



NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 28 2015

RECEIVED

Apache Corporation

Eddy County, New Mexico

Sec 20, T17-S, R31-E

Lee Federal #67 API # 30-015-41347

SL: 1650' FNL & 1950' FWL WLF 20-178-31E

Wellbore #1

Survey: DDC MWD

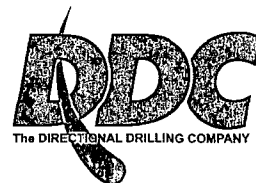
NM OIL CONSERVATION
ARTESIA DISTRICT

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DDC Survey Report

01 December, 2014





Survey Certification Sheet

Apache Corporation
Company

WT-141145
Job Number

12/1/14
Date

Sec20, T17S, R31E
Lease

Lee Federal #67
Well Name

Eddy, NM
County & State

API: 30-015-41347

Surveyed from a depth of: 308.4 feet to 6400 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Kevin Low

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Bryon Reed
MWD General Manager

Bryon
Reed

Digitally signed by Bryon Reed
DN: cn=Bryon Reed, o=The
Directional Drilling Company,
ou=DDC-MWD,
email=bryon.reed@directional
drillers.com, c=US
Date: 2014.12.01 14:02:21
-06'00'



HP
Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well Lee-Federal #67
Project:	Eddy County, New Mexico	TVD Reference:	Well @ 3656.0usft (Capstar #119)
Site:	Sec 20, T17-S, R31-E	MD Reference:	Well @ 3656.0usft (Capstar #119)
Well:	Lee Federal #67	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Project	Eddy County, New Mexico		
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	Sec 20, T17-S, R31-E		
Site Position:		Northing:	661,172.80 usft
From:	Map	Easting:	634,332.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 49' 0.798 N
		Longitude:	103° 53' 45.878 W
		Grid Convergence:	0.24 °

Well:	Lee Federal #67		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 49' 21.399 N
		Longitude:	103° 53' 36.894 W
		Ground Level:	3,645.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	11/5/2014	7.36
			Dip Angle
			(°)
			60.60
			Field Strength
			(nT)
			48,600

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			269.58

Survey Program	Date 11/25/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
92.3	308.4	Phoenix Gyro (Wellbore #1)	Good_gyro
368.0	6,400.0	DDC MWD (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

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)
Tie In @ 308.4' MD / 308.4' TVD									
308.4	0.63	302.61	308.4	1.0	-1.8	1.8	0.00	0.00	0.00
368.0	0.60	298.60	368.0	1.3	-2.4	2.3	0.09	-0.05	-6.73
460.0	0.60	318.30	460.0	1.9	-3.1	3.1	0.22	0.00	21.41
551.0	0.90	312.10	551.0	2.7	-3.9	3.9	0.34	0.33	-6.81
642.0	0.80	298.40	642.0	3.5	-5.0	5.0	0.25	-0.11	-15.05
737.0	0.80	300.70	737.0	4.2	-6.2	6.2	0.03	0.00	2.42
832.0	0.40	282.40	831.9	4.6	-7.1	7.1	0.46	-0.42	-19.26
927.0	0.40	264.10	926.9	4.6	-7.7	7.7	0.13	0.00	-19.26
1,022.0	0.50	189.10	1,021.9	4.2	-8.1	8.1	0.58	0.11	-78.95



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Survey Report



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Well:	Lee Federal #67	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

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)	
1,117.0	0.80	171.80	1,116.9	3.1	-8.1	8.1	0.37	0.32	-18.21	
1,211.0	0.80	159.20	1,210.9	1.8	-7.8	7.8	0.19	0.00	-13.40	
1,306.0	0.80	151.40	1,305.9	0.6	-7.2	7.2	0.11	0.00	-8.21	
1,401.0	0.60	152.10	1,400.9	-0.4	-6.7	6.7	0.21	-0.21	0.74	
1,496.0	0.40	201.20	1,495.9	-1.1	-6.6	6.6	0.48	-0.21	51.68	
1,591.0	1.10	266.20	1,590.9	-1.5	-7.6	7.6	1.05	0.74	68.42	
1,686.0	1.70	267.60	1,685.9	-1.6	-9.9	9.9	0.63	0.63	1.47	
1,780.0	3.00	271.70	1,779.8	-1.6	-13.8	13.8	1.39	1.38	4.36	
1,875.0	3.80	273.40	1,874.6	-1.3	-19.4	19.4	0.85	0.84	1.79	
1,969.0	4.00	272.40	1,968.4	-1.0	-25.8	25.8	0.22	0.21	-1.06	
2,064.0	3.30	267.30	2,063.2	-1.0	-31.8	31.8	0.81	-0.74	-5.37	
2,159.0	2.80	266.40	2,158.1	-1.3	-36.9	36.9	0.53	-0.53	-0.95	
2,254.0	2.80	270.60	2,253.0	-1.4	-41.5	41.5	0.22	0.00	4.42	
2,349.0	3.00	272.70	2,347.8	-1.3	-46.3	46.3	0.24	0.21	2.21	
2,443.0	3.30	276.20	2,441.7	-0.9	-51.5	51.5	0.38	0.32	3.72	
2,538.0	3.50	280.10	2,536.5	-0.1	-57.0	57.0	0.32	0.21	4.11	
2,633.0	3.30	273.40	2,631.4	0.6	-62.6	62.6	0.47	-0.21	-7.05	
2,728.0	3.50	275.90	2,726.2	1.1	-68.2	68.2	0.26	0.21	2.63	
2,823.0	3.60	267.80	2,821.0	1.3	-74.1	74.1	0.54	0.11	-8.53	
2,917.0	4.00	265.90	2,914.8	0.9	-80.3	80.3	0.45	0.43	-2.02	
3,012.0	3.20	271.00	3,009.6	0.7	-86.3	86.3	0.91	-0.84	5.37	
3,105.0	3.10	271.00	3,102.5	0.8	-91.4	91.4	0.11	-0.11	0.00	
3,200.0	3.60	269.90	3,197.3	0.8	-96.9	96.9	0.53	0.53	-1.16	
3,294.0	4.40	269.00	3,291.1	0.8	-103.5	103.5	0.85	0.85	-0.96	
3,389.0	4.60	267.60	3,385.8	0.6	-110.9	110.9	0.24	0.21	-1.47	
3,468.0	5.00	267.30	3,464.5	0.3	-117.5	117.5	0.51	0.51	-0.38	
3,554.0	5.30	269.20	3,550.2	0.0	-125.2	125.2	0.40	0.35	2.21	
3,649.0	5.30	268.90	3,644.8	-0.1	-134.0	134.0	0.03	0.00	-0.32	
3,744.0	4.00	271.10	3,739.5	-0.1	-141.7	141.7	1.38	-1.37	2.32	
3,838.0	3.10	271.80	3,833.3	0.0	-147.5	147.5	0.96	-0.96	0.74	
3,933.0	3.20	273.60	3,928.1	0.3	-152.8	152.7	0.15	0.11	1.89	
4,028.0	3.10	274.80	4,023.0	0.6	-158.0	158.0	0.13	-0.11	1.26	
4,123.0	3.20	277.30	4,117.8	1.2	-163.2	163.1	0.18	0.11	2.63	
4,217.0	3.30	262.40	4,211.7	1.2	-168.4	168.4	0.90	0.11	-15.85	
4,312.0	3.60	265.00	4,306.5	0.5	-174.1	174.1	0.36	0.32	2.74	
4,407.0	3.70	264.50	4,401.3	0.0	-180.1	180.1	0.11	0.11	-0.53	
4,502.0	3.60	265.90	4,496.1	-0.5	-186.2	186.2	0.14	-0.11	1.47	
4,597.0	3.70	265.90	4,590.9	-1.0	-192.2	192.2	0.11	0.11	0.00	
4,691.0	3.80	268.00	4,684.7	-1.3	-198.3	198.3	0.18	0.11	2.23	
4,787.0	3.90	269.20	4,780.5	-1.4	-204.8	204.8	0.13	0.10	1.25	
4,881.0	3.10	281.90	4,874.3	-1.0	-210.5	210.5	1.18	-0.85	13.51	
4,976.0	3.50	264.30	4,969.2	-0.7	-215.9	215.9	1.14	0.42	-18.53	
5,071.0	3.80	264.50	5,064.0	-1.3	-221.9	221.9	0.32	0.32	0.21	



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Design:	Wellbore #1	Database:	Compass

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)	
5,165.0	3.00	265.20	5,157.8	-1.8	-227.4	227.4	0.85	-0.85	0.74	
5,260.0	3.10	264.50	5,252.7	-2.3	-232.5	232.5	0.11	0.11	-0.74	
5,355.0	3.10	265.90	5,347.6	-2.7	-237.6	237.6	0.08	0.00	1.47	
5,450.0	3.00	270.10	5,442.4	-2.9	-242.6	242.6	0.26	-0.11	4.42	
5,544.0	3.00	273.80	5,536.3	-2.7	-247.5	247.6	0.21	0.00	3.94	
5,639.0	3.30	256.20	5,631.2	-3.2	-252.7	252.7	1.06	0.32	-18.53	
5,734.0	3.60	253.70	5,726.0	-4.7	-258.2	258.2	0.35	0.32	-2.63	
5,828.0	3.40	271.50	5,819.8	-5.4	-263.8	263.9	1.17	-0.21	18.94	
5,923.0	3.50	274.30	5,914.6	-5.1	-269.5	269.6	0.21	0.11	2.95	
6,017.0	3.80	276.10	6,008.4	-4.6	-275.5	275.5	0.34	0.32	1.91	
6,111.0	4.00	278.40	6,102.2	-3.8	-281.8	281.8	0.27	0.21	2.45	
6,206.0	3.10	281.50	6,197.0	-2.8	-287.6	287.6	0.97	-0.95	3.26	
6,301.0	2.70	279.60	6,291.9	-1.9	-292.3	292.4	0.43	-0.42	-2.00	
6,350.0	2.60	278.70	6,340.9	-1.5	-294.6	294.6	0.22	-0.20	-1.84	
TD @ 6400' MD / 6390.8' TVD										
6,400.0	2.60	278.70	6,390.8	-1.2	-296.8	296.8	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
308.4	308.4	1.0	-1.8	Tie In @ 308.4' MD / 308.4' TVD	
6,400.0	6,390.8	-1.2	-296.8	TD @ 6400' MD / 6390.8' TVD	

Checked By: _____ Approved By: _____ Date: _____