

Results of Directional Survey

API number:	30-025-41285	DD
OGRID:		Operator: APACHE CORP
	Property:	NORTHEAST DRINKARD UNIT # 651

surface	ULSTR:	J	15	T	21S	R	37E
				2525	FSL	2110	FEL

BH Loc	ULSTR:	G	15	T	21S	R	37E
6859	MD	6856.9	TVD	2639	FNL	2062	FEL
				2641	FSL		

Top Perf/OH	ULSTR:	J	15	T	21S	R	37E
5525	MD	5526.4	TVD	2632	FSL	2075	FEL

Bot Perf/OH	ULSTR:	G	15	T	21S	R	37E
6614	MD	6612.0	TVD	2639	FNL	2067	FEL
				2641	FSL		

	MD	N/S	E/W	VD
	5481	106.12	34.48	5479.1
TOP PERFS/OH	5525	107.30	34.67	5526.39
	5561	108.26	34.82	5565.08
	6589	116.79	42.90	6586.98
BOT PERFS/OH	6614	116.42	43.37	6611.98
	6675	115.53	44.53	6672.97

NEXT TO LAST	6808	115.87	47.29	6805.94
LAST READING	6859	115.73	48.44	6856.92
TD	6859	115.73	48.44	6856.92

Surface Location	2525	FS	2110	FE
Projected BHL	2641	FS	2062	FE
Location of				
Top Perfs/OH	2632	FS	2075	FE
Bottom Perfs/OH	2641	FS	2067	FE

SUMMARY of Subsurface Locations

Surface Location	J-15-21S-37E	2525	FS	2110	FE	Vert. Depth
Top Perfs/OH	J-15-21S-37E	2632	FS	2075	FE	5526.39
Bottom Perfs/OH	G-15-21S-37E	2641	FS	2067	FE	6611.98
Projected TD	G-15-21S-37E	2641	FS	2062	FE	6856.92

MAR 31 2014

Apache Corporation (873)
303 Veterans Airpark Lane, #3000
Midland, TX 79705

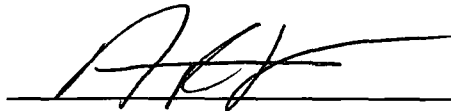
Northeast Drinkard Unit # 651 30-025-41285 UL J 15-215-37E 2525' FSL + 2110' FEL
Lea County, New Mexico

401	4.01	0.25	0.44	1.75	1.75
567	1.66	0.20	0.35	0.58	2.34
837	2.70	0.50	0.88	2.36	4.70
1094	2.57	0.30	0.53	1.35	6.05
1283	1.89	0.50	0.88	1.65	7.70
1307	0.24	0.10	0.18	0.04	7.74
1435	1.28	0.00	0.00	0.00	7.74
1563	1.28	0.40	0.70	0.90	8.64
2075	5.12	2.40	4.20	21.50	30.14
2203	1.28	2.40	4.20	5.38	35.52
2458	2.55	1.30	2.28	5.80	41.32
2544	0.86	2.20	3.85	3.31	44.63
2757	2.13	3.90	6.83	14.54	59.17
2842	0.85	4.10	7.18	6.10	65.27
2970	1.28	3.00	5.25	6.72	71.99

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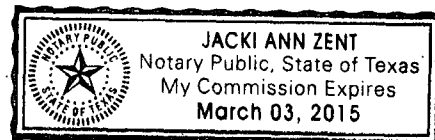
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Archie Brown - General Manager

The attached instrument was acknowledged before me on the 3rd day of December, 2013 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public



Apache Corporation

Lea County, NM (NAD83 NME)

NEDU 30-025-41285 UL J 15-215-37E 2525' FSL + 2110' FEL
#651

WB1/Job #1311618

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Survey: Phoenix MWD Survey

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Phoenix Final Survey Report

09 December, 2013





Phoenix Technology Services

Phoenix Final Survey Report

FEB 14 2014



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #651
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3421.00usft (Capstar 120)
Site:	NEDU	MD Reference:	KB @ 3421.00usft (Capstar 120)
Well:	#651	North Reference:	Grid
Wellbore:	WB1/Job #1311618	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	NEDU		
Site Position:		Northing:	549,246.17 usft
From:	Map	Easting:	907,874.81 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 30' 15.55234 N
		Longitude:	103° 8' 39.81023 W
		Grid Convergence:	0.64 °

Well	#651		
Well Position	+N/-S	0.00 usft	Northing: 539,875.08 usft
	+E/-W	0.00 usft	Easting: 906,503.27 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 28' 42.99029 N
		Longitude:	103° 8' 57.03809 W
		Ground Level:	3,410.00 usft

Wellbore	WB1/Job #1311618				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/24/13	7.10	60.43	48,570

Design	Surveys (Capstar 120)			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	0.00

Survey Program	Date 11/28/13				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
3,093.00	6,859.00	Phoenix MWD Survey (WB1/Job #131161)	MWD	MWD - Standard	

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,757.00	3.90	0.00	2,756.20	47.40	0.00	47.40	0.00
Tie-on to Teledrift Survey							
3,093.00	2.60	79.50	3,091.79	60.22	7.50	60.22	1.27
First Phoenix MWD Survey							
3,178.00	1.90	51.80	3,176.73	61.44	10.50	61.44	1.50
3,263.00	2.00	54.00	3,261.68	63.19	12.81	63.19	0.15
3,349.00	1.00	46.20	3,347.65	64.59	14.56	64.59	1.18
3,435.00	1.00	29.90	3,433.64	65.76	15.48	65.76	0.33
3,520.00	1.00	25.10	3,518.62	67.07	16.16	67.07	0.10
3,605.00	1.10	27.80	3,603.61	68.47	16.86	68.47	0.13
3,691.00	1.00	27.30	3,689.60	69.86	17.59	69.86	0.12
3,776.00	1.00	28.50	3,774.58	71.17	18.28	71.17	0.02



Phoenix Technology Services

Phoenix Final Survey Report

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Company:	Apache Corporation	Local Co-ordinate Reference:	Well #651
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3421.00usft (Capstar 120)
Site:	NEDU	MD Reference:	KB @ 3421.00usft (Capstar 120)
Well:	#651	North Reference:	Grid
Wellbore:	WB1/Job #1311618	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	GCR DB

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Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	
3,862.00	0.80	38.10	3,860.57	72.31	19.01	72.31	0.29	
3,947.00	0.50	36.10	3,945.57	73.07	19.59	73.07	0.35	
4,031.00	0.70	35.00	4,029.56	73.79	20.11	73.79	0.24	
4,117.00	0.80	13.50	4,115.55	74.80	20.55	74.80	0.34	
4,202.00	0.80	21.00	4,200.55	75.94	20.90	75.94	0.12	
4,287.00	0.80	44.00	4,285.54	76.92	21.52	76.92	0.38	
4,372.00	1.40	24.20	4,370.52	78.29	22.36	78.29	0.83	
4,458.00	1.60	15.20	4,456.49	80.41	23.11	80.41	0.36	
4,543.00	1.70	23.00	4,541.46	82.71	23.91	82.71	0.29	
4,629.00	1.50	24.00	4,627.42	84.92	24.87	84.92	0.23	
4,714.00	1.60	24.20	4,712.39	87.01	25.80	87.01	0.12	
4,799.00	1.70	30.90	4,797.36	89.18	26.94	89.18	0.26	
4,885.00	1.70	27.10	4,883.32	91.41	28.18	91.41	0.13	
4,970.00	1.50	29.50	4,968.29	93.50	29.30	93.50	0.25	
5,056.00	1.90	24.10	5,054.25	95.78	30.43	95.78	0.50	
5,141.00	1.50	23.90	5,139.21	98.08	31.46	98.08	0.47	
5,226.00	1.30	19.80	5,224.19	100.01	32.24	100.01	0.26	
5,311.00	1.50	24.50	5,309.16	101.93	33.03	101.93	0.27	
5,396.00	1.50	20.50	5,394.13	103.98	33.88	103.98	0.12	
5,481.00	1.50	11.20	5,479.10	106.12	34.48	106.12	0.29	
5,567.00	1.40	6.80	5,565.08	108.26	34.82	108.26	0.17	
5,651.00	0.90	16.10	5,649.06	109.92	35.13	109.92	0.63	
5,736.00	0.60	21.30	5,734.05	110.97	35.48	110.97	0.36	
5,822.00	0.50	47.40	5,820.05	111.64	35.92	111.64	0.31	
5,907.00	0.80	30.50	5,905.04	112.41	36.49	112.41	0.42	
5,992.00	0.90	39.90	5,990.03	113.43	37.22	113.43	0.20	
6,077.00	0.60	22.60	6,075.02	114.35	37.82	114.35	0.44	
6,163.00	0.60	33.80	6,161.02	115.14	38.24	115.14	0.14	
6,248.00	0.60	37.40	6,246.02	115.87	38.76	115.87	0.04	
6,333.00	0.50	58.00	6,331.01	116.42	39.34	116.42	0.26	
6,419.00	0.60	66.20	6,417.01	116.80	40.08	116.80	0.15	
6,504.00	1.10	89.50	6,502.00	116.98	41.30	116.98	0.70	
6,589.00	1.10	104.30	6,586.98	116.79	42.90	116.79	0.33	
6,675.00	1.10	93.60	6,672.97	116.53	44.53	116.53	0.24	
6,760.00	1.30	111.10	6,757.95	116.14	46.24	116.14	0.49	
6,808.00	1.30	97.00	6,805.94	115.87	47.29	115.87	0.66	
Last Phoenix MWD Survey								
6,859.00	1.30	97.00	6,856.92	115.73	48.44	115.73	0.00	
Projection to Bit								



Phoenix Technology Services
Phoenix Final Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #651
Project:	Lea County, NM (NAD83 NME)	TVD Reference:	KB @ 3421.00usft (Capstar 120)
Site:	NEDU	MD Reference:	KB @ 3421.00usft (Capstar 120)
Well:	#651	North Reference:	Grid
Wellbore:	WB1/Job #1311618	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 120)	Database:	GCR DB

Survey Annotations

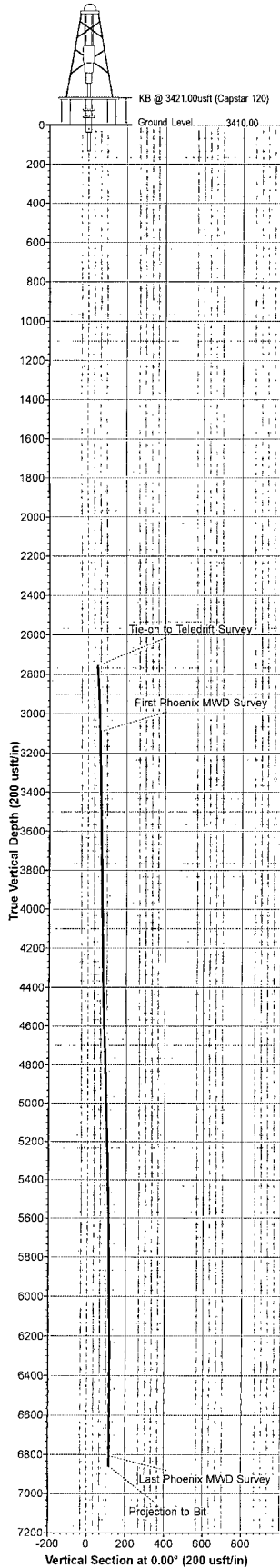
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,757.00	2,756.20	47.40	0.00	Tie-on to Teledrift Survey
3,093.00	3,091.79	60.22	7.50	First Phoenix MWD Survey
6,808.00	6,805.94	115.87	47.29	Last Phoenix MWD Survey
6,859.00	6,856.92	115.73	48.44	Projection to Bit

Checked By: _____	Approved By: _____	Date: _____
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WELL DETAILS					
	Ground Level:	3410.00			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	539875.08	906503.27	32° 28' 42.99029 N	103° 8' 57.03809 W

LEGEND

— Phoenix MWD Survey

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone

Local Origin: Well #651, Grid North

Latitude: 32° 28' 42.99029 N
Longitude: 103° 8' 57.03809 W

Grid East: 906503.27
Grid North: 539875.08
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 24-Nov-13
Magnetic Declination: 7.10°
Dip Angle from Horizontal: 60.43°
Magnetic Field Strength: 48570

To convert a Magnetic Direction to a Grid Direction, Add 6.47°
To convert a Magnetic Direction to a True Direction, Add 7.10° East
To convert a True Direction to a Grid Direction, Subtract 0.64°

