

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 09 2014

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Apache Corporation

Eddy County, NM (NAD27 NME)

SB State

#2 API#30-015-42002

SL: 1900' FNL & 990' FNL UL: E 02-18S-27E

WB1/Job #1410349

Design: Surveys (Capstar 120)

Standard Survey Report

19 March, 2014

Survey Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #2
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3579.00usft (Capstar 120)
Site:	SB State	MD Reference:	KB @ 3579.00usft (Capstar 120)
Well:	#2	North Reference:	Grid
Wellbore:	WB1/Job #1410349	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	Compass 5000 GCR DB

Project	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	SB State		
Site Position:		Northing:	646,167.30 usft
From:	Map	Easting:	524,175.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 46' 34.97110 N
		Longitude:	104° 15' 16.83912 W
		Grid Convergence:	0.04 °

Well	#2		
Well Position	+N/-S	0.00 usft	Northing: 646,782.60 usft
	+E/-W	0.00 usft	Easting: 524,355.60 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 46' 41.05847 N
		Longitude:	104° 15' 14.72072 W
		Ground Level:	3,568.00 usft

Wellbore	WB1/Job #1410349				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	02/24/14	7.73	60.50	48,576

Design	Surveys (Capstar 120)			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	354.60

Survey Program	Date	03/19/14		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	300.00	Gyro Surveys (WB1/Job #1410349)	NS-GYRO-MS	North sensing gyrocompassing m/s
337.00	4,115.00	Phoenix MWD Surveys (WB1/Job #14103)	MWD	MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.52	145.36	100.00	-0.37	0.26	-0.40	0.52	0.52	0.00
200.00	0.55	119.41	199.99	-0.98	0.93	-1.07	0.24	0.03	-25.95
300.00	0.43	107.23	299.99	-1.33	1.71	-1.48	0.16	-0.12	-12.18
Tie In to Gyro Surveys									
337.00	0.30	134.20	336.99	-1.44	1.91	-1.61	0.57	-0.35	72.89
First Phoenix MWD Survey									
456.00	0.70	338.60	455.99	-0.98	1.87	-1.15	0.82	0.34	-130.76
517.00	1.90	336.50	516.97	0.30	1.33	0.17	1.97	1.97	-3.44

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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)
588.00	3.00	338.00	587.90	3.10	0.17	3.07	1.55	1.55	2.11
673.00	4.00	338.90	672.75	7.93	-1.73	8.05	1.18	1.18	1.06
758.00	3.70	338.20	757.55	13.24	-3.82	13.54	0.36	-0.35	-0.82
844.00	3.30	337.30	843.39	18.10	-5.81	18.56	0.47	-0.47	-1.05
929.00	3.10	339.20	928.26	22.50	-7.57	23.12	0.27	-0.24	2.24
1,015.00	4.00	340.10	1,014.09	27.50	-9.41	28.26	1.05	1.05	1.05
1,100.00	3.40	338.20	1,098.92	32.63	-11.36	33.55	0.72	-0.71	-2.24
1,186.00	3.80	341.60	1,184.75	37.70	-13.20	38.77	0.53	0.47	3.95
1,271.00	5.10	339.40	1,269.49	43.91	-15.42	45.16	1.54	1.53	-2.59
1,357.00	4.70	333.40	1,355.18	50.64	-18.35	52.14	0.76	-0.47	-6.98
1,442.00	4.40	331.20	1,439.91	56.61	-21.48	58.38	0.41	-0.35	-2.59
1,528.00	3.80	341.90	1,525.69	62.21	-23.95	64.19	1.13	-0.70	12.44
1,613.00	3.70	2.00	1,610.51	67.63	-24.73	69.65	1.54	-0.12	23.65
1,698.00	3.70	0.80	1,695.33	73.11	-24.60	75.10	0.09	0.00	-1.41
1,783.00	4.70	1.10	1,780.10	79.33	-24.49	81.29	1.18	1.18	0.35
1,868.00	5.20	3.60	1,864.79	86.66	-24.18	88.55	0.64	0.59	2.94
1,954.00	4.90	2.90	1,950.45	94.22	-23.75	96.03	0.36	-0.35	-0.81
2,039.00	4.80	2.20	2,035.15	101.40	-23.43	103.15	0.14	-0.12	-0.82
2,125.00	4.80	3.00	2,120.85	108.59	-23.10	110.28	0.08	0.00	0.93
2,210.00	4.70	3.00	2,205.55	115.61	-22.74	117.24	0.12	-0.12	0.00
2,295.00	4.80	0.30	2,290.26	122.65	-22.54	124.22	0.29	0.12	-3.18
2,381.00	4.70	0.60	2,375.97	129.77	-22.48	131.31	0.12	-0.12	0.35
2,466.00	4.70	359.60	2,460.68	136.73	-22.47	138.24	0.10	0.00	-1.18
2,552.00	4.70	1.30	2,546.39	143.78	-22.41	145.25	0.16	0.00	1.98
2,637.00	4.30	2.00	2,631.13	150.45	-22.22	151.87	0.47	-0.47	0.82
2,723.00	3.70	6.40	2,716.92	156.43	-21.80	157.78	0.78	-0.70	5.12
2,808.00	3.60	345.10	2,801.75	161.73	-22.18	163.10	1.59	-0.12	-25.06
2,893.00	3.70	342.00	2,886.58	166.92	-23.71	168.41	0.26	0.12	-3.65
2,978.00	3.80	350.60	2,971.40	172.30	-25.02	173.89	0.67	0.12	10.12
3,064.00	4.10	355.00	3,057.19	178.18	-25.76	179.81	0.50	0.35	5.12
3,149.00	4.10	354.30	3,141.98	184.23	-26.32	185.89	0.06	0.00	-0.82
3,234.00	4.00	9.20	3,226.77	190.18	-26.15	191.80	1.24	-0.12	17.53
3,320.00	4.00	357.00	3,312.56	196.14	-25.83	197.70	0.99	0.00	-14.19
3,405.00	4.10	351.10	3,397.35	202.10	-26.45	203.69	0.50	0.12	-6.94
3,490.00	4.00	351.70	3,482.13	208.03	-27.35	209.69	0.13	-0.12	0.71
3,575.00	4.20	359.20	3,566.92	214.08	-27.82	215.75	0.67	0.24	8.82
3,660.00	4.40	359.50	3,651.68	220.45	-27.89	222.10	0.24	0.24	0.35
3,746.00	4.40	357.70	3,737.42	227.05	-28.06	228.68	0.16	0.00	-2.09
3,831.00	4.00	357.10	3,822.20	233.27	-28.34	234.90	0.47	-0.47	-0.71
3,916.00	3.70	357.00	3,907.00	238.97	-28.63	240.60	0.35	-0.35	-0.12
4,002.00	2.90	353.20	3,992.86	243.90	-29.03	245.55	0.96	-0.93	-4.42
4,066.00	1.60	8.00	4,056.81	246.39	-29.10	248.04	2.21	-2.03	23.13
Final Phoenix MWD Survey									
4,115.00	1.60	8.00	4,105.79	247.75	-28.91	249.37	0.00	0.00	0.00

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Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	299.99	-1.33	1.71	Tie In to Gyro Surveys
337.00	336.99	-1.44	1.91	First Phoenix MWD Survey
4,066.00	4,056.81	246.39	-29.10	Final Phoenix MWD Survey
4,115.00	4,105.79	247.75	-28.91	Projection to TD