



Apache Corporation

Eddy County, NM (NAD27 NME)
Cedar Lake Federal CA
#549H

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 03 2017

OH / Job #61008
Survey: Phoenix MWD Surveys

RECEIVED

30-015-43508

Anticollision Report

13 April, 2017

Please provide signature
page for directional survey



Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

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

Survey Program	Date 4/13/2017				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
601.00	9,490.00	Phoenix MWD Surveys (OH / Job #61008)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
NFE Federal COM						
#46H - OH / Job #1514748 - Surveys (Capstar 119)	4,924.38	9,827.00	547.47	387.23	3.417	CC, ES, SF
#47H - OH / Job #1610026 - Surveys (Capstar 119)	759.60	753.32	9.54	6.19	2.845	CC, ES
#47H - OH / Job #1610026 - Surveys (Capstar 119)	3,644.16	3,636.43	29.87	6.42	1.274	Level 3, SF
#48H - OH / Job #1514802 - Surveys (Capstar 119)	5,282.49	10,170.00	627.48	485.96	4.434	CC, ES
#48H - OH / Job #1514802 - Surveys (Capstar 119)	5,400.00	10,170.00	642.31	495.81	4.385	SF
#51H - OH - Plan 5 10-06-16	752.73	749.05	25.42	22.17	7.826	CC
#51H - OH - Plan 5 10-06-16	800.00	796.27	25.67	22.09	7.157	ES
#51H - OH - Plan 5 10-06-16	5,035.66	5,029.63	90.65	57.12	2.704	SF

Offset Design NFE Federal COM - #46H - OH / Job #1514748 - Surveys (Capstar 119)												Offset Site Error:	0.00 usft
Survey Program: 99-CB-GYRO-MS, 4225-PHX+MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
480.00	479.98	9,827.00	4,912.16	0.00	153.87	160.84	509.85	-168.75	4,464.74	4,315.96	148.78	30.009	
500.00	499.98	9,827.00	4,912.16	0.04	153.87	166.59	509.85	-168.75	4,444.91	4,296.90	148.02	30.030	
600.00	599.97	9,827.00	4,912.16	0.22	153.87	-58.11	509.85	-168.75	4,345.68	4,203.42	142.25	30.549	
700.00	699.95	9,827.00	4,912.16	0.57	153.87	-103.08	509.85	-168.75	4,246.41	4,111.04	135.38	31.367	
800.00	799.87	9,827.00	4,912.16	0.93	153.87	-126.69	509.85	-168.75	4,147.44	4,022.20	125.23	33.117	
900.00	899.67	9,827.00	4,912.16	1.30	153.87	-131.00	509.85	-168.75	4,048.77	3,929.23	119.54	33.870	
1,000.00	999.43	9,827.00	4,912.16	1.66	153.87	-129.79	509.85	-168.75	3,950.24	3,831.23	119.01	33.193	
1,100.00	1,099.21	9,827.00	4,912.16	2.03	153.87	-125.85	509.85	-168.75	3,851.67	3,731.46	120.22	32.040	
1,200.00	1,199.05	9,827.00	4,912.16	2.40	153.87	-111.56	509.85	-168.75	3,752.99	3,627.49	125.49	29.906	
1,300.00	1,298.97	9,827.00	4,912.16	2.76	153.87	-95.44	509.85	-168.75	3,654.15	3,523.14	131.01	27.891	
1,400.00	1,398.92	9,827.00	4,912.16	3.12	153.87	-86.81	509.85	-168.75	3,555.24	3,420.17	135.08	26.320	
1,500.00	1,498.89	9,827.00	4,912.16	3.47	153.87	-46.57	509.85	-168.75	3,456.34	3,313.55	142.79	24.206	
1,600.00	1,598.88	9,827.00	4,912.16	3.82	153.87	-23.45	509.85	-168.75	3,357.42	3,212.28	145.14	23.132	
1,700.00	1,698.87	9,827.00	4,912.16	4.15	153.87	45.37	509.85	-168.75	3,258.54	3,107.10	151.45	21.516	
1,800.00	1,798.85	9,827.00	4,912.16	4.49	153.87	53.35	509.85	-168.75	3,159.77	3,007.37	152.40	20.733	
1,900.00	1,898.83	9,827.00	4,912.16	4.82	153.87	90.26	509.85	-168.75	3,061.13	2,909.69	151.44	20.213	
2,000.00	1,998.83	9,827.00	4,912.16	5.16	153.87	161.21	509.85	-168.75	2,962.90	2,812.53	150.37	19.704	
2,100.00	2,098.81	9,827.00	4,912.16	5.49	153.87	150.49	509.85	-168.75	2,864.92	2,713.42	151.51	18.909	
2,200.00	2,198.80	9,827.00	4,912.16	5.83	153.87	155.06	509.85	-168.75	2,767.11	2,615.43	151.68	18.244	
2,300.00	2,298.79	9,827.00	4,912.16	6.18	153.87	163.69	509.85	-168.75	2,669.44	2,518.06	151.38	17.634	

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

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Survey Program: 99-CB-GYRO-MS, 4225-PHX+MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)										
2,400.00	2,398.77	9,827.00	4,912.16	6.52	153.87	156.52	509.85	-168.75	509.85	-168.75	2,571.95	2,419.69	152.26	16.891	
2,500.00	2,498.76	9,827.00	4,912.16	6.87	153.87	154.23	509.85	-168.75	509.85	-168.75	2,474.66	2,322.06	152.61	16.216	
2,600.00	2,598.75	9,827.00	4,912.16	7.21	153.87	141.65	509.85	-168.75	509.85	-168.75	2,377.54	2,224.35	153.19	15.520	
2,700.00	2,698.74	9,827.00	4,912.16	7.56	153.87	140.76	509.85	-168.75	509.85	-168.75	2,280.61	2,126.99	153.62	14.846	
2,800.00	2,798.73	9,827.00	4,912.16	7.91	153.87	138.04	509.85	-168.75	509.85	-168.75	2,183.92	2,030.22	153.69	14.210	
2,900.00	2,898.73	9,827.00	4,912.16	8.26	153.87	110.42	509.85	-168.75	509.85	-168.75	2,087.47	1,932.70	154.77	13.487	
3,000.00	2,998.72	9,827.00	4,912.16	8.60	153.87	119.40	509.85	-168.75	509.85	-168.75	1,991.33	1,836.31	155.01	12.846	
3,100.00	3,098.71	9,827.00	4,912.16	8.95	153.87	121.67	509.85	-168.75	509.85	-168.75	1,895.61	1,740.46	155.14	12.218	
3,200.00	3,198.70	9,827.00	4,912.16	9.30	153.87	107.81	509.85	-168.75	509.85	-168.75	1,800.27	1,644.27	156.00	11.540	
3,300.00	3,298.70	9,827.00	4,912.16	9.65	153.87	112.08	509.85	-168.75	509.85	-168.75	1,705.53	1,549.22	156.30	10.912	
3,400.00	3,398.69	9,827.00	4,912.16	10.00	153.87	106.91	509.85	-168.75	509.85	-168.75	1,611.40	1,454.54	156.86	10.273	
3,500.00	3,498.68	9,827.00	4,912.16	10.35	153.87	113.29	509.85	-168.75	509.85	-168.75	1,518.02	1,360.75	157.27	9.652	
3,600.00	3,598.66	9,827.00	4,912.16	10.70	153.87	108.40	509.85	-168.75	509.85	-168.75	1,425.61	1,267.99	157.62	9.045	
3,700.00	3,698.66	9,827.00	4,912.16	11.05	153.87	-57.33	509.85	-168.75	509.85	-168.75	1,334.09	1,177.90	156.19	8.542	
3,800.00	3,798.66	9,827.00	4,912.16	11.40	153.87	-33.72	509.85	-168.75	509.85	-168.75	1,243.72	1,087.14	156.57	7.943	
3,900.00	3,898.66	9,827.00	4,912.16	11.74	153.87	-15.03	509.85	-168.75	509.85	-168.75	1,154.86	997.88	156.98	7.357	
4,000.00	3,998.66	9,827.00	4,912.16	12.09	153.87	-4.04	509.85	-168.75	509.85	-168.75	1,067.90	910.50	157.40	6.785	
4,100.00	4,098.65	9,827.00	4,912.16	12.43	153.87	4.23	509.85	-168.75	509.85	-168.75	983.36	825.54	157.82	6.231	
4,200.00	4,198.65	9,827.00	4,912.16	12.78	153.87	9.59	509.85	-168.75	509.85	-168.75	901.99	743.79	158.20	5.701	
4,300.00	4,298.65	9,827.00	4,912.16	13.13	153.87	12.79	509.85	-168.75	509.85	-168.75	824.77	666.21	158.56	5.202	
4,400.00	4,398.65	9,827.00	4,912.16	13.48	153.87	5.37	509.85	-168.75	509.85	-168.75	752.99	594.12	158.87	4.740	
4,500.00	4,498.65	9,827.00	4,912.16	13.83	153.87	10.55	509.85	-168.75	509.85	-168.75	688.31	529.07	159.24	4.322	
4,600.00	4,598.65	9,827.00	4,912.16	14.18	153.87	8.50	509.85	-168.75	509.85	-168.75	632.86	473.27	159.59	3.966	
4,700.00	4,698.64	9,827.00	4,912.16	14.53	153.87	16.23	509.85	-168.75	509.85	-168.75	589.25	429.29	159.95	3.684	
4,800.00	4,798.64	9,827.00	4,912.16	14.88	153.87	9.68	509.85	-168.75	509.85	-168.75	560.26	399.95	160.31	3.495	
4,900.00	4,898.56	9,827.00	4,912.16	15.23	153.87	-81.32	509.85	-168.75	509.85	-168.75	547.92	387.69	160.23	3.420	
4,924.38	4,922.82	9,827.00	4,912.16	15.31	153.87	-80.48	509.85	-168.75	509.85	-168.75	547.47	387.23	160.23	3.417	CC, ES, SF
5,000.00	4,997.28	9,827.00	4,912.16	15.58	153.87	-79.13	509.85	-168.75	509.85	-168.75	552.19	391.68	160.51	3.440	
5,100.00	5,092.32	9,827.00	4,912.16	15.93	153.87	-79.76	509.85	-168.75	509.85	-168.75	571.26	409.30	161.97	3.527	
5,200.00	5,179.98	9,827.00	4,912.16	16.31	153.87	-78.77	509.85	-168.75	509.85	-168.75	605.44	441.29	164.15	3.688	
5,300.00	5,258.11	9,827.00	4,912.16	16.73	153.87	-75.53	509.85	-168.75	509.85	-168.75	653.55	487.90	165.66	3.945	
5,400.00	5,321.32	9,827.00	4,912.16	17.26	153.87	-67.10	509.85	-168.75	509.85	-168.75	709.16	548.32	160.83	4.409	
5,500.00	5,364.73	9,827.00	4,912.16	17.94	153.87	-58.52	509.85	-168.75	509.85	-168.75	766.20	617.45	148.75	5.151	
5,600.00	5,385.43	9,827.00	4,912.16	18.79	153.87	-51.60	509.85	-168.75	509.85	-168.75	820.80	688.37	132.43	6.198	
5,700.00	5,387.82	9,827.00	4,912.16	19.78	153.87	-49.01	509.85	-168.75	509.85	-168.75	873.36	748.40	124.96	6.989	
5,800.00	5,385.47	9,827.00	4,912.16	20.94	153.87	-47.98	509.85	-168.75	509.85	-168.75	931.21	808.20	123.00	7.571	
5,900.00	5,381.83	9,827.00	4,912.16	22.24	153.87	-47.98	509.85	-168.75	509.85	-168.75	995.46	870.40	125.06	7.960	
6,000.00	5,378.56	9,827.00	4,912.16	23.68	153.87	-45.44	509.85	-168.75	509.85	-168.75	1,066.69	943.19	123.50	8.637	
6,100.00	5,376.39	9,827.00	4,912.16	25.24	153.87	-43.62	509.85	-168.75	509.85	-168.75	1,145.67	1,021.97	123.69	9.262	
6,200.00	5,375.01	9,827.00	4,912.16	26.89	153.87	-42.11	509.85	-168.75	509.85	-168.75	1,229.21	1,106.13	123.08	9.987	
6,300.00	5,374.10	9,827.00	4,912.16	28.63	153.87	-40.62	509.85	-168.75	509.85	-168.75	1,316.05	1,194.98	121.06	10.871	
6,400.00	5,371.04	9,827.00	4,912.16	30.43	153.87	-38.40	509.85	-168.75	509.85	-168.75	1,404.05	1,286.65	117.41	11.959	
6,500.00	5,367.76	9,827.00	4,912.16	32.29	153.87	-36.09	509.85	-168.75	509.85	-168.75	1,494.21	1,379.84	114.38	13.064	
6,600.00	5,364.87	9,827.00	4,912.16	34.19	153.87	-30.52	509.85	-168.75	509.85	-168.75	1,586.40	1,482.31	104.08	15.242	
6,700.00	5,363.85	9,827.00	4,912.16	36.13	153.87	-23.58	509.85	-168.75	509.85	-168.75	1,681.01	1,591.44	89.58	18.766	
6,800.00	5,365.06	9,827.00	4,912.16	38.11	153.87	-15.50	509.85	-168.75	509.85	-168.75	1,777.37	1,704.87	72.50	24.516	
6,900.00	5,366.99	9,827.00	4,912.16	40.10	153.87	-5.13	509.85	-168.75	509.85	-168.75	1,874.60	1,818.30	56.30	33.295	
7,000.00	5,367.79	9,827.00	4,912.16	42.11	153.87	-4.01	509.85	-168.75	509.85	-168.75	1,971.92	1,915.88	56.05	35.184	
7,100.00	5,368.89	9,827.00	4,912.16	44.15	153.87	0.55	509.85	-168.75	509.85	-168.75	2,069.58	2,014.34	55.24	37.463	
7,200.00	5,371.11	9,827.00	4,912.16	46.21	153.87	-4.14	509.85	-168.75	509.85	-168.75	2,167.66	2,109.84	57.83	37.484	
7,300.00	5,373.97	9,827.00	4,912.16	48.31	153.87	-3.42	509.85	-168.75	509.85	-168.75	2,266.03	2,208.03	58.00	39.067	
7,400.00	5,375.16	9,827.00	4,912.16	50.42	153.87	-3.93	509.85	-168.75	509.85	-168.75	2,364.24	2,305.07	59.16	39.962	

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Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
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Database: Compass 5000 GCR
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Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
7,500.00	5,378.02	9,827.00	4,912.16	52.54	153.87	-5.72	509.85	-168.75	2,462.87	2,401.15	61.72	39.904		
7,600.00	5,379.97	9,827.00	4,912.16	54.69	153.87	-2.43	509.85	-168.75	2,561.46	2,501.73	59.72	42.890		
7,700.00	5,379.86	9,827.00	4,912.16	56.84	153.87	-2.76	509.85	-168.75	2,659.81	2,599.18	60.64	43.865		
7,800.00	5,380.61	9,827.00	4,912.16	59.01	153.87	-3.30	509.85	-168.75	2,758.43	2,696.60	61.83	44.610		
7,900.00	5,381.40	9,827.00	4,912.16	61.19	153.87	-3.93	509.85	-168.75	2,857.15	2,794.05	63.10	45.280		
8,000.00	5,384.17	9,827.00	4,912.16	63.38	153.87	-3.91	509.85	-168.75	2,956.23	2,892.31	63.92	46.249		
8,100.00	5,386.02	9,827.00	4,912.16	65.58	153.87	1.01	509.85	-168.75	3,055.26	2,992.24	63.02	48.482		
8,200.00	5,385.90	9,827.00	4,912.16	67.78	153.87	0.56	509.85	-168.75	3,154.07	3,090.39	63.67	49.534		
8,300.00	5,386.86	9,827.00	4,912.16	69.99	153.87	-3.40	509.85	-168.75	3,253.10	3,187.25	65.85	49.399		
8,400.00	5,388.57	9,827.00	4,912.16	72.21	153.87	-8.91	509.85	-168.75	3,352.28	3,278.59	73.69	45.494		
8,500.00	5,393.56	9,827.00	4,912.16	74.44	153.87	-15.44	509.85	-168.75	3,451.84	3,363.42	88.42	39.039		
8,600.00	5,397.80	9,827.00	4,912.16	76.67	153.87	-12.03	509.85	-168.75	3,551.34	3,469.84	81.50	43.574		
8,700.00	5,400.13	9,827.00	4,912.16	78.91	153.87	-9.50	509.85	-168.75	3,650.69	3,573.41	77.28	47.237		
8,800.00	5,400.75	9,827.00	4,912.16	81.15	153.87	-9.19	509.85	-168.75	3,749.88	3,672.34	77.53	48.364		
8,900.00	5,401.29	9,827.00	4,912.16	83.39	153.87	-14.66	509.85	-168.75	3,849.08	3,758.74	90.34	42.608		
9,000.00	5,402.18	9,827.00	4,912.16	85.64	153.87	-17.08	509.85	-168.75	3,948.34	3,850.82	97.52	40.486		
9,100.00	5,402.09	9,827.00	4,912.16	87.89	153.87	-16.02	509.85	-168.75	4,047.50	3,951.83	95.67	42.308		
9,200.00	5,401.19	9,827.00	4,912.16	90.15	153.87	-10.60	509.85	-168.75	4,146.62	4,062.85	83.77	49.501		
9,300.00	5,401.14	9,827.00	4,912.16	92.40	153.87	-12.84	509.85	-168.75	4,245.90	4,156.25	89.65	47.359		
9,400.00	5,401.22	9,827.00	4,912.16	94.66	153.87	-12.56	509.85	-168.75	4,345.22	4,255.30	89.92	48.321		
9,490.00	5,401.32	9,827.00	4,912.16	96.70	153.87	-6.51	509.85	-168.75	4,434.66	4,355.82	78.84	56.248		

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #47H - OH / Job #1610026 - Surveys (Capstar 119)													Offset Site Error:	0.00 usft
Survey Program: 100-PHX_SPT_GTD, 4396-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
480.00	479.98	473.98	480.49	0.00	1.52	-11.10	-17.35	0.94	15.94	14.43	1.52	10.516		
500.00	499.98	494.00	500.49	0.04	1.59	-4.91	-16.67	1.01	15.03	13.40	1.63	9.232		
600.00	599.97	593.88	600.32	0.22	1.98	138.32	-13.44	0.78	11.82	9.63	2.20	5.379		
700.00	699.95	693.82	700.22	0.57	2.36	112.29	-10.67	-0.03	10.11	7.18	2.93	3.448		
759.60	759.51	753.32	759.69	0.79	2.59	116.22	-9.16	-0.49	9.54	6.19	3.35	2.845 CC, ES		
800.00	799.87	793.63	800.00	0.93	2.75	125.83	-8.30	-0.76	9.85	6.23	3.62	2.719		
900.00	899.67	893.37	899.72	1.30	3.13	153.98	-6.43	-1.31	14.01	9.73	4.28	3.274		
1,000.00	999.43	993.13	999.46	1.66	3.52	169.75	-4.52	-1.70	20.31	15.35	4.97	4.091		
1,100.00	1,099.21	1,092.90	1,099.22	2.03	3.91	178.90	-2.72	-1.91	26.84	21.18	5.67	4.736		
1,200.00	1,199.05	1,192.49	1,198.80	2.40	4.24	-170.03	-2.41	-2.28	32.64	26.27	6.37	5.125		
1,300.00	1,298.97	1,293.05	1,299.35	2.76	4.55	-160.21	-3.08	-2.14	36.59	29.52	7.07	5.173		
1,400.00	1,398.92	1,393.14	1,399.44	3.12	4.87	-156.69	-3.13	-0.83	38.20	30.42	7.78	4.908		
1,500.00	1,498.89	1,493.07	1,499.35	3.47	5.20	-125.39	-3.50	0.59	38.73	30.23	8.50	4.558		
1,600.00	1,598.88	1,592.87	1,599.15	3.82	5.52	-107.56	-4.11	1.77	38.25	29.04	9.21	4.154		
1,700.00	1,698.87	1,692.48	1,698.76	4.15	5.84	-48.89	-4.82	2.26	37.64	27.74	9.90	3.803		
1,800.00	1,798.85	1,792.36	1,798.63	4.49	6.15	-44.43	-5.37	1.97	36.71	26.14	10.57	3.474		
1,900.00	1,898.83	1,892.35	1,898.61	4.82	6.49	-7.26	-5.51	1.36	35.89	24.66	11.24	3.194		
2,000.00	1,998.83	1,992.70	1,998.97	5.16	6.83	66.76	-5.51	1.19	35.37	23.44	11.92	2.966		
2,100.00	2,098.81	2,092.53	2,098.80	5.49	7.18	57.73	-5.27	1.36	34.40	21.79	12.61	2.728		
2,200.00	2,198.80	2,192.47	2,198.74	5.83	7.53	65.74	-5.00	1.10	33.77	20.48	13.29	2.540		
2,300.00	2,298.79	2,292.54	2,298.81	6.18	7.88	77.79	-5.00	1.03	33.30	19.31	13.98	2.381		
2,400.00	2,398.77	2,392.59	2,398.86	6.52	8.24	73.01	-4.77	1.14	32.76	18.08	14.68	2.231		
2,500.00	2,498.76	2,492.37	2,498.63	6.87	8.58	73.49	-4.82	1.11	32.26	16.89	15.37	2.098		
2,511.33	2,510.09	2,503.67	2,509.94	6.91	8.62	72.55	-4.84	1.07	32.26	16.80	15.45	2.087		
2,600.00	2,598.75	2,592.15	2,598.41	7.21	8.92	63.04	-4.93	0.42	32.53	16.47	16.07	2.025		
2,700.00	2,698.74	2,692.57	2,698.83	7.56	9.28	64.83	-4.63	-0.06	32.45	15.68	16.76	1.936		
2,771.74	2,770.48	2,764.07	2,770.32	7.81	9.53	65.01	-4.44	-0.08	32.08	14.81	17.26	1.858		
2,800.00	2,798.73	2,792.20	2,798.46	7.91	9.63	64.55	-4.52	-0.26	32.13	14.67	17.46	1.840		
2,900.00	2,898.73	2,892.40	2,898.66	8.26	9.98	37.44	-4.67	-0.86	32.05	13.89	18.16	1.765		
2,979.92	2,978.64	2,972.09	2,978.35	8.53	10.27	46.34	-4.42	-1.26	31.75	13.03	18.72	1.696		
3,000.00	2,998.72	2,992.10	2,998.35	8.60	10.34	48.57	-4.38	-1.47	31.72	12.86	18.86	1.682		
3,100.00	3,098.71	3,092.36	3,098.61	8.95	10.70	52.76	-4.33	-2.28	31.88	12.31	19.57	1.629		
3,189.74	3,188.45	3,181.87	3,188.11	9.27	11.01	40.91	-4.27	-2.83	31.70	11.50	20.21	1.569		
3,200.00	3,198.70	3,192.09	3,198.34	9.30	11.05	39.65	-4.25	-2.94	31.61	11.33	20.28	1.559		
3,300.00	3,298.70	3,292.36	3,298.60	9.65	11.41	45.78	-4.15	-3.74	31.48	10.48	20.99	1.499 Level 3		
3,400.00	3,398.69	3,392.13	3,398.37	10.00	11.76	41.59	-4.34	-4.36	31.06	9.35	21.71	1.431 Level 3		
3,500.00	3,498.68	3,492.21	3,498.44	10.35	12.12	50.01	-4.07	-5.25	30.99	8.56	22.42	1.382 Level 3		
3,600.00	3,598.66	3,592.49	3,598.72	10.70	12.47	48.07	-3.79	-5.53	30.18	7.04	23.13	1.304 Level 3		
3,644.16	3,642.82	3,636.43	3,642.67	10.86	12.62	45.46	-3.99	-5.59	29.87	6.42	23.45	1.274 Level 3, SF		
3,700.00	3,698.66	3,691.90	3,698.13	11.05	12.82	-114.98	-3.72	-6.17	30.50	6.67	23.84	1.280 Level 3		
3,800.00	3,798.66	3,792.16	3,798.37	11.40	13.19	-90.66	-2.69	-7.42	32.02	7.48	24.55	1.305 Level 3		
3,900.00	3,898.66	3,891.77	3,897.97	11.74	13.55	-72.04	-1.98	-8.67	33.33	8.08	25.25	1.320 Level 3		
4,000.00	3,998.66	3,991.61	3,997.79	12.09	13.92	-62.69	-1.94	-10.99	35.40	9.44	25.96	1.363 Level 3		
4,100.00	4,098.65	4,091.46	4,097.60	12.43	14.28	-55.56	-1.58	-13.60	37.70	11.03	26.67	1.413 Level 3		
4,200.00	4,198.65	4,191.47	4,197.56	12.78	14.66	-49.48	-0.08	-16.15	40.08	12.69	27.39	1.463 Level 3		
4,300.00	4,298.65	4,291.59	4,297.64	13.13	15.03	-45.05	1.73	-18.40	42.23	14.12	28.11	1.502		
4,400.00	4,398.65	4,391.38	4,397.39	13.48	15.34	-50.36	4.08	-20.10	44.07	15.30	28.77	1.532		
4,500.00	4,498.65	4,495.05	4,500.82	13.83	15.35	-38.26	9.31	-17.97	43.29	14.14	29.15	1.485 Level 3		
4,598.60	4,597.24	4,593.93	4,597.06	14.17	15.37	-9.81	23.90	-1.47	37.87	8.34	29.53	1.282 Level 3		
4,600.00	4,598.65	4,595.27	4,598.33	14.18	15.37	-9.19	24.17	-1.14	37.87	8.33	29.53	1.282 Level 3		
4,700.00	4,698.64	4,693.78	4,699.18	14.53	15.41	42.20	45.99	27.07	55.01	25.25	29.77	1.648		
4,800.00	4,798.64	4,758.54	4,741.08	14.88	15.49	58.41	69.19	61.83	102.08	71.97	30.11	3.391		

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

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #47H - OH / Job #1610026 - Surveys (Capstar 119)														Offset Site Error:	0.00 usft
Survey Program: 100-PHX_SPT_GTD, 4396-PHX+MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
4,900.00	4,898.56	4,822.00	4,788.27	15.23	15.61	-20.08	89.56	98.96	162.38	131.97	30.41	5.340			
5,000.00	4,997.28	4,877.41	4,824.72	15.58	15.78	-11.89	107.81	136.45	224.21	194.07	30.14	7.439			
5,100.00	5,092.32	4,928.24	4,853.64	15.93	16.01	-10.04	126.21	173.95	283.49	254.52	28.97	9.786			
5,200.00	5,179.98	4,976.70	4,876.61	16.31	16.30	-9.78	145.75	211.85	337.60	310.77	26.83	12.583			
5,300.00	5,258.11	5,023.24	4,893.91	16.73	16.66	-10.13	165.80	250.08	387.38	363.50	23.88	16.220			
5,400.00	5,321.32	5,077.00	4,908.68	17.26	17.17	-9.46	190.36	295.55	427.83	408.67	19.16	22.328			
5,500.00	5,364.73	5,133.30	4,919.27	17.94	17.81	-9.14	216.62	344.18	454.72	440.79	13.93	32.634			
5,600.00	5,385.43	5,201.00	4,925.62	18.79	18.69	-9.25	247.88	403.87	466.78	456.57	10.21	45.735			
5,700.00	5,387.82	5,282.78	4,928.52	19.78	19.96	-9.49	283.36	477.49	465.81	455.33	10.48	44.458			
5,800.00	5,385.47	5,377.02	4,929.63	20.94	21.56	-9.18	319.43	564.52	461.77	450.22	11.55	39.965			
5,900.00	5,381.83	5,478.90	4,929.21	22.24	23.48	-8.31	353.98	660.36	457.45	444.77	12.68	36.075			
6,000.00	5,378.56	5,604.06	4,933.58	23.68	26.05	-7.52	394.10	778.81	449.69	435.60	14.09	31.915			
6,100.00	5,376.39	5,700.24	4,938.48	25.24	28.15	-7.51	422.87	870.45	442.18	426.50	15.68	28.203			
6,200.00	5,375.01	5,808.82	4,943.87	26.89	30.63	-7.20	450.61	975.27	435.43	418.21	17.22	25.282			
6,300.00	5,374.10	5,906.78	4,949.30	28.63	32.95	-6.37	469.65	1,071.19	428.13	409.72	18.41	23.251			
6,400.00	5,371.04	5,999.13	4,952.65	30.43	35.18	-5.01	483.15	1,162.48	420.28	400.89	19.39	21.676			
6,500.00	5,367.76	6,090.35	4,953.96	32.29	37.42	-3.33	491.86	1,253.26	414.53	394.14	20.39	20.333			
6,600.00	5,364.87	6,193.15	4,954.59	34.19	39.98	-1.06	496.09	1,355.96	410.39	388.81	21.57	19.022			
6,700.00	5,363.85	6,291.37	4,955.76	36.13	42.46	0.95	495.87	1,454.17	408.15	385.06	23.09	17.673			
6,720.70	5,363.89	6,311.36	4,955.94	36.54	42.96	1.28	495.71	1,474.16	408.06	384.62	23.44	17.407			
6,800.00	5,365.06	6,390.47	4,956.47	38.11	44.99	2.39	494.97	1,553.26	408.96	384.09	24.87	16.444			
6,900.00	5,366.99	6,494.11	4,957.79	40.10	47.68	3.05	494.41	1,656.90	409.84	383.28	26.56	15.429			
7,000.00	5,367.79	6,599.05	4,960.22	42.11	50.44	3.35	494.82	1,761.81	408.43	380.33	28.10	14.536			
7,100.00	5,368.89	6,702.09	4,963.52	44.15	53.18	3.15	497.15	1,864.76	406.26	376.47	29.79	13.636			
7,188.58	5,371.36	6,788.73	4,966.49	45.98	55.51	2.78	500.86	1,951.27	405.55	374.34	31.21	12.996			
7,200.00	5,371.11	6,799.59	4,966.80	46.21	55.80	2.73	501.32	1,962.12	404.94	373.56	31.39	12.902			
7,300.00	5,373.97	6,895.83	4,969.03	48.31	58.40	2.42	505.11	2,058.26	405.38	372.67	32.71	12.393			
7,387.49	5,375.34	6,981.86	4,970.57	50.15	60.74	2.19	508.32	2,144.21	405.12	371.13	33.99	11.918			
7,400.00	5,375.16	6,990.00	4,970.69	50.42	60.96	2.17	508.62	2,152.34	404.76	370.62	34.15	11.854			
7,500.00	5,378.02	7,082.19	4,970.80	52.54	63.48	2.01	511.47	2,244.49	407.51	371.78	35.73	11.405			
7,600.00	5,379.97	7,179.20	4,968.75	54.69	66.14	2.00	513.37	2,341.46	411.55	374.41	37.14	11.082			
7,700.00	5,379.86	7,279.90	4,966.98	56.84	68.90	2.06	514.26	2,442.14	413.21	374.60	38.61	10.702			
7,800.00	5,380.61	7,377.53	4,964.89	59.01	71.59	2.27	514.27	2,539.74	416.17	375.83	40.34	10.318			
7,900.00	5,381.40	7,487.98	4,963.73	61.19	74.64	2.66	513.35	2,650.18	418.13	376.05	42.08	9.938			
8,000.00	5,384.17	7,582.88	4,963.60	63.38	77.26	3.05	511.80	2,745.06	421.19	377.33	43.86	9.602			
8,100.00	5,386.02	7,683.52	4,962.30	65.58	80.06	3.49	509.65	2,845.67	424.53	379.07	45.46	9.338			
8,200.00	5,385.90	7,790.67	4,962.46	67.78	83.04	3.81	507.83	2,952.80	424.40	377.26	47.13	9.004			
8,300.00	5,386.86	7,894.54	4,963.84	69.99	85.94	3.91	508.33	3,056.66	424.06	375.10	48.96	8.661			
8,327.95	5,387.29	7,921.01	4,964.22	70.61	86.68	3.92	508.79	3,083.13	424.09	374.65	49.44	8.577			
8,400.00	5,388.57	7,989.25	4,964.75	72.21	88.59	3.93	510.19	3,151.35	424.82	374.14	50.68	8.382			
8,500.00	5,393.56	8,093.91	4,965.38	74.44	91.53	4.01	512.50	3,255.98	429.27	376.80	52.47	8.182			
8,600.00	5,397.80	8,194.43	4,967.31	76.67	94.35	4.26	513.91	3,356.47	431.73	377.63	54.10	7.980			
8,700.00	5,400.13	8,293.05	4,968.54	78.91	97.13	4.65	513.86	3,455.08	433.05	377.23	55.81	7.759			
8,800.00	5,400.75	8,403.16	4,971.51	81.15	100.23	5.13	513.87	3,565.15	431.23	373.51	57.73	7.470			
8,900.00	5,401.29	8,495.98	4,974.28	83.39	102.84	5.67	513.54	3,657.93	429.17	369.32	59.85	7.170			
9,000.00	5,402.18	8,593.63	4,975.96	85.64	105.60	6.34	513.13	3,755.56	428.86	366.83	62.03	6.914			
9,100.00	5,402.09	8,690.23	4,977.07	87.89	108.33	6.67	515.77	3,852.11	427.92	364.05	63.87	6.700			
9,163.88	5,401.76	8,748.73	4,976.99	89.33	109.98	6.82	517.44	3,910.59	427.81	362.71	65.11	6.571			
9,200.00	5,401.19	8,781.92	4,976.63	90.15	110.92	6.91	518.24	3,943.76	427.71	361.88	65.83	6.497			
9,300.00	5,401.14	8,885.18	4,975.49	92.40	113.84	7.00	521.47	4,046.97	428.87	361.33	67.53	6.350			
9,400.00	5,401.22	8,994.51	4,975.52	94.66	116.93	6.94	526.56	4,156.18	428.88	359.52	69.35	6.184			
9,479.98	5,401.39	9,068.00	4,976.42	96.47	119.01	6.77	530.41	4,229.56	427.95	357.66	70.29	6.088			

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

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #47H - OH / Job #1610026 - Surveys (Capstar 119)													Offset Site Error: 0.00 usft
Survey Program: 100-PHX_SPT_GTD, 4396-PHX+MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,490.00	5,401.32	9,068.00	4,976.42	96.70	119.01	6.77	530.41	4,229.56	428.01	357.66	70.35	6.084	

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #48H - OH / Job #1514802 - Surveys (Capstar 119)												Offset Site Error:	0.00 usft
Survey Program: 113-NS-GYRO-MS, 4693-PHX+MWD+HDGM												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
480.00	479.98	10,170.00	5,332.25	0.00	146.76	162.84	593.27	-169.67	4,891.50	4,748.75	142.75	34.267	
500.00	499.98	10,170.00	5,332.25	0.04	146.76	168.70	593.27	-169.67	4,871.69	4,729.56	142.13	34.275	
600.00	599.97	10,170.00	5,332.25	0.22	146.76	-55.35	593.27	-169.67	4,772.53	4,635.07	137.45	34.721	
700.00	699.95	10,170.00	5,332.25	0.57	146.76	-100.32	593.27	-169.67	4,673.32	4,542.20	131.12	35.641	
800.00	799.87	10,170.00	5,332.25	0.93	146.76	-124.10	593.27	-169.67	4,574.40	4,453.17	121.23	37.734	
900.00	899.67	10,170.00	5,332.25	1.30	146.76	-128.49	593.27	-169.67	4,475.78	4,360.21	115.57	38.728	
1,000.00	999.43	10,170.00	5,332.25	1.66	146.76	-127.26	593.27	-169.67	4,377.28	4,262.18	115.10	38.031	
1,100.00	1,099.21	10,170.00	5,332.25	2.03	146.76	-123.23	593.27	-169.67	4,278.75	4,162.32	116.43	36.750	
1,200.00	1,199.05	10,170.00	5,332.25	2.40	146.76	-108.69	593.27	-169.67	4,180.09	4,058.14	121.95	34.277	
1,300.00	1,298.97	10,170.00	5,332.25	2.76	146.76	-92.39	593.27	-169.67	4,081.28	3,953.79	127.49	32.012	
1,400.00	1,398.92	10,170.00	5,332.25	3.12	146.76	-83.73	593.27	-169.67	3,982.40	3,851.02	131.38	30.311	
1,500.00	1,498.89	10,170.00	5,332.25	3.47	146.76	-43.43	593.27	-169.67	3,883.53	3,744.93	138.60	28.021	
1,600.00	1,598.88	10,170.00	5,332.25	3.82	146.76	-20.27	593.27	-169.67	3,784.84	3,643.85	140.79	26.882	
1,700.00	1,698.87	10,170.00	5,332.25	4.15	146.76	48.40	593.27	-169.67	3,685.80	3,539.56	146.24	25.203	
1,800.00	1,798.85	10,170.00	5,332.25	4.49	146.76	56.34	593.27	-169.67	3,587.07	3,439.99	147.08	24.388	
1,900.00	1,898.83	10,170.00	5,332.25	4.82	146.76	93.06	593.27	-169.67	3,488.47	3,342.28	146.19	23.863	
2,000.00	1,998.83	10,170.00	5,332.25	5.16	146.76	163.83	593.27	-169.67	3,390.25	3,245.11	145.14	23.359	
2,100.00	2,098.81	10,170.00	5,332.25	5.49	146.76	153.10	593.27	-169.67	3,292.27	3,146.09	146.19	22.521	
2,200.00	2,198.80	10,170.00	5,332.25	5.83	146.76	157.66	593.27	-169.67	3,194.44	3,048.09	146.36	21.826	
2,300.00	2,298.79	10,170.00	5,332.25	6.18	146.76	166.28	593.27	-169.67	3,096.73	2,950.60	146.13	21.192	
2,400.00	2,398.77	10,170.00	5,332.25	6.52	146.76	159.11	593.27	-169.67	2,999.17	2,852.22	146.96	20.408	
2,500.00	2,498.76	10,170.00	5,332.25	6.87	146.76	156.84	593.27	-169.67	2,901.78	2,754.47	147.32	19.698	
2,600.00	2,598.75	10,170.00	5,332.25	7.21	146.76	144.32	593.27	-169.67	2,804.51	2,656.60	147.91	18.961	
2,700.00	2,698.74	10,170.00	5,332.25	7.56	146.76	143.43	593.27	-169.67	2,707.39	2,559.06	148.33	18.252	
2,800.00	2,798.73	10,170.00	5,332.25	7.91	146.76	140.72	593.27	-169.67	2,610.45	2,462.01	148.45	17.585	
2,900.00	2,898.73	10,170.00	5,332.25	8.26	146.76	113.19	593.27	-169.67	2,513.69	2,364.19	149.50	16.814	
3,000.00	2,998.72	10,170.00	5,332.25	8.60	146.76	122.14	593.27	-169.67	2,417.15	2,267.42	149.73	16.143	
3,100.00	3,098.71	10,170.00	5,332.25	8.95	146.76	124.39	593.27	-169.67	2,320.93	2,171.05	149.88	15.485	
3,200.00	3,198.70	10,170.00	5,332.25	9.30	146.76	110.60	593.27	-169.67	2,224.96	2,074.24	150.72	14.762	
3,300.00	3,298.70	10,170.00	5,332.25	9.65	146.76	114.85	593.27	-169.67	2,129.42	1,978.40	151.02	14.100	
3,400.00	3,398.69	10,170.00	5,332.25	10.00	146.76	109.71	593.27	-169.67	2,034.29	1,882.72	151.57	13.422	
3,500.00	3,498.68	10,170.00	5,332.25	10.35	146.76	116.09	593.27	-169.67	1,939.65	1,787.68	151.98	12.763	
3,600.00	3,598.66	10,170.00	5,332.25	10.70	146.76	111.21	593.27	-169.67	1,845.65	1,693.32	152.32	12.117	
3,700.00	3,698.66	10,170.00	5,332.25	11.05	146.76	-54.83	593.27	-169.67	1,752.10	1,601.23	150.87	11.613	
3,800.00	3,798.66	10,170.00	5,332.25	11.40	146.76	-31.21	593.27	-169.67	1,659.17	1,507.90	151.27	10.968	
3,900.00	3,898.66	10,170.00	5,332.25	11.74	146.76	-12.48	593.27	-169.67	1,567.04	1,415.35	151.69	10.331	
4,000.00	3,998.66	10,170.00	5,332.25	12.09	146.76	-1.47	593.27	-169.67	1,475.88	1,323.75	152.13	9.702	
4,100.00	4,098.65	10,170.00	5,332.25	12.43	146.76	6.84	593.27	-169.67	1,385.88	1,233.33	152.56	9.084	
4,200.00	4,198.65	10,170.00	5,332.25	12.78	146.76	12.21	593.27	-169.67	1,297.37	1,144.41	152.95	8.482	
4,300.00	4,298.65	10,170.00	5,332.25	13.13	146.76	15.41	593.27	-169.67	1,210.67	1,057.36	153.30	7.897	
4,400.00	4,398.65	10,170.00	5,332.25	13.48	146.76	7.96	593.27	-169.67	1,126.22	972.62	153.60	7.332	
4,500.00	4,498.65	10,170.00	5,332.25	13.83	146.76	13.16	593.27	-169.67	1,044.54	890.56	153.98	6.784	
4,600.00	4,598.65	10,170.00	5,332.25	14.18	146.76	11.10	593.27	-169.67	966.29	811.97	154.32	6.261	
4,700.00	4,698.64	10,170.00	5,332.25	14.53	146.76	18.87	593.27	-169.67	892.37	737.65	154.72	5.768	
4,800.00	4,798.64	10,170.00	5,332.25	14.88	146.76	12.30	593.27	-169.67	823.96	668.91	155.05	5.314	
4,900.00	4,898.56	10,170.00	5,332.25	15.23	146.76	-81.82	593.27	-169.67	762.22	609.82	152.40	5.001	
5,000.00	4,997.28	10,170.00	5,332.25	15.58	146.76	-85.42	593.27	-169.67	708.17	561.11	147.06	4.816	
5,100.00	5,092.32	10,170.00	5,332.25	15.93	146.76	-92.88	593.27	-169.67	663.74	521.62	142.12	4.670	
5,200.00	5,179.98	10,170.00	5,332.25	16.31	146.76	-98.83	593.27	-169.67	635.28	495.20	140.08	4.535	
5,282.49	5,245.00	10,170.00	5,332.25	16.66	146.76	-101.93	593.27	-169.67	627.48	485.96	141.52	4.434 CC, ES	
5,300.00	5,258.11	10,170.00	5,332.25	16.73	146.76	-102.20	593.27	-169.67	628.15	485.98	142.17	4.418	
5,400.00	5,321.32	10,170.00	5,332.25	17.26	146.76	-100.29	593.27	-169.67	642.31	495.81	146.49	4.385 SF	

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

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #48H - OH / Job #1514802 - Surveys (Capstar 119)													Offset Site Error:	0.00 usft
Survey Program: 113-NS-GYRO-MS, 4693-PHX+MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,500.00	5,364.73	10,170.00	5,332.25	17.94	146.76	-95.28	593.27	-169.67	674.30	522.81	151.50	4.451		
5,600.00	5,385.43	10,170.00	5,332.25	18.79	146.76	-88.30	593.27	-169.67	719.50	566.00	153.50	4.687		
5,700.00	5,387.82	10,170.00	5,332.25	19.78	146.76	-84.70	593.27	-169.67	773.30	620.12	153.18	5.048		
5,800.00	5,385.47	10,170.00	5,332.25	20.94	146.76	-83.24	593.27	-169.67	835.24	681.43	153.82	5.430		
5,900.00	5,381.83	10,170.00	5,332.25	22.24	146.76	-83.82	593.27	-169.67	904.35	748.22	156.12	5.792		
6,000.00	5,378.56	10,170.00	5,332.25	23.68	146.76	-82.84	593.27	-169.67	980.42	820.40	160.02	6.127		
6,100.00	5,376.39	10,170.00	5,332.25	25.24	146.76	-83.96	593.27	-169.67	1,064.23	899.71	164.52	6.469		
6,200.00	5,375.01	10,170.00	5,332.25	26.89	146.76	-84.67	593.27	-169.67	1,152.15	984.50	167.65	6.872		
6,300.00	5,374.10	10,170.00	5,332.25	28.63	146.76	-82.70	593.27	-169.67	1,242.96	1,073.99	168.97	7.356		
6,400.00	5,371.04	10,170.00	5,332.25	30.43	146.76	-79.85	593.27	-169.67	1,335.19	1,165.38	169.81	7.863		
6,500.00	5,367.76	10,170.00	5,332.25	32.29	146.76	-79.69	593.27	-169.67	1,429.35	1,256.86	172.49	8.286		
6,600.00	5,364.87	10,170.00	5,332.25	34.19	146.76	-80.42	593.27	-169.67	1,525.20	1,348.96	176.24	8.654		
6,700.00	5,363.85	10,170.00	5,332.25	36.13	146.76	-83.62	593.27	-169.67	1,622.96	1,442.59	180.37	8.998		
6,800.00	5,365.06	10,170.00	5,332.25	38.11	146.76	-89.72	593.27	-169.67	1,721.85	1,538.20	183.66	9.375		
6,900.00	5,366.99	10,170.00	5,332.25	40.10	146.76	-89.09	593.27	-169.67	1,821.46	1,635.88	185.59	9.815		
7,000.00	5,367.79	10,170.00	5,332.25	42.11	146.76	-73.20	593.27	-169.67	1,921.25	1,740.76	180.49	10.645		
7,100.00	5,368.89	10,170.00	5,332.25	44.15	146.76	-92.40	593.27	-169.67	2,021.12	1,831.69	189.43	10.669		
7,200.00	5,371.11	10,170.00	5,332.25	46.21	146.76	-110.57	593.27	-169.67	2,121.02	1,940.44	180.58	11.746		
7,300.00	5,373.97	10,170.00	5,332.25	48.31	146.76	-89.08	593.27	-169.67	2,220.89	2,026.91	193.98	11.449		
7,400.00	5,375.16	10,170.00	5,332.25	50.42	146.76	-82.97	593.27	-169.67	2,320.77	2,125.89	194.88	11.909		
7,500.00	5,378.02	10,170.00	5,332.25	52.54	146.76	-101.90	593.27	-169.67	2,420.64	2,226.25	194.39	12.452		
7,600.00	5,379.97	10,170.00	5,332.25	54.69	146.76	-75.42	593.27	-169.67	2,520.53	2,325.80	194.73	12.944		
7,700.00	5,379.86	10,170.00	5,332.25	56.84	146.76	-56.92	593.27	-169.67	2,620.43	2,447.18	173.25	15.125		
7,800.00	5,380.61	10,170.00	5,332.25	59.01	146.76	-81.99	593.27	-169.67	2,720.34	2,517.19	203.15	13.391		
7,900.00	5,381.40	10,170.00	5,332.25	61.19	146.76	-80.04	593.27	-169.67	2,820.25	2,615.88	204.37	13.800		
8,000.00	5,384.17	10,170.00	5,332.25	63.38	146.76	-106.12	593.27	-169.67	2,920.18	2,718.46	201.72	14.476		
8,100.00	5,386.02	10,170.00	5,332.25	65.58	146.76	-67.32	593.27	-169.67	3,020.13	2,823.32	196.81	15.346		
8,200.00	5,385.90	10,170.00	5,332.25	67.78	146.76	-47.61	593.27	-169.67	3,120.08	2,956.15	163.94	19.032		
8,300.00	5,386.86	10,170.00	5,332.25	69.99	146.76	-82.06	593.27	-169.67	3,220.03	3,005.82	214.21	15.032		
8,400.00	5,388.57	10,170.00	5,332.25	72.21	146.76	-111.36	593.27	-169.67	3,319.95	3,115.40	204.56	16.230		
8,500.00	5,393.56	10,170.00	5,332.25	74.44	146.76	-123.60	593.27	-169.67	3,419.79	3,232.67	187.12	18.276		
8,600.00	5,397.80	10,170.00	5,332.25	76.67	146.76	-107.25	593.27	-169.67	3,519.65	3,306.03	213.62	16.476		
8,700.00	5,400.13	10,170.00	5,332.25	78.91	146.76	-84.56	593.27	-169.67	3,619.55	3,395.31	224.24	16.141		
8,800.00	5,400.75	10,170.00	5,332.25	81.15	146.76	-66.98	593.27	-169.67	3,719.45	3,508.25	211.20	17.611		
8,900.00	5,401.29	10,170.00	5,332.25	83.39	146.76	-84.76	593.27	-169.67	3,819.32	3,590.48	228.85	16.689		
9,000.00	5,402.18	10,170.00	5,332.25	85.64	146.76	-77.99	593.27	-169.67	3,919.17	3,691.72	227.45	17.231		
9,100.00	5,402.09	10,170.00	5,332.25	87.89	146.76	-65.24	593.27	-169.67	4,018.97	3,804.02	214.96	18.697		
9,200.00	5,401.19	10,170.00	5,332.25	90.15	146.76	-73.35	593.27	-169.67	4,118.80	3,891.20	227.61	18.096		
9,300.00	5,401.14	10,170.00	5,332.25	92.40	146.76	-64.68	593.27	-169.67	4,218.69	4,000.46	218.23	19.331		
9,400.00	5,401.22	10,170.00	5,332.25	94.66	146.76	-81.26	593.27	-169.67	4,318.57	4,080.04	238.53	18.105		
9,490.00	5,401.32	10,170.00	5,332.25	96.70	146.76	-54.85	593.27	-169.67	4,408.49	4,204.99	203.51	21.663		

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #51H - OH - Plan 5 10-06-16													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
480.00	479.98	476.38	479.98	0.00	1.51	178.84	25.00	-0.20	26.58	25.07	1.51	17.600		
500.00	499.98	496.38	499.98	0.04	1.58	-174.25	25.00	-0.20	26.83	25.22	1.62	16.588		
600.00	599.97	596.37	599.97	0.22	1.94	-32.96	25.00	-0.20	26.73	24.57	2.16	12.362		
700.00	699.95	696.35	699.95	0.57	2.30	-75.00	25.00	-0.20	25.62	22.75	2.87	8.924		
752.73	752.65	749.05	752.65	0.76	2.49	-90.00	25.00	-0.20	25.42	22.17	3.25	7.826 CC		
800.00	799.87	796.27	799.87	0.93	2.66	-99.88	25.00	-0.20	25.67	22.09	3.59	7.157 ES		
900.00	899.67	896.07	899.67	1.30	3.01	-113.43	25.00	-0.20	27.55	23.24	4.31	6.392		
1,000.00	999.43	995.83	999.43	1.66	3.37	-123.49	25.00	-0.20	30.97	25.94	5.03	6.154		
1,100.00	1,099.21	1,095.61	1,099.21	2.03	3.73	-129.50	25.00	-0.20	34.85	29.10	5.75	6.061		
1,200.00	1,199.05	1,195.45	1,199.05	2.40	4.09	-125.19	25.00	-0.20	38.19	31.72	6.46	5.907		
1,300.00	1,298.97	1,295.37	1,298.97	2.76	4.44	-117.66	25.00	-0.20	40.38	33.20	7.18	5.623		
1,400.00	1,398.92	1,395.32	1,398.92	3.12	4.80	-115.73	25.00	-0.20	41.70	33.81	7.89	5.282		
1,500.00	1,498.89	1,495.29	1,498.89	3.47	5.16	-84.46	25.00	-0.20	42.28	33.67	8.60	4.914		
1,600.00	1,598.88	1,595.28	1,598.88	3.82	5.52	-65.05	25.00	-0.20	41.73	32.42	9.31	4.483		
1,700.00	1,698.87	1,695.00	1,698.87	4.15	5.88	-2.98	25.79	-0.20	40.75	30.75	10.00	4.074		
1,800.00	1,798.85	1,794.67	1,798.85	4.49	6.23	7.64	28.31	-0.20	39.90	29.20	10.70	3.730		
1,834.18	1,833.02	1,828.71	1,832.25	4.60	6.36	17.38	29.56	-0.20	39.91	28.98	10.93	3.650		
1,900.00	1,898.83	1,894.23	1,897.70	4.82	6.59	52.34	32.55	-0.20	40.36	28.97	11.39	3.543		
2,000.00	1,998.83	1,994.01	1,997.34	5.16	6.95	131.97	37.77	-0.20	43.88	31.79	12.09	3.629		
2,100.00	2,098.81	2,093.77	2,096.97	5.49	7.31	126.54	42.99	-0.20	48.55	35.76	12.79	3.796		
2,200.00	2,198.80	2,193.53	2,196.59	5.83	7.66	136.56	48.21	-0.20	53.73	40.24	13.49	3.983		
2,300.00	2,298.79	2,293.29	2,296.22	6.18	8.02	150.09	53.44	-0.20	59.25	45.06	14.19	4.175		
2,400.00	2,398.77	2,393.06	2,395.85	6.52	8.38	145.62	58.66	-0.20	65.04	50.14	14.89	4.367		
2,500.00	2,498.76	2,492.82	2,495.47	6.87	8.74	146.33	63.88	-0.20	70.98	55.39	15.60	4.551		
2,600.00	2,598.75	2,592.60	2,595.11	7.21	9.10	135.91	69.10	-0.20	76.84	60.53	16.30	4.713		
2,700.00	2,698.74	2,692.39	2,694.76	7.56	9.46	137.09	74.32	-0.20	82.61	65.60	17.01	4.857		
2,800.00	2,798.73	2,792.18	2,794.42	7.91	9.82	136.59	79.55	-0.20	88.32	70.60	17.72	4.985		
2,900.00	2,898.73	2,893.43	2,895.56	8.26	10.18	109.65	84.08	-0.20	93.18	74.75	18.43	5.056		
3,000.00	2,998.72	2,994.95	2,997.04	8.60	10.55	120.02	86.84	-0.20	96.24	77.10	19.14	5.028		
3,100.00	3,098.71	3,096.56	3,098.66	8.95	10.91	123.28	87.81	-0.20	97.75	77.90	19.85	4.924		
3,200.00	3,198.70	3,196.61	3,198.70	9.30	11.27	109.44	87.81	-0.20	98.11	77.55	20.56	4.772		
3,300.00	3,298.70	3,296.60	3,298.70	9.65	11.63	114.47	87.81	-0.20	98.66	77.39	21.27	4.639		
3,400.00	3,398.69	3,396.59	3,398.69	10.00	11.98	109.78	87.81	-0.20	99.16	77.18	21.98	4.512		
3,500.00	3,498.68	3,496.58	3,498.68	10.35	12.34	116.82	87.81	-0.20	99.70	77.01	22.69	4.395		
3,600.00	3,598.66	3,596.57	3,598.66	10.70	12.70	112.85	87.81	-0.20	100.45	77.05	23.40	4.293		
3,700.00	3,698.66	3,696.57	3,698.66	11.05	13.06	-50.44	87.81	-0.20	100.60	76.49	24.10	4.173		
3,800.00	3,798.66	3,796.57	3,798.66	11.40	13.41	-27.02	87.81	-0.20	100.34	75.53	24.81	4.045		
3,900.00	3,898.66	3,896.56	3,898.66	11.74	13.77	-8.47	87.81	-0.20	99.93	74.42	25.51	3.917		
4,000.00	3,998.66	3,996.56	3,998.66	12.09	14.13	2.42	87.81	-0.20	99.39	73.18	26.21	3.792		
4,100.00	4,098.65	4,096.56	4,098.65	12.43	14.49	10.66	87.81	-0.20	98.74	71.82	26.92	3.668		
4,200.00	4,198.65	4,196.56	4,198.65	12.78	14.85	16.05	87.81	-0.20	98.12	70.50	27.62	3.552		
4,300.00	4,298.65	4,296.56	4,298.65	13.13	15.20	19.35	87.81	-0.20	97.55	69.22	28.33	3.443		
4,400.00	4,398.65	4,396.56	4,398.65	13.48	15.56	12.07	87.81	-0.20	97.07	68.04	29.04	3.343		
4,500.00	4,498.65	4,496.55	4,498.65	13.83	15.92	17.30	87.81	-0.20	96.61	66.87	29.74	3.248		
4,600.00	4,598.65	4,596.55	4,598.65	14.18	16.28	15.34	87.81	-0.20	96.12	65.67	30.45	3.156		
4,700.00	4,698.64	4,696.55	4,698.64	14.53	16.64	23.15	87.81	-0.20	95.59	64.43	31.16	3.068		
4,800.00	4,798.64	4,796.55	4,798.64	14.88	16.99	16.82	87.81	-0.20	95.07	63.20	31.87	2.983		
4,900.00	4,898.66	4,896.47	4,898.66	15.23	17.35	-75.47	87.81	-0.20	93.86	61.29	32.57	2.882		
5,000.00	4,997.28	4,995.19	4,997.28	15.58	17.71	-83.13	87.81	-0.20	91.20	57.93	33.27	2.741		
5,035.66	5,031.72	5,029.63	5,031.72	15.70	17.83	-90.07	87.81	-0.20	90.65	57.12	33.53	2.704 SF		
5,100.00	5,092.32	5,090.22	5,092.32	15.93	18.05	-103.71	87.81	-0.20	93.11	59.29	33.82	2.753		
5,200.00	5,179.98	5,177.89	5,179.98	16.31	18.36	-126.24	87.81	-0.20	116.12	83.32	32.80	3.541		

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

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design NFE Federal COM - #51H - OH - Plan 5 10-06-16													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,300.00	5,258.11	5,256.01	5,258.11	16.73	18.64	-141.80	87.81	-0.20	165.28	135.50	29.78	5.550		
5,400.00	5,321.32	5,319.22	5,321.32	17.26	18.87	-145.66	87.81	-0.20	235.57	209.27	26.30	8.957		
5,500.00	5,364.73	5,402.27	5,404.17	17.94	19.16	-147.80	90.17	3.56	319.59	296.76	22.83	13.999		
5,600.00	5,385.43	5,565.00	5,558.54	18.79	19.73	-154.11	116.18	44.99	405.42	387.25	18.16	22.320		
5,700.00	5,387.82	6,090.08	5,816.81	19.78	22.52	-159.46	343.29	406.66	458.95	442.54	16.41	27.966		
5,800.00	5,385.47	6,198.96	5,818.76	20.94	23.49	-158.37	397.96	500.78	466.41	448.23	18.18	25.658		
5,900.00	5,381.83	6,308.65	5,820.76	22.24	24.66	-158.07	447.53	598.60	473.27	453.49	19.79	23.918		
6,000.00	5,378.56	6,418.67	5,822.77	23.68	26.00	-158.16	491.52	699.40	478.61	457.47	21.14	22.641		
6,100.00	5,376.39	6,528.86	5,824.80	25.24	27.49	-158.12	529.69	802.73	483.32	460.51	22.81	21.185		
6,200.00	5,375.01	6,639.20	5,826.84	26.89	29.10	-158.30	561.88	908.24	486.32	461.85	24.47	19.875		
6,300.00	5,374.10	6,749.41	5,828.88	28.63	30.82	-158.82	587.89	1,015.30	487.71	461.85	25.86	18.859		
6,400.00	5,371.04	6,858.83	5,830.89	30.43	32.61	-160.04	607.56	1,122.90	489.33	462.60	26.73	18.304		
6,500.00	5,367.76	6,967.29	5,832.86	32.29	34.46	-161.58	620.95	1,230.50	490.39	462.93	27.45	17.862		
6,600.00	5,364.87	7,074.65	5,834.80	34.19	36.34	-163.32	628.17	1,337.59	490.69	462.69	28.00	17.523		
6,700.00	5,363.85	7,178.27	5,836.64	36.13	38.19	-164.87	629.87	1,441.17	489.80	461.03	28.77	17.023		
6,800.00	5,365.06	7,277.86	5,838.41	38.11	40.01	-165.88	630.54	1,540.74	488.08	458.13	29.95	16.297		
6,900.00	5,366.99	7,377.79	5,840.18	40.10	41.89	-166.30	631.21	1,640.65	487.09	455.79	31.30	15.562		
6,924.69	5,367.38	7,402.48	5,840.62	40.59	42.36	-166.35	631.38	1,665.34	487.03	455.39	31.64	15.395		
7,000.00	5,367.79	7,477.77	5,841.95	42.11	43.82	-166.53	631.89	1,740.61	487.64	454.99	32.65	14.935		
7,100.00	5,368.89	7,577.76	5,843.73	44.15	45.78	-166.60	632.56	1,840.59	488.20	453.59	34.61	14.106		
7,200.00	5,371.11	7,677.76	5,845.50	46.21	47.77	-166.60	633.24	1,940.56	487.72	451.01	36.71	13.285		
7,300.00	5,373.97	7,777.74	5,847.28	48.31	49.79	-166.69	633.91	2,040.53	486.42	448.29	38.13	12.757		
7,316.65	5,374.26	7,794.39	5,847.57	48.66	50.13	-166.71	634.02	2,057.18	486.38	447.98	38.40	12.666		
7,400.00	5,375.16	7,877.73	5,849.05	50.42	51.83	-166.84	634.58	2,140.51	486.73	447.00	39.73	12.250		
7,500.00	5,378.02	7,977.72	5,850.82	52.54	53.90	-166.95	635.26	2,240.47	485.37	443.69	41.68	11.644		
7,555.95	5,379.35	8,032.40	5,851.82	53.74	55.04	-167.04	635.62	2,295.15	484.90	442.47	42.42	11.430		
7,600.00	5,379.97	8,075.89	5,852.75	54.69	55.95	-167.11	635.92	2,338.62	485.10	442.10	43.00	11.280		
7,700.00	5,379.86	8,175.86	5,854.91	56.84	58.05	-167.24	636.59	2,438.57	487.16	442.72	44.44	10.961		
7,800.00	5,380.61	8,275.84	5,857.07	59.01	60.17	-167.40	637.27	2,538.53	488.30	441.91	46.39	10.527		
7,900.00	5,381.40	8,375.83	5,859.23	61.19	62.31	-167.56	637.94	2,638.48	489.39	441.39	48.00	10.195		
8,000.00	5,384.17	8,475.82	5,861.38	63.38	64.45	-167.65	638.62	2,738.45	488.61	438.66	49.96	9.780		
8,039.59	5,385.14	8,515.41	5,862.24	64.25	65.31	-167.69	638.89	2,778.03	488.43	437.93	50.50	9.672		
8,100.00	5,386.02	8,575.81	5,863.54	65.58	66.61	-167.74	639.29	2,838.42	488.78	437.45	51.33	9.522		
8,200.00	5,385.90	8,675.79	5,865.70	67.78	68.78	-167.76	639.97	2,938.37	491.06	438.15	52.91	9.282		
8,300.00	5,386.86	8,775.78	5,867.85	69.99	70.96	-167.84	640.64	3,038.33	492.12	437.23	54.89	8.966		
8,400.00	5,388.57	8,875.76	5,870.01	72.21	73.14	-168.01	641.32	3,138.29	492.26	435.47	56.79	8.668		
8,500.00	5,393.56	8,975.69	5,872.17	74.44	75.34	-168.19	641.99	3,238.19	489.00	430.44	58.56	8.350		
8,600.00	5,397.80	9,075.63	5,874.32	76.67	77.54	-168.47	642.67	3,338.11	486.41	426.60	59.81	8.133		
8,688.69	5,400.00	9,164.29	5,876.24	78.65	79.49	-168.72	643.27	3,426.74	485.68	424.80	60.89	7.977		
8,700.00	5,400.13	9,175.60	5,878.48	78.91	79.74	-168.75	643.34	3,438.05	485.76	424.73	61.03	7.959		
8,800.00	5,400.75	9,275.56	5,878.64	81.15	81.96	-169.05	644.02	3,537.98	486.80	424.55	62.25	7.820		
8,900.00	5,401.29	9,375.50	5,880.79	83.39	84.18	-169.43	644.69	3,637.90	487.83	424.10	63.73	7.655		
9,000.00	5,402.18	9,475.41	5,882.95	85.64	86.40	-169.90	645.37	3,737.79	488.38	423.54	64.84	7.532		
9,100.00	5,402.09	9,575.28	5,885.10	87.89	88.62	-170.46	646.04	3,837.63	489.83	424.06	65.77	7.447		
9,200.00	5,401.19	9,675.16	5,887.26	90.15	90.86	-170.98	646.72	3,937.48	492.23	425.21	67.01	7.345		
9,300.00	5,401.14	9,775.08	5,889.42	92.40	93.09	-171.38	647.39	4,037.38	493.90	425.74	68.17	7.246		
9,400.00	5,401.22	9,874.99	5,891.57	94.66	95.33	-171.84	648.06	4,137.27	495.44	425.93	69.51	7.127		
9,490.00	5,401.32	9,964.94	5,893.51	96.70	97.35	-172.16	648.67	4,227.19	496.92	426.42	70.50	7.049		

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

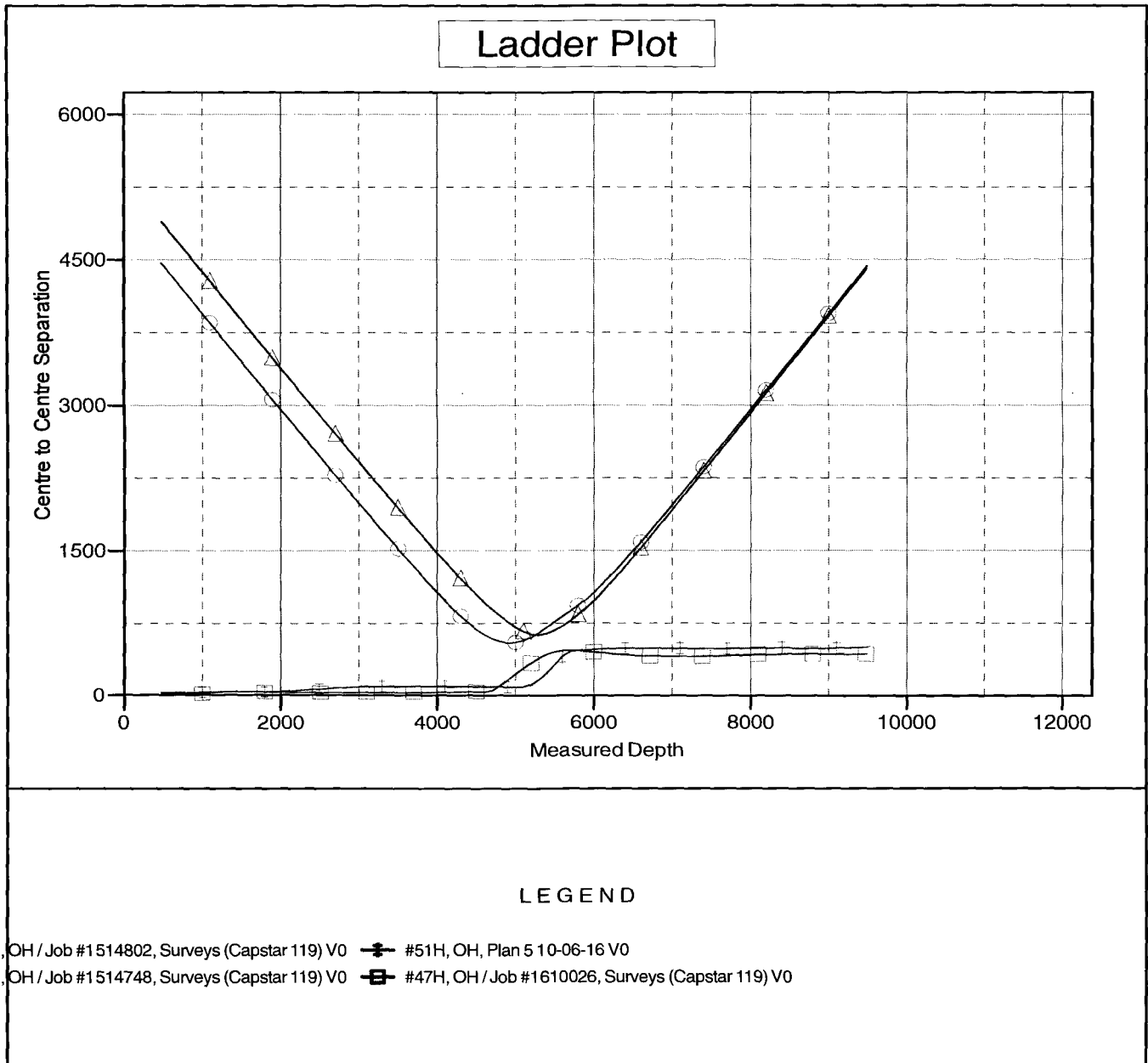
Reference Depths are relative to GL + KB @ 3811.60usft (Trinidad 436) Coordinates are relative to: #549H

Offset Depths are relative to Offset Datum

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

Central Meridian is 104° 19' 60.00000 W

Grid Convergence at Surface is: 0.24°



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

Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Reference Site: Cedar Lake Federal CA
Site Error: 0.00 usft
Reference Well: #549H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61008
Reference Design: Survey: Phoenix MWD Surveys

Local Co-ordinate Reference: Well #549H
TVD Reference: GL + KB @ 3811.60usft (Trinidad 436)
MD Reference: GL + KB @ 3811.60usft (Trinidad 436)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL + KB @ 3811.60usft (Trinidad 436) Coordinates are relative to: #549H

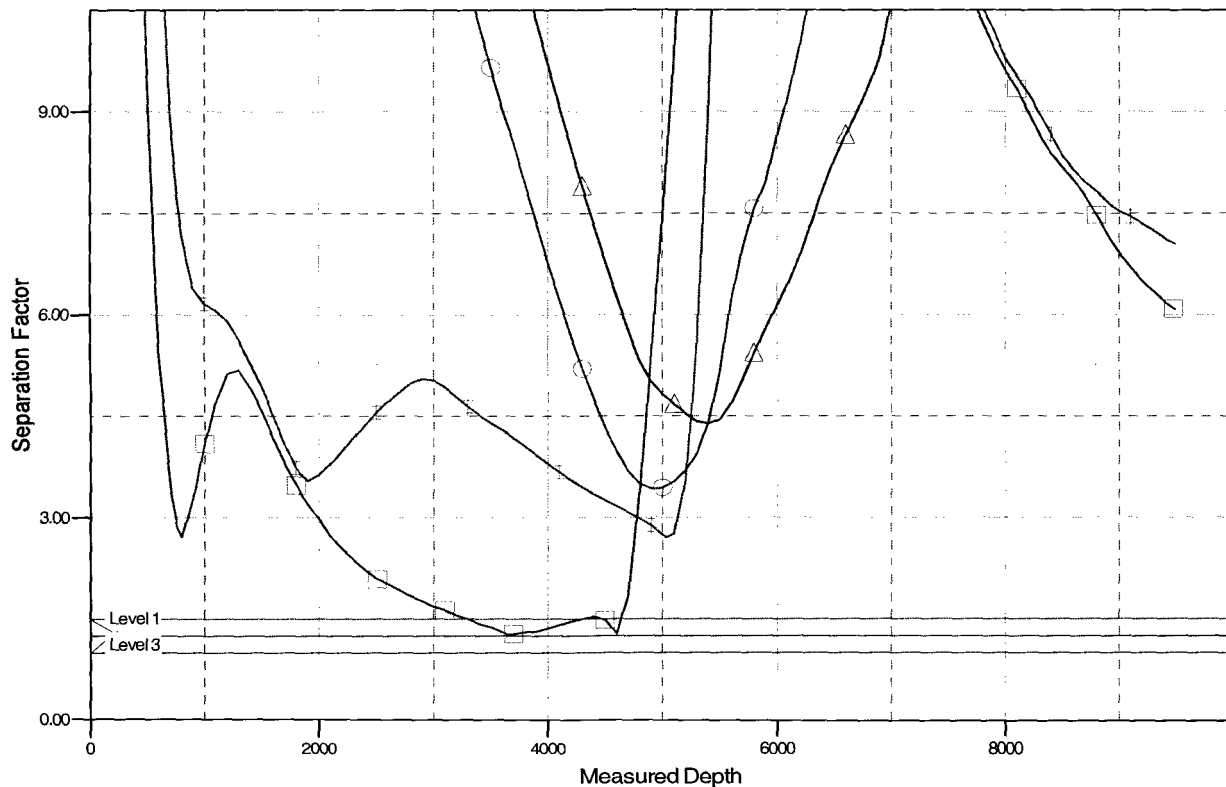
Offset Depths are relative to Offset Datum

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

Central Meridian is 104° 19' 60.00000 W

Grid Convergence at Surface is: 0.24°

Separation Factor Plot

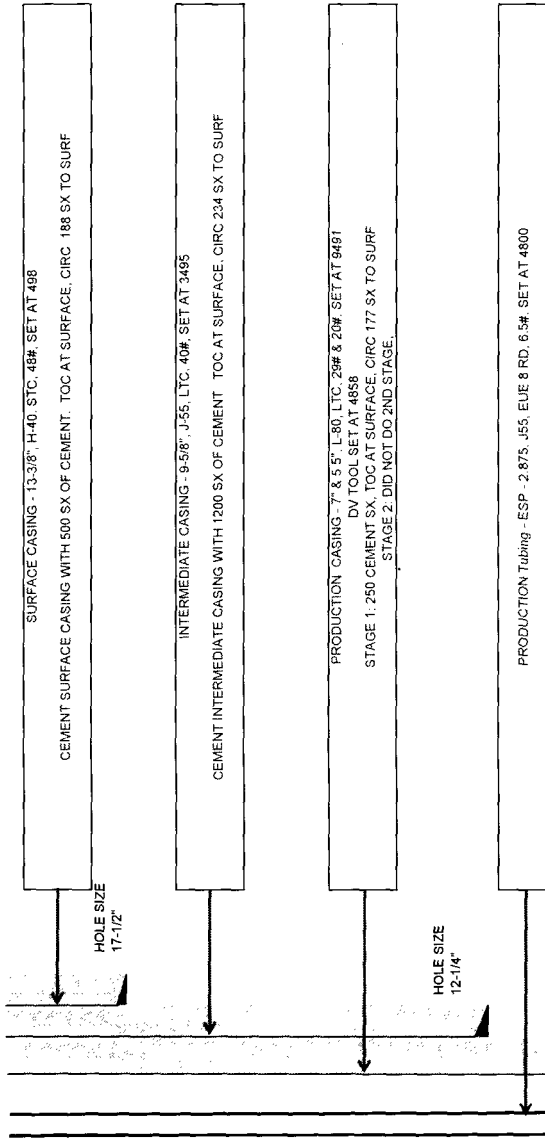


LEGEND

-1, OH / Job #1514802, Surveys (Capstar 119) V0 #51H, OH, Plan 5 10-06-16 V0
 -1, OH / Job #1514748, Surveys (Capstar 119) V0 #47H, OH / Job #1610026, Surveys (Capstar 119) V0

46164

WELL NAME: CEDAR LAKE FEDERAL CA 5
 API: 30-015-43508
 SPUD DATE: 3/30/2017
 FIELD: CEDAR LAKE (BP)
 COUNTY: EDDY
 STATE: NEW MEXICO
 SURFACE LOC: 2510' FNL & 715' FWL
 SECTION: 5
 TOWNSHIP: 17-S
 RANGE: 31-E
 SURVEY: RONALD J. EIDSON
 BOTTOM HOLE LOC: 1995' FNL & 330' FEL
 SECTION: 5
 TOWNSHIP: 17-S
 RANGE: 31-E
 SURVEY: RONALD J. EIDSON
 RIG RELEASE: 1/23/2016
 KB (ft): 3,811.00
 GL (ft): 3,795.30
 KB/GL DIFF (ft): 15.70
 TMD (ft): 9,490.00
 PBMD (ft): 9,490.00
 DEEPEST TVD (ft): 4,970.00



TAPERED CASING STRING:
 7" 28# L-80 TO X-OVER @ 4850' WITH 5"
 WEATHERFORD DVT @ 4800'
 TAPERING TO 5.5" 20# L-80 AT X-OVER
 AT 4850' TO 10,563'



TMD (ft): 9,490
 TVD AT TMD (ft): 5,402
 PBMD (ft): 9,490

PACKERS & SLEEVES
 TOP PERF (MD): 9,270
 BOTTOM PERF (MD): 5,744

KOP (ft): 4,895
 TD OF PILOT HOLE (ft): N/A

LAST UPDATED BY: MISTI HATHCOCK
 LAST UPDATED: 7/13/2017