



NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 25 2017

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Apache Corporation

**Eddy County, NM (NAD 83 NME)
Palmillo 14-15 State
#301H**

OH / Job #61178

Design: Surveys (H&P 482)

Standard Survey Report

22 June, 2017

**Please provide signature
page for directional survey**





Phoenix Technology Services LP Survey Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Site: Palmillo 14-15 State
Well: #301H
Wellbore: OH / Job #61178
Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

Project	Eddy County, NM (NAD 83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Palmillo 14-15 State		
Site Position:		Northing:	601,823.50 usft
From:	Map	Easting:	595,664.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 39' 15.60896 N
		Longitude:	104° 9' 24.52874 W
		Grid Convergence:	0.10 "

Well	#301H		
Well Position	+N-S	0.00 usft	Northing: 601,788.40 usft
	+E-W	0.00 usft	Easting: 595,664.30 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 39' 15.26164 N
		Longitude:	104° 9' 24.53060 W
		Ground Level:	3,420.00 usft

Wellbore	OH / Job #61178		
Magnetics	Model Name	Sample Date	Declination
	HDGM	6/10/2017	7.42
			Dip Angle
			60.52
			Field Strength
			48,189

Design	Surveys (H&P 482)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tis On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			88.13

Survey Program	Date 6/22/2017		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	7,850.00	Phoenix Gyro Surveys (OH / Job #61178)	PHX_SPT_GTD
7,850.00	13,581.00	Phoenix MWD Surveys (OH / Job #61178)	MWD+HDGM
			Description
			PHX Continuous north-seeking gyro
			OWSG Rev.2 MWD + HDGM

Survey									
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.07	148.47	100.00	-0.05	0.03	0.03	0.07	0.07	0.00
200.00	0.20	195.80	200.00	-0.27	0.02	0.01	0.16	0.13	47.33
300.00	0.15	39.68	300.00	-0.34	0.05	0.04	0.34	-0.05	-156.12
400.00	0.49	42.61	400.00	0.08	0.43	0.43	0.34	0.34	2.93
500.00	0.37	60.11	500.00	0.55	0.99	1.01	0.18	-0.12	17.50
600.00	0.29	71.57	599.99	0.79	1.51	1.54	0.10	-0.08	11.46
700.00	0.34	60.42	699.99	1.02	2.01	2.05	0.08	0.05	-11.15
800.00	2.13	279.68	799.97	1.48	0.44	0.49	2.40	1.79	-140.74
900.00	2.37	273.39	899.89	1.91	-3.46	-3.39	0.34	0.24	-6.29



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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)
1,000.00	2.48	267.53	999.80	1.94	-7.68	-7.62	0.27	0.11	-5.86
1,100.00	2.47	254.32	1,099.71	1.27	-11.92	-11.87	0.57	-0.01	-13.21
1,200.00	2.57	255.43	1,199.62	0.12	-16.16	-16.15	0.11	0.10	1.11
1,300.00	3.07	268.09	1,299.50	-0.53	-21.01	-21.02	0.80	0.50	12.66
1,400.00	3.24	271.59	1,399.34	-0.54	-26.51	-26.51	0.26	0.17	3.50
1,500.00	3.95	285.35	1,499.15	0.45	-32.66	-32.63	1.11	0.71	13.76
1,600.00	4.00	274.06	1,598.91	1.60	-39.46	-39.38	0.78	0.05	-11.29
1,700.00	3.57	262.86	1,698.69	1.46	-46.03	-45.95	0.85	-0.43	-11.20
1,800.00	2.31	272.90	1,798.56	1.18	-51.13	-51.06	1.36	-1.26	10.04
1,900.00	1.95	273.74	1,898.49	1.39	-54.84	-54.76	0.36	-0.36	0.64
2,000.00	0.94	274.43	1,998.46	1.57	-57.35	-57.27	1.01	-1.01	0.69
2,100.00	1.05	268.48	2,098.44	1.61	-59.09	-59.00	0.15	0.11	-5.95
2,200.00	0.65	286.58	2,198.43	1.74	-60.55	-60.46	0.48	-0.40	18.10
2,300.00	0.75	281.57	2,298.42	2.04	-61.73	-61.63	0.12	0.10	-5.01
2,400.00	0.69	272.69	2,398.42	2.20	-62.98	-62.87	0.13	-0.06	-8.88
2,500.00	0.72	250.27	2,498.41	2.01	-64.17	-64.07	0.28	0.03	-22.42
2,600.00	0.68	268.07	2,598.40	1.78	-65.35	-65.26	0.22	-0.04	17.80
2,700.00	0.68	283.05	2,698.39	1.89	-66.52	-66.43	0.18	0.00	14.98
2,800.00	0.45	288.57	2,798.39	2.15	-67.47	-67.37	0.24	-0.23	5.52
2,900.00	0.60	275.53	2,898.38	2.33	-68.37	-68.26	0.19	0.15	-13.04
3,000.00	0.51	260.18	2,998.38	2.30	-69.33	-69.22	0.17	-0.09	-15.35
3,100.00	0.38	301.35	3,098.38	2.40	-70.05	-69.93	0.34	-0.13	41.17
3,200.00	0.43	312.30	3,198.37	2.83	-70.61	-70.48	0.09	0.05	10.95
3,300.00	0.53	320.64	3,298.37	3.44	-71.18	-71.03	0.12	0.10	8.34
3,400.00	0.57	295.37	3,398.37	4.01	-71.92	-71.75	0.24	0.04	-25.27
3,500.00	0.58	314.04	3,498.36	4.57	-72.74	-72.55	0.19	0.01	18.67
3,600.00	0.66	288.79	3,598.36	5.11	-73.65	-73.44	0.28	0.08	-25.25
3,700.00	0.64	288.63	3,698.35	5.47	-74.72	-74.50	0.02	-0.02	-0.16
3,800.00	0.79	283.23	3,798.34	5.81	-75.92	-75.69	0.16	0.15	-5.40
3,900.00	1.03	280.22	3,898.33	6.13	-77.48	-77.24	0.24	0.24	-3.01
4,000.00	0.57	329.67	3,998.32	6.71	-78.61	-78.35	0.79	-0.46	49.45
4,100.00	0.58	263.73	4,098.32	7.09	-79.37	-79.09	0.63	0.01	-65.94
4,200.00	0.51	4.54	4,198.31	7.48	-79.83	-79.55	0.84	-0.07	100.81
4,300.00	0.62	263.91	4,298.31	7.86	-80.34	-80.04	0.87	0.11	-100.63
4,400.00	0.64	265.07	4,398.30	7.76	-81.43	-81.14	0.02	0.02	1.16
4,500.00	0.87	268.20	4,498.30	7.69	-82.75	-82.45	0.23	0.23	3.13
4,600.00	0.76	288.98	4,598.29	7.88	-84.13	-83.83	0.31	-0.11	20.78
4,700.00	0.79	272.57	4,698.28	8.12	-85.45	-85.14	0.22	0.03	-16.41
4,800.00	0.77	293.94	4,798.27	8.43	-86.75	-86.43	0.29	-0.02	21.37
4,900.00	0.47	231.89	4,898.26	8.45	-87.69	-87.37	0.69	-0.30	-62.05
5,000.00	0.62	255.40	4,998.26	8.06	-88.53	-88.22	0.27	0.15	23.51
5,100.00	0.56	245.84	5,098.25	7.72	-89.50	-89.20	0.12	-0.06	-9.56
5,200.00	0.71	285.56	5,198.25	7.69	-90.55	-90.25	0.45	0.15	39.72



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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)
5,300.00	1.49	288.44	5,298.23	8.27	-92.38	-92.06	0.78	0.78	2.88
5,400.00	0.68	298.51	5,398.21	8.96	-94.13	-93.79	0.83	-0.81	10.07
5,500.00	0.52	324.06	5,498.20	9.61	-94.92	-94.56	0.31	-0.16	25.55
5,600.00	0.59	358.26	5,598.20	10.49	-95.20	-94.81	0.33	0.07	34.20
5,700.00	0.86	13.81	5,698.19	11.74	-95.04	-94.61	0.33	0.27	15.55
5,800.00	0.90	12.09	5,798.18	13.23	-94.69	-94.21	0.05	0.04	-1.72
5,900.00	0.34	52.71	5,898.17	14.18	-94.29	-93.78	0.68	-0.56	40.62
6,000.00	0.22	91.29	5,998.17	14.36	-93.87	-93.35	0.22	-0.12	38.58
6,100.00	0.24	100.12	6,098.17	14.31	-93.47	-92.95	0.04	0.02	8.83
6,200.00	0.35	124.56	6,198.17	14.10	-93.01	-92.50	0.16	0.11	24.44
6,300.00	0.13	179.22	6,298.17	13.82	-92.76	-92.26	0.29	-0.22	54.66
6,400.00	0.48	153.07	6,398.17	13.33	-92.57	-92.08	0.37	0.35	-26.15
6,500.00	0.62	166.27	6,498.16	12.43	-92.25	-91.79	0.19	0.14	13.20
6,600.00	0.94	179.11	6,598.15	11.09	-92.11	-91.70	0.36	0.32	12.84
6,700.00	0.96	180.21	6,698.14	9.43	-92.10	-91.74	0.03	0.02	1.10
6,800.00	1.04	147.49	6,798.13	7.83	-91.61	-91.31	0.57	0.08	-32.72
6,900.00	0.80	133.35	6,898.11	6.58	-90.62	-90.35	0.33	-0.24	-14.14
7,000.00	0.70	132.22	6,998.10	5.69	-89.66	-89.42	0.10	-0.10	-1.13
7,100.00	0.77	176.56	7,098.10	4.61	-89.16	-88.97	0.56	0.07	44.34
7,200.00	1.11	201.32	7,198.08	3.04	-89.48	-89.33	0.52	0.34	24.76
7,300.00	1.05	197.87	7,298.07	1.26	-90.11	-90.02	0.09	-0.06	-3.45
7,400.00	0.93	210.53	7,398.05	-0.31	-90.80	-90.76	0.25	-0.12	12.66
7,500.00	0.69	208.18	7,498.04	-1.54	-91.50	-91.50	0.24	-0.24	-2.35
7,600.00	0.79	201.35	7,598.03	-2.71	-92.03	-92.07	0.13	0.10	-6.83
7,700.00	1.76	186.04	7,698.01	-4.88	-92.45	-92.56	1.02	0.97	-15.31
7,800.00	1.87	155.29	7,797.96	-7.89	-91.93	-92.13	0.97	0.11	-30.75
7,850.00	1.74	133.11	7,847.94	-9.15	-91.03	-91.28	1.41	-0.26	-44.36
Tie In									
7,971.00	0.38	163.61	7,968.91	-10.79	-89.58	-89.88	1.18	-1.12	25.21
First Phoenix MWD Survey									
8,018.00	4.80	78.50	8,015.86	-10.55	-87.60	-87.90	10.18	9.40	-181.09
8,066.00	11.50	74.32	8,063.35	-8.85	-81.02	-81.27	14.00	13.96	-8.71
8,113.00	18.99	69.64	8,108.66	-4.92	-69.33	-69.45	16.14	15.94	-9.96
8,161.00	25.52	73.10	8,153.06	0.81	-52.09	-52.04	13.87	13.60	7.21
8,208.00	30.94	80.18	8,194.47	5.82	-30.48	-30.27	13.54	11.53	15.05
8,255.00	35.85	84.19	8,233.70	9.28	-4.86	-4.55	11.45	10.45	8.53
8,302.00	40.39	85.62	8,270.67	11.83	24.03	24.40	9.84	9.66	3.04
8,350.00	44.63	84.58	8,308.04	14.61	56.34	56.78	8.95	8.83	-2.17
8,397.00	50.90	83.42	8,337.62	18.27	90.93	91.47	13.46	13.34	-2.47
8,444.00	55.08	83.60	8,365.91	22.51	128.21	128.87	8.90	8.89	0.38
8,491.00	58.90	84.85	8,391.51	26.46	167.41	168.19	8.43	8.13	2.66
8,539.00	62.28	85.41	8,415.08	30.01	209.07	209.94	7.11	7.04	1.17
8,586.00	67.23	84.49	8,435.11	33.76	251.40	252.37	10.68	10.53	-1.96
8,633.00	73.18	82.57	8,451.03	38.75	295.32	296.43	13.23	12.66	-4.09



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8,663.00	76.27	81.68	8,458.93	42.72	323.98	325.20	10.69	10.30	-2.97
8,726.00	83.91	79.50	8,469.76	52.87	385.16	386.67	12.60	12.13	-3.46
8,821.00	86.22	78.64	8,477.94	70.81	478.08	480.13	2.59	2.43	-0.91
8,892.00	87.19	78.69	8,482.02	84.75	547.58	550.05	1.36	1.36	0.06
HL Crossing: 8892' MD, 87.19° Inc, 78.69° Azm									
8,915.00	87.50	78.70	8,483.08	89.25	570.11	572.71	1.36	1.36	0.06
9,009.00	88.04	78.95	8,486.74	107.46	662.26	665.40	0.63	0.57	0.27
9,104.00	88.77	80.26	8,489.39	124.59	755.66	759.31	1.58	0.77	1.38
9,198.00	88.88	81.67	8,491.31	139.35	848.47	852.56	1.50	0.12	1.50
9,292.00	89.08	83.55	8,492.99	151.44	941.67	946.10	2.01	0.21	2.00
9,387.00	89.64	86.66	8,494.05	159.54	1,036.31	1,040.95	3.33	0.59	3.27
9,481.00	89.19	88.46	8,495.01	163.54	1,130.21	1,134.94	1.97	-0.48	1.91
9,576.00	87.68	90.56	8,497.60	164.36	1,225.16	1,229.87	2.72	-1.59	2.21
9,670.00	88.12	90.74	8,501.05	163.29	1,319.09	1,323.71	0.51	0.47	0.19
9,765.00	88.66	90.86	8,503.72	161.97	1,414.05	1,418.57	0.58	0.57	0.13
9,860.00	89.36	90.91	8,505.36	160.50	1,509.02	1,513.45	0.74	0.74	0.05
9,954.00	88.38	90.86	8,507.21	159.05	1,602.99	1,607.32	1.04	-1.04	-0.05
10,049.00	89.02	90.68	8,509.37	157.77	1,697.96	1,702.19	0.70	0.67	-0.19
10,143.00	88.23	90.39	8,511.62	156.89	1,791.93	1,796.08	0.90	-0.84	-0.31
10,238.00	88.74	90.07	8,514.14	156.51	1,886.89	1,890.99	0.63	0.54	-0.34
10,333.00	87.98	89.81	8,516.85	156.61	1,981.85	1,985.90	0.85	-0.80	-0.27
10,427.00	87.17	90.02	8,520.83	156.75	2,075.77	2,079.77	0.89	-0.86	0.22
10,522.00	85.77	89.68	8,526.68	157.00	2,170.58	2,174.54	1.52	-1.47	-0.36
10,617.00	85.55	89.60	8,533.87	157.59	2,265.31	2,269.24	0.25	-0.23	-0.08
10,712.00	85.58	89.61	8,541.22	158.25	2,360.02	2,363.92	0.03	0.03	0.01
10,806.00	85.62	89.44	8,548.43	159.02	2,453.74	2,457.62	0.19	0.04	-0.18
10,901.00	85.82	89.82	8,555.52	159.64	2,548.47	2,552.32	0.45	0.21	0.40
10,995.00	85.88	90.06	8,562.32	159.73	2,642.23	2,646.03	0.26	0.06	0.26
11,022.00	85.99	89.86	8,564.23	159.75	2,669.16	2,672.95	0.84	0.41	-0.74
11,117.00	88.11	88.75	8,568.29	160.90	2,764.05	2,767.83	3.49	3.28	-1.17
11,212.00	89.69	88.99	8,569.29	162.78	2,859.03	2,862.81	0.66	0.61	0.25
11,306.00	88.77	89.71	8,570.55	163.84	2,953.01	2,956.78	1.24	-0.98	0.77
11,401.00	88.29	89.37	8,572.99	164.61	3,047.98	3,051.72	0.62	-0.51	-0.36
11,495.00	89.19	89.70	8,575.06	165.37	3,141.95	3,145.67	1.02	0.96	0.35
11,590.00	87.73	90.01	8,577.61	165.61	3,236.91	3,240.59	1.57	-1.54	0.33
11,685.00	87.79	89.91	8,581.32	165.68	3,331.84	3,335.47	0.12	0.06	-0.11
11,779.00	88.26	89.67	8,584.56	166.02	3,425.78	3,429.37	0.56	0.50	-0.26
11,874.00	88.46	89.54	8,587.28	166.67	3,520.74	3,524.30	0.25	0.21	-0.14
11,969.00	88.71	88.93	8,589.63	167.94	3,615.70	3,619.26	0.69	0.26	-0.64
12,063.00	88.93	88.64	8,591.56	169.94	3,709.66	3,713.23	0.39	0.23	-0.31
12,158.00	88.88	88.31	8,593.38	172.46	3,804.61	3,808.21	0.35	-0.05	-0.35
12,252.00	88.01	89.24	8,595.93	174.47	3,898.55	3,902.17	1.35	-0.93	0.99
12,347.00	87.06	90.15	8,600.02	174.98	3,993.46	3,997.04	1.38	-1.00	0.96



Phoenix Technology Services LP Survey Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Site: Palmillo 14-15 State
Well: #301H
Wellbore: OH / Job #61178
Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

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)
12,442.00	87.25	90.50	8,604.73	174.44	4,088.34	4,091.86	0.42	0.20	0.37
12,536.00	87.79	90.51	8,608.80	173.61	4,182.25	4,185.69	0.57	0.57	0.01
12,631.00	88.35	90.53	8,612.00	172.75	4,277.19	4,280.55	0.59	0.59	0.02
12,725.00	88.85	90.53	8,614.29	171.88	4,371.16	4,374.44	0.53	0.53	0.00
12,820.00	88.83	90.19	8,617.87	171.28	4,466.09	4,469.30	2.16	-2.13	-0.36
12,915.00	86.86	89.66	8,623.10	171.41	4,560.94	4,564.11	0.56	0.03	-0.56
13,009.00	87.17	89.35	8,628.00	172.22	4,654.81	4,657.95	0.47	0.33	-0.33
13,104.00	87.09	89.09	8,632.75	173.51	4,749.68	4,752.81	0.29	-0.08	-0.27
13,198.00	87.40	88.83	8,637.27	175.22	4,843.56	4,846.70	0.43	0.33	-0.28
13,293.00	87.34	88.57	8,641.63	177.37	4,938.43	4,941.59	0.28	-0.06	-0.27
13,388.00	87.45	88.55	8,645.95	179.75	5,033.31	5,036.49	0.12	0.12	-0.02
13,482.00	86.95	87.88	8,650.54	182.68	5,127.15	5,130.38	0.89	-0.53	-0.71
13,511.00	86.98	88.34	8,652.08	183.63	5,156.09	5,159.34	1.59	0.10	1.59
Final Phoenix MWD Survey									
13,534.00	87.00	88.34	8,653.28	184.30	5,179.05	5,182.30	0.10	0.10	0.00
HL Crossing: 13534' MD, 87.00° Inc, 88.34° Azm									
13,581.00	87.05	88.34	8,655.72	185.66	5,225.97	5,229.24	0.10	0.10	0.00
PTD: 13581' MD, 87.05° Inc, 88.34° Azm									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,850.00	7,847.94	-9.15	-91.03	Tie In
7,971.00	7,968.91	-10.79	-89.58	First Phoenix MWD Survey
8,892.00	8,482.02	84.75	547.58	HL Crossing: 8892' MD, 87.19° Inc, 78.69° Azm
13,511.00	8,652.08	183.63	5,156.09	Final Phoenix MWD Survey
13,534.00	8,653.28	184.30	5,179.05	HL Crossing: 13534' MD, 87.00° Inc, 88.34° Azm
13,581.00	8,655.72	185.66	5,225.97	PTD: 13581' MD, 87.05° Inc, 88.34° Azm



Apache Corporation

Eddy County, NM (NAD 83 NME)

Palmillo 14-15 State

#301H

OH / Job #61178

Surveys (H&P 482)

Anticollision Report

22 June, 2017

**Please provide signature
page for directional survey**





Phoenix Technology Services LP

Anticollision Report



Company: Apache Corporation
 Project: Eddy County, NM (NAD 83 NME)
 Reference Site: Palmillo 14-15 State
 Site Error: 0.00 usft
 Reference Well: #301H
 Well Error: 0.00 usft
 Reference Wellbore: OH / Job #61178
 Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
 TVD Reference: GL + KB @ 3446 00usft (H&P 482)
 MD Reference: GL + KB @ 3446 00usft (H&P 482)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Compass 5000 GCR
 Offset TVD Reference: Reference Datum

Reference	Surveys (H&P 482)		
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 6/22/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	7,850.00	Phoenix Gyro Surveys (OH / Job #61178)	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
7,850.00	13,581.00	Phoenix MWD Surveys (OH / Job #61178)	MWD+HDGM	OWSG Rev 2 MWD + HDGM	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Atlantic State						
#1 - OH - Surveys	9,598.09	8,498.00	2,888.43	2,606.07	10.230	CC, ES
#1 - OH - Surveys	10,200.00	8,498.00	2,952.23	2,658.90	10.064	SF
East Millman Unit						
#218 - OH - Surveys	11,878.33	8,522.42	413.94	135.59	1.487	Level 3, CC, ES
#218 - OH - Surveys	11,900.00	8,523.00	414.58	135.74	1.487	Level 3, SF
Palmillo 14 State Com						
#1H - WB1/Job #1411057 - Surveys (Pioneer 28)	0.00	31.56	1,943.75			
#1H - WB1/Job #1411057 - Surveys (Pioneer 28)	13,579.89	11,874.00	1,966.65	1,560.95	4.848	ES
#1H - WB1/Job #1411057 - Surveys (Pioneer 28)	13,581.00	11,874.00	1,966.74	1,561.02	4.847	SF
#4H - WB1/Job #1411413 - Surveys (Pioneer 28)	9,500.00	7,662.00	4,324.70	4,254.75	61.830	CC
#4H - WB1/Job #1411413 - Surveys (Pioneer 28)	13,581.00	11,759.00	4,393.56	3,934.89	9.579	ES, SF
Palmillo 14-15 State						
#2H - OH / Job #61176 - Surveys (H&P 482)	957.01	957.41	20.71	15.98	4.380	CC
#2H - OH / Job #61176 - Surveys (H&P 482)	1,000.00	1,000.37	20.85	15.90	4.211	ES
#2H - OH / Job #61176 - Surveys (H&P 482)	6,664.88	6,666.66	87.11	52.03	2.483	SF

Offset Design Atlantic State- #1 - OH - Surveys											
Survey Program: 378-INC-ONLY-Offset Well											
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset 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)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)
0.00	0.00	13.00	0.00	0.00	0.12	22.70	3,052.70	1,276.71	3,308.92		
100.00	100.00	113.00	100.00	0.14	1.02	-125.78	3,052.70	1,278.71	3,308.95	3,307.80	1.15
200.00	200.00	213.00	200.00	0.53	1.92	-173.11	3,052.70	1,278.71	3,309.16	3,306.74	2.43
300.00	300.00	313.00	300.00	0.86	2.82	-16.99	3,052.70	1,278.71	3,309.21	3,305.65	3.66
400.00	400.00	413.00	400.00	1.20	4.09	-19.92	3,052.70	1,278.71	3,308.68	3,303.42	5.26
500.00	500.00	513.00	500.00	1.56	5.99	-37.43	3,052.70	1,278.71	3,308.03	3,300.50	7.52
600.00	599.89	612.89	599.89	1.94	7.69	-48.89	3,052.70	1,278.71	3,307.60	3,297.82	9.78
700.00	699.89	712.89	699.89	2.32	9.60	-37.75	3,052.70	1,278.71	3,307.20	3,295.15	12.05
735.86	735.95	748.95	735.95	2.44	10.48	90.00	3,052.70	1,278.71	3,307.12	3,284.25	12.86
800.00	799.97	812.97	799.97	2.66	11.70	103.01	3,052.70	1,278.71	3,307.39	3,293.06	14.31

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 376-INC-ONLY-Offset Well													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	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	
900.00	899.89	912.90	899.89	2.97	13.79	109.36	3.052.70	1.276.71	3.308.49	3.291.75	16.74	197.665		
1.000.00	999.80	1.012.81	999.80	3.30	16.12	115.28	3.052.70	1.276.71	3.310.10	3.290.69	19.41	170.545		
1.100.00	1.099.71	1.112.72	1.099.71	3.64	18.45	128.55	3.052.70	1.276.71	3.312.37	3.290.29	22.08	150.023		
1.200.00	1.199.62	1.212.62	1.199.62	3.99	20.77	127.50	3.052.70	1.276.71	3.315.08	3.290.32	24.75	133.919		
1.300.00	1.299.50	1.312.50	1.299.50	4.35	23.10	114.91	3.052.70	1.276.71	3.317.57	3.290.13	27.44	120.914		
1.400.00	1.399.34	1.358.00	1.344.98	4.71	24.16	111.44	3.052.70	1.276.71	3.320.18	3.291.33	28.86	115.059		
1.500.00	1.499.15	1.512.17	1.499.15	5.07	26.27	97.85	3.052.70	1.276.71	3.321.25	3.287.92	33.33	99.646		
1.600.00	1.599.91	1.511.93	1.598.91	5.44	30.93	109.23	3.052.70	1.276.71	3.322.87	3.286.52	36.35	91.421		
1.700.00	1.698.69	1.711.71	1.698.69	5.81	33.59	120.53	3.052.70	1.276.71	3.325.60	3.286.24	39.36	84.489		
1.800.00	1.798.56	1.810.00	1.796.89	6.17	36.21	110.60	3.052.70	1.276.71	3.327.90	3.285.54	42.36	78.572		
1.900.00	1.898.49	1.911.60	1.898.49	6.54	38.76	109.83	3.052.70	1.276.71	3.329.19	3.283.92	45.26	73.552		
2.000.00	1.998.46	2.011.57	1.998.46	6.91	41.27	109.18	3.052.70	1.276.71	3.330.03	3.281.90	48.13	69.191		
2.100.00	2.098.44	2.111.55	2.098.44	7.29	43.78	115.16	3.052.70	1.276.71	3.330.69	3.279.70	50.69	65.321		
2.200.00	2.198.43	2.211.54	2.198.43	7.67	46.29	97.09	3.052.70	1.276.71	3.331.15	3.277.30	53.65	61.858		
2.300.00	2.298.42	2.291.00	2.277.83	8.05	48.29	102.11	3.052.70	1.276.71	3.331.42	3.275.23	56.20	59.283		
2.400.00	2.398.42	2.411.58	2.398.42	8.43	51.20	111.02	3.052.70	1.276.71	3.331.71	3.272.25	59.46	56.034		
2.500.00	2.498.41	2.511.57	2.498.41	8.81	53.61	133.45	3.052.70	1.276.71	3.332.36	3.270.13	62.23	53.551		
2.600.00	2.598.40	2.511.57	2.598.40	9.19	56.03	115.67	3.052.70	1.276.71	3.333.05	3.268.05	65.00	51.278		
2.700.00	2.698.39	2.711.56	2.698.39	9.57	58.45	100.71	3.052.70	1.276.71	3.333.42	3.265.65	67.77	49.189		
2.800.00	2.798.39	2.798.00	2.772.78	9.95	60.24	95.21	3.052.70	1.276.71	3.333.66	3.263.75	69.91	47.682		
2.900.00	2.898.38	2.911.61	2.898.38	10.34	63.03	108.26	3.052.70	1.276.71	3.333.76	3.260.72	73.05	45.639		
3.000.00	2.998.38	3.011.61	2.998.38	10.72	65.24	123.83	3.052.70	1.276.71	3.334.17	3.258.58	75.62	44.093		
3.100.00	3.098.38	3.111.61	3.098.38	11.10	67.46	82.47	3.052.70	1.276.71	3.334.38	3.256.19	78.18	42.648		
3.200.00	3.198.37	3.211.61	3.198.37	11.48	69.68	71.53	3.052.70	1.276.71	3.334.21	3.253.47	80.74	41.295		
3.300.00	3.298.37	3.311.61	3.298.37	11.86	71.89	83.21	3.052.70	1.276.71	3.333.89	3.250.59	83.30	40.023		
3.382.95	3.381.31	3.394.55	3.381.31	12.17	73.73	84.51	3.052.70	1.276.71	3.333.67	3.248.25	85.42	39.025		
3.400.00	3.398.37	3.400.00	3.385.74	12.23	73.85	88.49	3.052.70	1.276.71	3.333.69	3.248.08	85.60	38.943		
3.500.00	3.498.36	3.511.62	3.498.36	12.62	76.55	69.84	3.052.70	1.276.71	3.333.48	3.244.83	88.64	37.605		
3.577.29	3.575.64	3.589.90	3.575.64	12.91	78.42	90.00	3.052.70	1.276.71	3.333.34	3.242.56	90.78	36.719		
3.600.00	3.598.36	3.611.61	3.598.36	13.00	78.96	95.11	3.052.70	1.276.71	3.333.35	3.241.95	91.41	36.467		
3.700.00	3.698.35	3.711.61	3.698.35	13.38	81.38	95.29	3.052.70	1.276.71	3.333.46	3.239.28	94.17	35.397		
3.800.00	3.798.34	3.811.60	3.798.34	13.77	83.80	100.71	3.052.70	1.276.71	3.333.64	3.236.70	96.94	34.389		
3.900.00	3.898.33	3.894.00	3.880.70	14.16	85.79	103.74	3.052.70	1.276.71	3.334.02	3.234.74	99.28	33.582		
4.000.00	3.998.32	4.011.62	3.998.32	14.53	88.99	54.32	3.052.70	1.276.71	3.333.90	3.231.07	102.83	32.423		
4.053.21	4.051.53	4.064.83	4.051.53	14.73	90.44	90.00	3.052.70	1.276.71	3.333.75	3.229.29	104.46	31.913		
4.100.00	4.098.32	4.111.61	4.098.32	14.91	91.71	120.27	3.052.70	1.276.71	3.333.87	3.227.97	105.90	31.482		
4.200.00	4.198.31	4.211.61	4.198.31	15.27	94.43	19.47	3.052.70	1.276.71	3.333.70	3.224.74	108.96	30.595		
4.260.72	4.259.04	4.272.33	4.259.04	15.49	96.08	90.00	3.052.70	1.276.71	3.333.45	3.222.62	110.63	30.078		
4.300.00	4.298.31	4.311.61	4.298.31	15.63	97.15	120.11	3.052.70	1.276.71	3.333.55	3.221.52	112.03	29.755		
4.400.00	4.398.30	4.394.00	4.380.65	16.02	99.40	118.96	3.052.70	1.276.71	3.334.14	3.219.52	114.53	29.087		
4.500.00	4.498.30	4.511.65	4.498.30	16.40	102.98	115.86	3.052.70	1.276.71	3.334.70	3.216.14	118.56	28.126		
4.600.00	4.598.29	4.611.64	4.598.29	16.79	106.02	95.10	3.052.70	1.276.71	3.335.09	3.213.13	121.96	27.346		
4.700.00	4.698.28	4.711.63	4.698.28	17.17	109.07	111.53	3.052.70	1.276.71	3.335.40	3.210.04	125.35	26.608		
4.800.00	4.798.27	4.806.00	4.782.56	17.56	111.94	90.19	3.052.70	1.276.71	3.335.68	3.207.08	128.58	25.942		
4.900.00	4.898.26	4.911.70	4.898.26	17.94	115.40	152.25	3.052.70	1.276.71	3.336.02	3.203.63	132.39	25.198		
5.000.00	4.998.26	4.998.00	4.966.52	18.31	117.63	128.75	3.052.70	1.276.71	3.336.87	3.201.89	134.98	24.722		
5.100.00	5.098.25	4.998.00	4.966.52	18.69	117.63	139.31	3.052.70	1.276.71	3.340.02	3.204.69	135.33	24.680		
5.193.63	5.191.87	5.235.36	5.191.87	19.04	125.52	100.51	3.052.70	1.276.71	3.337.87	3.194.31	143.58	23.250		
5.200.00	5.198.25	5.211.73	5.198.25	19.07	125.75	98.62	3.052.70	1.276.71	3.337.88	3.194.08	143.81	23.211		
5.300.00	5.298.23	5.289.00	5.275.42	19.46	128.45	95.76	3.052.70	1.276.71	3.338.16	3.191.32	146.87	22.730		
5.400.00	5.398.21	5.411.79	5.398.21	19.84	133.05	85.74	3.052.70	1.276.71	3.338.19	3.188.38	151.61	21.969		
5.434.93	5.433.13	5.444.00	5.430.36	19.98	134.26	78.38	3.052.70	1.276.71	3.338.14	3.185.01	153.13	21.799		

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 (NAD 83 NME)
Reference Site: Palmilio 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 378-INC-ONLY-Offset Well													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	Offset	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,500.00	5,498.20	5,444.00	5,430.36	20.22	134.25	60.19	3,052.70	1,276.71	3,338.61	3,185.26	153.36	21.770		
5,600.00	5,598.20	5,597.00	5,583.29	20.58	139.65	26.01	3,052.70	1,276.71	3,337.27	3,178.18	159.09	20.977		
5,700.00	5,698.19	5,711.90	5,698.19	20.92	143.59	10.47	3,052.70	1,276.71	3,336.03	3,172.68	163.36	20.422		
5,791.10	5,789.28	5,752.00	5,738.25	21.22	144.97	12.05	3,052.70	1,276.71	3,335.06	3,170.02	165.04	20.208		
5,800.00	5,799.18	5,752.00	5,738.25	21.25	144.97	12.19	3,052.70	1,276.71	3,335.07	3,170.00	165.07	20.204		
5,900.00	5,898.17	5,908.00	5,894.19	21.56	150.85	-28.42	3,052.70	1,276.71	3,333.50	3,162.19	171.31	19.459		
5,995.68	5,993.85	6,002.00	5,988.15	21.84	154.41	-84.65	3,052.70	1,276.71	3,333.18	3,157.98	175.20	19.025		
6,000.00	5,996.17	6,002.00	5,988.15	21.85	154.41	-67.01	3,052.70	1,276.71	3,333.18	3,157.97	175.21	19.023		
6,088.26	6,084.43	6,096.00	6,082.11	22.09	157.86	-74.72	3,052.70	1,276.71	3,333.05	3,154.09	178.97	18.624		
6,100.00	6,098.17	6,096.00	6,082.11	22.13	157.86	-75.85	3,052.70	1,276.71	3,333.08	3,154.06	179.01	18.619		
6,165.80	6,163.97	6,177.86	6,163.97	22.31	160.87	-93.94	3,052.70	1,276.71	3,333.02	3,150.76	182.25	18.288		
6,200.00	6,198.17	6,190.00	6,178.07	22.41	161.32	-100.29	3,052.70	1,276.71	3,333.12	3,150.30	182.82	18.232		
6,300.00	6,298.17	6,312.10	6,298.17	22.71	165.82	-154.96	3,052.70	1,276.71	3,333.20	3,145.53	187.67	17.761		
6,400.00	6,398.17	6,344.00	6,330.02	23.02	166.99	-128.81	3,052.70	1,276.71	3,334.26	3,145.07	189.19	17.624		
6,477.88	6,476.05	6,490.03	6,476.05	23.28	172.55	-139.66	3,052.70	1,276.71	3,334.07	3,139.05	195.02	17.096		
6,500.00	6,496.16	6,493.00	6,478.96	23.33	172.67	-142.03	3,052.70	1,276.71	3,334.31	3,139.10	195.21	17.080		
6,600.00	6,596.15	6,591.00	6,576.91	23.65	176.40	-154.88	3,052.70	1,276.71	3,335.49	3,136.20	199.28	16.737		
6,700.00	6,696.14	6,682.00	6,667.88	23.97	179.87	-155.99	3,052.70	1,276.71	3,337.07	3,133.95	203.12	16.429		
6,800.00	6,796.13	6,776.00	6,761.84	24.29	183.58	-123.28	3,052.70	1,276.71	3,338.39	3,131.21	207.18	16.113		
6,900.00	6,896.11	6,866.00	6,853.79	24.60	187.20	-109.18	3,052.70	1,276.71	3,339.22	3,128.05	211.17	15.813		
7,000.00	6,996.10	7,012.31	6,996.10	24.90	192.90	-108.07	3,052.70	1,276.71	3,339.34	3,122.12	217.22	15.373		
7,100.00	7,096.10	7,112.37	7,096.10	25.22	196.98	-152.42	3,052.70	1,276.71	3,340.13	3,118.49	221.64	15.070		
7,200.00	7,196.08	7,187.00	7,172.65	25.56	200.02	-177.19	3,052.70	1,276.71	3,341.79	3,116.77	225.01	14.852		
7,300.00	7,296.07	7,305.00	7,290.58	25.81	204.98	-173.74	3,052.70	1,276.71	3,343.58	3,113.24	230.33	14.516		
7,400.00	7,396.05	7,412.50	7,396.05	26.27	209.39	-173.60	3,052.70	1,276.71	3,345.28	3,110.17	235.12	14.228		
7,500.00	7,496.04	7,512.54	7,496.04	26.63	213.22	-175.95	3,052.70	1,276.71	3,346.69	3,107.38	239.31	13.985		
7,600.00	7,596.03	7,558.00	7,543.47	26.98	214.91	-177.22	3,052.70	1,276.71	3,348.43	3,107.06	241.37	13.873		
7,700.00	7,696.01	7,712.54	7,696.01	27.33	219.92	-181.91	3,052.70	1,276.71	3,350.13	3,103.47	246.66	13.582		
7,800.00	7,796.96	7,805.00	7,790.37	27.67	222.91	-131.18	3,052.70	1,276.71	3,352.67	3,102.81	250.06	13.408		
7,900.00	7,897.92	7,912.55	7,897.92	27.91	225.87	-113.00	3,052.70	1,276.71	3,353.89	3,100.58	253.33	13.239		
8,000.00	7,997.90	8,012.53	7,997.90	28.02	228.62	-57.31	3,052.70	1,276.71	3,354.02	3,097.91	256.11	13.096		
8,100.00	8,096.29	8,110.92	8,096.29	28.04	231.33	-47.98	3,052.70	1,276.71	3,343.55	3,089.58	253.97	13.165		
8,200.00	8,197.57	8,202.20	8,187.57	28.07	233.84	-59.58	3,052.70	1,276.71	3,317.69	3,084.74	252.95	13.116		
8,300.00	8,299.14	8,283.77	8,269.14	28.10	236.09	-66.86	3,052.70	1,276.71	3,289.36	3,032.87	256.49	12.824		
8,400.00	8,398.51	8,310.00	8,295.29	28.14	236.81	-71.04	3,052.70	1,276.71	3,257.10	3,001.12	255.98	12.724		
8,500.00	8,398.11	8,410.82	8,396.11	28.19	239.83	-76.67	3,052.70	1,276.71	3,219.85	2,957.36	262.49	12.267		
8,600.00	8,440.33	8,455.04	8,440.33	28.36	241.15	-80.68	3,052.70	1,276.71	3,182.82	2,916.48	266.44	11.946		
8,700.00	8,466.30	8,481.00	8,466.30	28.95	241.93	-85.40	3,052.70	1,276.71	3,141.13	2,871.08	270.05	11.632		
8,800.00	8,476.48	8,491.17	8,476.48	29.72	242.24	-87.86	3,052.70	1,276.71	3,096.30	2,824.54	271.76	11.393		
8,900.00	8,482.40	8,497.11	8,482.40	30.62	242.41	-88.74	3,052.70	1,276.71	3,052.81	2,779.85	272.97	11.184		
9,000.00	8,486.43	8,498.00	8,483.26	31.68	242.44	-89.08	3,052.70	1,276.71	3,012.16	2,738.10	274.06	10.991		
9,100.00	8,489.30	8,498.00	8,483.26	32.82	242.44	-89.42	3,052.70	1,276.71	2,975.47	2,700.23	275.25	10.810		
9,200.00	8,491.35	8,498.00	8,483.26	34.10	242.44	-89.50	3,052.70	1,276.71	2,944.09	2,667.58	276.53	10.647		
9,300.00	8,493.11	8,498.00	8,483.26	35.48	242.44	-89.61	3,052.70	1,276.71	2,918.78	2,640.88	277.90	10.503		
9,400.00	8,494.14	8,498.00	8,483.26	36.96	242.44	-89.73	3,052.70	1,276.71	2,901.37	2,622.04	279.33	10.387		
9,500.00	8,495.33	8,498.00	8,483.26	38.52	242.44	-89.69	3,052.70	1,276.71	2,891.55	2,610.72	280.83	10.297		
9,598.09	8,498.15	8,498.00	8,483.26	40.11	242.44	-89.70	3,052.70	1,276.71	2,888.43	2,606.07	282.36	10.230 CC ES		
9,600.00	8,498.55	8,498.00	8,483.26	40.15	242.44	-89.70	3,052.70	1,276.71	2,888.78	2,606.37	282.39	10.230		
9,700.00	8,501.99	8,498.00	8,483.26	41.84	242.44	-89.69	3,052.70	1,276.71	2,890.77	2,606.69	284.08	10.176		
9,800.00	8,504.46	8,498.00	8,483.26	43.59	242.44	-89.68	3,052.70	1,276.71	2,896.47	2,610.64	285.83	10.134		
9,900.00	8,505.95	8,498.00	8,483.26	45.38	242.44	-89.67	3,052.70	1,276.71	2,905.70	2,618.07	287.83	10.102		
10,000.00	8,508.39	8,498.00	8,483.26	47.22	242.44	-89.69	3,052.70	1,276.71	2,918.26	2,628.77	289.49	10.081		

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 (NAD 83 NME)
Reference Site: Palmilla 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2 00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Atlantic State - #1 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 378-INC-ONLY-Offset Well													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
10,100.00	8,510.43	8,498.00	8,483.26	49.10	242.44	-89.70	3,052.70	1,276.71	2,933.84	2,642.45	291.39	10.068		
10,200.00	8,513.23	8,498.00	8,483.26	51.02	242.44	-89.70	3,052.70	1,276.71	2,952.23	2,658.80	293.33	10.064 SF		
10,300.00	8,515.77	8,498.00	8,483.26	52.97	242.44	-89.76	3,052.70	1,276.71	2,973.32	2,678.02	295.30	10.069		
10,400.00	8,519.55	8,498.00	8,483.26	54.95	242.44	-89.97	3,052.70	1,276.71	2,997.33	2,700.04	297.28	10.082		
10,500.00	8,525.12	8,498.00	8,483.26	56.95	242.44	-90.33	3,052.70	1,276.71	3,024.52	2,725.23	299.29	10.106		
10,600.00	8,532.56	8,498.00	8,483.26	58.97	242.44	-90.48	3,052.70	1,276.71	3,054.31	2,753.00	301.32	10.136		
10,700.00	8,540.29	8,498.00	8,483.26	61.01	242.44	-90.48	3,052.70	1,276.71	3,088.97	2,783.60	303.35	10.175		
10,800.00	8,547.97	8,498.00	8,483.26	63.07	242.44	-90.45	3,052.70	1,276.71	3,122.38	2,816.94	305.43	10.223		
10,900.00	8,555.44	8,498.00	8,483.26	65.14	242.44	-90.40	3,052.70	1,276.71	3,160.69	2,853.19	307.49	10.279		
11,000.00	8,562.68	8,498.00	8,483.26	67.23	242.44	-90.37	3,052.70	1,276.71	3,202.16	2,892.59	309.58	10.344		
11,100.00	8,567.95	8,498.00	8,483.26	69.34	242.44	-89.04	3,052.70	1,276.71	3,245.54	2,933.84	311.70	10.412		
11,200.00	8,569.22	8,498.00	8,483.26	71.46	242.44	-88.51	3,052.70	1,276.71	3,290.32	2,975.56	313.76	10.487		
11,300.00	8,570.43	8,498.00	8,483.26	73.59	242.44	-88.95	3,052.70	1,276.71	3,338.14	3,022.23	315.91	10.567		
11,400.00	8,572.96	8,498.00	8,483.26	75.73	242.44	-89.25	3,052.70	1,276.71	3,388.66	3,070.57	318.10	10.653		
11,500.00	8,575.13	8,498.00	8,483.26	77.89	242.44	-88.75	3,052.70	1,276.71	3,441.33	3,121.15	320.19	10.748		
11,600.00	8,578.01	8,498.00	8,483.26	80.05	242.44	-89.67	3,052.70	1,276.71	3,496.56	3,174.16	322.40	10.845		
11,700.00	8,581.89	8,498.00	8,483.26	82.22	242.44	-89.57	3,052.70	1,276.71	3,553.85	3,229.28	324.58	10.949		
11,800.00	8,585.19	8,498.00	8,483.26	84.39	242.44	-89.25	3,052.70	1,276.71	3,612.72	3,285.97	326.75	11.057		
11,900.00	8,587.96	8,498.00	8,483.26	86.58	242.44	-89.07	3,052.70	1,276.71	3,673.10	3,344.17	328.93	11.167		
12,000.00	8,590.31	8,498.00	8,483.26	88.77	242.44	-88.87	3,052.70	1,276.71	3,734.52	3,403.39	331.12	11.278		
12,100.00	8,592.26	8,498.00	8,483.26	90.96	242.44	-88.77	3,052.70	1,276.71	3,797.04	3,463.72	333.32	11.392		
12,200.00	8,594.34	8,498.00	8,483.26	93.16	242.44	-89.12	3,052.70	1,276.71	3,860.84	3,525.30	335.55	11.506		
12,300.00	8,597.80	8,512.53	8,597.80	95.38	245.73	-92.27	3,052.70	1,276.71	3,925.49	3,584.72	340.78	11.519		
12,400.00	8,602.68	8,617.42	8,602.68	97.57	245.87	-92.78	3,052.70	1,276.71	3,994.22	3,651.25	342.96	11.646		
12,500.00	8,607.34	8,622.08	8,607.34	99.79	246.01	-92.45	3,052.70	1,276.71	4,064.70	3,719.32	345.38	11.789		
12,600.00	8,611.06	8,625.79	8,611.06	102.01	246.11	-91.92	3,052.70	1,276.71	4,136.47	3,788.65	347.82	11.892		
12,700.00	8,613.76	8,628.50	8,613.76	104.23	246.19	-91.39	3,052.70	1,276.71	4,209.44	3,859.22	350.22	12.020		
12,800.00	8,616.84	8,631.58	8,616.84	106.46	246.28	-93.04	3,052.70	1,276.71	4,283.37	3,931.19	352.18	12.163		
12,900.00	8,622.28	8,637.02	8,622.28	108.69	246.44	-93.53	3,052.70	1,276.71	4,357.79	4,003.36	354.43	12.295		
13,000.00	8,627.55	8,642.29	8,627.55	110.92	246.59	-93.27	3,052.70	1,276.71	4,432.68	4,075.77	356.91	12.419		
13,100.00	8,632.55	8,647.29	8,632.55	113.16	246.73	-93.39	3,052.70	1,276.71	4,508.20	4,148.95	359.26	12.549		
13,200.00	8,637.36	8,652.10	8,637.36	115.39	246.87	-93.09	3,052.70	1,276.71	4,584.36	4,222.62	361.74	12.673		
13,300.00	8,641.96	8,656.69	8,641.96	117.63	247.00	-93.21	3,052.70	1,276.71	4,661.12	4,297.05	364.07	12.803		
13,400.00	8,646.49	8,661.23	8,646.49	119.87	247.13	-93.24	3,052.70	1,276.71	4,738.59	4,372.16	366.43	12.932		
13,500.00	8,651.50	8,666.23	8,651.50	122.12	247.28	-93.62	3,052.70	1,276.71	4,816.43	4,447.84	368.59	13.067		
13,581.00	8,655.72	8,670.46	8,655.72	123.93	247.40	-93.82	3,052.70	1,276.71	4,880.22	4,509.70	370.52	13.171		



Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Millman Unit - #218 - OH - Surveys												Offset Site Error:	0.00 usft
Survey Program: 398-INC-ONLY-Offset Well												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 Toeface (")	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	0.00	65.60	0.00	0.00	80.63	580.70	3,520.94	3,569.10				
100.00	100.00	34.40	100.00	0.14	0.30	-67.84	580.70	3,520.94	3,568.48	3,568.05	0.43	8,327.528	
123.69	123.69	58.09	123.69	0.23	0.50	-90.00	580.70	3,520.94	3,568.47	3,567.76	0.72	4,987.391	
200.00	200.00	134.40	200.00	0.53	1.16	-115.17	580.70	3,520.94	3,568.53	3,566.89	1.64	2,176.660	
300.00	300.00	234.40	300.00	0.86	2.02	40.95	580.70	3,520.94	3,568.50	3,565.55	2.95	1,250.763	
400.00	400.00	334.40	400.00	1.20	2.89	38.03	580.70	3,520.94	3,568.07	3,563.99	4.08	874.740	
500.00	500.00	434.40	500.00	1.56	4.11	20.53	580.70	3,520.94	3,567.43	3,561.76	5.67	629.317	
599.99	599.99	534.39	599.99	1.94	5.95	8.07	580.70	3,520.94	3,566.88	3,558.99	7.89	452.231	
699.99	699.99	634.39	699.99	2.32	7.79	20.23	580.70	3,520.94	3,566.35	3,556.24	10.11	352.796	
713.68	713.67	648.07	713.67	2.37	8.04	90.00	580.70	3,520.94	3,566.31	3,555.90	10.41	342.706	
800.00	799.97	734.37	799.97	2.66	9.63	160.96	580.70	3,520.94	3,567.83	3,555.54	12.28	290.467	
900.00	899.89	834.30	899.89	2.97	11.90	167.27	580.70	3,520.94	3,571.60	3,556.74	14.86	240.343	
1,000.00	999.80	934.21	999.80	3.30	14.19	173.15	580.70	3,520.94	3,575.77	3,558.30	17.47	204.676	
1,100.00	1,099.71	1,034.11	1,099.71	3.64	16.48	-173.63	580.70	3,520.94	3,580.06	3,559.96	20.09	178.163	
1,200.00	1,199.62	1,134.02	1,199.62	3.99	18.77	-174.75	580.70	3,520.94	3,584.43	3,561.70	22.73	157.719	
1,300.00	1,299.50	1,233.90	1,299.50	4.35	21.06	172.58	580.70	3,520.94	3,589.32	3,563.96	25.36	141.539	
1,400.00	1,399.34	1,333.76	1,399.34	4.71	23.78	169.09	580.70	3,520.94	3,594.75	3,566.32	28.43	126.459	
1,500.00	1,499.15	1,433.58	1,499.15	5.07	26.20	155.32	580.70	3,520.94	3,600.65	3,569.46	31.20	115.421	
1,600.00	1,598.91	1,533.37	1,598.91	5.44	28.37	168.67	580.70	3,520.94	3,607.18	3,573.46	33.72	106.970	
1,700.00	1,698.69	1,624.00	1,698.69	5.81	30.22	177.91	580.70	3,520.94	3,613.70	3,577.75	35.95	100.526	
1,800.00	1,798.56	1,733.02	1,798.56	6.17	32.54	167.88	580.70	3,520.94	3,618.77	3,580.09	38.67	93.670	
1,900.00	1,898.49	1,832.96	1,898.49	6.54	34.82	167.05	580.70	3,520.94	3,622.40	3,581.07	41.33	87.654	
2,000.00	1,998.46	1,932.93	1,998.46	6.91	37.21	166.37	580.70	3,520.94	3,624.85	3,580.74	44.11	82.177	
2,100.00	2,098.44	2,032.92	2,098.44	7.29	39.61	172.33	580.70	3,520.94	3,626.56	3,579.68	46.88	77.356	
2,200.00	2,198.43	2,132.90	2,198.43	7.67	42.01	154.24	580.70	3,520.94	3,627.98	3,578.32	49.66	73.060	
2,300.00	2,298.42	2,232.92	2,298.42	8.05	44.47	159.25	580.70	3,520.94	3,629.10	3,578.60	52.50	69.123	
2,400.00	2,398.42	2,332.93	2,398.42	8.43	47.18	168.14	580.70	3,520.94	3,630.30	3,574.72	55.58	65.312	
2,500.00	2,498.41	2,432.94	2,498.41	8.81	49.55	-169.44	580.70	3,520.94	3,631.51	3,573.17	58.34	62.248	
2,600.00	2,598.40	2,532.93	2,598.40	9.19	51.68	172.76	580.70	3,520.94	3,632.71	3,571.87	60.85	59.702	
2,700.00	2,698.39	2,632.93	2,698.39	9.57	53.82	157.78	580.70	3,520.94	3,633.85	3,570.48	63.37	57.345	
2,800.00	2,798.39	2,732.93	2,798.39	9.95	56.04	152.27	580.70	3,520.94	3,634.75	3,568.78	65.97	55.099	
2,900.00	2,898.38	2,832.92	2,898.38	10.34	58.26	165.32	580.70	3,520.94	3,635.60	3,567.04	68.57	53.024	
3,000.00	2,998.38	2,932.92	2,998.38	10.72	60.48	-179.33	580.70	3,520.94	3,636.55	3,565.39	71.17	51.098	
3,100.00	3,098.38	3,032.94	3,098.38	11.10	62.68	139.50	580.70	3,520.94	3,637.25	3,563.50	73.76	49.318	
3,200.00	3,198.37	3,132.93	3,198.37	11.48	64.81	128.56	580.70	3,520.94	3,637.74	3,561.49	76.25	47.711	
3,300.00	3,298.37	3,232.93	3,298.37	11.86	66.93	120.23	580.70	3,520.94	3,638.20	3,559.47	78.73	46.209	
3,400.00	3,398.37	3,332.95	3,398.37	12.23	69.03	145.51	580.70	3,520.94	3,638.85	3,557.75	81.10	44.870	
3,500.00	3,498.36	3,432.94	3,498.36	12.62	70.69	126.85	580.70	3,520.94	3,639.58	3,556.33	83.23	43.730	
3,600.00	3,598.36	3,532.94	3,598.36	13.00	72.45	152.11	580.70	3,520.94	3,640.37	3,555.02	85.36	42.649	
3,700.00	3,698.35	3,632.94	3,698.35	13.38	74.21	152.28	580.70	3,520.94	3,641.38	3,553.87	87.50	41.614	
3,800.00	3,798.34	3,732.93	3,798.34	13.77	75.99	157.69	580.70	3,520.94	3,642.51	3,552.85	89.66	40.627	
3,900.00	3,898.33	3,832.92	3,898.33	14.16	77.76	160.71	580.70	3,520.94	3,644.00	3,552.19	91.81	39.691	
4,000.00	3,998.32	3,932.91	3,998.32	14.53	79.54	111.27	580.70	3,520.94	3,645.02	3,551.06	93.96	38.794	
4,100.00	4,098.32	4,032.91	4,098.32	14.91	81.31	177.22	580.70	3,520.94	3,645.71	3,549.61	96.10	37.937	
4,200.00	4,198.31	4,132.91	4,198.31	15.27	83.30	76.42	580.70	3,520.94	3,646.11	3,547.66	98.45	37.036	
4,216.21	4,214.52	4,149.11	4,214.52	15.33	83.65	90.00	580.70	3,520.94	3,646.09	3,547.24	98.85	36.885	
4,300.00	4,298.31	4,232.90	4,298.31	15.63	85.43	177.05	580.70	3,520.94	3,646.55	3,545.62	100.93	36.131	
4,400.00	4,398.30	4,332.90	4,398.30	16.02	87.56	175.89	580.70	3,520.94	3,647.84	3,544.20	103.44	35.264	
4,500.00	4,498.30	4,432.89	4,498.30	16.40	89.69	172.76	580.70	3,520.94	3,648.95	3,543.01	105.95	34.441	
4,600.00	4,598.29	4,532.89	4,598.29	16.79	91.87	151.99	580.70	3,520.94	3,650.29	3,541.78	108.51	33.639	
4,700.00	4,698.28	4,632.88	4,698.28	17.17	94.08	168.41	580.70	3,520.94	3,651.55	3,540.45	111.11	32.865	
4,800.00	4,798.27	4,732.87	4,798.27	17.56	96.30	147.04	580.70	3,520.94	3,652.79	3,539.09	113.71	32.125	

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Millman Unit - #218 - OH - Surveys														Offset Site Error:	0.00 usft
Survey Program: 398-INC-ONLY-Offset Well														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	Offset										
4,900.00	4,898.25	4,832.89	4,898.26	17.94	98.43	-150.90	580.70	3,520.94	3,653.72	3,537.50	116.22	31.439			
5,000.00	4,998.26	4,932.89	4,998.26	18.31	100.47	-174.41	580.70	3,520.94	3,654.61	3,535.97	118.64	30.805			
5,100.00	5,098.25	5,032.88	5,098.25	18.69	102.51	-164.86	580.70	3,520.94	3,655.62	3,534.56	121.07	30.195			
5,200.00	5,198.25	5,132.88	5,198.25	19.07	104.55	-155.42	580.70	3,520.94	3,656.66	3,533.17	123.49	29.611			
5,300.00	5,298.23	5,232.86	5,298.23	19.46	106.59	-152.55	580.70	3,520.94	3,658.37	3,532.49	125.89	29.060			
5,400.00	5,398.21	5,332.86	5,398.21	19.84	108.54	-142.50	580.70	3,520.94	3,660.00	3,531.76	128.24	28.541			
5,500.00	5,498.20	5,432.86	5,498.20	20.22	110.41	-116.96	580.70	3,520.94	3,660.88	3,530.20	130.48	28.056			
5,600.00	5,598.20	5,532.85	5,598.20	20.58	112.28	-82.78	580.70	3,520.94	3,660.82	3,528.13	132.69	27.590			
5,700.00	5,698.19	5,632.84	5,698.19	20.92	114.15	-67.25	580.70	3,520.94	3,660.46	3,526.59	134.87	27.140			
5,800.00	5,798.18	5,732.84	5,798.18	21.25	116.37	-68.99	580.70	3,520.94	3,659.89	3,522.48	137.41	26.635			
5,900.00	5,898.17	5,832.84	5,898.17	21.56	118.67	-28.39	580.70	3,520.94	3,659.35	3,519.34	140.01	26.137			
6,000.00	5,998.17	5,932.84	5,998.17	21.85	120.97	-10.19	580.70	3,520.94	3,658.90	3,516.30	142.59	25.680			
6,100.00	6,098.17	6,032.84	6,098.17	22.13	123.27	-19.03	580.70	3,520.94	3,658.51	3,513.33	145.18	25.200			
6,200.00	6,198.17	6,132.83	6,198.17	22.41	125.57	-43.47	580.70	3,520.94	3,658.09	3,510.31	147.78	24.754			
6,283.25	6,291.42	6,228.08	6,291.42	22.69	127.72	-80.00	580.70	3,520.94	3,657.88	3,507.68	150.23	24.349			
6,300.00	6,298.17	6,232.83	6,298.17	22.71	127.67	-88.14	580.70	3,520.94	3,657.89	3,507.48	150.40	24.321			
6,400.00	6,398.17	6,332.84	6,398.17	23.02	130.27	-71.99	580.70	3,520.94	3,657.77	3,504.64	153.13	23.887			
6,500.00	6,498.16	6,432.84	6,498.16	23.33	132.92	-85.21	580.70	3,520.94	3,657.50	3,501.48	156.11	23.429			
6,528.21	6,526.37	6,461.04	6,526.37	23.42	133.87	-90.00	580.70	3,520.94	3,657.58	3,500.63	156.96	23.303			
6,600.00	6,598.15	6,532.83	6,598.15	23.65	135.58	-98.07	580.70	3,520.94	3,657.67	3,498.56	159.11	22.989			
6,700.00	6,698.14	6,632.88	6,698.14	23.97	138.22	-99.19	580.70	3,520.94	3,657.92	3,495.82	162.10	22.566			
6,800.00	6,798.13	6,732.86	6,798.13	24.29	140.79	-66.50	580.70	3,520.94	3,657.69	3,492.89	165.00	22.168			
6,900.00	6,898.11	6,832.85	6,898.11	24.60	143.37	-52.39	580.70	3,520.94	3,656.90	3,489.01	167.89	21.782			
7,000.00	6,998.10	6,932.84	6,998.10	24.90	145.95	-51.27	580.70	3,520.94	3,656.09	3,485.31	170.78	21.408			
7,078.54	7,076.64	7,011.38	7,076.64	25.15	147.97	-87.24	580.70	3,520.94	3,655.77	3,482.70	173.07	21.123			
7,100.00	7,098.10	7,017.00	7,098.10	25.22	148.12	-95.62	580.70	3,520.94	3,655.81	3,482.52	173.29	21.097			
7,200.00	7,198.08	7,132.86	7,198.08	25.56	151.32	-120.41	580.70	3,520.94	3,656.33	3,479.49	176.84	20.676			
7,300.00	7,298.07	7,232.88	7,298.07	25.91	154.12	-118.98	580.70	3,520.94	3,657.24	3,477.24	180.00	20.318			
7,400.00	7,398.05	7,332.86	7,398.05	26.27	156.99	-129.66	580.70	3,520.94	3,658.17	3,474.94	183.23	19.965			
7,500.00	7,498.04	7,432.85	7,498.04	26.63	159.86	-127.33	580.70	3,520.94	3,659.05	3,472.59	186.47	19.623			
7,600.00	7,598.03	7,532.84	7,598.03	26.98	162.74	-120.52	580.70	3,520.94	3,659.77	3,470.08	189.71	19.292			
7,700.00	7,698.01	7,632.82	7,698.01	27.33	165.61	-105.24	580.70	3,520.94	3,660.52	3,467.59	192.93	18.973			
7,800.00	7,797.96	7,732.87	7,797.96	27.67	168.52	-74.55	580.70	3,520.94	3,660.49	3,464.32	196.17	18.660			
7,900.00	7,897.92	7,832.85	7,897.92	27.91	171.56	-56.35	580.70	3,520.94	3,659.07	3,459.62	199.45	18.346			
8,000.00	7,997.90	7,932.83	7,997.90	28.02	174.65	-0.60	580.70	3,520.94	3,657.68	3,455.50	202.38	18.074			
8,100.00	8,096.29	8,031.22	8,096.29	28.04	177.69	10.65	580.70	3,520.94	3,641.65	3,444.48	197.17	18.470			
8,200.00	8,187.57	8,122.50	8,187.57	28.07	180.51	1.92	580.70	3,520.94	3,601.70	3,420.72	189.97	19.902			
8,300.00	8,269.14	8,196.00	8,269.97	28.10	182.78	-6.27	580.70	3,520.94	3,544.17	3,381.72	162.45	21.817			
8,400.00	8,339.51	8,274.54	8,339.51	28.14	185.07	-4.37	580.70	3,520.94	3,473.49	3,337.74	135.75	25.588			
8,500.00	8,396.11	8,331.15	8,396.11	28.19	186.72	-8.54	580.70	3,520.94	3,391.30	3,276.62	114.68	29.571			
8,600.00	8,440.33	8,375.37	8,440.33	28.38	188.00	-9.45	580.70	3,520.94	3,302.00	3,213.85	88.15	37.457			
8,700.00	8,466.30	8,401.33	8,466.30	28.95	188.76	0.33	580.70	3,520.94	3,205.66	3,161.42	44.24	72.466			
8,800.00	8,476.46	8,411.49	8,476.46	29.72	189.06	21.01	580.70	3,520.94	3,108.22	3,021.87	84.55	36.739			
8,900.00	8,482.40	8,417.44	8,482.40	30.62	189.23	34.32	580.70	3,520.94	3,008.45	2,879.64	128.80	23.709			
9,000.00	8,488.43	8,421.46	8,488.43	31.68	189.35	38.69	580.70	3,520.94	2,908.58	2,763.25	143.32	20.280			
9,100.00	8,489.30	8,424.33	8,489.30	32.82	189.43	18.77	580.70	3,520.94	2,806.64	2,729.11	77.53	36.202			
9,200.00	8,491.35	8,426.39	8,491.35	34.10	189.49	-44.29	580.70	3,520.94	2,706.67	2,548.72	157.94	17.137			
9,300.00	8,493.11	8,428.15	8,493.11	35.48	189.54	-75.07	580.70	3,520.94	2,606.78	2,389.16	217.59	11.880			
9,400.00	8,494.14	8,429.17	8,494.14	36.96	189.57	-86.33	580.70	3,520.94	2,507.15	2,281.14	226.01	11.093			
9,500.00	8,495.33	8,430.36	8,495.33	38.52	189.61	-82.89	580.70	3,520.94	2,408.06	2,181.78	228.28	10.642			
9,600.00	8,498.55	8,433.59	8,498.55	40.15	189.70	-78.79	580.70	3,520.94	2,309.67	2,084.30	225.37	10.249			
9,700.00	8,501.99	8,437.02	8,501.99	41.84	189.80	-81.78	580.70	3,520.94	2,211.68	1,982.56	229.12	9.653			

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design East Miliman Unit - #218 - OH - Surveys													Offset Site Error:	0.00 usft
Survey Program: 398-INC-ONLY-Offset Well													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	Offset	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,800.00	8,504.46	8,439.49	8,504.46	43.58	189.87	-85.06	580.70	3,520.84	2,113.80	1,881.48	232.42	9.095		
9,900.00	8,505.95	8,440.98	8,505.95	45.38	189.82	-85.41	580.70	3,520.84	2,016.33	1,781.95	234.38	8.803		
10,000.00	8,508.39	8,443.42	8,508.39	47.22	189.99	-84.55	580.70	3,520.84	1,919.01	1,683.01	236.00	8.132		
10,100.00	8,510.43	8,445.46	8,510.43	49.10	190.05	-84.35	580.70	3,520.84	1,821.89	1,584.02	237.87	7.859		
10,200.00	8,513.23	8,448.27	8,513.23	51.02	190.13	-84.33	580.70	3,520.84	1,724.88	1,485.10	239.88	7.191		
10,300.00	8,515.77	8,450.80	8,515.77	52.97	190.20	-83.48	580.70	3,520.84	1,628.29	1,386.75	241.54	6.741		
10,400.00	8,519.55	8,454.59	8,519.55	54.85	190.31	-81.03	580.70	3,520.84	1,531.97	1,289.72	242.25	6.324		
10,500.00	8,525.12	8,460.15	8,525.12	56.95	190.47	-77.38	580.70	3,520.84	1,436.25	1,194.70	241.55	5.946		
10,600.00	8,532.56	8,467.59	8,532.56	58.97	190.69	-76.69	580.70	3,520.84	1,341.11	1,098.00	243.10	5.517		
10,700.00	8,540.29	8,475.32	8,540.29	61.01	190.92	-77.66	580.70	3,520.84	1,246.67	1,000.44	246.23	5.063		
10,800.00	8,547.97	8,483.00	8,547.97	63.07	191.14	-78.69	580.70	3,520.84	1,153.07	903.69	249.37	4.624		
10,900.00	8,555.44	8,490.48	8,555.44	65.14	191.36	-80.35	580.70	3,520.84	1,060.62	807.71	252.91	4.194		
11,000.00	8,562.68	8,497.71	8,562.68	67.23	191.57	-81.57	580.70	3,520.84	969.85	713.84	256.01	3.788		
11,100.00	8,567.95	8,502.98	8,567.95	69.34	191.72	-82.21	580.70	3,520.84	880.57	619.84	260.73	3.377		
11,200.00	8,569.22	8,504.25	8,569.22	71.46	191.76	-83.36	580.70	3,520.84	793.09	529.92	263.16	3.014		
11,300.00	8,570.43	8,505.46	8,570.43	73.59	191.79	-83.37	580.70	3,520.84	709.35	444.14	265.21	2.675		
11,400.00	8,572.96	8,507.99	8,572.96	75.73	191.87	-88.02	580.70	3,520.84	630.70	363.30	267.40	2.359		
11,500.00	8,575.13	8,510.16	8,575.13	77.89	191.93	-89.19	580.70	3,520.84	558.88	289.15	269.72	2.072		
11,600.00	8,578.01	8,513.04	8,578.01	80.05	192.01	-88.51	580.70	3,520.84	497.38	225.46	271.89	1.829		
11,700.00	8,581.89	8,516.93	8,581.89	82.22	192.13	-89.10	580.70	3,520.84	450.04	175.80	274.24	1.641		
11,800.00	8,585.19	8,520.23	8,585.19	84.39	192.22	-89.69	580.70	3,520.84	421.13	144.58	276.55	1.523		
11,875.33	8,587.39	8,522.42	8,587.39	86.10	192.29	-90.00	580.70	3,520.84	413.94	135.59	278.34	1.487	Level 3, CC ES	
11,900.00	8,587.96	8,523.00	8,587.96	86.58	192.31	-90.08	580.70	3,520.84	414.58	135.74	278.84	1.487	Level 3, SF	
12,000.00	8,590.31	8,525.34	8,590.31	88.77	192.37	-90.34	580.70	3,520.84	430.91	149.80	281.11	1.533		
12,100.00	8,592.25	8,527.29	8,592.25	90.96	192.43	-90.56	580.70	3,520.84	467.88	184.52	283.36	1.651		
12,200.00	8,594.34	8,529.38	8,594.34	93.16	192.49	-91.15	580.70	3,520.84	521.36	235.79	285.57	1.826		
12,300.00	8,597.80	8,532.83	8,597.80	95.36	192.59	-92.56	580.70	3,520.84	588.03	300.41	287.62	2.044		
12,400.00	8,602.68	8,537.72	8,602.68	97.57	192.73	-93.71	580.70	3,520.84	664.00	374.38	289.63	2.293		
12,500.00	8,607.34	8,542.38	8,607.34	99.79	192.87	-93.78	580.70	3,520.84	746.00	454.06	291.94	2.555		
12,600.00	8,611.06	8,546.09	8,611.06	102.01	192.98	-93.33	580.70	3,520.84	831.89	537.59	294.40	2.828		
12,700.00	8,613.76	8,548.80	8,613.76	104.23	193.06	-92.65	580.70	3,520.84	920.84	623.97	296.87	3.102		
12,800.00	8,616.84	8,551.88	8,616.84	106.46	193.15	-96.25	580.70	3,520.84	1,011.69	713.87	297.82	3.397		
12,900.00	8,622.28	8,557.31	8,622.28	108.69	193.30	-97.72	580.70	3,520.84	1,103.75	804.42	299.33	3.687		
13,000.00	8,627.55	8,562.58	8,627.55	110.92	193.48	-97.57	580.70	3,520.84	1,196.79	894.98	301.81	3.965		
13,100.00	8,632.55	8,567.59	8,632.55	113.16	193.60	-98.24	580.70	3,520.84	1,290.69	986.98	303.70	4.250		
13,200.00	8,637.36	8,572.40	8,637.36	115.39	193.74	-97.86	580.70	3,520.84	1,385.28	1,078.94	306.34	4.522		
13,300.00	8,641.86	8,576.99	8,641.86	117.63	193.88	-98.48	580.70	3,520.84	1,480.44	1,172.21	308.23	4.803		
13,400.00	8,646.49	8,581.52	8,646.49	119.87	194.01	-98.89	580.70	3,520.84	1,576.12	1,265.88	310.27	5.080		
13,500.00	8,651.50	8,586.53	8,651.50	122.12	194.18	-100.74	580.70	3,520.84	1,672.09	1,361.12	310.97	5.377		
13,581.00	8,655.72	8,590.76	8,655.72	123.93	194.28	-101.10	580.70	3,520.84	1,750.20	1,437.68	312.52	5.600		

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #1H - WB1/Job #1411057 - Surveys (Pioneer 28)													Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRO-MS, 6810-PHX+MWD+BGGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	31.56	-1.44	0.00	0.03	19.60	1,831.13	652.04	1,943.75				
100.00	100.00	127.05	94.05	0.14	0.17	-128.88	1,831.37	651.90	1,943.98	1,943.87	0.31	6,335.881	
200.00	200.00	222.98	189.98	0.53	0.43	-176.22	1,831.93	651.54	1,944.62	1,943.68	0.94	2,073.263	
300.00	300.00	321.86	288.65	0.86	0.69	-20.12	1,832.63	651.19	1,945.22	1,943.68	1.54	1,266.874	
400.00	400.00	420.98	387.97	1.20	0.94	-23.07	1,833.31	651.02	1,945.29	1,943.17	2.12	818.330	
441.16	441.15	461.23	428.22	1.35	1.04	-29.11	1,833.57	651.05	1,945.26	1,942.89	2.36	623.748	
500.00	500.00	519.24	486.23	1.56	1.17	-40.58	1,833.94	651.20	1,945.32	1,942.62	2.70	719.196	
600.00	599.99	619.49	586.48	1.94	1.41	-52.05	1,834.60	651.45	1,945.62	1,942.32	3.30	569.069	
700.00	699.99	719.57	686.55	2.32	1.66	-40.92	1,835.25	651.68	1,945.93	1,942.02	3.92	496.996	
800.00	799.97	817.58	784.56	2.66	1.91	99.85	1,835.91	651.94	1,946.75	1,942.23	4.51	431.313	
900.00	899.89	911.40	878.37	2.97	2.13	136.24	1,836.67	652.46	1,946.59	1,943.51	5.08	383.376	
1,000.00	999.80	1,005.81	972.78	3.30	2.35	112.23	1,837.54	653.51	1,951.24	1,945.60	5.64	345.999	
1,100.00	1,099.71	1,102.63	1,069.58	3.64	2.56	125.58	1,838.49	655.05	1,954.78	1,948.59	6.19	315.597	
1,200.00	1,199.62	1,202.90	1,169.83	3.99	2.78	124.61	1,839.51	656.76	1,958.84	1,952.08	6.77	289.537	
1,300.00	1,299.50	1,306.20	1,273.11	4.35	3.02	112.10	1,840.53	658.28	1,962.56	1,955.20	7.36	266.601	
1,400.00	1,399.34	1,410.45	1,377.36	4.71	3.27	108.78	1,841.40	659.59	1,965.70	1,957.73	7.97	246.697	
1,500.00	1,499.15	1,510.68	1,477.57	5.07	3.51	95.23	1,842.13	660.86	1,968.05	1,959.48	8.57	229.662	
1,600.00	1,598.91	1,618.30	1,585.19	5.44	3.77	106.73	1,842.73	661.93	1,970.25	1,961.05	9.19	214.326	
1,700.00	1,598.69	1,719.34	1,686.22	5.81	4.02	118.12	1,843.16	662.62	1,973.37	1,963.57	9.80	201.270	
1,800.00	1,798.56	1,817.73	1,784.61	6.17	4.27	108.27	1,843.62	663.31	1,976.16	1,965.75	10.41	189.770	
1,900.00	1,898.40	1,919.38	1,885.23	6.54	4.52	107.55	1,844.04	664.07	1,977.96	1,966.94	11.02	179.441	
2,000.00	1,998.46	2,018.65	1,985.52	6.91	4.77	106.96	1,844.46	664.72	1,979.34	1,967.72	11.63	170.228	
2,100.00	2,098.44	2,118.25	2,085.12	7.29	5.03	112.96	1,844.97	665.29	1,980.63	1,968.39	12.24	161.849	
2,200.00	2,198.43	2,223.90	2,190.77	7.67	5.29	94.92	1,845.35	665.88	1,981.57	1,968.72	12.85	154.194	
2,300.00	2,298.42	2,328.03	2,294.90	8.05	5.53	99.98	1,845.41	666.37	1,981.98	1,968.53	13.43	147.528	
2,400.00	2,398.42	2,425.91	2,392.77	8.43	5.75	108.91	1,845.50	666.83	1,982.53	1,968.52	14.01	141.555	
2,500.00	2,498.41	2,528.29	2,495.15	8.81	5.98	131.37	1,845.55	667.35	1,983.38	1,968.79	14.59	135.952	
2,600.00	2,598.40	2,630.78	2,597.64	9.19	6.20	113.61	1,845.48	667.73	1,984.10	1,968.94	15.16	130.891	
2,700.00	2,698.39	2,728.69	2,695.56	9.57	6.42	98.67	1,845.51	667.88	1,984.51	1,968.77	15.74	126.102	
2,800.00	2,798.39	2,826.74	2,793.80	9.95	6.67	93.18	1,845.70	667.95	1,984.83	1,968.49	16.33	121.511	
2,900.00	2,898.38	2,926.50	2,893.37	10.34	6.93	106.24	1,845.90	668.10	1,985.24	1,968.30	16.94	117.193	
3,000.00	2,998.38	3,024.89	2,991.75	10.72	7.18	121.62	1,846.13	668.27	1,985.90	1,968.35	17.55	113.168	
3,100.00	3,098.38	3,122.39	3,069.25	11.10	7.43	80.47	1,846.52	668.37	1,986.49	1,968.35	18.14	109.502	
3,200.00	3,198.37	3,224.04	3,190.90	11.48	7.68	69.54	1,846.96	668.49	1,986.75	1,968.01	18.73	106.048	
3,300.00	3,298.37	3,329.49	3,296.35	11.86	7.91	61.22	1,847.20	668.53	1,986.61	1,967.30	19.31	102.868	
3,400.00	3,398.37	3,431.86	3,398.71	12.23	8.06	86.51	1,847.38	668.19	1,986.40	1,966.60	19.80	100.329	
3,500.00	3,498.36	3,534.53	3,501.39	12.62	8.13	67.85	1,847.53	667.59	1,986.10	1,965.88	20.22	98.214	
3,600.00	3,598.36	3,634.55	3,601.45	13.00	8.21	93.10	1,847.65	666.74	1,985.74	1,965.09	20.64	96.193	
3,700.00	3,698.35	3,732.34	3,699.19	13.38	8.30	93.26	1,847.73	666.46	1,985.72	1,964.95	20.77	95.589	
3,800.00	3,798.34	3,836.07	3,802.90	13.77	8.40	98.66	1,848.02	665.71	1,985.76	1,964.67	21.08	94.192	
3,900.00	3,898.33	3,935.79	3,902.62	14.16	8.50	101.68	1,848.35	664.47	1,985.73	1,964.20	21.53	92.214	
4,000.00	3,998.32	4,033.79	4,000.62	14.53	8.60	52.25	1,848.40	664.16	1,985.73	1,964.09	21.65	91.738	
4,100.00	4,098.32	4,131.56	4,098.39	14.78	8.67	96.79	1,848.54	663.31	1,985.77	1,963.78	21.98	90.342	
4,200.00	4,198.31	4,227.96	4,194.79	14.91	8.72	118.19	1,848.70	662.53	1,985.50	1,963.07	22.43	88.522	
4,300.00	4,298.31	4,329.27	4,296.06	15.63	9.02	117.98	1,848.81	662.05	1,985.26	1,962.53	22.73	87.339	
4,400.00	4,398.30	4,428.28	4,395.06	16.02	9.18	116.80	1,848.89	661.81	1,985.34	1,962.45	22.90	86.709	
4,500.00	4,498.30	4,524.85	4,491.64	16.40	9.34	113.66	1,849.33	661.05	1,985.28	1,961.90	23.38	84.903	
4,600.00	4,598.29	4,616.74	4,583.50	16.79	9.51	92.87	1,849.64	660.49	1,985.10	1,961.44	23.66	83.907	
4,700.00	4,698.28	4,714.92	4,681.69	17.17	9.67	117.98	1,849.92	659.93	1,985.24	1,961.35	23.89	83.100	
4,800.00	4,798.27	4,813.11	4,780.46	17.55	9.83	116.80	1,850.64	659.51	1,985.88	1,961.49	24.40	81.394	
4,900.00	4,898.26	4,911.30	4,878.55	17.93	10.00	113.66	1,851.45	657.01	1,986.65	1,961.74	24.91	79.742	
5,000.00	4,998.25	5,009.49	4,976.70	18.31	10.17	92.87	1,852.57	655.65	1,987.55	1,962.12	25.44	78.141	

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #81178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #1H - WB1/Job #1411057 - Surveys (Pioneer 28)													Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRD-MS, 6810-PHX+MWD+BGGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4700.00	4.898 28	4.716 38	4.883 12	17 17	9 70	109 25	1,854 08	653 96	1,988 59	1,962 61	25 98	76 538	
4800.00	4.798 27	4.820 09	4.786 80	17 58	9 91	87 86	1,855 56	652 03	1,989 43	1,962 89	26 54	74 973	
4900.00	4.898 26	4.918 05	4.885 74	17 94	10 10	149 87	1,856 93	650 28	1,990 39	1,963 31	27 08	73 497	
5000.00	4.898 26	5.024 17	4.990 83	18 31	10 31	126 32	1,858 17	648 59	1,991 56	1,963 92	27 64	72 043	
5100.00	5.098 25	5.126 51	5.093 17	18 69	10 51	135 86	1,858 98	647 33	1,992 51	1,964 31	28 20	70 657	
5200.00	5.198 25	5.223 44	5.190 09	19 07	10 71	98 13	1,859 76	646 22	1,993 26	1,964 51	28 75	69 332	
5300.00	5.298 23	5.318 82	5.285 26	19 46	10 91	93 26	1,860 73	645 09	1,993 90	1,964 60	29 30	68 045	
5400.00	5.398 21	5.409 44	5.378 05	19 84	11 11	83 19	1,862 12	643 78	1,994 80	1,964 94	29 85	66 818	
5500.00	5.498 20	5.504 45	5.471 03	20 22	11 33	57 61	1,864 06	642 12	1,995 73	1,965 31	30 42	65 616	
5600.00	5.598 20	5.608 05	5.574 58	20 58	11 56	23 35	1,866 33	639 94	1,996 27	1,965 28	30 99	64 417	
5700.00	5.698 19	5.706 86	5.673 34	20 92	11 78	7 72	1,868 57	637 58	1,996 29	1,964 74	31 55	63 276	
5800.00	5.798 18	5.816 95	5.783 37	21 25	12 03	9 35	1,870 86	634 78	1,995 77	1,963 64	32 13	62 112	
5900.00	5.898 17	5.929 99	5.896 35	21 56	12 26	-31 37	1,872 52	631 84	1,995 17	1,962 46	32 71	60 993	
6000.00	5.998 17	6.033 43	5.999 76	21 85	12 47	-70 04	1,873 42	629 10	1,994 69	1,961 43	33 26	59 969	
6028.49	6.028 66	6.058 01	6.024 33	21 93	12 52	-72 73	1,873 62	628 58	1,994 66	1,961 25	33 41	59 700	
6100.00	6.098 17	6.122 32	6.088 83	22 13	12 65	-78 93	1,874 24	627 60	1,994 83	1,961 04	33 80	59 028	
6200.00	6.198 17	6.227 38	6.193 68	22 41	12 89	-103 43	1,875 34	626 19	1,995 36	1,960 99	34 37	58 048	
6300.00	6.298 17	6.347 78	6.314 03	22 71	13 11	-158 17	1,875 69	623 81	1,995 07	1,960 12	34 95	57 083	
6400.00	6.398 17	6.448 73	6.414 96	23 02	13 29	-132 11	1,875 87	620 93	1,994 60	1,959 12	35 48	56 220	
6459.82	6.459 99	6.517 59	6.483 78	23 24	13 42	-142 09	1,876 17	618 60	1,994 51	1,958 66	35 85	55 636	
6500.00	6.498 16	6.548 15	6.514 32	23 33	13 48	-145 43	1,876 33	617 46	1,994 52	1,958 51	36 01	55 384	
6600.00	6.598 15	6.649 03	6.615 11	23 65	13 67	-158 40	1,878 96	613 47	1,994 89	1,958 34	36 55	54 573	
6700.00	6.698 14	6.750 92	6.716 91	23 97	13 87	-159 64	1,877 66	609 07	1,995 56	1,958 46	37 11	53 782	
6800.00	6.798 13	6.842 00	6.807 91	24 29	13 97	-127 08	1,878 28	605 22	1,996 07	1,958 50	37 57	53 135	
6900.00	6.898 11	6.919 32	6.885 22	24 60	13 98	-112 98	1,878 65	604 38	1,996 95	1,959 03	37 92	52 658	
7000.00	6.998 10	6.989 76	6.955 57	24 90	13 99	-111 79	1,878 45	607 50	1,998 76	1,960 48	38 28	52 210	
7100.00	7.098 10	7.041 82	7.007 37	25 22	14 00	-156 01	1,878 26	612 63	2,002 83	1,964 18	38 65	51 825	
7200.00	7.198 08	7.075 63	7.040 80	25 56	14 01	-179 34	1,878 51	617 87	2,010 52	1,971 51	39 01	51 537	
7300.00	7.298 07	7.093 00	7.057 82	25 91	14 02	-177 12	1,878 85	621 10	2,022 09	1,982 71	39 38	51 350	
7400.00	7.398 05	7.124 00	7.087 76	26 27	14 04	-170 39	1,879 93	629 04	2,037 10	1,997 34	39 76	51 232	
7500.00	7.498 04	7.156 00	7.117 76	26 63	14 08	-173 03	1,881 62	640 01	2,055 72	2,015 56	40 16	51 183	
7600.00	7.598 03	7.169 85	7.130 39	26 98	14 11	-178 98	1,882 42	645 64	2,077 64	2,037 09	40 55	51 233	
7700.00	7.698 01	7.202 24	7.158 98	27 33	14 21	-164 17	1,884 18	660 74	2,103 90	2,062 91	40 99	51 324	
7800.00	7.797 96	7.250 00	7.198 98	27 67	14 47	-132 52	1,885 88	686 73	2,133 41	2,091 84	41 58	51 312	
7900.00	7.897 92	7.281 00	7.223 49	27 91	14 78	-113 94	1,886 59	705 89	2,164 57	2,122 49	42 09	51 432	
8000.00	7.997 90	7.303 10	7.240 12	28 02	15 05	-57 32	1,886 84	720 24	2,197 65	2,155 22	42 44	51 787	
8100.00	8.096 29	7.344 00	7.268 78	28 04	15 74	-43 59	1,886 29	749 39	2,223 31	2,181 17	42 14	52 758	
8200.00	8.187 57	7.375 00	7.288 47	28 07	16 49	-49 57	1,884 88	773 28	2,234 83	2,193 29	41 54	53 803	
8300.00	8.289 14	7.418 48	7.313 72	28 10	17 83	-53 69	1,882 24	808 57	2,242 58	2,200 74	41 84	53 595	
8400.00	8.339 51	7.460 88	7.335 92	28 14	19 44	-51 87	1,879 13	844 54	2,243 54	2,202 00	41 54	54 012	
8500.00	8.396 11	7.501 00	7.354 88	28 19	21 21	-53 11	1,875 84	879 75	2,235 69	2,193 22	42 47	52 637	
8600.00	8.440 33	7.543 18	7.373 09	28 36	23 32	-53 53	1,872 32	917 63	2,222 91	2,179 15	43 76	50 802	
8700.00	8.466 30	7.584 00	7.381 31	28 95	24 42	-54 54	1,870 56	936 88	2,197 81	2,153 12	44 68	49 185	
8800.00	8.476 46	7.595 00	7.392 04	29 72	26 20	-55 55	1,867 85	965 63	2,162 91	2,118 04	46 87	46 145	
8900.00	8.482 40	7.626 00	7.400 84	30 62	28 09	-56 03	1,865 08	995 22	2,127 72	2,078 44	49 27	43 181	
9000.00	8.486 43	7.668 76	7.410 63	31 66	30 85	-56 29	1,861 23	1,038 66	2,094 27	2,041 81	52 46	39 923	
9100.00	8.489 30	7.702 44	7.416 49	32 82	33 12	-56 73	1,856 19	1,069 88	2,083 91	2,008 36	55 55	37 154	
9200.00	8.491 35	7.738 58	7.420 95	34 10	35 62	-56 97	1,855 08	1,105 41	2,038 02	1,979 10	58 92	34 591	
9300.00	8.493 11	7.807 35	7.425 98	35 48	40 53	-57 16	1,849 05	1,173 72	2,016 91	1,952 52	64 39	31 325	
9400.00	8.494 14	7.898 53	7.431 62	36 96	47 16	-57 42	1,840 71	1,264 35	1,999 77	1,928 26	71 51	27 966	
9500.00	8.495 33	7.978 16	7.435 39	38 52	52 91	-57 43	1,833 59	1,341 56	1,988 97	1,909 21	77 76	25 553	
9600.00	8.498 55	8.043 00	7.437 63	40 15	57 80	-57 39	1,827 95	1,408 12	1,978 69	1,896 32	83 37	23 747	

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #1H - WB1/Job #1411057 - Surveys (Pioneer 28)													Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 6610-PHX-MWD-BGGM													Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,700.00	8,501.99	8,088.04	7,437.89	41.84	61.30	-57.34	1,824.53	1,453.02	1,975.89	1,888.25	87.64	22.545		
9,800.00	8,504.46	8,137.00	7,438.07	43.58	64.99	-57.23	1,821.23	1,501.83	1,974.63	1,882.47	92.16	21.426		
9,813.49	8,504.71	8,137.00	7,436.07	43.82	64.99	-57.23	1,821.23	1,501.83	1,974.63	1,882.26	92.37	21.377		
9,900.00	8,505.95	8,200.28	7,432.80	45.38	69.79	-57.10	1,818.04	1,564.95	1,975.20	1,877.58	97.62	20.233		
10,000.00	8,508.39	8,276.15	7,430.06	47.22	75.57	-56.98	1,816.14	1,640.74	1,977.62	1,873.67	103.95	19.025		
10,100.00	8,510.43	8,358.45	7,428.11	49.10	81.94	-56.90	1,815.79	1,724.02	1,980.61	1,869.76	110.85	17.867		
10,200.00	8,513.23	8,444.56	7,427.60	51.02	89.48	-56.86	1,816.99	1,809.12	1,984.21	1,866.26	117.95	16.823		
10,300.00	8,515.77	8,519.47	7,428.16	52.97	94.24	-56.88	1,819.76	1,883.97	1,988.33	1,863.82	124.50	15.970		
10,400.00	8,519.55	8,623.23	7,429.64	54.95	102.22	-56.93	1,824.65	1,987.60	1,993.37	1,860.36	133.01	14.986		
10,500.00	8,525.12	8,723.93	7,431.36	56.95	109.99	-56.97	1,829.40	2,088.18	1,999.32	1,857.95	141.36	14.143		
10,600.00	8,532.56	8,825.27	7,433.55	58.97	117.83	-56.93	1,834.55	2,189.35	2,005.98	1,856.30	149.65	13.404		
10,700.00	8,540.29	8,959.84	7,437.85	61.01	128.23	-56.88	1,841.02	2,323.50	2,011.96	1,851.91	160.05	12.571		
10,800.00	8,547.97	9,167.13	7,447.30	63.07	144.35	-56.69	1,841.72	2,530.72	2,012.47	1,837.44	175.03	11.499		
10,890.35	8,554.73	9,248.72	7,449.37	64.94	150.70	-56.58	1,839.24	2,612.25	2,012.13	1,830.42	181.70	11.074		
10,900.00	8,555.44	9,257.31	7,449.50	65.14	151.37	-56.56	1,838.95	2,620.83	2,012.11	1,829.71	182.40	11.031		
11,000.00	8,562.68	9,338.74	7,450.60	67.23	157.72	-56.42	1,836.54	2,702.22	2,012.82	1,823.62	189.19	10.639		
11,100.00	8,567.95	9,427.76	7,452.19	69.34	164.66	-56.27	1,835.03	2,791.21	2,012.84	1,816.17	196.46	10.244		
11,200.00	8,569.22	9,516.54	7,454.50	71.46	171.59	-56.28	1,834.50	2,879.96	2,009.74	1,805.70	204.03	9.850		
11,300.00	8,570.43	9,603.39	7,457.34	73.59	178.36	-56.32	1,835.01	2,968.76	2,008.05	1,796.41	211.64	9.488		
11,338.35	8,571.28	9,636.59	7,458.44	74.41	180.95	-56.33	1,835.40	2,999.94	2,007.98	1,793.45	214.53	9.360		
11,400.00	8,572.98	9,690.39	7,460.28	75.73	185.14	-56.34	1,838.28	3,053.70	2,008.15	1,788.95	219.20	9.161		
11,500.00	8,575.13	9,782.65	7,463.70	77.89	192.34	-56.40	1,838.49	3,145.88	2,008.61	1,781.44	227.18	8.842		
11,600.00	8,578.01	9,883.77	7,468.23	80.05	200.22	-56.51	1,841.57	3,246.84	2,010.09	1,774.22	235.87	8.622		
11,700.00	8,581.89	9,984.90	7,472.77	82.22	208.10	-56.56	1,844.51	3,347.83	2,012.10	1,767.62	244.48	8.230		
11,800.00	8,585.19	10,080.75	7,475.84	84.39	215.58	-56.57	1,846.57	3,443.60	2,013.58	1,760.93	252.65	7.970		
11,900.00	8,587.96	10,185.24	7,479.74	86.58	223.74	-56.62	1,849.31	3,547.99	2,014.59	1,753.11	261.48	7.705		
12,000.00	8,590.31	10,291.53	7,484.79	88.77	232.03	-56.69	1,852.33	3,654.11	2,014.29	1,743.79	270.50	7.447		
12,100.00	8,592.26	10,395.72	7,490.63	90.96	240.15	-56.79	1,855.57	3,758.09	2,012.96	1,733.50	279.46	7.203		
12,200.00	8,594.34	10,521.26	7,498.27	93.16	249.93	-56.90	1,858.52	3,863.36	2,010.44	1,720.49	289.94	6.934		
12,287.56	8,597.29	10,604.66	7,503.07	95.09	256.44	-56.98	1,859.90	3,966.61	2,009.42	1,712.13	297.29	6.759		
12,300.00	8,597.80	10,615.78	7,503.73	95.36	257.30	-56.99	1,860.12	3,977.71	2,009.44	1,711.16	298.28	6.737		
12,400.00	8,602.68	10,710.49	7,510.14	97.57	264.68	-57.10	1,862.79	4,072.16	2,010.92	1,704.28	306.64	6.558		
12,500.00	8,607.34	10,846.98	7,522.41	99.79	275.28	-57.34	1,867.67	4,208.01	2,012.37	1,694.12	318.25	6.323		
12,600.00	8,611.06	11,038.83	7,541.01	102.01	290.17	-57.64	1,866.70	4,398.92	2,009.19	1,675.37	333.82	6.019		
12,700.00	8,613.76	11,125.39	7,548.41	104.23	296.80	-57.78	1,863.78	4,485.11	2,003.98	1,662.11	341.87	5.862		
12,800.00	8,616.84	11,245.00	7,558.53	106.46	308.18	-57.79	1,859.79	4,604.22	1,998.95	1,647.16	351.79	5.682		
12,900.00	8,622.29	11,339.00	7,566.64	108.69	313.49	-57.74	1,858.11	4,697.80	1,993.97	1,634.09	359.89	5.541		
13,000.00	8,627.55	11,407.86	7,570.87	110.92	318.88	-57.69	1,853.26	4,788.47	1,989.32	1,623.11	366.21	5.432		
13,100.00	8,632.55	11,497.40	7,574.13	113.16	325.85	-57.56	1,849.37	4,855.87	1,985.22	1,611.62	373.60	5.314		
13,200.00	8,637.36	11,585.62	7,577.25	115.39	332.74	-57.44	1,845.75	4,943.95	1,980.93	1,600.03	380.90	5.201		
13,300.00	8,641.96	11,661.54	7,580.78	117.63	340.24	-57.32	1,842.62	5,039.76	1,976.73	1,588.06	388.68	5.086		
13,400.00	8,646.49	11,772.37	7,584.17	119.87	347.34	-57.21	1,839.75	5,130.48	1,972.39	1,576.23	396.18	4.979		
13,500.00	8,651.50	11,865.72	7,587.29	122.12	354.64	-57.05	1,837.26	5,223.75	1,968.32	1,564.71	403.82	4.877		
13,579.89	8,655.67	11,874.00	7,587.57	123.91	355.29	-57.06	1,837.04	5,232.02	1,966.65	1,560.95	405.69	4.848 ES		
13,581.00	8,655.72	11,874.00	7,587.57	123.93	355.29	-57.06	1,837.04	5,232.02	1,966.74	1,561.02	405.72	4.847 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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)													Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRO-MS, 6676-PHX-MWD-BGGM													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)					
0.00	0.00	30.07	0.07	0.00	0.03	8.55	4.369.87	657.21	4.418.01				
100.00	100.00	131.56	101.56	0.14	0.16	-139.92	4.369.84	657.32	4.419.05	4.418.75	0.30	N/A	
200.00	200.00	235.88	205.88	0.53	0.35	172.75	4.369.76	657.26	4.419.18	4.418.32	0.87	5,094.065	
300.00	300.00	348.44	318.44	0.88	0.58	-31.13	4.369.58	656.76	4.419.03	4.417.60	1.43	3,086.298	
400.00	400.00	430.90	400.90	1.20	0.74	-34.08	4.369.31	655.97	4.418.14	4.416.22	1.92	2,301.705	
442.46	442.46	453.12	423.11	1.35	0.77	-40.32	4.369.36	655.95	4.417.96	4.415.86	2.10	2,102.306	
500.00	500.00	500.00	469.99	1.56	0.84	-51.58	4.369.74	656.34	4.418.17	4.415.80	2.37	1,863.393	
600.00	599.99	560.04	530.01	1.94	0.91	-63.03	4.370.51	657.24	4.419.20	4.416.41	2.79	1,583.991	
700.00	699.99	661.01	630.97	2.32	1.05	-51.87	4.371.96	658.76	4.420.54	4.417.25	3.29	1,344.375	
800.00	799.97	761.85	731.79	2.66	1.23	88.87	4.373.33	659.88	4.421.83	4.418.01	3.82	1,156.264	
900.00	899.89	866.99	836.92	2.97	1.45	95.20	4.374.91	660.13	4.423.51	4.419.12	4.39	1,007.483	
1,000.00	999.80	987.34	957.28	3.30	1.72	101.12	4.376.36	660.33	4.425.34	4.420.33	5.01	883.341	
1,100.00	1,099.71	1,085.06	1,054.98	3.64	1.95	114.37	4.377.29	660.45	4.427.60	4.422.01	5.59	792.162	
1,200.00	1,199.62	1,228.69	1,198.51	3.99	2.24	113.34	4.377.85	660.98	4.428.79	4.423.56	6.22	711.664	
1,300.00	1,299.50	1,329.02	1,298.93	4.35	2.40	100.74	4.378.03	660.65	4.431.30	4.424.56	6.74	657.445	
1,400.00	1,399.34	1,444.14	1,414.05	4.71	2.56	97.33	4.377.64	660.75	4.431.82	4.424.56	7.26	610.279	
1,500.00	1,499.15	1,526.41	1,496.32	5.07	2.69	83.67	4.377.46	661.08	4.431.65	4.423.90	7.76	571.392	
1,537.67	1,536.73	1,555.99	1,525.90	5.21	2.75	87.97	4.377.50	661.15	4.431.52	4.423.57	7.95	557.370	
1,600.00	1,599.91	1,605.95	1,575.86	5.44	2.85	95.00	4.377.70	661.14	4.431.88	4.423.60	8.28	535.515	
1,700.00	1,699.69	1,701.13	1,671.03	5.81	3.05	108.26	4.378.29	660.93	4.433.64	4.424.80	8.84	501.580	
1,800.00	1,798.56	1,848.30	1,818.20	6.17	3.26	98.35	4.377.99	660.96	4.434.40	4.424.99	9.42	470.890	
1,900.00	1,898.49	1,932.66	1,902.56	6.54	3.37	95.55	4.377.79	660.84	4.434.53	4.424.65	9.88	448.734	
2,000.00	1,998.46	2,021.55	1,991.45	6.91	3.52	94.88	4.377.89	660.53	4.434.82	4.424.44	10.38	427.413	
2,100.00	2,098.44	2,118.10	2,088.00	7.29	3.70	100.85	4.378.08	660.65	4.435.28	4.424.38	10.91	406.630	
2,200.00	2,198.43	2,215.72	2,185.62	7.67	3.91	82.78	4.378.38	660.75	4.435.69	4.424.23	11.46	386.939	
2,300.00	2,298.42	2,325.28	2,295.18	8.05	4.13	87.80	4.378.56	660.65	4.435.75	4.423.71	12.04	368.542	
2,400.00	2,398.42	2,431.21	2,401.11	8.43	4.33	96.70	4.378.65	660.48	4.435.85	4.423.27	12.58	352.580	
2,500.00	2,498.41	2,542.32	2,512.22	8.81	4.49	119.13	4.378.38	660.34	4.435.95	4.422.86	13.09	338.907	
2,600.00	2,598.40	2,634.09	2,603.99	9.19	4.62	101.35	4.378.15	660.41	4.436.14	4.422.58	13.56	327.053	
2,700.00	2,698.39	2,724.03	2,693.94	9.57	4.77	86.38	4.378.16	660.36	4.436.22	4.422.15	14.07	315.380	
2,800.00	2,798.39	2,820.48	2,790.39	9.95	4.95	80.87	4.378.29	660.51	4.436.28	4.421.89	14.60	303.906	
2,900.00	2,898.38	2,927.21	2,897.11	10.34	5.14	93.93	4.378.36	660.77	4.436.36	4.421.23	15.13	293.183	
3,000.00	2,998.38	3,027.79	2,997.69	10.72	5.30	109.29	4.378.33	660.81	4.436.52	4.420.88	15.64	283.673	
3,100.00	3,098.38	3,119.86	3,089.76	11.10	5.46	88.13	4.378.45	660.90	4.436.68	4.420.53	16.15	274.763	
3,200.00	3,198.37	3,236.86	3,206.76	11.48	5.67	57.19	4.378.62	660.45	4.436.45	4.419.75	16.71	265.524	
3,300.00	3,298.37	3,365.02	3,334.91	11.86	5.88	48.85	4.378.01	659.50	4.435.32	4.418.07	17.28	257.004	
3,400.00	3,398.37	3,440.80	3,410.68	12.23	6.00	74.12	4.377.58	658.76	4.434.21	4.416.48	17.73	250.046	
3,500.00	3,498.36	3,502.52	3,472.40	12.62	6.12	55.45	4.377.80	658.18	4.433.96	4.415.77	18.19	243.700	
3,602.37	3,500.73	3,510.56	3,480.44	12.62	6.13	56.11	4.377.85	658.11	4.433.96	4.415.74	18.22	243.389	
3,600.00	3,598.36	3,675.25	3,645.12	13.00	6.43	80.69	4.377.17	656.19	4.432.81	4.413.95	18.85	235.112	
3,700.00	3,698.36	3,765.66	3,735.52	13.38	6.59	80.85	4.376.48	654.92	4.431.64	4.412.27	19.37	228.841	
3,800.00	3,798.34	3,877.27	3,847.11	13.77	6.80	86.25	4.375.82	652.96	4.430.65	4.410.73	19.82	222.368	
3,900.00	3,898.33	3,981.26	3,951.08	14.16	7.00	89.28	4.374.89	651.03	4.429.40	4.408.93	20.47	216.341	
4,000.00	3,998.32	4,075.99	4,045.79	14.53	7.18	39.80	4.374.10	649.18	4.427.87	4.408.86	21.01	210.738	
4,100.00	4,098.32	4,165.91	4,135.69	14.91	7.37	105.72	4.373.50	647.48	4.426.65	4.405.11	21.54	205.471	
4,200.00	4,198.31	4,250.41	4,220.17	15.27	7.54	4.90	4.373.13	646.14	4.425.66	4.403.59	22.07	200.532	
4,300.00	4,298.31	4,358.30	4,328.05	15.63	7.76	105.52	4.372.94	644.54	4.424.96	4.402.32	22.64	195.478	
4,400.00	4,398.30	4,451.73	4,421.48	16.02	7.91	104.38	4.372.21	644.45	4.424.47	4.401.33	23.14	191.235	
4,437.91	4,436.21	4,479.05	4,448.80	16.16	7.95	102.96	4.372.07	644.63	4.424.42	4.401.11	23.31	189.632	
4,500.00	4,498.30	4,528.85	4,498.59	16.40	8.02	101.27	4.371.93	645.15	4.424.53	4.400.94	23.59	187.569	
4,600.00	4,598.29	4,645.27	4,615.01	16.79	8.18	80.53	4.371.76	646.40	4.424.64	4.400.54	24.10	183.603	
4,700.00	4,698.28	4,771.47	4,741.21	17.17	8.38	96.96	4.370.65	648.07	4.423.64	4.398.98	24.66	179.390	

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 State Com - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)														Offset Site Error: 0.00 usft
Survey Program: 100-NS-GYRO-MS, 6878-PHX-MWD-BGGM														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,800.00	4,799.27	4,868.26	4,835.99	17.56	8.58	75.61	4,369.78	646.12	4,422.86	4,397.48	25.18	175.671		
4,881.32	4,879.58	4,928.93	4,898.66	17.87	8.67	121.88	4,369.36	645.82	4,422.11	4,396.54	25.58	172.901		
4,900.00	4,899.26	4,940.64	4,910.36	17.94	8.70	137.66	4,369.33	645.75	4,422.14	4,396.48	25.66	172.309		
5,000.00	4,999.26	5,016.01	4,985.73	18.31	8.85	114.15	4,369.57	645.15	4,422.81	4,396.65	26.16	169.058		
5,088.43	5,086.68	5,138.55	5,108.26	18.64	9.10	122.50	4,369.17	644.04	4,422.69	4,395.97	26.72	165.525		
5,100.00	5,099.25	5,145.88	5,115.59	18.69	9.11	123.71	4,369.14	643.98	4,422.70	4,395.93	26.77	165.183		
5,200.00	5,199.25	5,213.52	5,183.24	19.07	9.25	83.99	4,369.25	643.47	4,422.82	4,395.66	27.26	162.230		
5,300.00	5,299.23	5,300.00	5,269.71	19.46	9.43	81.12	4,369.74	642.71	4,423.08	4,395.29	27.79	159.135		
5,400.00	5,398.21	5,388.10	5,357.80	19.84	9.62	71.06	4,370.52	641.79	4,423.40	4,395.07	28.33	156.148		
5,500.00	5,498.20	5,473.94	5,443.63	20.22	9.79	45.51	4,371.64	640.71	4,423.96	4,395.11	28.86	153.312		
5,600.00	5,598.20	5,565.44	5,535.10	20.58	9.99	11.29	4,373.15	639.19	4,424.49	4,395.09	29.40	150.503		
5,700.00	5,698.19	5,673.38	5,642.98	20.92	10.22	-4.28	4,375.02	637.18	4,424.63	4,394.55	29.98	147.589		
5,800.00	5,798.18	5,790.93	5,760.51	21.25	10.48	-2.80	4,376.70	634.60	4,424.15	4,393.56	30.59	144.619		
5,871.38	5,869.55	5,868.47	5,836.02	21.47	10.65	-22.31	4,377.81	632.77	4,423.89	4,392.87	31.02	142.627		
5,900.00	5,898.17	5,896.33	5,865.88	21.56	10.71	-43.26	4,377.98	632.03	4,423.93	4,392.74	31.19	141.854		
6,000.00	5,998.17	5,992.08	5,961.59	21.85	10.93	-81.88	4,379.12	629.60	4,424.46	4,392.71	31.76	139.330		
6,100.00	6,098.17	6,126.26	6,095.72	22.13	11.24	-90.76	4,380.34	626.02	4,424.92	4,392.50	32.41	136.521		
6,200.00	6,198.17	6,248.87	6,218.25	22.41	11.52	-115.26	4,380.68	621.93	4,424.76	4,391.72	33.04	133.914		
6,300.00	6,298.17	6,381.91	6,331.24	22.71	11.79	-169.97	4,380.57	618.63	4,424.44	4,390.80	33.65	131.499		
6,400.00	6,398.17	6,489.31	6,458.58	23.02	12.08	-143.87	4,379.87	614.71	4,423.85	4,389.58	34.28	129.046		
6,500.00	6,498.16	6,591.53	6,560.75	23.33	12.32	-157.12	4,378.94	611.41	4,423.28	4,388.42	34.86	126.894		
6,556.65	6,554.81	6,545.22	6,514.41	23.51	12.44	-165.68	4,378.45	609.74	4,423.18	4,387.98	35.18	125.745		
6,600.00	6,598.15	6,685.93	6,655.09	23.65	12.53	-170.00	4,378.12	608.44	4,423.23	4,387.81	35.42	124.868		
6,700.00	6,698.14	6,781.06	6,750.18	23.97	12.76	-171.14	4,377.42	605.41	4,423.64	4,387.65	35.98	122.931		
6,800.00	6,798.13	6,886.89	6,855.96	24.29	12.80	-138.47	4,376.57	602.22	4,423.87	4,387.39	36.48	121.270		
6,900.00	6,898.11	7,190.00	7,136.40	24.60	13.53	-123.23	4,359.65	687.50	4,419.74	4,382.29	37.45	118.021		
7,000.00	6,998.10	7,221.00	7,162.91	24.90	13.87	-121.85	4,346.31	705.97	4,416.01	4,377.88	38.13	115.816		
7,100.00	7,098.10	7,233.24	7,172.29	25.22	14.04	-166.08	4,344.69	713.66	4,414.33	4,375.68	38.65	114.201		
7,115.32	7,113.42	7,236.88	7,175.04	25.27	14.10	-171.10	4,344.21	715.99	4,414.30	4,375.54	38.76	113.886		
7,200.00	7,198.06	7,253.00	7,187.08	25.56	14.33	-169.33	4,342.15	728.52	4,415.19	4,375.80	39.29	112.371		
7,300.00	7,298.07	7,268.65	7,198.48	25.91	14.63	-172.92	4,340.28	737.08	4,418.28	4,378.34	39.94	110.621		
7,400.00	7,398.05	7,284.00	7,209.38	26.27	14.92	-160.39	4,338.61	747.78	4,423.24	4,382.65	40.59	108.979		
7,500.00	7,498.04	7,284.00	7,209.38	26.63	14.92	-162.75	4,338.61	747.78	4,429.97	4,389.02	40.94	108.194		
7,600.00	7,598.03	7,299.54	7,220.14	26.98	15.28	-169.73	4,337.17	758.88	4,438.63	4,396.96	41.67	106.527		
7,700.00	7,698.01	7,315.00	7,230.56	27.33	15.65	-174.78	4,336.05	770.24	4,450.44	4,408.06	42.38	105.022		
7,800.00	7,797.96	7,315.00	7,230.56	27.67	15.65	-143.91	4,336.05	770.24	4,464.87	4,422.13	42.74	104.472		
7,900.00	7,897.92	7,315.00	7,230.56	27.91	15.65	-125.71	4,336.05	770.24	4,480.41	4,437.40	43.01	104.168		
8,000.00	7,997.90	7,347.00	7,250.98	28.02	16.57	-89.36	4,334.41	794.81	4,496.58	4,452.52	44.06	102.061		
8,100.00	8,096.29	7,347.00	7,250.98	28.04	16.57	-57.60	4,334.41	794.81	4,506.80	4,463.02	43.58	103.417		
8,200.00	8,187.57	7,363.43	7,260.73	28.07	17.14	-65.26	4,333.79	808.01	4,506.27	4,462.51	43.76	102.984		
8,211.61	8,197.57	7,365.36	7,261.84	28.07	17.21	-66.05	4,333.72	809.59	4,506.23	4,462.40	43.82	102.828		
8,300.00	8,269.14	7,378.00	7,268.93	28.10	17.65	-70.45	4,333.31	820.05	4,506.90	4,462.65	44.25	101.848		
8,400.00	8,339.51	7,409.00	7,285.03	28.14	18.91	-69.14	4,332.55	848.52	4,504.45	4,459.51	44.94	100.223		
8,500.00	8,396.11	7,409.00	7,285.03	28.19	18.91	-70.61	4,332.55	848.52	4,496.85	4,451.80	45.07	99.781		
8,600.00	8,440.33	7,441.00	7,300.05	28.36	20.39	-71.04	4,332.11	874.77	4,487.47	4,440.89	46.59	96.322		
8,700.00	8,466.30	7,473.00	7,313.63	28.95	22.02	-72.05	4,332.04	903.76	4,469.27	4,420.85	48.42	92.294		
8,800.00	8,478.46	7,473.00	7,313.63	29.72	22.02	-72.98	4,332.04	903.76	4,443.45	4,394.31	49.14	90.421		
8,900.00	8,482.40	7,504.00	7,325.24	30.62	23.73	-73.48	4,332.31	932.49	4,416.98	4,365.30	51.68	85.476		
9,000.00	8,486.43	7,535.00	7,335.38	31.66	25.56	-73.78	4,332.80	961.77	4,391.82	4,337.35	54.47	80.635		
9,100.00	8,489.30	7,567.00	7,344.36	32.82	27.56	-74.16	4,333.42	992.48	4,369.07	4,311.41	57.66	75.776		
9,200.00	8,491.35	7,561.35	7,347.87	34.10	28.49	-74.33	4,333.75	1,006.39	4,349.99	4,290.04	59.95	72.559		
9,300.00	8,493.11	7,598.00	7,351.44	35.48	29.58	-74.52	4,334.26	1,022.64	4,335.59	4,273.07	62.52	69.345		

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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14 Slate Corn - #4H - WB1/Job #1411413 - Surveys (Pioneer 28)														Offset Site Error:	0.00 usft
Survey Program: 100-NS-GYRO-MS, 6876-PHX+MWD+BGM														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)										
9,400.00	8,494.14	7,630.02	7,356.96	36.96	31.77	-74.72	4,335.43	1,054.15	4,327.25	4,261.00	66.26	65.308			
9,488.40	8,495.45	7,662.00	7,360.84	38.49	33.98	-74.79	4,336.75	1,085.87	4,324.77	4,254.85	69.92	61.854			
9,500.00	8,495.33	7,662.00	7,360.84	38.52	33.98	-74.78	4,338.75	1,085.87	4,324.70	4,254.75	69.94	61.830 CC			
9,600.00	8,498.65	7,750.42	7,368.45	40.15	40.29	-74.62	4,340.37	1,173.88	4,327.12	4,249.45	77.67	55.715			
9,700.00	8,501.99	7,846.49	7,374.68	41.84	47.36	-74.96	4,343.83	1,269.89	4,330.97	4,244.82	86.15	50.271			
9,800.00	8,504.46	7,945.00	7,379.34	43.58	54.73	-74.99	4,346.92	1,368.04	4,334.83	4,239.84	94.69	45.635			
9,900.00	8,505.85	8,039.00	7,382.62	45.38	61.85	-75.02	4,349.71	1,461.94	4,338.69	4,235.05	103.63	41.866			
10,000.00	8,508.39	8,154.87	7,386.93	47.22	70.69	-75.07	4,353.13	1,577.68	4,342.65	4,228.65	114.00	38.094			
10,100.00	8,510.43	8,256.73	7,391.05	49.10	78.51	-75.11	4,355.79	1,679.42	4,345.77	4,222.35	123.42	35.211			
10,200.00	8,513.23	8,415.00	7,395.99	51.02	90.71	-75.13	4,359.54	1,837.56	4,348.92	4,211.81	137.11	31.718			
10,300.00	8,515.77	8,490.47	7,398.49	52.97	96.55	-75.14	4,360.62	1,912.98	4,350.17	4,205.50	144.68	30.068			
10,400.00	8,519.55	8,603.00	7,402.64	54.95	105.26	-75.15	4,362.58	2,025.42	4,351.67	4,196.65	155.03	28.071			
10,500.00	8,525.12	8,697.00	7,408.21	56.95	112.54	-75.18	4,364.62	2,119.23	4,353.55	4,189.52	164.03	26.541			
10,600.00	8,532.56	8,822.13	7,416.77	58.97	122.24	-75.17	4,367.12	2,244.04	4,355.01	4,179.63	175.38	24.832			
10,700.00	8,540.29	8,886.00	7,420.82	61.01	127.20	-75.16	4,368.49	2,307.77	4,356.80	4,174.65	182.15	23.919			
10,800.00	8,547.97	8,954.90	7,424.72	63.07	132.55	-75.14	4,370.39	2,376.53	4,359.23	4,169.91	189.32	23.026			
10,900.00	8,555.44	9,043.41	7,429.42	65.14	139.42	-75.14	4,373.37	2,464.86	4,362.37	4,164.43	197.95	22.038			
11,000.00	8,562.68	9,155.87	7,436.78	67.23	148.16	-75.16	4,377.40	2,577.01	4,365.92	4,157.52	208.41	20.849			
11,100.00	8,567.95	9,315.86	7,448.55	69.34	160.59	-75.13	4,381.17	2,736.52	4,366.54	4,143.97	222.57	19.619			
11,200.00	8,569.22	9,400.50	7,453.90	71.46	167.17	-75.19	4,383.12	2,820.96	4,369.52	4,134.45	231.07	18.693			
11,277.54	8,570.15	9,481.82	7,459.06	73.11	173.51	-75.25	4,384.88	2,902.21	4,365.11	4,126.27	238.84	18.278			
11,300.00	8,570.43	9,500.91	7,460.22	73.59	174.99	-75.27	4,385.29	2,921.16	4,365.10	4,124.36	240.74	18.132			
11,400.00	8,572.96	9,619.01	7,466.59	75.73	184.19	-75.31	4,387.64	3,039.06	4,365.57	4,113.78	251.79	17.338			
11,500.00	8,575.13	9,740.48	7,471.43	77.89	193.67	-75.35	4,389.75	3,160.41	4,365.21	4,102.13	263.08	16.593			
11,529.53	8,575.69	9,766.71	7,472.19	78.52	195.72	-75.35	4,388.88	3,166.64	4,365.15	4,099.48	265.68	16.430			
11,600.00	8,578.01	9,827.00	7,473.48	80.05	200.43	-75.36	4,389.12	3,246.92	4,365.55	4,093.88	271.68	16.069			
11,700.00	8,581.89	9,886.16	7,474.11	82.22	205.05	-75.33	4,389.55	3,306.07	4,366.89	4,088.64	278.25	15.594			
11,800.00	8,585.19	10,005.55	7,474.41	84.39	214.39	-75.27	4,390.95	3,425.46	4,368.44	4,079.08	289.36	15.097			
11,900.00	8,587.96	10,078.89	7,474.81	86.58	220.12	-75.24	4,391.53	3,498.80	4,369.12	4,072.10	297.02	14.710			
12,000.00	8,590.31	10,235.22	7,475.05	88.77	232.34	-75.18	4,392.56	3,655.11	4,368.77	4,057.88	310.92	14.051			
12,100.00	8,592.26	10,319.87	7,475.53	90.96	238.96	-75.15	4,392.59	3,739.76	4,366.94	4,047.53	319.41	13.672			
12,200.00	8,594.34	10,391.00	7,475.28	93.16	244.52	-75.13	4,392.97	3,819.89	4,365.44	4,039.55	326.89	13.354			
12,215.06	8,594.76	10,391.00	7,475.28	93.49	244.52	-75.13	4,392.97	3,819.89	4,365.40	4,038.18	327.22	13.341			
12,300.00	8,597.80	10,439.36	7,474.88	95.36	248.30	-75.15	4,393.63	3,859.25	4,366.48	4,033.84	332.64	13.127			
12,400.00	8,602.68	10,485.00	7,474.54	97.57	251.87	-75.15	4,394.69	3,904.87	4,370.43	4,032.31	338.12	12.926			
12,500.00	8,607.34	10,556.43	7,473.71	99.79	257.46	-75.09	4,396.97	3,976.26	4,375.86	4,030.30	345.56	12.663			
12,600.00	8,611.06	10,648.04	7,472.18	102.01	264.61	-75.01	4,400.46	4,067.79	4,381.78	4,027.26	354.52	12.360			
12,700.00	8,613.75	10,823.06	7,471.21	104.23	278.30	-74.94	4,405.17	4,242.74	4,385.76	4,015.96	369.80	11.860			
12,800.00	8,616.84	10,916.09	7,470.32	106.46	285.58	-74.95	4,407.48	4,335.73	4,389.92	4,010.91	379.01	11.583			
12,900.00	8,622.28	11,027.72	7,469.91	108.69	294.31	-74.87	4,410.04	4,447.33	4,393.67	4,004.11	389.56	11.278			
13,000.00	8,627.55	11,118.12	7,469.71	110.92	301.23	-74.79	4,412.13	4,535.71	4,396.63	3,998.30	398.33	11.038			
13,100.00	8,632.55	11,253.70	7,469.38	113.16	312.00	-74.69	4,415.16	4,673.25	4,398.91	3,988.17	410.74	10.710			
13,200.00	8,637.36	11,443.67	7,470.83	115.39	326.89	-74.57	4,417.07	4,863.41	4,399.33	3,972.25	427.08	10.301			
13,300.00	8,641.96	11,545.34	7,471.35	117.63	334.83	-74.50	4,416.77	4,964.87	4,397.92	3,961.15	436.78	10.069			
13,400.00	8,646.49	11,639.20	7,471.77	119.87	342.18	-74.44	4,416.46	5,059.73	4,396.27	3,950.36	445.91	9.859			
13,500.00	8,651.50	11,723.54	7,471.74	122.12	348.78	-74.35	4,416.40	5,143.07	4,394.42	3,940.15	454.27	9.674			
13,581.00	8,655.72	11,759.00	7,471.68	123.93	351.56	-74.33	4,416.40	5,178.53	4,393.56	3,934.89	458.67	9.579 ES 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 (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446 00usft (H&P 482)
MD Reference: GL + KB @ 3446 00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14-15 State - #2H - OH / Job #61176 - Surveys (H&P 482)												Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD_6500-MWD-HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance					Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/S (usft)	Offset Wellbore Centre +E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	0.15	35.10	0.10	35.10				
100.00	100.00	100.25	100.25	0.14	0.07	-147.96	34.73	0.34	34.79	34.58	0.21	167.654	
200.00	200.00	200.24	200.24	0.53	0.24	165.34	34.02	0.70	34.30	33.54	0.77	44.775	
300.00	300.00	300.31	300.30	0.86	0.42	-37.62	33.21	1.26	33.57	32.29	1.26	26.274	
400.00	400.00	400.40	400.38	1.20	0.60	-39.75	32.13	2.03	32.10	30.32	1.78	18.064	
500.00	500.00	500.59	500.56	1.58	0.78	-57.69	30.58	2.27	30.06	27.76	2.30	13.072	
600.00	599.99	600.73	600.67	1.94	0.95	-69.67	28.41	2.34	27.64	24.81	2.83	9.772	
700.00	699.99	700.83	700.55	2.32	1.13	-58.88	26.07	2.59	25.07	21.71	3.36	7.483	
800.00	799.97	800.65	800.44	2.66	1.31	87.27	23.68	3.15	22.57	18.68	3.89	5.796	
900.00	899.89	900.46	900.32	2.97	1.48	106.39	21.64	3.62	20.96	16.53	4.43	4.733	
957.01	956.85	957.41	957.26	3.15	1.59	117.85	20.30	3.82	20.71	15.98	4.73	4.380 CC	
1,000.00	999.80	1,000.37	1,000.21	3.30	1.66	126.25	19.27	3.90	20.85	15.99	4.95	4.211 ES	
1,100.00	1,099.71	1,100.53	1,100.31	3.64	1.84	153.28	15.88	4.08	21.68	16.22	5.46	3.969	
1,200.00	1,199.62	1,200.30	1,199.98	3.99	2.02	165.73	11.52	4.54	23.63	17.65	5.98	3.952	
1,300.00	1,299.50	1,300.00	1,299.58	4.35	2.19	165.96	7.01	5.42	27.49	20.98	6.51	4.224	
1,400.00	1,399.34	1,399.75	1,399.22	4.71	2.37	173.30	2.39	6.37	33.02	25.97	7.05	4.684	
1,500.00	1,499.15	1,499.51	1,498.85	5.07	2.55	168.93	-2.54	6.95	39.72	32.13	7.59	5.231	
1,600.00	1,598.91	1,598.83	1,598.04	5.44	2.73	-173.08	-7.50	7.58	47.92	39.77	8.14	5.884	
1,700.00	1,698.69	1,698.57	1,697.66	5.81	2.91	-158.38	-12.61	8.31	56.11	47.41	8.70	6.450	
1,800.00	1,798.56	1,798.55	1,797.51	6.17	3.09	-165.55	-17.50	8.72	62.71	53.46	9.26	6.774	
1,900.00	1,898.49	1,898.01	1,896.85	6.54	3.28	-163.33	-22.40	9.17	68.31	58.49	9.81	6.961	
2,000.00	1,998.46	1,998.12	1,996.86	6.91	3.46	-161.61	-26.74	9.95	73.03	62.66	10.37	7.044	
2,100.00	2,098.44	2,099.26	2,097.98	7.29	3.63	-155.48	-28.09	10.92	76.05	65.13	10.92	6.966	
2,200.00	2,198.43	2,200.97	2,199.66	7.67	3.80	-175.60	-25.80	11.28	76.93	65.47	11.47	6.709	
2,300.00	2,298.42	2,301.60	2,300.39	8.05	3.97	-173.66	-21.34	10.59	76.04	64.02	12.02	6.327	
2,400.00	2,398.42	2,401.92	2,400.35	8.43	4.14	-168.68	-15.88	9.45	74.67	62.10	12.57	5.941	
2,500.00	2,498.41	2,501.88	2,500.12	8.81	4.31	-150.94	-9.89	8.16	73.32	60.21	13.12	5.590	
2,600.00	2,598.40	2,601.25	2,599.30	9.19	4.48	-173.67	-3.80	7.12	72.69	59.02	13.67	5.319	
2,607.35	2,605.75	2,608.57	2,606.61	9.22	4.49	-175.12	-3.35	7.06	72.69	58.98	13.71	5.303	
2,700.00	2,698.39	2,700.91	2,698.78	9.57	4.65	-166.48	2.49	6.47	72.99	58.78	14.22	5.135	
2,800.00	2,798.39	2,801.35	2,798.99	9.95	4.82	-156.25	8.77	5.50	73.27	58.51	14.76	4.964	
2,825.01	2,823.40	2,826.38	2,823.98	10.05	4.86	-158.10	10.30	5.14	73.26	58.38	14.90	4.918	
2,900.00	2,898.38	2,901.40	2,898.83	10.34	4.99	-164.48	15.07	3.92	73.40	58.10	15.30	4.797	
3,000.00	2,998.38	3,000.78	2,997.98	10.72	5.17	-174.75	21.62	2.42	74.30	58.47	15.84	4.682	
3,100.00	3,098.38	3,100.13	3,097.13	11.10	5.34	-129.00	27.97	1.58	78.06	59.70	16.36	4.649	
3,200.00	3,198.37	3,200.08	3,197.88	11.48	5.52	-115.86	31.70	1.44	77.62	60.74	16.89	4.598	
3,300.00	3,298.37	3,301.34	3,298.25	11.86	5.69	-107.12	33.07	1.30	78.31	60.99	17.41	4.499	
3,400.00	3,398.37	3,401.34	3,398.24	12.23	5.86	-132.11	34.24	0.99	78.93	60.99	17.94	4.400	
3,500.00	3,498.36	3,501.32	3,498.21	12.62	6.04	-131.07	35.54	0.62	79.63	61.16	18.47	4.311	
3,600.00	3,598.36	3,600.79	3,597.67	13.00	6.21	-137.89	37.07	0.54	80.78	61.78	19.00	4.251	
3,700.00	3,698.35	3,701.61	3,698.49	13.38	6.39	-137.85	38.17	0.42	81.95	62.40	19.55	4.193	
3,800.00	3,798.34	3,801.27	3,798.14	13.77	6.56	-143.31	38.82	0.18	82.95	62.86	20.09	4.129	
3,900.00	3,898.33	3,901.73	3,896.60	14.16	6.73	-146.59	39.28	-0.07	84.21	63.56	20.64	4.079	
4,000.00	3,998.32	4,001.65	3,998.52	14.53	6.91	-97.78	39.21	-0.34	84.75	63.56	21.18	4.001	
4,008.15	4,006.47	4,009.77	4,006.64	14.57	6.92	-102.40	39.18	-0.35	84.74	63.51	21.23	3.992	
4,100.00	4,098.32	4,101.38	4,098.25	14.91	7.08	-164.10	39.25	-0.43	85.23	63.51	21.72	3.923	
4,200.00	4,198.31	4,202.02	4,198.69	15.27	7.26	-63.31	39.62	-0.92	85.21	62.97	22.24	3.831	
4,276.50	4,274.81	4,278.54	4,275.40	15.55	7.39	-149.46	39.67	-1.51	84.80	62.15	22.65	3.744	
4,300.00	4,298.31	4,302.04	4,298.90	15.63	7.43	-164.10	39.63	-1.67	84.84	62.07	22.77	3.726	
4,400.00	4,398.30	4,401.54	4,398.41	16.02	7.60	-163.32	39.24	-1.95	85.49	62.16	23.33	3.664	
4,500.00	4,498.30	4,501.52	4,498.38	16.40	7.78	-160.79	38.74	-1.88	86.63	62.73	23.89	3.625	
4,600.00	4,598.29	4,601.33	4,598.19	16.79	7.95	-140.89	38.40	-1.74	87.87	63.41	24.45	3.593	

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Phoenix Technology Services LP Anticollision Report



Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14-15 State - #2H - OH / Job #61178 - Surveys (H&P 482)													Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD_6500-MWD+HDM													Offset Well Error:	0.00 usft
Reference	Vertical	Measured	Vertical	Semi Major Axis	Reference	Offset	Highside	Offset Wellbore Centre	Distance	Between	Minimum	Separation	Warning	
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	(usft)	(usft)		Toolface (°)	+N-S (usft)	+E-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)		
4.700.00	4.698.28	4.701.86	4.698.72	17.17	8.12	157.71		38.10	-1.84	88.82	83.80	25.02	3.551	
4.800.00	4.798.27	4.801.74	4.798.60	17.56	8.30	137.15		37.43	-2.07	89.51	83.93	25.58	3.500	
4.900.00	4.898.26	4.901.41	4.898.27	17.94	8.47	160.08		36.60	-1.99	90.21	84.07	26.14	3.451	
5.000.00	4.998.26	5.001.79	4.998.64	18.31	8.65	178.65		36.09	-2.04	90.92	84.22	26.70	3.405	
5.100.00	5.098.25	5.101.84	5.098.69	18.69	8.82	173.48		35.45	-2.32	91.49	84.23	27.26	3.358	
5.200.00	5.198.25	5.201.58	5.198.43	19.07	8.99	147.16		35.06	-2.54	92.17	84.34	27.82	3.312	
5.300.00	5.298.23	5.301.67	5.298.52	19.46	9.17	144.64		35.47	-2.93	93.49	85.11	28.38	3.294	
5.400.00	5.398.21	5.401.63	5.398.48	19.84	9.34	134.75		36.22	-3.47	94.67	85.74	28.93	3.272	
5.500.00	5.498.20	5.501.28	5.498.12	20.22	9.52	109.17		37.06	-3.93	95.14	85.67	29.46	3.229	
5.600.00	5.598.20	5.600.70	5.597.53	20.58	9.69	74.78		38.36	-3.81	95.55	85.58	29.97	3.188	
5.700.00	5.698.19	5.700.53	5.697.35	20.92	9.86	59.30		39.57	-3.36	95.82	85.37	30.45	3.146	
5.800.00	5.798.18	5.801.19	5.798.01	21.25	10.04	61.60		40.08	-2.96	95.58	84.63	30.95	3.089	
5.900.00	5.898.17	5.901.21	5.898.02	21.59	10.21	21.38		40.25	-2.84	95.10	83.67	31.43	3.028	
6.000.00	5.998.17	6.001.03	5.997.85	21.85	10.39	-17.23		40.42	-2.82	94.89	83.00	31.89	2.975	
6.100.00	6.098.17	6.102.13	6.098.95	22.13	10.56	-26.16		40.35	-2.88	94.26	81.90	32.36	2.913	
6.200.00	6.198.17	6.201.70	6.198.51	22.41	10.73	-50.34		39.47	-3.24	93.29	80.45	32.84	2.840	
6.300.00	6.298.17	6.302.46	6.299.26	22.71	10.91	-104.81		38.33	-3.73	92.34	78.99	33.36	2.768	
6.400.00	6.398.17	6.402.80	6.399.59	23.02	11.09	-78.08		36.86	-4.77	90.90	77.03	33.88	2.683	
6.500.00	6.498.16	6.502.47	6.499.24	23.33	11.28	-91.00		35.16	-5.73	89.46	75.07	34.39	2.602	
6.600.00	6.598.15	6.603.24	6.599.99	23.65	11.35	-103.83		33.41	-6.99	88.02	73.20	34.82	2.528	
6.664.88	6.663.02	6.666.66	6.663.39	23.95	11.38	-104.58		32.16	-7.85	87.11	72.03	35.08	2.483 SF	
6.700.00	6.698.14	6.699.84	6.698.65	23.97	11.39	-104.90		31.63	-7.49	87.48	72.27	35.21	2.485	
6.800.00	6.798.13	6.798.72	6.795.21	24.29	11.40	-117.95		31.18	-1.93	93.57	78.01	35.56	2.631	
6.900.00	6.898.11	6.898.76	6.893.17	24.60	11.44	-57.74		34.22	15.49	115.08	79.16	35.93	3.203	
7.000.00	6.998.10	6.947.55	6.938.30	24.90	11.49	-55.06		36.90	44.54	151.00	114.70	36.31	4.159	
7.100.00	7.098.10	7.020.76	7.001.59	25.22	11.55	-97.74		38.88	77.56	195.67	158.96	36.71	5.331	
7.200.00	7.198.08	7.090.61	7.060.75	25.58	11.65	-121.82		43.15	114.41	248.08	211.95	37.13	6.709	
7.300.00	7.298.07	7.149.14	7.108.45	25.91	11.79	-118.26		48.02	147.95	307.92	270.38	37.54	8.203	
7.400.00	7.398.05	7.192.00	7.141.20	26.27	11.93	-131.40		53.82	174.93	373.53	335.59	37.95	9.844	
7.500.00	7.498.04	7.237.19	7.173.33	26.63	12.12	-129.80		62.63	205.47	444.69	406.33	38.36	11.592	
7.600.00	7.598.03	7.272.66	7.198.70	26.98	12.29	-123.39		70.89	230.84	520.32	481.56	38.76	13.423	
7.700.00	7.698.01	7.304.65	7.216.32	27.33	12.48	-107.32		78.85	254.81	599.68	560.52	39.16	15.314	
7.800.00	7.797.96	7.331.43	7.231.78	27.67	12.65	-78.64		85.52	275.64	681.46	641.94	39.52	17.242	
7.900.00	7.897.92	7.349.00	7.241.28	27.91	12.78	-60.10		89.75	289.79	765.17	725.38	39.78	19.233	
8.000.00	7.997.90	7.381.00	7.257.09	28.02	13.03	-5.67		97.01	318.84	851.35	811.47	39.88	21.350	
8.100.00	8.096.29	7.391.00	7.257.09	28.04	13.03	2.96		97.01	318.84	831.03	892.68	38.35	24.276	
8.200.00	8.197.57	7.412.00	7.270.46	28.07	13.32	-1.82		103.43	343.85	996.94	961.67	35.27	28.269	
8.300.00	8.269.14	7.444.00	7.282.14	28.10	13.65	-4.40		109.16	373.08	1,051.88	1,019.89	31.67	32.900	
8.400.00	8.339.51	7.475.00	7.281.92	28.14	13.99	-3.36		114.08	402.08	1,096.34	1,068.65	27.69	38.595	
8.500.00	8.398.11	7.517.38	7.303.46	28.19	14.52	-3.69		120.66	442.32	1,128.73	1,104.42	24.31	46.433	
8.600.00	8.440.33	7.554.63	7.311.88	28.38	15.01	-8.44		126.43	478.13	1,152.15	1,131.55	20.61	55.915	
8.700.00	8.466.30	7.575.00	7.315.47	28.95	15.29	-2.80		129.39	497.97	1,161.92	1,144.87	17.05	68.136	
8.797.43	8.477.68	7.607.00	7.319.35	29.70	15.76	-2.57		133.65	529.44	1,162.91	1,146.30	16.62	69.991	
8.800.00	8.476.46	7.607.00	7.319.35	29.72	15.76	-2.55		133.65	529.44	1,161.27	1,144.67	16.61	69.927	
8.967.07	8.480.85	7.650.13	7.322.27	30.32	16.43	-2.41		139.32	572.09	1,161.15	1,144.25	16.90	68.720	
8.900.00	8.482.40	7.668.34	7.322.94	30.62	16.69	-2.36		141.58	589.13	1,161.24	1,144.21	17.03	68.184	
9.000.00	8.486.43	7.724.53	7.323.66	31.66	17.63	-2.23		150.28	645.66	1,163.65	1,148.04	17.81	66.077	
9.100.00	8.489.30	7.804.89	7.322.92	32.82	19.00	-2.12		163.07	724.98	1,167.35	1,148.98	18.37	63.559	
9.200.00	8.491.35	7.993.08	7.320.92	34.10	20.59	-2.07		176.83	812.07	1,171.65	1,152.39	19.26	60.821	
9.300.00	8.493.11	8.006.78	7.318.04	35.48	22.75	-2.06		192.21	924.67	1,176.01	1,155.63	20.38	57.711	
9.400.00	8.494.14	8.197.94	7.321.94	36.96	26.56	-2.00		204.75	1,115.27	1,174.90	1,152.86	22.04	53.314	
9.500.00	8.495.33	8.323.43	7.330.55	38.52	29.15	-1.93		205.03	1,240.45	1,169.07	1,145.67	23.40	49.960	

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Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Offset Design Palmillo 14-15 State - #2H - OH / Job #61178 - Surveys (H&P 482)														Offset Site Error:	0.00 usft
Survey Program: 100-SPT_GTD, 8500-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	Offset										
9 600.00	8 498.55	8 458.00	7 342.95	40.15	31.95	-1.91	201.43	1 374.39	1 162.95	1 138.06	24.90	46 705			
9 700.00	8 501.99	8 552.00	7 352.95	41.84	33.96	-1.84	198.21	1 467.80	1 155.69	1 129.57	26.12	44 242			
9 800.00	8 504.46	8 637.14	7 361.00	43.58	35.78	-1.76	195.01	1 552.50	1 148.62	1 121.31	27.31	42 061			
9 900.00	8 505.95	8 734.47	7 369.52	45.38	37.89	-1.69	191.97	1 649.41	1 141.31	1 112.69	28.62	39 682			
10 000.00	8 508.39	8 824.94	7 377.11	47.22	39.86	-1.71	191.00	1 739.55	1 135.37	1 105.45	29.91	37 953			
10 100.00	8 510.43	8 914.18	7 383.82	49.10	41.82	-1.74	190.07	1 828.54	1 129.92	1 098.70	31.22	36 190			
10 200.00	8 513.23	9 002.48	7 393.00	51.02	44.43	-1.82	191.65	1 946.48	1 125.03	1 092.28	32.76	34 340			
10 300.00	8 515.77	9 130.74	7 401.41	52.97	46.60	-1.89	193.57	2 044.35	1 119.06	1 084.88	34.18	32 740			
10 400.00	8 519.55	9 240.96	7 411.79	54.95	49.05	-2.05	196.61	2 153.84	1 113.45	1 077.72	35.73	31 161			
10 500.00	8 525.12	9 324.05	7 419.17	56.95	50.90	-2.18	199.51	2 236.76	1 110.27	1 073.16	37.12	29 913			
10 537.60	8 527.74	9 353.81	7 421.47	57.71	51.57	-2.23	200.66	2 256.40	1 110.04	1 072.42	37.62	29 506			
10 600.00	8 532.56	9 403.51	7 424.85	58.97	52.68	-2.31	202.75	2 315.94	1 110.69	1 072.23	38.46	28 878			
10 700.00	8 540.29	9 505.48	7 431.27	61.01	54.96	-2.47	206.50	2 417.64	1 112.25	1 072.28	39.97	27 830			
10 800.00	8 547.97	9 610.07	7 438.33	63.07	57.31	-2.52	208.70	2 521.97	1 113.23	1 071.74	41.49	26 934			
10 900.00	8 555.44	9 697.08	7 443.60	65.14	59.27	-2.59	210.15	2 608.90	1 114.87	1 071.81	42.87	26 002			
11 000.00	8 562.68	9 808.49	7 450.24	67.23	61.78	-2.74	213.05	2 719.99	1 116.09	1 071.61	44.47	25 095			
11 100.00	8 567.95	9 931.99	7 459.93	69.34	64.57	-2.76	215.89	2 843.06	1 113.55	1 067.45	46.09	24 158			
11 200.00	8 569.22	10 038.52	7 469.41	71.46	66.93	-2.77	217.66	2 947.14	1 105.73	1 058.13	47.60	23 231			
11 300.00	8 570.43	10 128.60	7 477.59	73.59	69.01	-2.84	218.74	3 038.86	1 098.07	1 048.88	49.08	22 371			
11 400.00	8 572.96	10 221.86	7 485.07	75.73	71.12	-2.80	218.89	3 131.81	1 092.55	1 042.00	50.54	21 516			
11 500.00	8 575.13	10 311.34	7 491.64	77.89	73.15	-2.76	218.02	3 221.05	1 087.30	1 035.36	51.94	20 936			
11 600.00	8 578.01	10 412.38	7 498.25	80.05	75.44	-2.71	216.81	3 321.87	1 083.66	1 030.09	53.48	20 262			
11 700.00	8 581.69	10 537.00	7 506.06	82.22	78.27	-2.59	214.68	3 446.07	1 079.52	1 024.37	55.15	19 576			
11 800.00	8 585.19	10 624.26	7 515.55	84.39	80.26	-2.49	213.33	3 533.00	1 074.15	1 017.63	56.53	19 003			
11 900.00	8 587.96	10 695.51	7 520.34	86.58	81.88	-2.40	212.39	3 604.08	1 070.13	1 012.33	57.79	18 516			
12 000.00	8 590.31	10 785.53	7 524.28	88.77	83.93	-2.24	211.22	3 694.01	1 067.93	1 008.75	59.18	18 045			
12 100.00	8 592.28	10 878.31	7 528.22	90.96	86.05	-2.01	209.35	3 785.68	1 065.49	1 004.91	60.58	17 589			
12 190.52	8 594.28	10 954.13	7 530.55	92.95	87.78	-1.85	208.07	3 862.46	1 064.61	1 002.80	61.81	17 223			
12 200.00	8 594.34	10 961.87	7 530.72	93.16	87.96	-1.82	207.95	3 870.19	1 064.44	1 002.50	61.94	17 185			
12 300.00	8 597.60	11 070.38	7 532.78	95.36	90.44	-1.70	206.68	3 978.68	1 065.97	1 002.45	63.52	16 781			
12 400.00	8 602.68	11 169.94	7 537.78	97.57	93.18	-1.71	206.29	4 098.13	1 066.63	1 001.42	65.21	16 357			
12 500.00	8 607.34	11 269.37	7 541.00	99.79	94.99	-1.74	206.04	4 177.49	1 067.29	1 000.71	66.58	16 030			
12 600.00	8 611.06	11 340.58	7 542.19	102.01	96.62	-1.78	205.90	4 248.68	1 069.37	1 001.49	67.88	15 753			
12 700.00	8 613.76	11 411.97	7 541.32	104.23	98.26	-1.80	205.99	4 320.07	1 073.29	1 004.10	69.19	15 512			
12 800.00	8 616.84	11 491.36	7 538.56	106.46	100.07	-1.84	206.16	4 399.41	1 079.85	1 009.23	70.62	15 291			
12 900.00	8 622.28	11 615.09	7 533.82	108.69	102.90	-1.88	206.94	4 523.03	1 089.28	1 016.91	72.37	15 052			
13 000.00	8 627.55	11 811.95	7 540.13	110.92	107.41	-1.75	206.12	4 719.71	1 090.46	1 015.84	74.61	14 615			
13 100.00	8 632.55	11 904.64	7 546.18	113.16	109.54	-1.57	204.28	4 812.18	1 088.84	1 012.79	76.05	14 317			
13 200.00	8 637.36	12 005.51	7 551.95	115.39	111.85	-1.36	202.51	4 912.87	1 087.84	1 010.31	77.54	14 030			
13 300.00	8 641.96	12 157.71	7 564.79	117.63	115.33	-1.16	202.35	5 064.50	1 084.01	1 004.58	79.44	13 646			
13 400.00	8 646.49	12 251.90	7 574.87	119.87	117.47	-1.10	203.67	5 158.14	1 077.80	996.88	80.92	13 320			
13 500.00	8 651.50	12 300.00	7 579.92	122.12	118.57	-1.02	204.40	5 205.97	1 073.51	991.45	82.06	13 083			
13 504.84	8 651.75	12 300.00	7 579.92	122.22	118.67	-1.02	204.40	5 205.97	1 073.50	991.40	82.09	13 077			
13 581.00	8 655.72	12 300.00	7 579.92	123.93	118.57	-1.03	204.40	5 205.97	1 076.15	993.47	82.68	13 016			



Phoenix Technology Services LP Anticollision Report

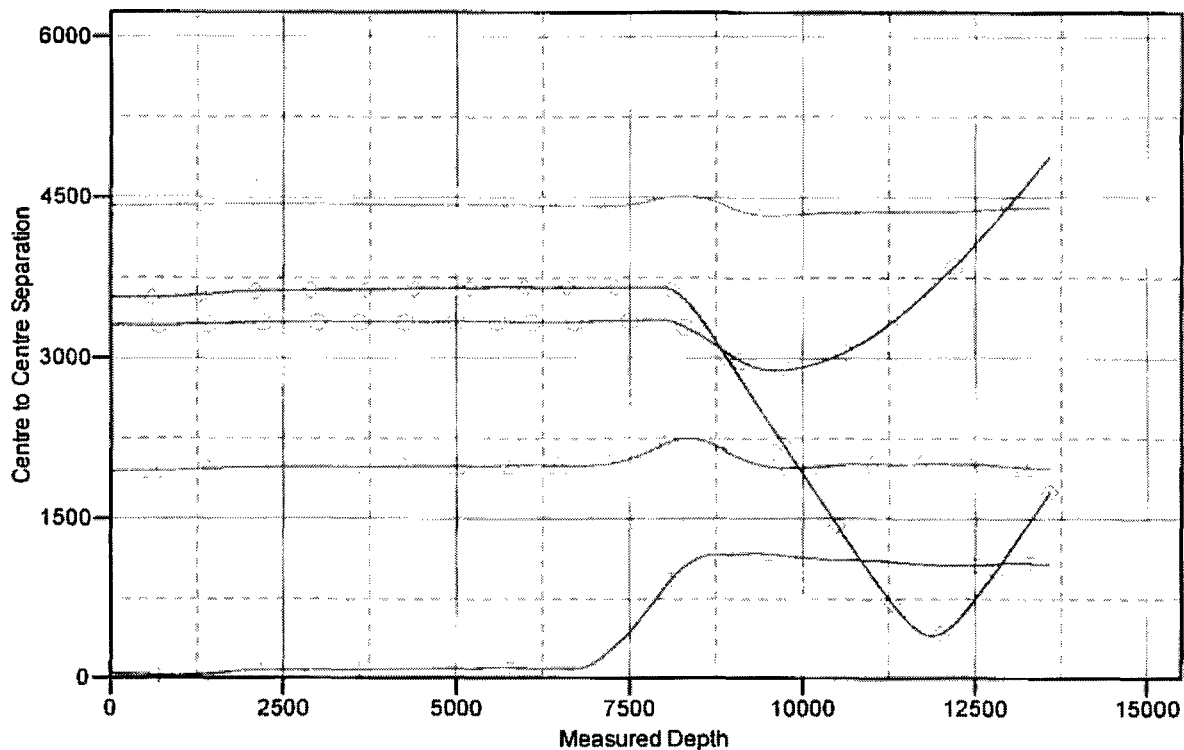


Company: Apache Corporation
Project: Eddy County, NM (NAD 83 NME)
Reference Site: Palmillo 14-15 State
Site Error: 0.00 usft
Reference Well: #301H
Well Error: 0.00 usft
Reference Wellbore: OH / Job #61178
Reference Design: Surveys (H&P 482)

Local Co-ordinate Reference: Well #301H
TVD Reference: GL + KB @ 3446.00usft (H&P 482)
MD Reference: GL + KB @ 3446.00usft (H&P 482)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL + KB @ 3446.00usft (H&P 482) Coordinates are relative to: #301H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is 104° 19' 60.00000 W Grid Convergence at Surface is: 0.10°

Ladder Plot



LEGEND

2-8, OH, Surveys V0
1-1, OH, Surveys V0
#4H, WB1/Job #1411413, Surveys (Pioneer 28) V0
#2H, OH / Job #61176, Surveys (H&P 482) V0
#1H, WB1/Job #1411057, Surveys (Pioneer 28) V0



Phoenix Technology Services LP Anticollision Report



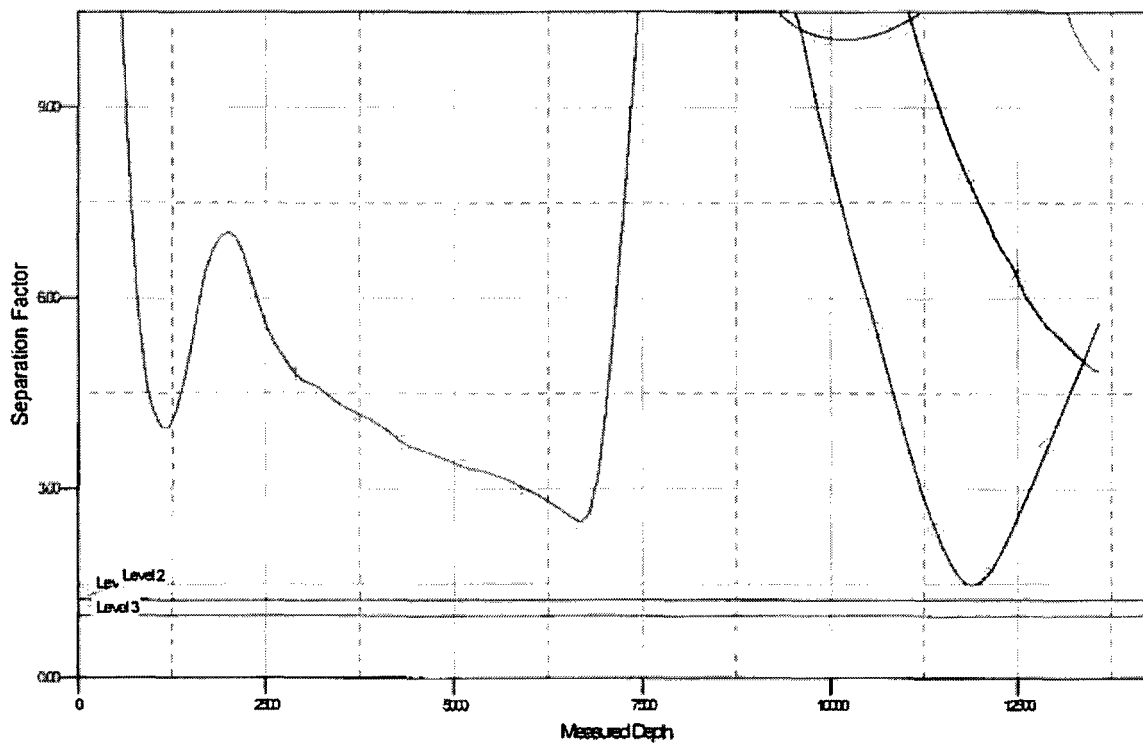
Company: Apache Corporation
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Reference Site: Palmillo 14-15 State
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Compass 5000 GCR
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL + KB @ 3446.00usft (H&P 482)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to #301H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.10°

Separation Factor Plot



LEGEND

218, OH, Surveys V0
#1, OH, Surveys V0

✕ #4H, WB1/Job #1411413, Surveys (Pioneer 28) V0
▲ #1H, WB1/Job #1411057, Surveys (Pioneer 28) V0

■ #2H, OH/Job #61176, Surveys (H&P 482) V0