



Apache Corporation (873)

Eddy County, NM (NAD27 NME)

NFE Federal 30-015-42907
#52H

A-6-17S-31E
485' FUL + 1025' FEL

WB1 / Job #1513428

Survey: Phoenix MWD Surveys

Standard Survey Report

06 May, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 24 2015

RECEIVED



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #52H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3778.00usft (Capstar 114)
Site:	NFE Federal	MD Reference:	KB @ 3778.00usft (Capstar 114)
Well:	#52H	North Reference:	Grid
Wellbore:	WB1 / Job #1513428	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	Compass 5000 GCR

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	NFE Federal		
Site Position:	Map	Northing:	673,264.70 usft
From:		Easting:	633,303.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 51' 0.49036 N
		Longitude:	103° 53' 57.34966 W
		Grid Convergence:	0.24 °

Well	#52H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 52' 9.58533 N
		Longitude:	103° 54' 12.07028 W
		Ground Level:	3,767.00 usft

Wellbore	WB1 / Job #1513428		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	4/22/2015	7.68
			Dip Angle (°)
			60.82
			Field Strength (nT)
			48,578

Design	Surveys (Capstar 114)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			269.61

Survey Program	Date 5/4/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	4,288.00	Phoenix Gyro Surveys (WB1 / Job #15134	NS-GYRO-MS
4,319.00	6,969.00	Phoenix MWD Surveys (WB1 / Job #1513	PHX+MWD+HDGM
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+HDGM

Survey			
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)
4,288.00	0.14	183.96	4,287.41
4,319.00	0.30	185.50	4,318.41
4,362.00	0.20	188.00	4,361.41
4,403.00	2.70	268.50	4,402.39
4,446.00	7.40	282.30	4,445.21
4,488.00	12.60	285.80	4,486.56
4,530.00	18.60	285.80	4,527.00
			+N/-S (usft)
			15.81
			+E/-W (usft)
			40.67
			Vertical Section (usft)
			-40.77
			Dogleg Rate (°/100usft)
			0.00
			Build Rate (°/100usft)
			0.00
			Turn Rate (°/100usft)
			0.00
Tie-on to Phoenix Gyro Survey			
4,319.00	0.30	185.50	4,318.41
			15.69
			40.66
			-40.76
			0.52
			0.52
			4.97
First Phoenix MWD Survey			
4,362.00	0.20	188.00	4,361.41
			15.50
			40.64
			-40.74
			0.23
			-0.23
			5.81
4,403.00	2.70	268.50	4,402.39
			15.40
			39.66
			-39.76
			6.52
			6.10
			196.34
4,446.00	7.40	282.30	4,445.21
			15.97
			35.94
			-36.05
			11.21
			10.93
			32.09
4,488.00	12.60	285.80	4,486.56
			17.79
			28.88
			-29.00
			12.46
			12.38
			8.33
4,530.00	18.60	285.80	4,527.00
			20.87
			18.02
			-18.16
			14.29
			14.29
			0.00

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Site:	NFE Federal	MD Reference:	KB @ 3778.00usft (Capstar 114)
Well:	#52H	North Reference:	Grid
Wellbore:	WB1 / Job #1513428	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	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)
4,573.00	23.50	286.00	4,567.11	25.10	3.17	-3.34	11.40	11.40	0.47
4,615.00	27.60	287.00	4,605.00	30.26	-14.19	13.98	9.82	9.76	2.38
4,658.00	31.60	285.90	4,642.38	36.26	-34.56	34.31	9.39	9.30	-2.56
4,701.00	36.00	283.70	4,678.10	42.34	-57.68	57.39	10.62	10.23	-5.12
4,743.00	41.10	279.70	4,710.95	47.59	-83.30	82.98	13.51	12.14	-9.52
4,786.00	46.30	275.70	4,742.03	51.52	-112.73	112.37	13.69	12.09	-9.30
4,828.00	51.90	271.50	4,769.52	53.46	-144.39	144.02	15.32	13.33	-10.00
4,871.00	56.00	268.80	4,794.83	53.53	-179.14	178.77	10.80	9.53	-6.28
4,914.00	59.40	266.50	4,817.80	52.03	-215.45	215.09	9.11	7.91	-5.35
4,957.00	63.20	265.00	4,838.45	49.23	-253.05	252.71	9.35	8.84	-3.49
5,000.00	66.90	265.50	4,856.58	46.00	-291.90	291.58	8.67	8.60	1.16
5,042.00	71.20	267.30	4,871.60	43.55	-331.03	330.73	10.99	10.24	4.29
5,085.00	74.30	268.00	4,884.35	41.87	-372.06	371.76	7.37	7.21	1.63
5,127.00	80.20	268.00	4,893.61	40.44	-412.98	412.69	14.05	14.05	0.00
5,169.00	86.60	267.30	4,898.44	38.73	-454.64	454.37	15.33	15.24	-1.67
5,211.00	89.70	267.30	4,899.80	36.75	-496.57	496.31	7.38	7.38	0.00
5,294.00	90.30	267.20	4,899.80	32.77	-579.47	579.24	0.73	0.72	-0.12
5,422.00	92.40	266.50	4,896.78	25.74	-707.24	707.05	1.73	1.64	-0.55
5,551.00	92.50	266.80	4,891.27	18.20	-835.90	835.76	0.24	0.08	0.23
5,679.00	93.70	266.80	4,884.34	11.07	-963.51	963.41	0.94	0.94	0.00
5,810.00	93.30	268.80	4,876.35	6.05	-1,094.16	1,094.10	1.55	-0.31	1.53
5,941.00	93.10	268.70	4,869.03	3.20	-1,224.93	1,224.88	0.17	-0.15	-0.08
6,069.00	92.50	268.80	4,862.78	0.41	-1,352.74	1,352.71	0.48	-0.47	0.08
6,198.00	91.40	268.80	4,858.39	-2.29	-1,481.64	1,481.62	0.85	-0.85	0.00
6,326.00	91.80	268.80	4,854.82	-4.97	-1,609.56	1,609.56	0.31	0.31	0.00
6,457.00	90.20	268.30	4,852.53	-8.29	-1,740.49	1,740.51	1.28	-1.22	-0.38
6,585.00	91.50	268.20	4,850.63	-12.19	-1,868.42	1,868.46	1.02	1.02	-0.08
6,713.00	90.90	269.40	4,847.95	-14.87	-1,996.36	1,996.41	1.05	-0.47	0.94
6,841.00	89.10	270.20	4,847.95	-15.32	-2,124.35	2,124.41	1.54	-1.41	0.63
6,969.00	90.80	270.90	4,848.06	-14.09	-2,252.34	2,252.38	1.44	1.33	0.55
7,100.00	91.50	271.60	4,845.43	-11.23	-2,383.28	2,383.30	0.76	0.53	0.53
7,228.00	92.90	271.40	4,840.52	-7.89	-2,511.14	2,511.13	1.10	1.09	-0.16
7,357.00	90.00	271.40	4,837.26	-4.74	-2,640.05	2,640.02	2.25	-2.25	0.00
7,485.00	89.70	270.30	4,837.59	-2.84	-2,768.03	2,767.98	0.89	-0.23	-0.86
7,613.00	89.80	269.20	4,838.15	-3.40	-2,896.02	2,895.98	0.86	0.08	-0.86
7,741.00	90.60	268.80	4,837.70	-5.63	-3,024.00	3,023.97	0.70	0.63	-0.31
7,869.00	91.60	268.50	4,835.25	-8.64	-3,151.94	3,151.93	0.82	0.78	-0.23
7,997.00	92.50	268.40	4,830.67	-12.10	-3,279.81	3,279.82	0.71	0.70	-0.08
8,126.00	92.80	268.20	4,824.70	-15.93	-3,408.62	3,408.65	0.28	0.23	-0.16
8,254.00	93.40	268.10	4,817.78	-20.05	-3,536.36	3,536.42	0.48	0.47	-0.08
8,281.00	93.50	268.20	4,816.16	-20.92	-3,563.30	3,563.36	0.52	0.37	0.37
Last Phoenix MWD Survey									
8,350.00	93.50	268.20	4,811.94	-23.09	-3,632.14	3,632.21	0.00	0.00	0.00
Projection to TD									

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Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,288.00	4,287.41	15.81	40.67	Tie-on to Phoenix Gyro Survey
4,319.00	4,318.41	15.69	40.66	First Phoenix MWD Survey
8,281.00	4,816.16	-20.92	-3,563.30	Last Phoenix MWD Survey
8,350.00	4,811.94	-23.09	-3,632.14	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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