

Apache Corporation
303 Veterans Airpark Lane, #3000
Midland, TX 79705

NFE Federal #054H
Eddy County, New Mexico

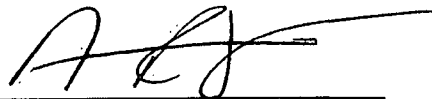
API# 30-015-42909
Sec. 6 T17S/R31E
420 FNL + 1025 FEL

240	2.40	0.75	1.31	3.15	3.15
358	1.18	1.00	1.75	2.07	5.22
572	2.14	0.80	1.40	3.00	8.21
788	2.16	0.50	0.88	1.89	10.10
1088	3.00	0.60	1.05	3.15	13.25
1344	2.56	0.80	1.40	3.58	16.84
1596	2.52	0.80	1.40	3.53	20.36
1865	2.69	0.30	0.53	1.41	21.78
2164	2.99	0.10	0.18	0.52	22.30
2380	2.16	0.20	0.35	0.76	23.05
2592	2.12	0.20	0.35	0.74	23.80
2928	3.36	0.30	0.53	1.76	25.56
3229	3.01	0.00	0.00	0.00	25.56
3357	1.28	0.20	0.35	0.45	26.01
3476	1.19	0.10	0.18	0.21	26.22
3550	0.74	0.30	0.53	0.39	26.61
3793	2.43	0.50	0.88	2.13	28.73
4050	2.57	0.30	0.53	1.35	30.08
4351	3.01	0.20	0.35	1.05	31.13
4694	3.43	0.80	1.40	4.80	35.94

NM OIL CONSERVATION
ARTESIA DISTRICT

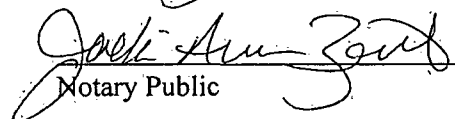
SEP 23 2015

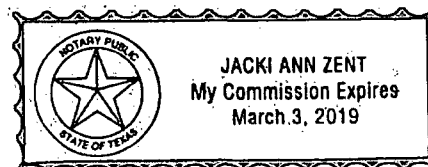
RECEIVED



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 29th day of June, 2015 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public





Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal

#54H

OH / Job #1513593

Design: Surveys (Capstar 114)

Standard Survey Report

07 June, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 23 2015

RECEIVED



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #54H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3780.00usft (Capstar 114)
Site:	NFE Federal	MD Reference:	KB @ 3780.00usft (Capstar 114)
Well:	#54H	North Reference:	Grid
Wellbore:	OH / Job #1513593	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:		Northing:	673,264.70 usft
From:	Map	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:	#54H		
Well Position	+N/-S	0.00 usft	Northing: 680,307.20 usft
	+E/-W	0.00 usft	Easting: 632,018.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 52' 10.22852 N
		Longitude:	103° 54' 12.07186 W
		Ground Level:	3,769.00 usft

Wellbore:	OH / Job #1513593				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM	5/19/2015	7.67	60.82	48,570

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

Survey Program	Date	6/7/2015			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
74.73	4,686.12	Phoenix Gyro Survey (OH / Job #1513593)	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
4,768.00	8,647.00	Phoenix MWD Survey (OH / Job #1513593)	PHX+MWD+HDGM	PHX+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	
74.73	0.35	280.26	74.73	0.04	-0.22	0.22	0.47	0.47	0.00	
161.74	0.36	278.13	161.74	0.13	-0.76	0.76	0.02	0.01	-2.45	
248.75	0.44	172.01	248.75	-0.17	-0.98	0.98	0.74	0.09	-121.96	
335.76	0.69	161.82	335.75	-0.99	-0.77	0.78	0.31	0.29	-11.71	
422.76	0.63	172.35	422.75	-1.97	-0.54	0.56	0.16	-0.07	12.10	
509.77	0.62	168.60	509.75	-2.90	-0.39	0.41	0.05	-0.01	-4.31	
596.78	0.62	164.49	596.76	-3.82	-0.17	0.19	0.05	0.00	-4.72	
683.78	0.47	162.97	683.75	-4.61	0.06	-0.03	0.17	-0.17	-1.75	
770.79	0.41	144.53	770.76	-5.21	0.35	-0.31	0.18	-0.07	-21.19	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #54H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3780.00usft (Capstar 114)
Site:	NFE Federal	MD Reference:	KB @ 3780.00usft (Capstar 114)
Well:	#54H	North Reference:	Grid
Wellbore:	OH / Job #1513593	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)
857.80	0.34	152.21	857.77	-5.69	0.65	-0.61	0.10	-0.08	8.83
944.81	0.34	106.15	944.78	-5.99	1.02	-0.98	0.31	0.00	-52.94
1,031.81	0.56	92.83	1,031.77	-6.08	1.69	-1.65	0.28	0.25	-15.31
1,118.82	0.78	96.25	1,118.78	-6.17	2.70	-2.66	0.26	0.25	3.93
1,205.83	0.74	90.15	1,205.78	-6.23	3.85	-3.81	0.10	-0.05	-7.01
1,292.84	0.96	98.38	1,292.78	-6.34	5.14	-5.09	0.29	0.25	9.46
1,379.84	1.02	106.82	1,379.77	-6.67	6.60	-6.55	0.18	0.07	9.70
1,466.85	0.91	110.77	1,466.77	-7.14	7.99	-7.94	0.15	-0.13	4.54
1,553.86	0.77	104.34	1,553.77	-7.53	9.20	-9.15	0.19	-0.16	-7.39
1,640.86	0.77	103.42	1,640.76	-7.81	10.33	-10.28	0.01	0.00	-1.06
1,727.87	0.69	116.51	1,727.76	-8.18	11.37	-11.31	0.21	-0.09	15.04
1,814.88	0.58	103.94	1,814.77	-8.52	12.27	-12.21	0.20	-0.13	-14.45
1,901.89	0.31	105.39	1,901.77	-8.69	12.92	-12.86	0.31	-0.31	1.67
1,988.89	0.18	100.80	1,988.77	-8.78	13.28	-13.22	0.15	-0.15	-5.28
2,075.90	0.09	326.28	2,075.78	-8.74	13.38	-13.32	0.29	-0.10	-154.60
2,162.91	0.19	331.94	2,162.79	-8.56	13.27	-13.21	0.12	0.11	6.50
2,249.92	0.15	262.51	2,249.80	-8.45	13.09	-13.03	0.23	-0.05	-79.80
2,336.92	0.14	324.61	2,336.80	-8.38	12.92	-12.86	0.17	-0.01	71.38
2,423.93	0.08	254.07	2,423.81	-8.31	12.80	-12.74	0.16	-0.07	-81.07
2,510.94	0.12	127.73	2,510.82	-8.38	12.81	-12.75	0.21	0.05	-145.20
2,597.95	0.13	222.46	2,597.83	-8.51	12.82	-12.76	0.21	0.01	108.87
2,684.95	0.08	242.47	2,684.83	-8.61	12.70	-12.64	0.07	-0.06	23.00
2,771.96	0.27	343.85	2,771.84	-8.44	12.59	-12.53	0.34	0.22	116.52
2,858.97	0.22	7.04	2,858.85	-8.08	12.55	-12.49	0.13	-0.06	26.65
2,945.97	0.22	11.72	2,945.85	-7.75	12.60	-12.55	0.02	0.00	5.38
3,032.98	0.22	331.56	3,032.86	-7.44	12.56	-12.51	0.17	0.00	-46.16
3,119.99	0.17	337.56	3,119.87	-7.17	12.43	-12.38	0.06	-0.06	6.90
3,207.00	0.17	323.33	3,206.88	-6.95	12.30	-12.26	0.05	0.00	-16.35
3,294.00	0.05	245.44	3,293.88	-6.86	12.19	-12.14	0.19	-0.14	-89.53
3,381.01	0.05	245.32	3,380.89	-6.89	12.12	-12.07	0.00	0.00	-0.14
3,468.02	0.15	185.94	3,467.90	-7.02	12.08	-12.03	0.15	0.11	-68.25
3,555.03	0.15	181.13	3,554.91	-7.25	12.06	-12.01	0.01	0.00	-5.53
3,642.03	0.25	173.47	3,641.91	-7.55	12.08	-12.03	0.12	0.11	-8.80
3,729.04	0.34	181.33	3,728.92	-8.00	12.10	-12.04	0.11	0.10	9.03
3,816.05	0.41	207.67	3,815.92	-8.53	11.95	-11.89	0.21	0.08	30.27
3,903.05	0.45	232.39	3,902.92	-9.02	11.53	-11.47	0.22	0.05	28.41
3,990.06	0.34	238.49	3,989.93	-9.36	11.04	-10.98	0.14	-0.13	7.01
4,077.07	0.25	243.63	4,076.94	-9.58	10.65	-10.58	0.11	-0.10	5.91
4,164.08	0.18	256.81	4,163.95	-9.69	10.35	-10.28	0.10	-0.08	15.15
4,251.08	0.29	227.40	4,250.95	-9.87	10.05	-9.98	0.18	0.13	-33.80
4,338.09	0.32	233.14	4,337.96	-10.17	9.70	-9.63	0.05	0.03	6.60
4,425.10	0.40	206.06	4,424.96	-10.59	9.37	-9.30	0.21	0.09	-31.12
4,512.11	0.45	200.48	4,511.97	-11.18	9.11	-9.04	0.07	0.06	-6.41

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Well:	#54H	North Reference:	Grid
Wellbore:	OH / Job #1513593	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)
4,555.61	0.59	199.03	4,555.47	-11.55	8.98	-8.90	0.32	0.32	-3.33
4,642.62	0.50	202.52	4,642.48	-12.33	8.69	-8.61	0.11	-0.10	4.01
4,686.12	0.50	203.15	4,685.97	-12.68	8.54	-8.46	0.01	0.00	1.45
Tie-on to Phoenix Gyro Survey									
4,768.00	6.30	262.70	4,767.68	-13.58	3.94	-3.85	7.40	7.08	72.73
First Phoenix MWD Survey									
4,814.00	13.30	266.60	4,812.98	-14.21	-3.85	3.95	15.28	15.22	8.48
4,857.00	18.80	270.10	4,854.29	-14.49	-15.73	15.83	12.98	12.79	8.14
4,899.00	22.30	271.90	4,893.61	-14.22	-30.47	30.56	8.47	8.33	4.29
4,942.00	26.60	273.60	4,932.75	-13.34	-48.24	48.32	10.13	10.00	3.95
4,985.00	31.70	274.40	4,970.29	-11.87	-69.12	69.20	11.89	11.86	1.86
5,027.00	36.30	273.00	5,005.10	-10.37	-92.55	92.62	11.11	10.95	-3.33
5,070.00	40.30	270.40	5,038.84	-9.61	-119.18	119.24	10.03	9.30	-6.05
5,113.00	43.70	268.30	5,070.79	-9.95	-147.94	148.01	8.55	7.91	-4.88
5,155.00	47.70	267.30	5,100.12	-11.11	-177.97	178.05	9.67	9.52	-2.38
5,198.00	51.60	268.40	5,127.96	-12.33	-210.71	210.79	9.28	9.07	2.56
5,241.00	55.90	268.90	5,153.38	-13.15	-245.37	245.46	10.04	10.00	1.16
5,284.00	60.60	269.30	5,176.00	-13.72	-281.92	282.01	10.96	10.93	0.93
5,327.00	64.40	269.60	5,195.85	-14.08	-320.06	320.14	8.86	8.84	0.70
5,369.00	70.10	270.00	5,212.09	-14.21	-358.77	358.86	13.60	13.57	0.95
5,412.00	76.50	269.60	5,224.44	-14.36	-399.94	400.03	14.91	14.88	-0.93
5,449.00	82.70	269.10	5,231.11	-14.77	-436.31	436.40	16.81	16.76	-1.35
5,498.00	91.70	268.60	5,233.50	-15.76	-485.19	485.29	18.40	18.37	-1.02
5,630.00	91.60	270.00	5,229.70	-17.37	-617.12	617.23	1.06	-0.08	1.06
5,758.00	90.60	271.80	5,227.24	-15.36	-745.08	745.16	1.61	-0.78	1.41
5,886.00	89.10	268.90	5,227.58	-14.58	-873.06	873.13	2.55	-1.17	-2.27
6,014.00	90.60	268.70	5,227.91	-17.26	-1,001.02	1,001.12	1.18	1.17	-0.16
6,142.00	92.50	268.50	5,224.45	-20.38	-1,128.93	1,129.05	1.49	1.48	-0.16
6,271.00	93.20	269.50	5,218.04	-22.63	-1,257.75	1,257.88	0.95	0.54	0.78
6,399.00	93.50	270.10	5,210.56	-23.08	-1,385.53	1,385.66	0.52	0.23	0.47
6,530.00	90.60	271.00	5,205.87	-21.82	-1,516.43	1,516.54	2.32	-2.21	0.69
6,661.00	91.50	270.80	5,203.47	-19.76	-1,647.39	1,647.48	0.70	0.69	-0.15
6,789.00	89.40	270.60	5,202.47	-18.20	-1,775.37	1,775.45	1.65	-1.64	-0.16
6,917.00	91.50	270.10	5,201.46	-17.42	-1,903.35	1,903.43	1.69	1.64	-0.39
7,052.00	90.20	269.70	5,199.46	-17.65	-2,038.33	2,038.41	1.01	-0.96	-0.30
7,180.00	90.00	269.70	5,199.24	-18.32	-2,166.33	2,166.41	0.16	-0.16	0.00
7,308.00	90.60	269.60	5,198.57	-19.10	-2,294.33	2,294.40	0.48	0.47	-0.08
7,437.00	91.30	269.70	5,196.43	-19.89	-2,423.31	2,423.38	0.55	0.54	0.08
7,565.00	92.90	270.00	5,191.74	-20.23	-2,551.21	2,551.29	1.27	1.25	0.23
7,692.00	90.70	270.50	5,187.75	-19.67	-2,678.14	2,678.21	1.78	-1.73	0.39
7,821.00	90.00	270.80	5,186.96	-18.21	-2,807.13	2,807.19	0.59	-0.54	0.23
7,949.00	90.20	269.60	5,186.74	-17.76	-2,935.13	2,935.18	0.95	0.16	-0.94
8,080.00	89.70	270.40	5,186.85	-17.76	-3,066.13	3,066.18	0.72	-0.38	0.61
8,209.00	92.70	269.90	5,184.15	-17.43	-3,195.08	3,195.13	2.36	2.33	-0.39

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Well:	#54H	North Reference:	Grid
Wellbore:	OH / Job #1513593	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)
8,337.00	90.70	268.50	5,180.35	-19.21	-3,323.00	3,323.06	1.91	-1.56	-1.09
8,465.00	90.60	268.50	5,178.90	-22.56	-3,450.95	3,451.03	0.08	-0.08	0.00
8,575.00	91.40	267.70	5,176.98	-26.21	-3,560.87	3,560.97	1.03	0.73	-0.73
Last Phoenix MWD Survey									
8,647.00	91.40	267.70	5,175.22	-29.10	-3,632.79	3,632.91	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,686.12	4,685.97	-12.68	8.54	Tie-on to Phoenix Gyro Survey
4,768.00	4,767.68	-13.58	3.94	First Phoenix MWD Survey
8,575.00	5,176.98	-26.21	-3,560.87	Last Phoenix MWD Survey
8,647.00	5,175.22	-29.10	-3,632.79	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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