

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

Crow Federal #40H
Eddy County, New Mexico

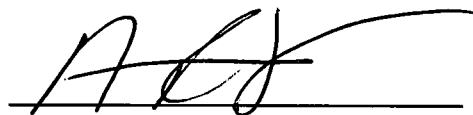
API # 30-015-42762

2208' FSL + 10' FWL

SEC. 4, T17S, R31E

265	2.65	0.25	0.44	1.16	1.16
507	2.42	0.50	0.88	2.12	3.28
650	1.43	0.50	0.88	1.25	4.53

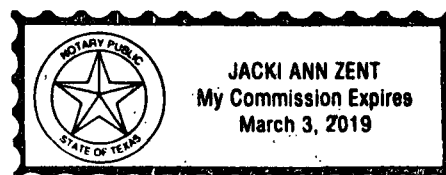
NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 23 2015
RECEIVED



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 30th day of March, 2015 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public





Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#40H

WB1 / Job #1512792

Survey: Phoenix MWD Surveys

Standard Survey Report

23 March, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 23 2015

RECEIVED



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H-
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3951.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	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		Crow Federal			
Site Position:		Northing:	671,130.90 usft	Latitude:	32° 50' 38.92796 N
From:	Map	Easting:	643,906.80 usft	Longitude:	103° 51' 53.16689 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.25 °

Well	#40H					
Well Position	+N/-S	0.00 usft	Northing:	677,737.90 usft	Latitude:	32° 51' 44.31673 N
	+E/-W	0.00 usft	Easting:	643,629.00 usft	Longitude:	103° 51' 56.08010 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,940.00 usft

Wellbore	WB1 / Job #1512792				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	3/11/2015	7.49	60.63	48,536

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	269.59	

Survey Program		Date	3/23/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	560.00	Gyrodata Surveys (WB1 / Job #1512792)	NS-GYRO-MS	North sensing gyrocompassing m/s	
708.00	9,989.00	Phoenix MWD Surveys (WB1 / Job #1512	PHX+MWD+BGGM	PHX+MWD+BGGM v3:standard declination	

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)
560.00	0.43	115.53	559.98	-3.59	1.70	-1.67	0.00	0.00	0.00
Tie-on to Gyrodata Gyro Survey									
708.00	0.30	168.70	707.98	-4.21	2.28	-2.25	0.23	-0.09	35.93
First Phoenix MWD Survey									
836.00	0.70	325.00	835.98	-3.89	1.89	-1.86	0.77	0.31	122.11
964.00	1.60	285.90	963.95	-2.76	-0.27	0.29	0.89	0.70	-30.55
1,096.00	2.20	282.60	1,095.88	-1.71	-4.52	4.53	0.46	0.45	-2.50
1,224.00	2.60	291.80	1,223.77	-0.09	-9.61	9.61	0.43	0.31	7.19
1,352.00	3.20	290.70	1,351.60	2.25	-15.65	15.63	0.47	0.47	-0.86

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Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	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)
1,480.00	3.60	300.30	1,479.38	5.54	-22.46	22.42	0.54	0.31	7.50
1,608.00	3.00	324.20	1,607.17	10.28	-27.89	27.82	1.16	-0.47	18.67
1,737.00	1.70	327.80	1,736.06	14.64	-30.89	30.78	1.01	-1.01	2.79
1,865.00	1.30	28.90	1,864.02	17.52	-31.20	31.07	1.22	-0.31	47.73
1,993.00	0.80	44.30	1,992.00	19.43	-29.87	29.73	0.45	-0.39	12.03
2,122.00	0.70	63.10	2,120.99	20.43	-28.54	28.39	0.20	-0.08	14.57
2,250.00	0.50	65.10	2,248.98	21.02	-27.33	27.18	0.16	-0.16	1.56
2,378.00	0.50	37.60	2,376.98	21.70	-26.49	26.33	0.19	0.00	-21.48
2,507.00	0.70	334.60	2,505.97	22.85	-26.48	26.32	0.50	0.16	-48.84
2,638.00	0.80	320.30	2,636.96	24.28	-27.41	27.23	0.16	0.08	-10.92
2,769.00	1.00	315.50	2,767.95	25.80	-28.79	28.61	0.16	0.15	-3.66
2,897.00	0.70	299.60	2,895.93	26.98	-30.26	30.06	0.30	-0.23	-12.42
3,026.00	1.00	294.50	3,024.92	27.84	-31.97	31.77	0.24	0.23	-3.95
3,152.00	1.20	288.50	3,150.89	28.71	-34.22	34.01	0.18	0.16	-4.76
3,280.00	1.40	269.90	3,278.86	29.14	-37.05	36.84	0.36	0.16	-14.53
3,448.00	1.30	266.80	3,446.81	29.03	-41.01	40.80	0.07	-0.06	-1.85
3,531.00	1.40	274.10	3,529.79	29.05	-42.96	42.75	0.24	0.12	8.80
3,615.00	2.00	189.60	3,613.76	27.67	-44.23	44.03	2.77	0.71	-100.60
3,743.00	3.00	177.60	3,741.64	22.13	-44.46	44.30	0.88	0.78	-9.38
3,871.00	3.10	176.10	3,869.46	15.33	-44.08	43.97	0.10	0.08	-1.17
3,999.00	3.20	180.60	3,997.27	8.30	-43.89	43.83	0.21	0.08	3.52
4,127.00	0.80	182.60	4,125.18	3.83	-43.96	43.94	1.88	-1.88	1.56
4,255.00	1.20	193.20	4,253.16	1.64	-44.31	44.30	0.34	0.31	8.28
4,383.00	1.20	192.40	4,381.13	-0.98	-44.90	44.91	0.01	0.00	-0.63
4,511.00	1.40	190.50	4,509.10	-3.82	-45.48	45.50	0.16	0.16	-1.48
4,639.00	1.20	195.90	4,637.07	-6.65	-46.13	46.18	0.18	-0.16	4.22
4,739.00	1.20	208.90	4,737.05	-8.57	-46.92	46.98	0.27	0.00	13.00
4,829.00	4.80	261.40	4,826.92	-9.96	-51.10	51.17	4.64	4.00	58.33
4,872.00	9.30	269.30	4,869.58	-10.27	-56.36	56.43	10.68	10.47	18.37
4,915.00	14.20	273.90	4,911.67	-9.96	-65.10	65.17	11.59	11.40	10.70
4,957.00	19.20	274.20	4,951.88	-9.10	-77.14	77.20	11.91	11.90	0.71
5,000.00	24.90	272.90	4,991.72	-8.12	-93.24	93.30	13.30	13.26	-3.02
5,043.00	30.40	271.40	5,029.80	-7.40	-113.17	113.22	12.89	12.79	-3.49
5,086.00	34.70	269.60	5,066.04	-7.22	-136.30	136.35	10.25	10.00	-4.19
5,128.00	40.20	269.00	5,099.37	-7.54	-161.83	161.88	13.12	13.10	-1.43
5,171.00	44.40	269.20	5,131.16	-7.99	-190.76	190.81	9.77	9.77	0.47
5,214.00	48.10	271.10	5,160.90	-7.90	-221.81	221.86	9.18	8.60	4.42
5,256.00	52.10	270.80	5,187.83	-7.36	-254.02	254.07	9.54	9.52	-0.71
5,299.00	56.20	270.70	5,213.01	-6.91	-288.86	288.91	9.54	9.53	-0.23
5,342.00	60.70	271.80	5,235.50	-6.10	-325.49	325.52	10.69	10.47	2.56
5,385.00	65.80	272.20	5,254.85	-4.76	-363.85	363.87	11.89	11.86	0.93
5,428.00	72.00	272.70	5,270.32	-3.04	-403.91	403.92	14.46	14.42	1.16
5,470.00	76.00	271.30	5,281.90	-1.64	-444.25	444.25	10.05	9.52	-3.33

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5,513.00	80.40	269.60	5,290.69	-1.31	-486.33	486.32	10.94	10.23	-3.95
5,556.00	84.30	268.40	5,296.41	-2.06	-528.93	528.93	9.48	9.07	-2.79
5,601.00	90.00	270.80	5,298.65	-2.37	-573.85	573.85	13.74	12.67	5.33
5,729.00	90.80	271.30	5,297.76	-0.02	-701.82	701.81	0.74	0.63	0.39
5,858.00	90.20	269.50	5,296.63	0.88	-830.81	830.78	1.47	-0.47	-1.40
5,989.00	91.30	269.00	5,294.92	-0.84	-961.79	961.77	0.92	0.84	-0.38
6,117.00	90.60	269.30	5,292.79	-2.74	-1,089.75	1,089.75	0.59	-0.55	0.23
6,246.00	91.10	268.20	5,290.88	-5.55	-1,218.71	1,218.71	0.94	0.39	-0.85
6,374.00	91.30	268.30	5,288.20	-9.46	-1,346.62	1,346.65	0.17	0.16	0.08
6,502.00	91.30	268.50	5,285.30	-13.03	-1,474.54	1,474.59	0.16	0.00	0.16
6,630.00	91.40	268.20	5,282.28	-16.71	-1,602.45	1,602.53	0.25	0.08	-0.23
6,759.00	92.00	269.10	5,278.45	-19.75	-1,731.35	1,731.45	0.84	0.47	0.70
6,887.00	92.40	268.60	5,273.54	-22.32	-1,859.23	1,859.34	0.50	0.31	-0.39
7,015.00	92.40	268.00	5,268.18	-26.11	-1,987.06	1,987.20	0.47	0.00	-0.47
7,143.00	92.70	268.90	5,262.48	-29.57	-2,114.89	2,115.04	0.74	0.23	0.70
7,271.00	90.40	269.20	5,259.02	-31.69	-2,242.81	2,242.98	1.81	-1.80	0.23
7,402.00	90.40	270.50	5,258.11	-32.04	-2,373.81	2,373.98	0.99	0.00	0.99
7,531.00	90.30	270.50	5,257.32	-30.91	-2,502.80	2,502.96	0.08	-0.08	0.00
7,659.00	90.00	270.00	5,256.98	-30.35	-2,630.80	2,630.95	0.46	-0.23	-0.39
7,787.00	89.50	269.50	5,257.54	-30.91	-2,758.79	2,758.95	0.55	-0.39	-0.39
7,916.00	90.60	269.00	5,257.43	-32.60	-2,887.78	2,887.94	0.94	0.85	-0.39
8,044.00	92.00	269.60	5,254.53	-34.16	-3,015.74	3,015.90	1.19	1.09	0.47
8,172.00	91.80	268.70	5,250.28	-36.06	-3,143.65	3,143.83	0.72	-0.16	-0.70
8,301.00	91.20	271.40	5,246.91	-35.95	-3,272.59	3,272.77	2.14	-0.47	2.09
8,429.00	90.90	271.00	5,244.56	-33.27	-3,400.54	3,400.69	0.39	-0.23	-0.31
8,556.00	90.40	270.20	5,243.12	-31.94	-3,527.53	3,527.66	0.74	-0.39	-0.63
8,684.00	89.90	270.00	5,242.78	-31.71	-3,655.52	3,655.66	0.42	-0.39	-0.16
8,812.00	89.80	269.80	5,243.12	-31.94	-3,783.52	3,783.66	0.17	-0.08	-0.16
8,940.00	89.40	270.10	5,244.01	-32.05	-3,911.52	3,911.65	0.39	-0.31	0.23
9,068.00	90.60	269.30	5,244.01	-32.72	-4,039.52	4,039.65	1.13	0.94	-0.63
9,196.00	90.80	268.90	5,242.45	-34.73	-4,167.49	4,167.63	0.35	0.16	-0.31
9,325.00	90.60	268.30	5,240.87	-37.88	-4,296.44	4,296.60	0.49	-0.16	-0.47
9,456.00	90.50	267.00	5,239.62	-43.25	-4,427.32	4,427.52	1.00	-0.08	-0.99
9,584.00	91.80	268.70	5,237.05	-48.05	-4,555.20	4,555.43	1.67	1.02	1.33
9,712.00	91.90	268.30	5,232.91	-51.40	-4,683.09	4,683.34	0.32	0.08	-0.31
9,839.00	91.60	267.00	5,229.04	-56.61	-4,809.92	4,810.20	1.05	-0.24	-1.02
9,925.00	91.60	266.80	5,226.63	-61.26	-4,895.76	4,896.07	0.23	0.00	-0.23
Last Phoenix MWD Survey									
9,989.00	91.60	266.80	5,224.85	-64.83	-4,959.64	4,959.97	0.00	0.00	0.00
Projection to TD									