	109.122			
7,274.00	5,288.65	4,865.70	4,862.53	60.40	9.58	3.53	-25.00	-50.49	2,294.61	2,273.41	21.20	108.238			
7,370.00	5,289.07	4,851.00	4,847.98	63.01	9.55	4.09	-24.93	-48.36	2,389.66	2,367.62	22.03	108.453			
7,464.00	5,289.81	4,851.00	4,847.98	65.56	9.55	2.29	-24.93	-48.36	2,482.43	2,460.11	22.32	111.213			
7,560.00	5,290.06	4,851.00	4,847.98	68.17	9.55	13.17	-24.93	-48.36	2,577.16	2,548.70	28.46	90.550			
7,656.00	5,290.06	4,851.00	4,847.98	70.79	9.55	12.52	-24.93	-48.36	2,671.92	2,643.05	28.86	92.572			
7,752.00	5,290.39	4,851.00	4,847.98	73.40	9.55	9.30	-24.93	-48.36	2,766.82	2,739.42	27.41	100.957			
7,849.00	5,290.90	4,851.00	4,847.98	76.05	9.55	10.90	-24.93	-48.36	2,862.82	2,833.46	29.36	97.519			
7,945.00	5,292.07	4,851.00	4,847.98	78.67	9.55	-3.18	-24.93	-48.36	2,958.00	2,931.95	26.05	113.550			
8,041.00	5,293.58	4,851.00	4,847.98	81.29	9.55	2.52	-24.93	-48.36	3,053.28	3,026.75	26.53	115.071			
8,137.00	5,294.67	4,851.00	4,847.98	83.91	9.55	3.20	-24.93	-48.36	3,148.56	3,121.16	27.40	114.916			

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



Phoenix Technology Services

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Offset Design Crow Federal - #13H - OH / Job #1310316 - Surveys (Capstar 114)													Offset Site Error
Survey Program: 613-MWD													Offset Well Error
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	Warning
8,232.00	5,294.67	4,851.00	4,847.98	86.51	9.55	8.46	-24.93	-48.36	3,242.74	3,211.98	30.76	105.433	
8,328.00	5,293.50	4,851.00	4,847.98	89.14	9.55	12.78	-24.93	-48.36	3,337.78	3,302.57	35.21	94.805	
8,424.00	5,293.08	4,851.00	4,847.98	91.76	9.55	12.74	-24.93	-48.36	3,432.97	3,396.86	36.11	95.080	
8,521.00	5,294.69	4,851.00	4,847.98	94.42	9.55	19.13	-24.93	-48.36	3,529.41	3,485.14	44.27	79.717	
8,617.00	5,297.79	4,851.00	4,847.98	97.05	9.55	26.07	-24.93	-48.36	3,625.01	3,570.63	54.38	66.667	
8,713.00	5,301.30	4,851.00	4,847.98	99.68	9.55	15.24	-24.93	-48.36	3,720.67	3,679.03	41.65	89.341	
8,809.00	5,304.32	4,851.00	4,847.98	102.31	9.55	3.77	-24.93	-48.36	3,816.34	3,783.77	32.58	117.151	
8,905.00	5,306.58	4,851.00	4,847.98	104.94	9.55	5.58	-24.93	-48.36	3,911.98	3,877.78	34.20	114.389	
9,001.00	5,308.93	4,851.00	4,847.98	107.57	9.55	0.02	-24.93	-48.36	4,007.64	3,974.42	33.21	120.661	
9,098.00	5,311.04	4,851.00	4,847.98	110.23	9.55	-5.35	-24.93	-48.36	4,104.29	4,068.64	35.65	115.130	
9,194.00	5,312.80	4,851.00	4,847.98	112.85	9.55	-17.54	-24.93	-48.36	4,199.92	4,160.07	49.85	84.255	
9,290.00	5,314.56	4,851.00	4,847.98	115.48	9.55	-5.08	-24.93	-48.36	4,295.56	4,258.61	36.95	116.246	
9,386.00	5,315.48	4,851.00	4,847.98	118.11	9.55	-4.62	-24.93	-48.36	4,391.16	4,353.78	37.39	117.455	
9,482.00	5,316.82	4,851.00	4,847.98	120.74	9.55	-8.54	-24.93	-48.36	4,486.81	4,444.45	42.37	105.908	
9,578.00	5,319.75	4,851.00	4,847.98	123.37	9.55	-5.39	-24.93	-48.36	4,582.59	4,543.19	39.40	116.297	
9,674.00	5,324.28	4,851.00	4,847.98	125.99	9.55	-2.77	-24.93	-48.36	4,678.48	4,639.78	38.70	120.901	
9,770.00	5,326.38	4,851.00	4,847.98	126.98	9.55	-8.97	-24.93	-48.36	4,714.45	4,670.73	43.73	107.818	
9,765.00	5,329.74	4,851.00	4,847.98	128.48	9.55	-8.97	-24.93	-48.36	4,769.42	4,725.24	44.19	107.939	

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design Crow Federal - #14H - Wellbore #1 / Job #1210352 - Plan 1 4-25-2012														Offset Site Error:	0.00 usft
Survey Program: D-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	-0.43	40.00	-0.30	41.23						
629.00	628.99	618.26	617.56	0.70	1.31	99.85	39.86	-22.50	46.11	44.12	2.00	23.090			
715.00	714.99	704.08	703.18	0.88	1.52	98.77	39.82	-28.48	49.14	46.76	2.39	20.600			
800.00	799.99	788.90	787.79	1.05	1.74	80.12	39.78	-34.40	52.49	49.74	2.76	19.041			
886.00	885.99	874.73	873.41	1.23	1.95	89.80	39.74	-40.39	56.22	53.08	3.14	17.905			
972.00	971.98	961.23	959.73	1.42	2.15	97.15	39.71	-45.93	60.03	56.51	3.51	17.081			
1,057.00	1,056.98	1,047.15	1,045.57	1.59	2.33	105.73	39.68	-49.59	62.76	58.91	3.85	16.289			
1,143.00	1,142.97	1,134.18	1,132.58	1.77	2.49	90.41	39.67	-51.32	64.12	59.93	4.19	15.308			
1,228.00	1,227.96	1,219.56	1,217.96	1.95	2.65	76.81	39.67	-51.46	64.03	59.49	4.54	14.094			
1,314.00	1,313.95	1,305.54	1,303.95	2.13	2.83	79.99	39.67	-51.46	63.71	58.81	4.90	13.004			
1,399.00	1,398.93	1,390.53	1,388.93	2.30	3.00	50.57	39.67	-51.46	63.02	57.77	5.25	12.007			
1,485.00	1,484.92	1,476.51	1,474.92	2.47	3.18	32.31	39.67	-51.46	61.75	56.15	5.60	11.018			
1,570.00	1,569.90	1,561.50	1,559.90	2.65	3.35	30.11	39.67	-51.46	60.35	54.40	5.96	10.134			
1,656.00	1,655.88	1,647.48	1,645.88	2.82	3.53	16.22	39.67	-51.46	58.85	52.53	6.31	9.321			
1,742.00	1,741.87	1,733.46	1,731.87	3.00	3.72	26.14	39.67	-51.46	57.25	50.57	6.68	8.571			
1,827.00	1,826.84	1,818.44	1,816.84	3.19	3.90	28.38	39.67	-51.46	55.47	48.42	7.05	7.872			
1,913.00	1,912.81	1,904.41	1,902.81	3.37	4.08	21.68	39.67	-51.46	53.43	46.02	7.41	7.207			
1,998.00	1,997.79	1,989.39	1,987.79	3.55	4.26	46.31	39.67	-51.46	51.88	44.11	7.78	6.673			
2,084.00	2,083.79	2,075.38	2,073.79	3.72	4.45	60.98	39.67	-51.46	51.19	43.05	8.14	6.288			
2,169.00	2,168.78	2,160.38	2,158.78	3.90	4.63	62.44	39.67	-51.46	50.73	42.22	8.51	5.965			
2,255.00	2,254.77	2,246.37	2,244.77	4.08	4.82	33.17	39.67	-51.46	50.01	41.14	8.88	5.635			
2,341.00	2,340.77	2,332.37	2,330.77	4.26	5.01	14.18	39.67	-51.46	49.28	40.04	9.24	5.334			
2,426.00	2,425.77	2,417.36	2,415.77	4.43	5.19	-49.83	39.67	-51.46	48.71	39.11	9.60	5.074			
2,512.00	2,511.76	2,503.36	2,501.76	4.61	5.38	-68.31	39.67	-51.46	48.22	38.26	9.96	4.840			
2,597.00	2,596.75	2,588.35	2,586.75	4.79	5.57	-65.38	39.67	-51.46	47.69	37.36	10.32	4.619			
2,683.00	2,682.73	2,674.33	2,672.73	4.97	5.76	-46.11	39.67	-51.46	46.61	35.93	10.69	4.361			
2,768.00	2,767.71	2,759.31	2,757.71	5.14	5.94	-66.96	39.67	-51.46	45.55	34.49	11.05	4.122			
2,854.00	2,853.69	2,845.29	2,843.69	5.32	6.13	-73.72	39.67	-51.46	44.98	33.57	11.41	3.941			
2,940.00	2,939.68	2,931.27	2,929.68	5.50	6.32	-58.41	39.67	-51.46	44.26	32.48	11.78	3.757			
3,025.00	3,024.65	3,016.25	3,014.65	5.68	6.51	-59.32	39.67	-51.46	43.15	31.00	12.14	3.553			
3,111.00	3,110.61	3,102.21	3,100.61	5.86	6.70	-59.59	39.67	-51.46	41.85	29.33	12.51	3.344			
3,197.00	3,196.58	3,188.17	3,186.58	6.04	6.89	-39.09	39.67	-51.46	40.30	27.42	12.88	3.128			
3,281.00	3,280.55	3,272.15	3,270.55	6.22	7.07	-23.09	39.67	-51.46	38.84	25.40	13.24	2.918			
3,367.00	3,366.53	3,358.13	3,356.53	6.40	7.26	-9.04	39.67	-51.46	36.92	23.31	13.61	2.712			
3,418.00	3,417.52	3,409.12	3,407.52	6.51	7.38	4.29	39.67	-51.46	35.91	22.07	13.83	2.598			
3,551.00	3,550.50	3,542.09	3,540.50	6.79	7.67	-9.12	39.67	-51.46	33.26	18.85	14.41	2.308			
3,608.30	3,607.79	3,599.39	3,597.79	6.91	7.80	-89.99	39.67	-51.46	32.67	18.01	14.65	2.229 CC, ES			
3,637.00	3,636.49	3,628.09	3,626.49	6.97	7.88	-148.16	39.67	-51.46	32.82	18.04	14.77	2.221 SF			
3,723.00	3,722.49	3,714.08	3,712.49	7.15	8.05	-149.10	39.67	-51.46	33.71	18.57	15.14	2.226			
3,808.00	3,807.46	3,799.06	3,797.46	7.32	8.24	-174.09	39.67	-51.46	35.56	20.06	15.50	2.294			
3,893.00	3,892.41	3,884.01	3,882.41	7.50	8.43	178.16	39.67	-51.46	38.59	22.73	15.86	2.433			
3,979.00	3,978.38	3,969.98	3,968.38	7.67	8.62	148.87	39.67	-51.46	40.63	24.38	16.25	2.501			
4,065.00	4,064.38	4,055.97	4,054.38	7.85	8.81	118.87	39.67	-51.46	41.12	24.50	16.62	2.474			
4,150.00	4,149.37	4,140.97	4,139.37	8.03	9.00	169.43	39.67	-51.46	41.96	24.97	16.99	2.470			
4,236.00	4,235.35	4,226.95	4,225.35	8.21	9.20	175.53	39.67	-51.46	43.82	26.47	17.35	2.525			
4,321.00	4,320.31	4,311.91	4,310.31	8.39	9.38	175.97	39.67	-51.46	46.33	28.62	17.72	2.615			
4,407.00	4,406.25	4,397.85	4,396.25	8.57	9.58	173.15	39.67	-51.46	49.62	31.54	18.08	2.744			
4,493.00	4,492.20	4,483.80	4,482.20	8.74	9.77	157.15	39.67	-51.46	52.45	33.98	18.47	2.840			
4,578.00	4,577.18	4,568.78	4,567.18	8.92	9.96	133.48	39.67	-51.46	54.01	35.18	18.84	2.867			
4,664.00	4,663.17	4,654.77	4,653.17	9.10	10.15	-136.94	39.67	-51.46	54.86	35.64	19.21	2.855			
4,729.00	4,728.17	4,719.76	4,718.17	9.24	10.29	-97.59	39.67	-51.46	55.10	35.60	19.49	2.826			
4,797.00	4,796.15	4,787.75	4,786.15	9.38	10.45	-105.21	39.67	-51.46	55.38	35.57	19.79	2.798			

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



Phoenix Technology Services Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset-TVD Reference: Offset Datum

Offset Design Crow Federal - #14H - Wellbore #1 / Job #1210352 - 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		Distance		Minimum		Separation		Warning				
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation	Factor	Factor	
Depth	Depth	Depth	Depth	(usft)	(usft)	(ft)	H/S (usft)	E/W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor	Factor	
4,829.00	4,828.15	4,819.74	4,818.15	9.45	10.52	-116.21	39.67	-51.46	55.62	35.70	19.92	2.792	2.792	
4,861.00	4,860.12	4,851.72	4,850.12	9.51	10.59	-140.10	39.67	-51.46	56.46	36.41	20.05	2.816	2.816	
4,893.00	4,891.93	4,883.53	4,881.93	9.58	10.66	-148.97	39.67	-51.46	59.28	39.22	20.04	2.957	2.957	
4,925.00	4,923.27	4,914.87	4,913.27	9.65	10.73	-152.70	39.67	-51.46	64.89	44.97	19.92	3.257	3.257	
4,957.00	4,955.82	4,945.41	4,943.82	9.73	10.80	-153.40	39.67	-51.46	73.42	53.80	19.62	3.743	3.743	
4,989.00	4,988.42	4,975.01	4,973.42	9.81	10.86	-157.08	39.67	-51.46	84.59	65.25	19.34	4.374	4.374	
5,021.00	5,012.05	5,003.64	5,002.05	9.88	10.93	-160.28	39.67	-51.46	98.07	79.19	18.88	5.194	5.194	
5,053.00	5,039.51	5,031.11	5,029.51	9.96	10.99	-162.88	39.67	-51.46	113.85	95.45	18.40	6.188	6.188	
5,085.00	5,065.87	5,057.46	5,055.87	10.07	11.05	-164.61	39.67	-51.46	131.49	113.51	17.98	7.313	7.313	
5,117.00	5,090.78	5,082.38	5,080.78	10.21	11.10	-165.13	39.67	-51.46	151.13	133.91	17.22	8.776	8.776	
5,149.00	5,113.83	5,105.43	5,103.83	10.37	11.16	-163.73	39.67	-51.46	172.88	156.31	16.57	10.433	10.433	
5,181.00	5,134.90	5,126.50	5,124.90	10.57	11.20	-163.80	39.67	-51.46	196.52	180.74	15.78	12.452	12.452	
5,213.00	5,153.80	5,145.39	5,143.80	10.81	11.24	-162.30	39.67	-51.46	221.93	206.81	15.12	14.682	14.682	
5,245.00	5,170.54	5,162.13	5,160.54	11.10	11.28	-163.47	39.67	-51.46	248.85	234.49	14.35	17.335	17.335	
5,277.00	5,185.28	5,176.88	5,175.28	11.45	11.31	-165.40	39.67	-51.46	277.00	263.42	13.58	20.394	20.394	
5,309.00	5,197.97	5,189.56	5,187.97	11.84	11.34	-163.86	39.67	-51.46	306.21	293.02	13.18	23.224	23.224	
5,341.00	5,208.65	5,200.24	5,198.65	12.28	11.37	-161.27	39.67	-51.46	336.20	322.97	13.24	25.399	25.399	
5,373.00	5,217.89	5,209.49	5,207.89	12.76	11.39	-159.83	39.67	-51.46	366.58	353.26	13.42	27.322	27.322	
5,405.00	5,226.42	5,218.02	5,216.42	13.28	11.41	-158.87	39.67	-51.46	397.37	383.64	13.73	28.951	28.951	
5,437.00	5,234.75	5,226.35	5,224.75	13.82	11.43	-159.62	39.67	-51.46	428.11	414.33	13.78	31.068	31.068	
5,469.00	5,242.39	5,233.98	5,232.39	14.40	11.44	-154.01	39.67	-51.46	459.03	443.98	15.05	30.494	30.494	
5,495.00	5,247.28	5,238.88	5,237.28	14.90	11.45	-149.79	39.67	-51.46	484.44	468.26	16.18	29.936	29.936	
5,518.00	5,250.44	5,242.04	5,240.44	15.35	11.46	-137.76	39.67	-51.46	507.11	487.47	19.64	25.825	25.825	
5,550.00	5,253.59	5,245.19	5,243.59	16.01	11.47	-131.89	39.67	-51.46	538.80	517.18	21.62	24.918	24.918	
5,584.00	5,257.36	5,248.96	5,247.36	18.08	11.48	-87.62	39.67	-51.46	634.33	604.80	29.53	21.482	21.482	
5,742.00	5,257.36	5,248.96	5,247.36	20.28	11.48	-92.74	39.67	-51.46	730.04	698.32	31.71	23.020	23.020	
5,838.00	5,258.11	5,249.71	5,248.11	22.57	11.48	-103.84	39.67	-51.46	825.85	792.68	33.17	24.895	24.895	
5,934.00	5,259.29	5,250.88	5,249.29	24.94	11.48	-107.21	39.67	-51.46	921.75	886.78	34.98	26.354	26.354	
6,030.00	5,260.21	5,251.81	5,250.21	27.38	11.48	-100.14	39.67	-51.46	1,017.67	979.38	38.30	26.574	26.574	
6,126.00	5,260.96	5,252.56	5,250.96	29.82	11.48	-134.30	39.67	-51.46	1,113.64	1,082.60	31.04	35.876	35.876	
6,222.00	5,261.63	5,253.23	5,251.63	32.31	11.49	107.20	39.67	-51.46	1,209.64	1,167.59	42.04	28.772	28.772	
6,318.00	5,263.22	5,254.82	5,253.22	34.82	11.49	-147.25	39.67	-51.46	1,305.62	1,277.60	28.02	48.601	48.601	
6,413.00	5,267.12	5,258.72	5,257.12	37.32	11.50	-142.13	39.67	-51.46	1,400.49	1,368.11	32.37	43.259	43.259	
6,508.00	5,270.68	5,262.28	5,260.68	39.82	11.51	-107.48	39.67	-51.46	1,495.27	1,446.13	49.15	30.425	30.425	
6,603.00	5,272.43	5,264.02	5,262.43	42.35	11.51	-127.99	39.67	-51.46	1,590.16	1,546.49	43.67	36.410	36.410	
6,699.00	5,274.27	5,265.86	5,264.27	44.91	11.51	-151.76	39.67	-51.46	1,686.13	1,655.31	30.82	54.708	54.708	
6,794.00	5,276.84	5,268.43	5,266.84	47.46	11.52	-159.84	39.67	-51.46	1,781.09	1,754.58	26.51	67.179	67.179	
6,890.00	5,280.52	5,272.12	5,270.52	50.04	11.53	-158.63	39.67	-51.46	1,877.01	1,848.54	28.47	65.930	65.930	
6,986.00	5,283.54	5,275.14	5,273.54	52.62	11.53	-126.37	39.67	-51.46	1,972.94	1,920.02	52.91	37.288	37.288	
7,082.00	5,285.80	5,277.40	5,275.80	55.21	11.54	-126.79	39.67	-51.46	2,068.86	2,014.11	54.75	37.785	37.785	
7,178.00	5,287.89	5,279.49	5,277.89	57.80	11.54	-116.79	39.67	-51.46	2,164.78	2,102.20	62.58	34.691	34.691	
7,274.00	5,288.65	5,280.25	5,278.65	60.40	11.55	-95.56	39.67	-51.46	2,260.75	2,189.12	71.63	31.560	31.560	
7,370.00	5,289.07	5,280.66	5,279.07	63.01	11.55	-114.26	39.67	-51.46	2,356.74	2,288.18	68.55	34.378	34.378	
7,464.00	5,289.81	5,281.40	5,279.81	65.58	11.55	-113.53	39.67	-51.46	2,450.72	2,379.47	71.25	34.396	34.396	
7,560.00	5,290.06	5,281.65	5,280.06	68.17	11.55	75.25	39.67	-51.46	2,546.71	2,469.44	77.27	32.957	32.957	
7,656.00	5,290.06	5,281.65	5,280.06	70.79	11.55	110.47	39.67	-51.46	2,642.71	2,565.07	77.64	34.039	34.039	
7,752.00	5,290.39	5,281.99	5,280.39	73.40	11.55	172.70	39.67	-51.46	2,738.71	2,711.81	26.90	101.824	101.824	
7,849.00	5,290.90	5,282.50	5,280.90	76.05	11.55	151.04	39.67	-51.46	2,835.70	2,787.57	48.13	58.916	58.916	
7,945.00	5,292.07	5,283.67	5,282.07	78.67	11.55	-121.14	39.67	-51.46	2,931.68	2,853.33	78.35	37.416	37.416	
8,041.00	5,293.58	5,285.18	5,283.58	81.29	11.56	-131.21	39.67	-51.46	3,027.65	2,955.62	72.03	42.033	42.033	
8,137.00	5,294.67	5,286.27	5,284.67	83.91	11.56	-122.43	39.67	-51.46	3,123.63	3,041.74	81.89	38.144	38.144	
8,232.00	5,294.67	5,286.27	5,284.67	86.51	11.56	2.81	39.67	-51.46	3,218.63	3,190.13	28.50	112.931	112.931	

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



Phoenix Technology Services

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Offset Design Crow Federal - #14H - Wellbore #1 / Job #1210352 - 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 (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,328.00	5,293.50	5,285.09	5,283.50	89.14	11.58	38.42	39.67	-51.46	3,314.62	3,248.14	66.48	49.858	
8,424.00	5,293.08	5,284.67	5,283.08	91.76	11.56	135.16	39.67	-51.46	3,410.61	3,334.61	75.99	44.880	
8,521.00	5,294.69	5,286.28	5,284.69	94.42	11.56	152.48	39.67	-51.46	3,507.59	3,451.52	56.07	62.553	
8,617.00	5,297.79	5,289.38	5,287.79	97.05	11.57	152.29	39.67	-51.46	3,603.52	3,545.88	57.67	62.488	
8,713.00	5,301.30	5,292.90	5,291.30	99.68	11.57	173.24	39.67	-51.46	3,699.45	3,665.27	34.18	108.245	
8,809.00	5,304.32	5,295.92	5,294.32	102.31	11.58	-157.65	39.67	-51.46	3,795.40	3,742.72	52.68	72.045	
8,905.00	5,306.58	5,298.18	5,296.58	104.94	11.59	-158.02	39.67	-51.46	3,891.37	3,838.02	53.35	72.946	
9,001.00	5,308.93	5,300.52	5,298.93	107.57	11.59	-151.38	39.67	-51.46	3,987.33	3,923.02	64.31	62.000	
9,098.00	5,311.04	5,302.64	5,301.04	110.23	11.60	-119.75	39.67	-51.46	4,084.29	3,977.22	107.07	38.146	
9,194.00	5,312.80	5,304.40	5,302.80	112.85	11.60	-118.88	39.67	-51.46	4,180.22	4,070.06	110.16	37.948	
9,290.00	5,314.56	5,306.16	5,304.56	115.48	11.60	-121.33	39.67	-51.46	4,276.15	4,166.08	110.07	38.849	
9,386.00	5,315.48	5,307.08	5,305.48	118.11	11.61	-103.14	39.67	-51.46	4,372.12	4,245.58	126.54	34.550	
9,482.00	5,316.82	5,308.42	5,306.82	120.74	11.61	-129.90	39.67	-51.46	4,468.08	4,363.87	104.22	42.873	
9,578.00	5,319.75	5,311.35	5,309.75	123.37	11.62	-152.89	39.67	-51.46	4,564.01	4,493.88	70.15	65.057	
9,674.00	5,324.28	5,315.87	5,314.28	125.99	11.63	-164.20	39.67	-51.46	4,659.89	4,607.09	52.80	88.255	
9,710.00	5,326.38	5,317.98	5,316.38	126.98	11.63	-162.58	39.67	-51.46	4,695.82	4,640.16	55.67	84.356	
9,765.00	5,329.74	5,321.33	5,319.74	128.48	11.64	-162.77	39.67	-51.46	4,750.71	4,694.75	55.96	84.899	



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #15H - OH / Job #1310461 - Plan #2 04-18-13											Offset Site Error: 0.00 usft		
Survey Program: 0-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)	+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	-0.38	105.00	-0.70	108.42				
629.00	628.99	601.99	601.99	0.70	1.23	127.17	105.00	-0.70	108.31	104.39	1.92	55.298	
715.00	714.99	687.99	687.99	0.88	1.42	131.92	105.00	-0.70	108.70	104.40	2.30	46.440	
800.00	799.99	772.99	772.99	1.05	1.81	118.38	105.00	-0.70	107.04	104.38	2.66	40.274	
886.00	885.99	858.99	858.99	1.23	1.80	132.67	105.00	-0.70	107.43	104.40	3.03	35.446	
972.00	971.98	944.98	944.98	1.42	2.00	143.38	105.00	-0.70	108.11	104.69	3.41	31.670	
1,057.00	1,056.98	1,029.98	1,029.98	1.59	2.19	153.75	105.00	-0.70	108.92	105.14	3.78	28.824	
1,143.00	1,142.97	1,115.97	1,115.97	1.77	2.38	138.93	105.00	-0.70	109.72	105.58	4.15	26.461	
1,228.00	1,227.96	1,200.96	1,200.96	1.95	2.57	124.76	105.00	-0.70	110.58	106.06	4.52	24.453	
1,314.00	1,313.95	1,286.95	1,286.95	2.13	2.77	127.22	105.00	-0.70	111.50	106.81	4.89	22.792	
1,399.00	1,398.93	1,371.93	1,371.93	2.30	2.96	97.27	105.00	-0.70	112.06	106.81	5.25	21.332	
1,485.00	1,484.92	1,457.92	1,457.92	2.47	3.15	78.85	105.00	-0.70	112.02	106.40	5.62	19.928	
1,570.00	1,569.90	1,542.90	1,542.90	2.65	3.34	76.66	105.00	-0.70	111.67	105.69	5.98	18.664	
1,656.00	1,655.88	1,628.88	1,628.88	2.82	3.53	62.96	105.00	-0.70	111.11	104.75	6.35	17.491	
1,742.00	1,741.87	1,714.87	1,714.87	3.00	3.73	73.08	105.00	-0.70	110.47	103.74	6.73	16.421	
1,827.00	1,826.84	1,799.84	1,799.84	3.19	3.92	75.38	105.00	-0.70	109.93	102.82	7.10	15.476	
1,913.00	1,912.81	1,885.81	1,885.81	3.37	4.11	68.80	105.00	-0.70	109.24	101.78	7.48	14.606	
1,998.55	1,998.44	1,962.44	1,962.44	3.53	4.28	90.00	105.00	-0.70	108.87	101.06	7.81	13.940	
1,998.00	1,997.79	1,970.79	1,970.79	3.55	4.30	93.33	105.00	-0.70	108.88	101.03	7.85	13.878	
2,084.00	2,083.79	2,056.79	2,056.79	3.72	4.50	107.61	105.00	-0.70	109.04	100.82	8.22	13.269	
2,169.00	2,168.78	2,141.78	2,141.78	3.90	4.69	108.59	105.00	-0.70	109.34	100.75	8.59	12.733	
2,255.00	2,254.77	2,227.77	2,227.77	4.08	4.88	78.98	105.00	-0.70	109.43	100.47	8.96	12.211	
2,341.00	2,340.77	2,313.77	2,313.77	4.26	5.07	59.97	105.00	-0.70	109.18	99.85	9.33	11.700	
2,426.00	2,425.77	2,398.77	2,398.77	4.43	5.26	-3.61	105.00	-0.70	108.59	98.89	9.70	11.198	
2,512.00	2,511.76	2,484.76	2,484.76	4.61	5.46	-21.23	105.00	-0.70	107.65	97.68	10.07	10.693	
2,597.00	2,596.75	2,569.75	2,569.75	4.79	5.65	-17.06	105.00	-0.70	106.38	95.95	10.43	10.196	
2,683.00	2,682.73	2,655.73	2,655.73	4.97	5.84	3.95	105.00	-0.70	104.55	93.74	10.81	9.675	
2,768.00	2,767.71	2,740.71	2,740.71	5.14	6.03	-15.04	105.00	-0.70	102.65	91.48	11.18	9.186	
2,854.00	2,853.69	2,826.69	2,826.69	5.32	6.23	-20.11	105.00	-0.70	101.08	89.53	11.55	8.754	
2,940.00	2,939.68	2,912.68	2,912.68	5.50	6.42	-2.99	105.00	-0.70	99.40	87.48	11.92	8.340	
3,025.00	3,024.65	2,997.65	2,997.65	5.68	6.61	-1.54	105.00	-0.70	97.25	84.96	12.29	7.915	
3,111.00	3,110.61	3,083.61	3,083.61	5.86	6.80	1.16	105.00	-0.70	94.70	82.04	12.66	7.480	
3,197.00	3,196.58	3,169.58	3,169.58	6.04	7.00	24.57	105.00	-0.70	92.32	79.29	13.04	7.061	
3,281.00	3,280.55	3,253.55	3,253.55	6.22	7.19	42.73	105.00	-0.70	90.68	77.27	13.40	6.765	
3,367.00	3,366.53	3,339.53	3,339.53	6.40	7.38	58.41	105.00	-0.70	89.54	75.76	13.78	6.498	
3,418.00	3,417.52	3,390.52	3,390.52	6.51	7.49	72.40	105.00	-0.70	89.11	75.11	14.00	6.364	
3,551.00	3,550.50	3,523.50	3,523.50	6.79	7.79	60.77	105.00	-0.70	88.05	73.47	14.58	6.038	
3,637.00	3,636.49	3,609.49	3,609.49	6.97	7.99	-77.36	105.00	-0.70	87.49	72.54	14.95	5.851	
3,723.00	3,722.49	3,695.49	3,695.49	7.15	8.18	-78.03	105.00	-0.70	87.27	71.95	15.32	5.695	
3,744.85	3,744.33	3,717.33	3,717.33	7.19	8.23	-90.00	105.00	-0.70	87.24	71.82	15.42	5.658 CC	
3,808.00	3,807.46	3,780.46	3,780.46	7.32	8.37	-103.56	105.00	-0.70	87.48	71.79	15.69	5.578 ES	
3,893.00	3,892.41	3,865.41	3,865.41	7.50	8.56	-113.02	105.00	-0.70	88.45	72.40	16.05	5.510	
3,979.00	3,978.38	3,951.38	3,951.38	7.67	8.75	-143.88	105.00	-0.70	89.47	73.05	16.43	5.447	
4,065.00	4,064.38	4,037.38	4,037.38	7.85	8.95	-174.67	105.00	-0.70	90.06	73.26	16.80	5.361	
4,150.00	4,149.37	4,122.37	4,122.37	8.03	9.14	-124.96	105.00	-0.70	90.71	73.54	17.17	5.284	
4,236.00	4,235.35	4,208.35	4,208.35	8.21	9.33	-120.15	105.00	-0.70	91.70	74.16	17.54	5.229	
4,321.00	4,320.31	4,293.31	4,293.31	8.39	9.52	-121.29	105.00	-0.70	92.99	75.08	17.90	5.193	
4,407.00	4,406.25	4,379.25	4,379.25	8.57	9.72	-126.15	105.00	-0.70	94.83	76.66	18.27	5.189	
4,493.00	4,492.20	4,465.20	4,465.20	8.74	9.91	-144.14	105.00	-0.70	96.80	78.15	18.65	5.191	
4,578.00	4,577.18	4,550.18	4,550.18	8.92	10.10	-169.40	105.00	-0.70	98.52	79.50	19.02	5.181	
4,664.00	4,663.17	4,636.17	4,636.17	9.10	10.29	-80.57	105.00	-0.70	99.35	79.96	19.39	5.123	
4,729.00	4,728.17	4,701.17	4,701.17	9.24	10.44	-40.82	105.00	-0.70	98.89	79.21	19.67	5.026	

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



Phoenix Technology Services Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset: TVD Reference:	Offset Datum

Offset Design: Crow Federal - #15H - OH / Job #1310461 - Plan #2 04-18-13												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
4,797.00	4,798.15	4,769.15	4,769.15	9.38	10.59	-47.65	105.00	-0.70	97.98	77.99	19.97	4.906	
4,829.00	4,828.15	4,801.15	4,801.15	9.45	10.66	-58.29	105.00	-0.70	97.53	77.42	20.11	4.850	
4,861.00	4,860.12	4,833.12	4,833.12	9.51	10.74	-82.00	105.00	-0.70	97.20	76.85	20.25	4.800	
4,885.87	4,884.87	4,857.87	4,857.87	9.57	10.79	-90.00	105.00	-0.70	97.09	76.74	20.35	4.770	
4,893.00	4,891.93	4,864.93	4,864.93	9.58	10.81	-91.25	105.00	-0.70	97.10	76.72	20.39	4.763	
4,925.00	4,923.27	4,896.27	4,896.27	9.66	10.88	-96.14	105.00	-0.70	97.54	77.03	20.52	4.754 SF	
4,957.00	4,953.82	4,926.82	4,926.82	9.73	10.95	-99.21	105.00	-0.70	98.85	78.21	20.63	4.791	
4,989.00	4,983.42	4,956.42	4,956.42	9.81	11.01	-105.73	105.00	-0.70	101.69	80.99	20.89	4.914	
5,021.00	5,012.05	4,985.05	4,985.05	9.88	11.08	-112.39	105.00	-0.70	106.86	86.21	20.65	5.174	
5,053.00	5,039.51	5,012.51	5,012.51	9.96	11.14	-118.69	105.00	-0.70	114.87	94.37	20.50	5.604	
5,085.00	5,065.87	5,038.87	5,038.87	10.07	11.20	-124.14	105.00	-0.70	125.70	105.42	20.28	6.199	
5,117.00	5,090.78	5,063.78	5,063.78	10.21	11.25	-127.78	105.00	-0.70	139.40	119.47	19.93	6.994	
5,149.00	5,113.83	5,086.83	5,086.83	10.37	11.31	-129.51	105.00	-0.70	155.90	136.24	19.66	7.930	
5,181.00	5,134.90	5,107.90	5,107.90	10.57	11.35	-131.58	105.00	-0.70	175.00	155.71	19.29	9.070	
5,213.00	5,153.80	5,126.80	5,126.80	10.81	11.40	-131.85	105.00	-0.70	196.55	177.44	19.11	10.285	
5,245.00	5,170.54	5,143.54	5,143.54	11.10	11.43	-133.47	105.00	-0.70	220.27	201.45	18.82	11.705	
5,277.00	5,185.28	5,158.28	5,158.28	11.45	11.47	-135.00	105.00	-0.70	245.94	227.38	18.57	13.246	
5,309.00	5,197.97	5,170.97	5,170.97	11.84	11.50	-133.23	105.00	-0.70	273.15	254.25	18.90	14.454	
5,341.00	5,208.65	5,181.66	5,181.65	12.28	11.52	-130.86	105.00	-0.70	301.45	281.95	19.50	15.458	
5,373.00	5,217.89	5,190.89	5,190.89	12.76	11.54	-130.00	105.00	-0.70	330.47	310.50	19.96	16.553	
5,405.00	5,226.42	5,199.42	5,199.42	13.28	11.56	-130.54	105.00	-0.70	359.89	339.66	20.23	17.789	
5,437.00	5,234.75	5,207.75	5,207.75	13.82	11.58	-132.61	105.00	-0.70	389.53	369.33	20.20	19.281	
5,469.00	5,242.39	5,215.39	5,215.39	14.40	11.60	-127.93	105.00	-0.70	419.45	397.87	21.58	19.433	
5,495.00	5,247.28	5,220.28	5,220.28	14.90	11.61	-122.19	105.00	-0.70	444.13	420.99	23.14	19.196	
5,518.00	5,250.44	5,223.44	5,223.44	15.35	11.61	-114.05	105.00	-0.70	466.20	441.22	24.98	18.662	
5,550.00	5,253.59	5,226.59	5,226.59	16.01	11.62	-109.34	105.00	-0.70	497.13	470.84	26.29	18.910	
5,546.00	5,257.38	5,230.36	5,230.36	18.08	11.63	-89.01	105.00	-0.70	590.85	561.15	29.70	19.895	
5,742.00	5,257.36	5,230.36	5,230.36	20.28	11.63	-91.16	105.00	-0.70	685.22	653.33	31.89	21.484	
5,838.00	5,258.11	5,231.11	5,231.11	22.57	11.63	-95.12	105.00	-0.70	780.10	746.02	34.08	22.891	
5,934.00	5,259.28	5,232.29	5,232.29	24.94	11.63	-96.00	105.00	-0.70	875.33	838.94	36.39	24.052	
6,030.00	5,260.21	5,233.21	5,233.21	27.36	11.64	-93.70	105.00	-0.70	970.73	931.81	38.92	24.942	
6,126.00	5,260.96	5,233.96	5,233.96	29.82	11.64	-96.97	105.00	-0.70	1,066.35	1,025.18	41.17	25.903	
6,222.00	5,261.63	5,234.63	5,234.63	32.31	11.64	-97.41	105.00	-0.70	1,162.19	1,118.61	43.58	26.668	
6,318.00	5,263.22	5,236.22	5,236.22	34.82	11.64	-111.60	105.00	-0.70	1,258.02	1,214.46	43.56	28.880	
6,413.00	5,267.12	5,240.12	5,240.12	37.32	11.65	-120.63	105.00	-0.70	1,352.63	1,309.78	42.85	31.568	
6,508.00	5,270.68	5,243.68	5,243.68	39.82	11.66	-100.54	105.00	-0.70	1,447.07	1,396.41	50.65	28.567	
6,603.00	5,272.43	5,245.43	5,245.43	42.35	11.66	-104.00	105.00	-0.70	1,541.68	1,489.13	52.55	29.338	
6,699.00	5,274.27	5,247.27	5,247.27	44.91	11.67	-113.37	105.00	-0.70	1,637.50	1,585.12	52.38	31.260	
6,794.00	5,276.84	5,249.84	5,249.84	47.46	11.67	-122.33	105.00	-0.70	1,732.34	1,681.46	50.88	34.044	
6,890.00	5,280.52	5,253.52	5,253.52	50.04	11.68	-130.12	105.00	-0.70	1,828.14	1,778.42	48.72	37.522	
6,986.00	5,283.54	5,256.54	5,256.54	52.62	11.69	-106.75	105.00	-0.70	1,923.94	1,862.12	61.82	31.123	
7,082.00	5,285.80	5,258.80	5,258.80	55.21	11.69	-112.30	105.00	-0.70	2,019.71	1,957.38	62.33	32.405	
7,178.00	5,287.89	5,260.89	5,260.89	57.80	11.70	-103.37	105.00	-0.70	2,115.48	2,047.71	67.77	31.216	
7,274.00	5,288.65	5,261.65	5,261.65	60.40	11.70	-92.10	105.00	-0.70	2,211.34	2,139.29	72.06	30.689	
7,370.00	5,289.07	5,262.07	5,262.07	63.01	11.70	-99.03	105.00	-0.70	2,307.24	2,233.39	73.85	31.241	
7,464.00	5,289.81	5,262.81	5,262.81	65.56	11.70	-100.44	105.00	-0.70	2,401.14	2,325.06	76.08	31.561	
7,560.00	5,290.06	5,263.06	5,263.06	68.17	11.70	-74.86	105.00	-0.70	2,497.09	2,419.70	77.39	32.265	
7,656.00	5,290.06	5,263.06	5,263.06	70.79	11.70	-102.35	105.00	-0.70	2,593.08	2,512.37	80.71	32.129	
7,752.00	5,290.39	5,263.39	5,263.39	73.40	11.70	-98.29	105.00	-0.70	2,689.06	2,604.79	84.27	31.909	
7,849.00	5,290.90	5,263.90	5,263.90	76.05	11.70	-109.53	105.00	-0.70	2,786.04	2,702.93	83.11	33.524	
7,945.00	5,292.07	5,265.07	5,265.07	78.67	11.71	-108.66	105.00	-0.70	2,881.96	2,795.97	85.99	33.515	
8,041.00	5,293.58	5,266.58	5,266.58	81.29	11.71	-110.19	105.00	-0.70	2,977.85	2,890.11	87.74	33.939	

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



Phoenix Technology Services

Anticollision Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3925.00usft (Capstar 114)
Reference Site:	Crow Federal	MD Reference:	KB @ 3925.00usft (Capstar 114)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	OH / Job #1310298	Database:	GCR DB
Reference Design:	Survey: Phoenix MWD Surveys	Offset TVD Reference:	Offset Datum

Offset Design: Crow Federal - #15H - OH / Job #1310461 - Plan #2 04-18-13											Offset Site Error:	0.00 usft
Survey Program: 0-MWD											Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset	Between	Between	Minimum	Separation	
Depth	Depth	Depth	Depth	Reference	Offset	Toolface	Wellbore	Centres	Ellipses	Separation	Factor	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)		
8,137.00	5,294.67	5,267.67	5,267.67	83.91	11.71	-103.98	105.00	-0.70	3,073.78	2,980.78	93.00	33.050
8,232.00	5,294.67	5,267.67	5,267.67	86.51	11.71	-66.68	105.00	-0.70	3,168.75	3,077.79	90.96	34.838
8,328.00	5,293.50	5,266.50	5,266.50	89.14	11.71	-25.84	105.00	-0.70	3,264.73	3,213.41	51.31	63.623
8,424.00	5,293.08	5,266.08	5,266.08	91.76	11.71	-119.08	105.00	-0.70	3,360.72	3,269.21	91.52	36.723
8,521.00	5,294.69	5,267.69	5,267.69	94.42	11.71	-168.52	105.00	-0.70	3,457.70	3,421.26	36.44	94.875
8,617.00	5,297.79	5,270.79	5,270.79	97.06	11.72	177.44	105.00	-0.70	3,553.65	3,522.31	31.34	113.395
8,713.00	5,301.30	5,274.30	5,274.30	99.68	11.73	-158.38	105.00	-0.70	3,649.58	3,599.01	50.58	72.158
8,809.00	5,304.32	5,277.32	5,277.32	102.31	11.73	-133.92	105.00	-0.70	3,745.51	3,660.39	85.13	44.000
8,905.00	5,306.58	5,279.58	5,279.58	104.94	11.74	-127.72	105.00	-0.70	3,841.45	3,747.01	94.44	40.676
9,001.00	5,308.93	5,281.93	5,281.93	107.57	11.74	-132.09	105.00	-0.70	3,937.38	3,846.05	91.34	43.109
9,098.00	5,311.04	5,284.04	5,284.04	110.23	11.75	-108.94	105.00	-0.70	4,034.29	3,918.44	115.85	34.823
9,194.00	5,312.80	5,285.80	5,285.80	112.85	11.75	-111.69	105.00	-0.70	4,130.18	4,013.78	116.38	35.488
9,290.00	5,314.56	5,287.56	5,287.56	115.48	11.76	-109.96	105.00	-0.70	4,226.03	4,105.88	120.15	35.172
9,386.00	5,315.48	5,288.48	5,288.48	118.11	11.76	-97.93	105.00	-0.70	4,321.98	4,193.27	128.69	33.584
9,482.00	5,316.82	5,289.82	5,289.82	120.74	11.76	-118.40	105.00	-0.70	4,417.87	4,300.08	117.80	37.505
9,578.00	5,319.75	5,292.75	5,292.75	123.37	11.77	-138.35	105.00	-0.70	4,513.76	4,419.65	94.11	47.964
9,674.00	5,324.28	5,297.28	5,297.28	125.99	11.78	-151.76	105.00	-0.70	4,609.60	4,536.09	73.51	62.705
9,710.00	5,326.38	5,299.38	5,299.38	126.96	11.78	-151.44	105.00	-0.70	4,645.52	4,570.95	74.57	62.298
9,765.00	5,329.74	5,302.74	5,302.74	128.48	11.79	-151.73	105.00	-0.70	4,700.39	4,625.51	74.88	62.774



Phoenix Technology Services Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310288
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset-TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3925.00usft (Capstar 114)

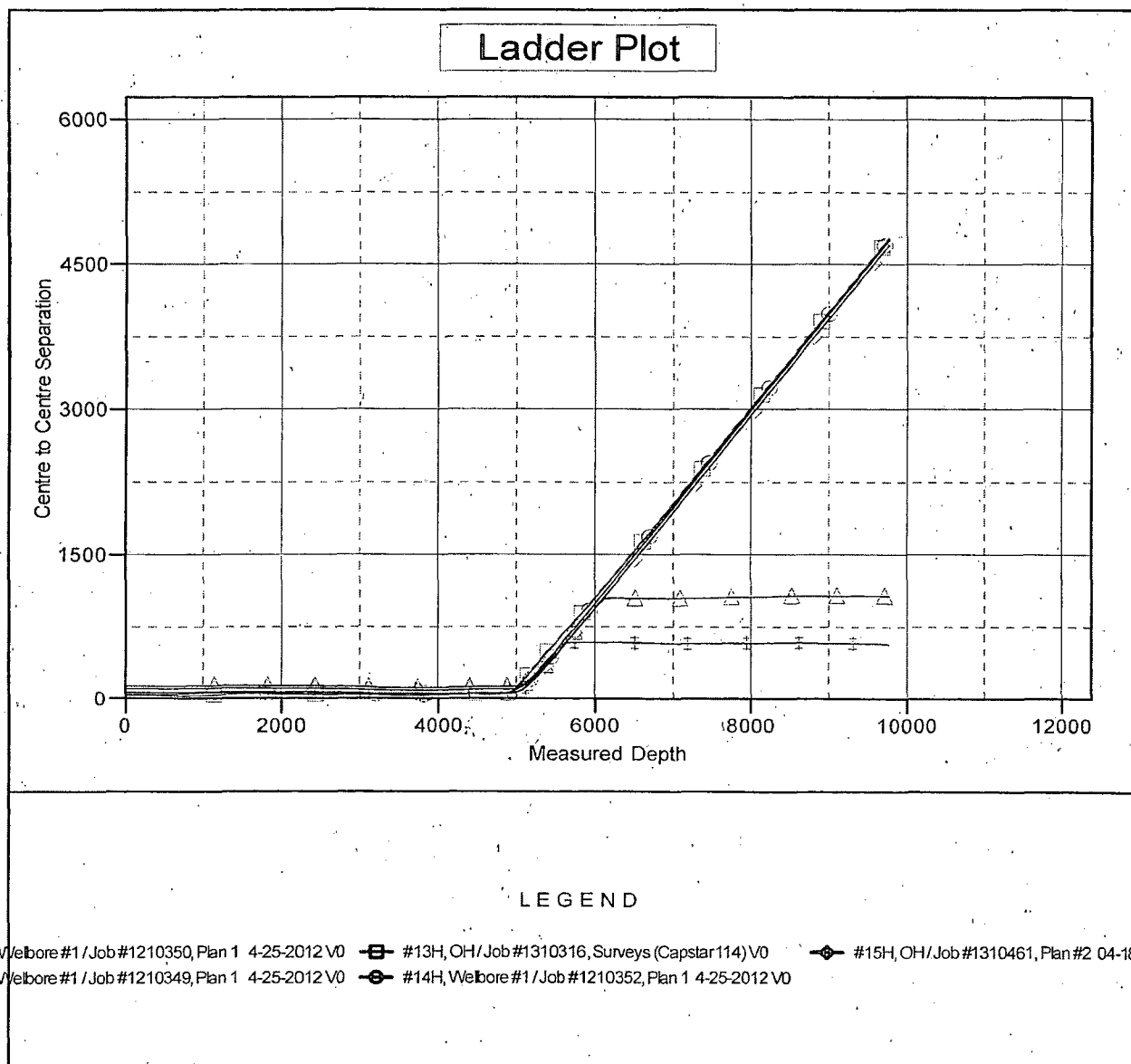
Offset Depths are relative to Offset Datum

Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: #10H

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

Grid Convergence at Surface is: 0.25°





Phoenix Technology Services
Anticollision Report



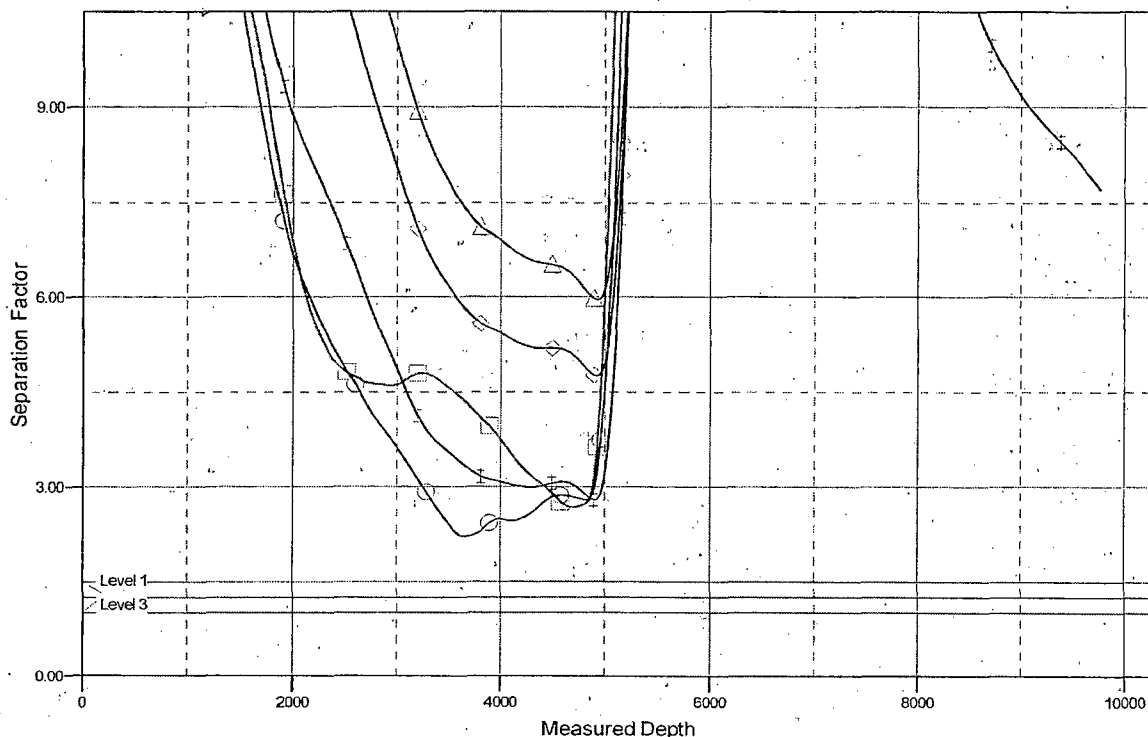
Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Crow Federal
Site Error: 0.00 usft
Reference Well: #10H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #1310298
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #10H
TVD Reference: KB @ 3925.00usft (Capstar 114)
MD Reference: KB @ 3925.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3925.00usft (Capstar 114)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: #10H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.25°

Separation Factor Plot



LEGEND

Wellbore #1 / Job #1210350, Plan 1 4-25-2012 V0 -#13H, OH / Job #1310316, Surveys (Capstar 114) V0 -#15H, OH / Job #1310461, Plan #2 04-18-13
Wellbore #1 / Job #1210349, Plan 1 4-25-2012 V0 -#14H, Wellbore #1 / Job #1210352, Plan 1 4-25-2012 V0

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

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, 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 30-15-40574		Pool Code 26770		Pool Name FREN; GLORIETA-YESO					
Property Code 308711		Property Name CROW FEDERAL						Well Number 10H	
OGRID No. 873		Operator Name APACHE CORPORATION						Elevation 3884'	
Surface Location									
UL or lot No. M	Section 10	Township 17-S	Range 31-E	Lot Idn	Feet from the 883	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 888	North/South line SOUTH	Feet from the 332	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 890	North/South line SOUTH	Feet from the 279	East/West line WEST	County EDDY
Dedicated Acres 160		Joint or Infill		Consolidation Code		Order No.			

GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=371130.9 N X=643906.8 E LAT.=32° 44' 14" N LONG.=103° 86' 47" W LAT.=32° 50' 39" N LONG.=103° 51' 53" W	GEODETIC COORDINATES NAD 27 NME FIRST TAKE POINT & KICK OFF POINT Y=671133.1 N X=644286.5 E LAT.=32° 44' 14" N LONG.=103° 86' 33" W LAT.=32° 50' 39" N LONG.=103° 51' 49" W	GEODETIC COORDINATES NAD 27 NME PENETRATION POINT Y=671137.9 N X=643936.0 E LAT.=32° 44' 16" N LONG.=103° 86' 47" W LAT.=32° 50' 39" N LONG.=103° 51' 53" W	GEODETIC COORDINATES NAD 27 NME LAST TAKE POINT Y=671167.6 N X=648378.3 E LAT.=32° 44' 19" N LONG.=103° 85' 02" W LAT.=32° 50' 39" N LONG.=103° 51' 01" 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. Signature: <i>[Signature]</i> Date: 02/03/2014 Printed Name: Fatima Vasquez E-mail Address: Fatima.Vasquez@apachecorp.com
CORNER COORDINATES TABLE A - Y=671567.1 N, X=643654.3 E B - Y=671606.0 N, X=648934.5 E C - Y=670246.2 N, X=643662.0 E D - Y=670286.2 N, X=638942.1 E				GEODETIC COORDINATES NAD 27 NME BOTTOM HOLE LOCATION Y=671171.8 N X=648604.9 E LAT.=32° 44' 20" N LONG.=103° 84' 47" W LAT.=32° 50' 39" 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: **12/19/2013**

Signature & Seal of Professional Surveyor: *[Signature]*

Certificate Number: **3239** Gary G. Eidson **12641**

BKL JWSC W.O.: 13.13.1414