



NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 16 2015

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Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal

#35H

WB1 / Job #1512836

Survey: Phoenix MWD Survey *API: 30-015-42587*

P-6-17S-31E 1010 FSL 155 FEL

Standard Survey Report

03 March, 2015



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #35H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3763.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3763.00usft (Capstar 119)
Well:	#35H	North Reference:	Grid
Wellbore:	WB1 / Job #1512836	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	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	#35H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 51' 32.16272 N
		Longitude:	103° 54' 1.80514 W
		Ground Level:	3,752.00 usft

Wellbore	WB1 / Job #1512836		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	2/23/2015	(°)
			7.40
			Dip Angle
			(°)
			60.62
			Field Strength
			(nT)
			48,517

Design	Surveys (Capstar 119)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			89.59

Survey Program	Date 3/3/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	4,797.00	Phoenix Gyro Survey (WB1 / Job #151283	NS-GYRO-MS
4,872.00	10,280.00	Phoenix MWD Survey (WB1 / Job #15128	PHX+MWD+BGGM
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+BGGM v3:standard declination

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)	
4,797.00	0.51	23.18	4,796.45	29.51	-11.14	-10.93	0.00	0.00	0.00	
Tie-on to Phoenix Gyro Survey										
4,872.00	0.80	44.90	4,871.45	30.19	-10.64	-10.42	0.50	0.39	28.96	
First Phoenix MWD Survey										
4,904.00	3.50	85.20	4,903.43	30.43	-9.51	-9.29	9.17	8.44	125.94	
4,936.00	7.30	89.20	4,935.28	30.54	-6.50	-6.28	11.93	11.88	12.50	
4,967.00	11.10	88.70	4,965.87	30.63	-1.55	-1.33	12.26	12.26	-1.61	
4,999.00	15.30	87.60	4,997.02	30.88	5.76	5.98	13.15	13.13	-3.44	
5,030.00	19.80	86.80	5,026.57	31.34	15.09	15.31	14.54	14.52	-2.58	

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Well:	#35H	North Reference:	Grid
Wellbore:	WB1 / Job #1512836	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	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)
5,062.00	23.60	85.70	5,056.30	32.13	26.89	27.12	11.94	11.88	-3.44
5,093.00	27.10	88.60	5,084.31	32.76	40.14	40.38	11.98	11.29	9.35
5,125.00	29.90	91.10	5,112.43	32.79	55.41	55.64	9.51	8.75	7.81
5,157.00	32.70	93.00	5,139.77	32.18	72.02	72.25	9.28	8.75	5.94
5,189.00	35.70	94.50	5,166.23	31.00	89.96	90.18	9.74	9.38	4.69
5,220.00	39.10	95.80	5,190.86	29.30	108.71	108.92	11.26	10.97	4.19
5,252.00	42.10	96.20	5,215.15	27.12	129.42	129.61	9.41	9.38	1.25
5,284.00	44.90	95.40	5,238.36	24.90	151.33	151.51	8.92	8.75	-2.50
5,315.00	47.10	94.80	5,259.89	22.92	173.54	173.70	7.23	7.10	-1.94
5,347.00	49.80	94.30	5,281.12	21.02	197.41	197.56	8.52	8.44	-1.56
5,379.00	53.70	93.10	5,300.93	19.41	222.48	222.62	12.54	12.19	-3.75
5,411.00	58.00	93.00	5,318.88	18.00	248.92	249.05	13.44	13.44	-0.31
5,442.00	62.50	93.10	5,334.26	16.57	275.79	275.90	14.52	14.52	0.32
5,474.00	66.90	93.00	5,347.94	15.03	304.67	304.77	13.75	13.75	-0.31
5,506.00	71.30	92.60	5,359.35	13.57	334.53	334.61	13.80	13.75	-1.25
5,537.00	74.70	91.60	5,368.41	12.49	364.15	364.23	11.39	10.97	-3.23
5,569.00	77.50	92.00	5,376.10	11.51	395.19	395.26	8.83	8.75	1.25
5,600.00	80.40	91.70	5,382.04	10.53	425.60	425.66	9.40	9.35	-0.97
5,649.00	84.70	91.90	5,388.39	9.00	474.15	474.20	8.78	8.78	0.41
5,680.00	87.90	91.50	5,390.39	8.08	505.07	505.11	10.40	10.32	-1.29
5,710.00	88.20	91.60	5,391.41	7.27	535.04	535.08	1.05	1.00	0.33
5,739.00	88.20	91.40	5,392.32	6.51	564.01	564.05	0.69	0.00	-0.69
5,829.00	88.50	90.60	5,394.91	4.94	653.96	653.98	0.95	0.33	-0.89
5,921.00	89.30	90.00	5,396.68	4.46	745.94	745.95	1.09	0.87	-0.65
6,012.00	89.60	90.30	5,397.55	4.23	836.94	836.95	0.47	0.33	0.33
6,108.00	87.60	89.80	5,399.90	4.14	932.90	932.91	2.15	-2.08	-0.52
6,203.00	87.80	89.30	5,403.71	4.89	1,027.82	1,027.83	0.57	0.21	-0.53
6,297.00	87.60	88.10	5,407.48	7.02	1,121.72	1,121.74	1.29	-0.21	-1.28
6,391.00	88.20	90.40	5,410.93	8.25	1,215.64	1,215.67	2.53	0.64	2.45
6,486.00	88.20	90.80	5,413.91	7.25	1,310.59	1,310.61	0.42	0.00	0.42
6,581.00	88.50	90.40	5,416.65	6.26	1,405.55	1,405.56	0.53	0.32	-0.42
6,676.00	88.40	90.00	5,419.22	5.93	1,500.51	1,500.52	0.43	-0.11	-0.42
6,771.00	88.00	88.80	5,422.20	6.92	1,595.46	1,595.47	1.33	-0.42	-1.26
6,866.00	88.00	88.90	5,425.52	8.83	1,690.38	1,690.40	0.11	0.00	0.11
6,961.00	87.70	88.00	5,429.08	11.39	1,785.28	1,785.31	1.00	-0.32	-0.95
7,055.00	88.20	89.70	5,432.44	13.28	1,879.19	1,879.24	1.88	0.53	1.81
7,150.00	87.70	88.80	5,435.84	14.52	1,974.12	1,974.18	1.08	-0.53	-0.95
7,244.00	88.60	89.90	5,438.88	15.59	2,068.07	2,068.13	1.51	0.96	1.17
7,338.00	90.80	91.70	5,439.37	14.27	2,162.05	2,162.09	3.02	2.34	1.91
7,433.00	90.90	91.80	5,437.96	11.37	2,256.99	2,257.02	0.15	0.11	0.11
7,528.00	89.50	90.30	5,437.63	9.63	2,351.97	2,351.98	2.16	-1.47	-1.58
7,623.00	88.40	88.60	5,439.37	10.54	2,446.95	2,446.96	2.13	-1.16	-1.79
7,717.00	88.60	88.70	5,441.83	12.76	2,540.89	2,540.91	0.24	0.21	0.11

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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)
7,812.00	88.60	88.50	5,444.15	15.08	2,635.83	2,635.87	0.21	0.00	-0.21
7,907.00	88.80	87.90	5,446.31	18.06	2,730.76	2,730.82	0.67	0.21	-0.63
8,002.00	88.50	88.20	5,448.54	21.29	2,825.68	2,825.76	0.45	-0.32	0.32
8,097.00	88.80	87.90	5,450.78	24.53	2,920.60	2,920.70	0.45	0.32	-0.32
8,192.00	87.50	87.60	5,453.85	28.25	3,015.47	3,015.60	1.40	-1.37	-0.32
8,287.00	87.60	89.10	5,457.91	30.99	3,110.34	3,110.48	1.58	0.11	1.58
8,382.00	88.10	89.20	5,461.47	32.39	3,205.26	3,205.41	0.54	0.53	0.11
8,476.00	88.00	88.90	5,464.67	33.95	3,299.20	3,299.35	0.34	-0.11	-0.32
8,570.00	88.70	88.70	5,467.38	35.92	3,393.14	3,393.31	0.77	0.74	-0.21
8,665.00	88.70	89.80	5,469.54	37.16	3,488.10	3,488.28	1.16	0.00	1.16
8,760.00	89.10	89.70	5,471.36	37.58	3,583.08	3,583.26	0.43	0.42	-0.11
8,856.00	89.30	89.20	5,472.70	38.50	3,679.07	3,679.25	0.56	0.21	-0.52
8,952.00	89.40	90.30	5,473.79	38.92	3,775.06	3,775.24	1.15	0.10	1.15
9,047.00	89.60	89.80	5,474.62	38.83	3,870.06	3,870.24	0.57	0.21	-0.53
9,142.00	88.00	91.50	5,476.61	37.76	3,965.02	3,965.19	2.46	-1.68	1.79
9,236.00	88.10	90.30	5,479.81	36.28	4,058.96	4,059.11	1.28	0.11	-1.28
9,330.00	86.20	91.10	5,484.48	35.14	4,152.83	4,152.97	2.19	-2.02	0.85
9,425.00	85.90	90.20	5,491.02	34.06	4,247.59	4,247.73	1.00	-0.32	-0.95
9,520.00	87.90	90.70	5,496.16	33.32	4,342.45	4,342.57	2.17	2.11	0.53
9,615.00	88.70	88.90	5,498.98	33.65	4,437.40	4,437.53	2.07	0.84	-1.89
9,709.00	89.20	88.50	5,500.70	35.78	4,531.36	4,531.50	0.68	0.53	-0.43
9,804.00	89.60	87.90	5,501.70	38.76	4,626.31	4,626.47	0.76	0.42	-0.63
9,898.00	89.80	87.90	5,502.19	42.21	4,720.24	4,720.42	0.21	0.21	0.00
9,992.00	89.70	87.80	5,502.60	45.73	4,814.18	4,814.38	0.15	-0.11	-0.11
10,087.00	89.80	87.30	5,503.01	49.79	4,909.09	4,909.32	0.54	0.11	-0.53
10,182.00	89.10	88.40	5,503.93	53.36	5,004.01	5,004.27	1.37	-0.74	1.16
10,216.00	89.10	88.30	5,504.46	54.34	5,038.00	5,038.26	0.29	0.00	-0.29
Last Phoenix MWD Survey									
10,280.00	89.10	88.30	5,505.47	56.24	5,101.96	5,102.23	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,797.00	4,796.45	29.51	-11.14	Tie-on to Phoenix Gyro Survey
4,872.00	4,871.45	30.19	-10.64	First Phoenix MWD Survey
10,216.00	5,504.46	54.34	5,038.00	Last Phoenix MWD Survey
10,280.00	5,505.47	56.24	5,101.96	Projection to TD

Checked By: _____ Approved By: _____ Date: _____