

Results of Directional Survey

API number:	30-025-41112		
OGRID:		Operator:	APACHE CORP
		Property:	NORTH MONUMENT G/SA UNIT # 2H

surface	ULSTR:	I	26	T 19S	R 36E
			1330	FSL	10 FEL

BH Loc	ULSTR:	P	23	T 19S	R 36E
4219	MD	3954.0	TVD	1011	FSL
				6291	FSL

Top Perf/OH	ULSTR:	E	25	T 19S	R 36E
5958	MD	3960.6	TVD	1806	FSL
				11	FWL

Bot Perf/OH	ULSTR:	P	23	T 19S	R 36E
8445	MD	3974.6	TVD	749	FSL
				6029	FSL

	MD	N/S	E/W	VD
	4167	423.93	23.46	3953.35
TOP PERFS/OH	4219	475.83	20.92	3954.40
	4234	490.80	20.19	3954.70
	8415	4669.40	-49.42	3974.36
BOT PERFS/OH	8445	4699.39	-49.99	3974.59
	8510	4764.37	-51.24	3975.10

NEXT TO LAST	8653	4907.22	-55.90	3971.10
LAST READING	8705	4959.17	-57.44	3969.42
TD	8707	4961.17	-57.50	3969.36

Surface Location	1330	FS	10	FE
Projected BHL	6291	FS	67	FE
Location of				
Top Perfs/OH	1806	FS	11	FW
Bottom Perfs/OH	6029	FS	60	FE

SUMMARY of Subsurface Locations

Surface Location	I-26-19S-36E	1330	FS	10	FE	Vert. Depth
Top Perfs/OH	H-26-19S-36E	1806	FS	11	FW	3954.40
Bottom Perfs/OH	P-23-19S-36E	6029	FS	60	FE	3974.59
Projected TD	P-23-19S-36E	6291	FS	67	FE	3969.36

NOV 05 2013

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

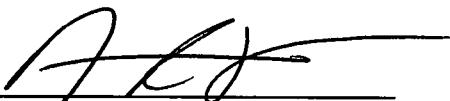
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OCT 21 2013

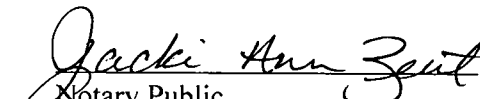
North Monument G/SA Unit #2H AP# 30-025-4112
Lea County, New Mexico 1330' FSL + 10' FEL, UL: I 26-195-36E

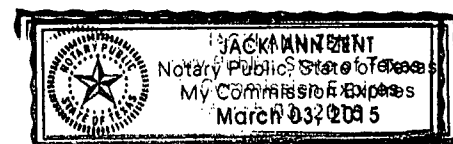
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250	2.50	0.30	0.53	1.31	1.31
500	2.50	0.40	0.70	1.75	3.06
750	2.50	0.40	0.70	1.75	4.81
1000	2.50	0.60	1.05	2.63	7.44
1198	1.98	0.00	0.00	0.00	7.44
1213	0.15	0.40	0.70	0.11	7.54
1384	1.71	0.20	0.35	0.60	8.14
1554	1.70	0.10	0.18	0.30	8.44
1724	1.70	0.70	1.23	2.08	10.52
1895	1.71	0.90	1.58	2.69	13.21
2279	3.84	3.10	5.43	20.83	34.05
2404	1.25	3.20	5.60	7.00	41.05
2577	1.73	2.50	4.38	7.57	48.62
2706	1.29	1.20	2.10	2.71	51.32
2834	1.28	0.70	1.23	1.57	52.89
2961	1.27	1.00	1.75	2.22	55.11
3132	1.71	0.60	1.05	1.80	56.91
3303	1.71	0.50	0.88	1.50	58.41
3473	1.70	0.90	1.58	2.68	61.08
3644	1.71	0.60	1.05	1.80	62.88
3897	2.53	1.10	1.93	4.87	67.75
4025	1.28	0.90	1.58	2.02	69.77


Archie Brown - General Manager

The attached instrument was acknowledged before me on the 1st day of August, 2013 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public



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APACHE CORP

Eunice

Lea County, NM

NMGSAU #2H API# 30-025-41112

VH - Job #320713-KW-681

Survey: Gyro

SDI Survey Report

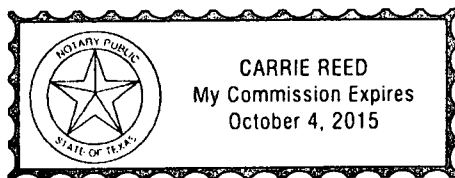
This survey is correct to the best of my knowledge and is supported by actual field data.

Richard

Notarized this date 16th of August, 2013.

Carrie Reed

Notary Signature
County of Midland
State of Texas



SDI
SDI Survey Report

Company:	APACHE CORP	Local Co-ordinate Reference:	Well NMGSAU #2H
Project:	Eunice	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	NMGSAU #2H	North Reference:	Grid
Wellbore:	VH - Job #320713-KW-681	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320713-KW-681	Database:	EDM-Regulatory

Project	Eunice		
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		Lea County, NM			
Site Position:		Northing:	550,762.04 usft	Latitude:	32° 30' 31.140 N
From:	Lat/Long	Easting:	862,794.70 usft	Longitude:	103° 9' 23.400 W
Position Uncertainty:	0.0 usft	Slot Radius:	0"	Grid Convergence:	0.63 °

Well	NMGSAU #2H, Directional					
Well Position	+N/-S	0.0 usft	Northing:	593,625.67 usft	Latitude:	32° 37' 40.300 N
	+E/-W	0.0 usft	Easting:	813,110.37 usft	Longitude:	103° 18' 58.730 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore	VH - Job #320713-KW-681				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/5/2013	7.24	60.55	48,707

Design		VH - Job #320713-KW-681		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.56

Survey Program		Date	8/12/2013		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.0	3,137.0	Gyro (VH - Job #320713-KW-681)	Keeper	Keeper Gyro	

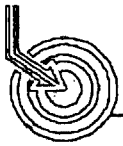
Survey									
MD	Inc	Azi (azimuth)	TVD	N/S	E/W	Closure Azimuth	Closure Distance		
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0		
100.0	0.23	6.40	100.0	0.2	0.0	6.40	0.2		
200.0	0.10	116.99	200.0	0.4	0.1	18.83	0.4		
300.0	0.13	141.75	300.0	0.2	0.3	49.55	0.4		
400.0	0.47	28.77	400.0	0.5	0.5	47.04	0.7		
500.0	0.45	355.31	500.0	1.3	0.7	29.33	1.4		
600.0	0.61	39.44	600.0	2.1	1.0	26.17	2.3		
700.0	0.61	17.45	700.0	3.0	1.5	26.88	3.3		
800.0	0.34	64.76	800.0	3.6	1.9	28.21	4.1		
900.0	0.58	108.43	900.0	3.6	2.7	36.90	4.5		
1,000.0	0.55	97.59	1,000.0	3.4	3.6	47.37	4.9		
1,100.0	0.46	93.67	1,100.0	3.3	4.5	54.16	5.6		

SDI

SDI Survey Report

Company:	APACHE CORP	Local Co-ordinate Reference:	Well NMGSAU #2H
Project:	Eunice	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	NMGSAU #2H	North Reference:	Grid
Wellbore:	VH - Job #320713-KW-681	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320713-KW-681	Database:	EDM-Regulatory

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,200.0	0.23	80.81	1,200.0	3.3	5.1	57.42	6.1	
1,300.0	0.24	37.92	1,300.0	3.5	5.4	57.51	6.5	
1,400.0	0.21	73.64	1,400.0	3.7	5.7	57.35	6.8	
1,500.0	0.24	44.80	1,500.0	3.9	6.1	57.40	7.2	
1,600.0	0.34	46.31	1,600.0	4.2	6.4	56.63	7.7	
1,700.0	0.47	39.68	1,700.0	4.8	6.9	55.45	8.4	
1,800.0	0.96	46.29	1,800.0	5.7	7.8	53.99	9.6	
1,900.0	1.23	56.73	1,899.9	6.8	9.3	53.69	11.5	
2,000.0	1.76	42.17	1,999.9	8.5	11.2	52.67	14.1	
2,100.0	2.93	42.67	2,099.8	11.6	14.0	50.39	18.1	
2,200.0	2.82	42.40	2,199.7	15.3	17.4	48.69	23.1	
2,300.0	3.64	47.67	2,299.5	19.2	21.4	48.04	28.7	
2,400.0	3.63	50.13	2,399.3	23.4	26.1	48.19	35.1	
2,500.0	3.37	50.83	2,499.1	27.3	30.9	48.53	41.2	
2,600.0	2.18	61.96	2,599.0	30.0	34.8	49.23	46.0	
2,700.0	1.25	75.50	2,699.0	31.2	37.5	50.29	48.8	
2,800.0	0.95	98.74	2,799.0	31.3	39.4	51.52	50.4	
2,900.0	0.57	108.17	2,899.0	31.0	40.7	52.67	51.2	
3,000.0	0.73	130.98	2,998.9	30.5	41.7	53.82	51.6	
3,100.0	0.64	135.30	3,098.9	29.7	42.5	55.11	51.9	
3,137.0	0.97	129.05	3,135.9	29.3	42.9	55.67	52.0	

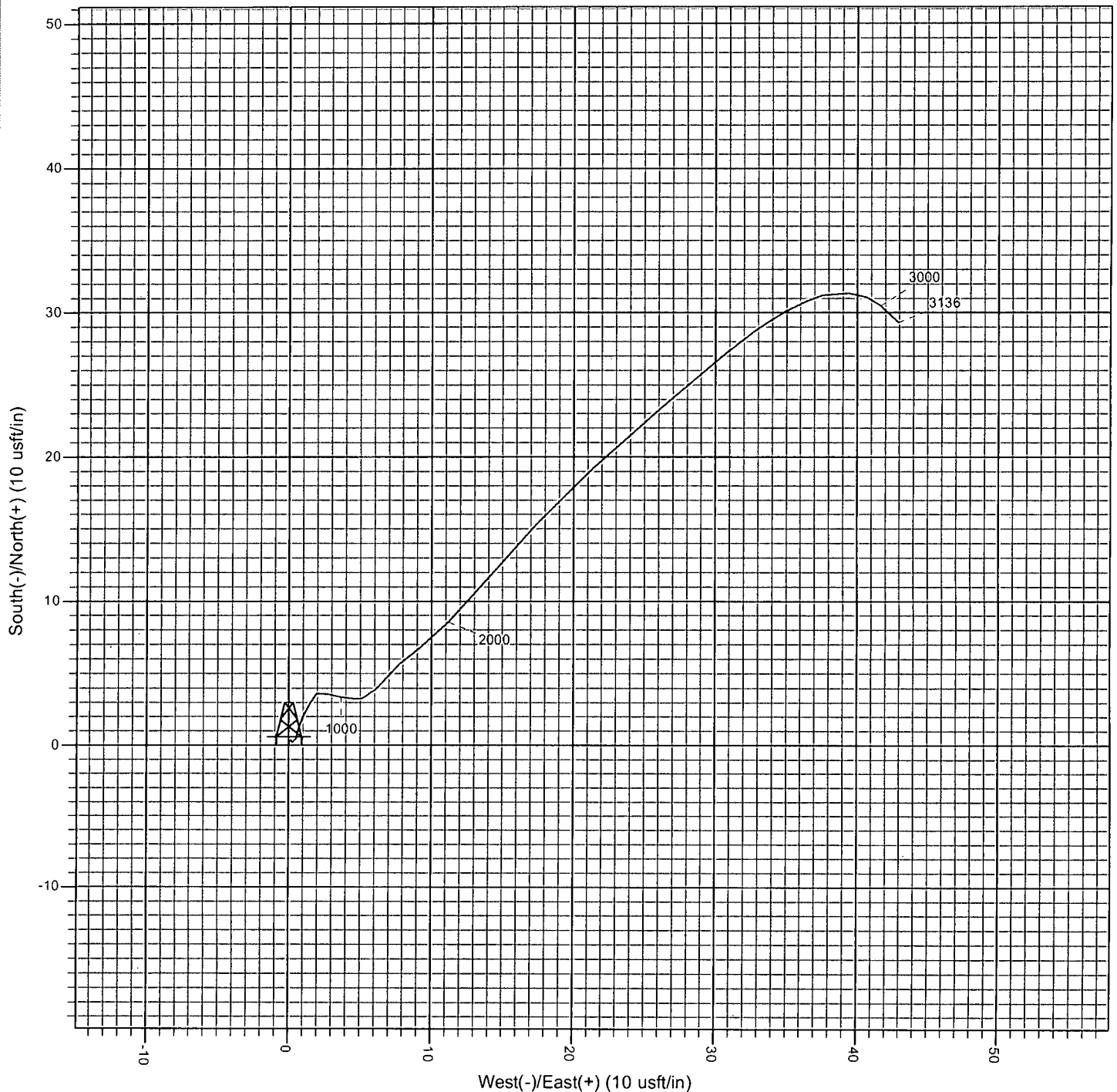


Scientific Drilling

Project: Eunice
Lea County, NM
Well: NMGSAU #2H
Wellbore: VH - Job #320713-KW-681
Design: VH - Job #320713-KW-681

WELL DETAILS: NMGSAU #2H
WELL @ 0.0usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	593625.67	813110.37	32° 37' 40.300 N	103° 18' 58.730 W	



PROJECT DETAILS: Eunice	SITE DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 30' 31.140 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 103° 9' 23.400 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.0
Zone: New Mexico East 3001	Convergence: 0.63
System Datum: Mean Sea Level	Local North: Grid



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Apache Corporation

Lea County, NM (NAD83 NME)

NMGSAU

#2H API#30-D25-4112

OH/Job#1310434

Survey: Phoenix MWD Surveys

Phoenix Final Survey Report

15 July, 2013





Phoenix Technology Services
Phoenix Final Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3644.00usft (Capstar 120)
Site:	NMGSAU	MD Reference:	KB @ 3644.00usft (Capstar 120)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job#1310434	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	GCR DB

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	NMGSAU		
Site Position:		Northing:	582,973.08 usft
From:	Map	Easting:	870,597.88 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 35' 53.144390 N
		Longitude:	103° 15' 51.083479 W
		Grid Convergence:	0.58 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 37' 40.035728 N
		Longitude:	103° 18' 58.728059 W
		Ground Level:	3,633.00 usft

Wellbore	OH/Job#1310434				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	04/17/13	7.27	60.56	48,701

Design	Surveys (Capstar 120)			
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	359.41

Survey Program	Date 07/15/13				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	3,137.00	SDI Gyro Survey (OH/Job#1310434)	Keeper	Keeper Standard Rate Gyro	
3,251.00	8,705.00	Phoenix MWD Surveys (OH/Job#1310434)	MWD	MWD - Standard	

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,137.00	0.97	129.05	3,135.94	29.39	42.89	28.95	0.00
Last Gyro Survey							
3,251.00	0.70	148.55	3,249.92	28.19	44.01	27.74	0.34
First Phoenix MWD Survey							
3,379.00	0.60	142.75	3,377.92	26.99	44.82	26.53	0.09
3,409.00	0.80	141.05	3,407.91	26.70	45.05	26.24	0.67
3,452.00	0.80	16.33	3,450.91	26.76	45.32	26.29	3.30
3,494.00	3.30	355.15	3,492.88	28.24	45.30	27.78	6.12
3,537.00	6.20	353.95	3,535.73	31.79	44.95	31.32	6.75
3,580.00	8.80	353.45	3,578.36	37.37	44.33	36.91	6.05
3,623.00	12.30	350.55	3,620.62	45.15	43.20	44.71	8.23



Phoenix Technology Services
Phoenix Final Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3644.00usft (Capstar 120)
Site:	NMGSAU	MD Reference:	KB @ 3644.00usft (Capstar 120)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job#1310434	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	GCR DB

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,665.00	17.10	348.15	3,661.24	55.62	41.20	55.19	11.52
3,708.00	22.50	347.35	3,701.68	69.84	38.10	69.45	12.57
3,750.00	28.00	347.95	3,739.65	87.34	34.28	86.98	13.11
3,793.00	33.80	351.95	3,776.54	109.07	30.49	108.75	14.30
3,836.00	40.30	355.85	3,810.84	134.82	27.81	134.52	16.07
3,878.00	47.10	358.05	3,841.19	163.77	26.30	163.49	16.59
3,921.00	53.60	359.65	3,868.62	196.86	25.66	196.58	15.38
3,964.00	58.70	359.65	3,892.56	232.55	25.44	232.28	11.86
4,006.00	63.80	359.45	3,912.76	269.36	25.15	269.09	12.15
4,049.00	69.30	359.75	3,929.86	308.80	24.87	308.52	12.81
4,091.00	75.90	359.55	3,942.41	348.85	24.63	348.58	15.72
4,134.00	82.70	358.65	3,950.39	391.07	23.96	390.81	15.95
4,167.00	87.00	359.60	3,953.35	423.93	23.46	423.66	13.34
4,234.00	90.70	354.80	3,954.70	490.80	20.19	490.57	9.04
4,330.00	90.60	355.50	3,953.61	586.45	12.07	586.30	0.74
4,425.00	87.70	358.40	3,955.02	681.29	7.02	681.18	4.32
4,520.00	90.00	358.40	3,956.93	776.22	4.37	776.14	2.42
4,615.00	89.40	358.00	3,957.42	871.18	1.38	871.12	0.76
4,710.00	89.80	358.70	3,958.09	966.13	-1.35	966.10	0.85
4,803.00	88.80	357.80	3,959.22	1,059.08	-4.19	1,059.07	1.45
4,898.00	90.60	358.00	3,959.72	1,154.01	-7.67	1,154.03	1.91
4,993.00	90.40	357.60	3,958.89	1,248.94	-11.32	1,248.99	0.47
5,088.00	90.30	358.00	3,958.31	1,343.87	-14.97	1,343.95	0.43
5,183.00	91.80	359.20	3,956.57	1,438.82	-17.29	1,438.92	2.02
5,279.00	88.10	0.50	3,956.65	1,534.80	-17.54	1,534.90	4.09
5,373.00	89.50	359.40	3,958.62	1,628.77	-17.62	1,628.87	1.89
5,469.00	88.20	357.90	3,960.55	1,724.72	-19.88	1,724.84	2.07
5,564.00	92.00	0.20	3,960.38	1,819.69	-21.46	1,819.81	4.68
5,659.00	92.00	1.10	3,957.07	1,914.62	-20.38	1,914.73	0.95
5,754.00	88.30	359.00	3,956.82	2,009.60	-20.30	2,009.70	4.48
5,849.00	89.50	359.90	3,958.64	2,104.57	-21.21	2,104.68	1.58
5,944.00	88.60	359.40	3,960.22	2,199.56	-21.79	2,199.67	1.08
6,039.00	88.40	358.90	3,962.71	2,294.51	-23.20	2,294.63	0.57
6,134.00	89.90	0.60	3,964.11	2,389.50	-23.61	2,389.61	2.39
6,229.00	88.80	359.00	3,965.19	2,484.49	-23.94	2,484.60	2.04
6,324.00	90.00	359.00	3,966.19	2,579.46	-25.60	2,579.59	1.26
6,419.00	90.60	358.40	3,965.69	2,674.44	-27.76	2,674.58	0.89
6,514.00	87.90	355.70	3,966.93	2,769.29	-32.64	2,769.48	4.02
6,609.00	91.40	1.00	3,967.51	2,864.20	-35.38	2,864.41	6.68
6,704.00	87.50	358.30	3,968.43	2,959.16	-35.96	2,959.38	4.99
6,799.00	89.00	358.70	3,971.33	3,054.08	-38.44	3,054.32	1.63
6,894.00	89.20	358.00	3,972.82	3,149.03	-41.18	3,149.29	0.77
6,989.00	88.60	356.50	3,974.64	3,243.90	-45.73	3,244.20	1.70
7,084.00	92.10	359.10	3,974.06	3,338.81	-49.38	3,339.14	4.59



Phoenix Technology Services
Phoenix Final Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3644.00usft (Capstar 120)
Site:	NMGSAU	MD Reference:	KB @ 3644.00usft (Capstar 120)
Well:	#2H	North Reference:	Grid
Wellbore:	OH/Job#1310434	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	GCR DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,179.00	89.00	0.00	3,973.15	3,433.79	-50.13	3,434.12	3.40
7,274.00	90.10	0.10	3,973.90	3,528.78	-50.04	3,529.11	1.16
7,369.00	91.60	0.40	3,972.49	3,623.77	-49.63	3,624.09	1.61
7,464.00	89.40	0.80	3,971.66	3,718.75	-48.63	3,719.06	2.35
7,559.00	90.70	0.50	3,971.58	3,813.75	-47.56	3,814.03	1.40
7,654.00	91.40	1.80	3,969.84	3,908.71	-45.65	3,908.97	1.55
7,749.00	89.40	359.00	3,969.17	4,003.69	-44.99	4,003.94	3.62
7,845.00	88.60	358.40	3,970.85	4,099.65	-47.17	4,099.92	1.04
7,939.00	90.90	0.60	3,971.26	4,193.63	-47.99	4,193.90	3.39
8,034.00	91.70	358.60	3,969.10	4,288.60	-48.65	4,288.87	2.27
8,129.00	89.40	1.80	3,968.19	4,383.58	-48.32	4,383.84	4.15
8,224.00	89.80	1.10	3,968.85	4,478.54	-45.91	4,478.78	0.85
8,319.00	87.30	357.70	3,971.26	4,573.49	-46.90	4,573.73	4.44
8,415.00	89.00	359.30	3,974.36	4,669.40	-49.42	4,669.66	2.43
8,510.00	90.10	358.50	3,975.10	4,764.37	-51.24	4,764.65	1.43
8,605.00	92.10	357.90	3,973.28	4,859.30	-54.22	4,859.60	2.20
8,653.00	93.10	358.10	3,971.10	4,907.22	-55.90	4,907.54	2.12
Current MWD Survey							
8,705.00	90.60	358.50	3,969.42	4,959.17	-57.44	4,959.50	4.87
Projection to Bit							

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,137.00	3,135.94	29.39	42.89	Last Gyro Survey
3,251.00	3,249.92	28.19	44.01	First Phoenix MWD Survey
8,653.00	3,971.10	4,907.22	-55.90	Current MWD Survey
8,705.00	3,969.42	4,959.17	-57.44	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1310434

OPERATOR Apache

WELL NAME NMGSAU #2H

COUNTY & STATE

Lea County, NM

API WELL NUMBER 30-025-41112

PROPOSED DIRECTION 359.96

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
3,137 ft	3,135.94 ft	0.97	129.1 ft	29.39 ft	42.89 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
6-Jul-13	3,251 ft	0.7	148.55

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
15-Jul-13	8,653 ft	93.1	358.1

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
15-Jun-13	8,705 ft	90.6	358.5

Billy Simpson

PRINT YOUR NAME ABOVE

Billy Simpson

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.24
DECLINATION OR GRID	GRID

7/15/2013

TODAY'S DATE

MWD SUPERVISOR 1

Billy Simpson

DIRECTIONAL DRILLER 1

Chris Dunning

MWD SUPERVISOR 2

Rick Reed

DIRECTIONAL DRILLER 2

Travis Gibson

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