

SEP 02 2016

RECEIVED

SURVEY CERTIFICATION FORM**PHOENIX**
TECHNOLOGY SERVICES

3610 Elkins Road Midland, TX 79705 t:432-684-0057 f:432-686-7964

Company: ApacheJob #: 1514815Well Name: Tony Federal #49County/State: Eddy Co, New MexicoSurvey Instrument Type: North Seek Rate Gyro ✓API # 30-015-43468**TIE-IN DATA**

Measure Depth (ft)	Vertical Depth (ft)	Inclination (°)	Azimuth (°)	N-S Coordinates	E-W Coordinates	Data Source
0	0	0	0	0	0	Surface

First Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2015-12-26	0	0	0

Last Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2015-12-26	3433	0.75	272.88

Projected TD Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
0	0	0	0

Grid Correction
-0.23

Gyro Operator: Leon LaskowskiGyro Supervisor: [Signature]

To the best of my knowledge I certify this survey data to be correct and true

Date: 2015-12-26Print Name: Leon LaskowskiSignature: [Signature]



PHOENIX

TECHNOLOGY SERVICES USA INC.

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

Celebrating 20 Years of Focused Solutions

December 30, 2015

Apache Corporation
Attention: Regulatory Department
303 Veterans Airpark Lane, Suite 3000,
Midland, TX 79705

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 02 2016

RECEIVED

Re: Apache Corporation
Tony Federal #49
Eddy County, NM
API #30-015-43468
Job No. 1514815

Dear Regulatory Department;

Phoenix Technology Services, Inc. has filed the Survey Data Certification, Surveys, and Lease Plat for the above referenced well with the State of New Mexico Oil Conservation Division – District 2 via certified mail. A copy of the filing is attached for your records.

Name of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Leon Laskowski	49	0	3,433	12/26/15	12/26/15	Gyro ✓

Thank you for the opportunity to be of service. Please contact me if you have any questions or require additional information.

Best Regards,

Alicia Marquez
Operations Administrator



PHOENIX

TECHNOLOGY SERVICES USA INC.

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

Celebrating 20 Years of Focused Solutions

December 30, 2015

Oil Conservation Division
State of New Mexico
811 S. First St.
Artesia, New Mexico 88210

NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 02 2016

RECEIVED

Dear District 2 - Artesia

Attention: Regulatory Department

Re: Apache Corporation
Tony Federal #49
Eddy County, NM
API #30-015-43468
Job No. 1514815

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Leon Laskowski	49	0	3,433	12/26/15	12/26/15	Gyro ✓

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Alicia Marquez
Operations Administrator



Company:
Well:
Location:
Rig:

Apache
Tony Federal #49
Eddy Co, New Mexico
Capstar 114

Job Number:
Grid Corr.:
Lat:
Long:

1514815
-0.23
32.83
-103.90

Date: 12/26/15
Calculation Method: Minimum Curvature
Proposed Azimuth:
RKB - MSL in feet:
Tie Into: Surface

11'

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Enter Tie-In Survey on Line 10													
TIE IN	0			0	0	0	0	0					
Gyro	100.00	0.33	104.06	100	100.00	-0.07	0.07 S	0.28 E	0.29	104.06	0.33	0.33	104.06
	200.00	0.55	146.29	100	200.00	-0.54	0.54 S	0.83 E	0.99	123.16	0.38	0.22	42.23
	300.00	1.23	176.26	100	299.98	-2.01	2.01 S	1.16 E	2.32	149.97	0.80	0.68	29.97
	400.00	1.95	175.76	100	399.95	-4.78	4.78 S	1.36 E	4.97	164.14	0.72	0.72	-0.50
	500.00	1.96	176.93	100	499.89	-8.18	8.18 S	1.57 E	8.33	169.11	0.04	0.01	1.17
	600.00	2.15	177.48	100	599.82	-11.76	11.76 S	1.75 E	11.89	171.54	0.19	0.19	0.55
	700.00	2.16	178.44	100	699.75	-15.52	15.52 S	1.88 E	15.63	173.08	0.04	0.01	0.96
	800.00	2.02	175.33	100	799.69	-19.16	19.16 S	2.08 E	19.27	173.81	0.18	-0.14	-3.11
	900.00	1.98	174.67	100	899.62	-22.64	22.64 S	2.38 E	22.76	174.00	0.05	-0.04	-0.66
	1000.00	1.82	168.94	100	999.57	-25.92	25.92 S	2.85 E	26.07	173.73	0.25	-0.16	-5.73
	1100.00	1.72	166.69	100	1099.52	-28.94	28.94 S	3.50 E	29.15	173.11	0.12	-0.10	-2.25
	1200.00	1.52	157.63	100	1199.48	-31.62	31.62 S	4.35 E	31.92	172.17	0.32	-0.20	-9.06
	1300.00	1.48	157.83	100	1299.45	-34.04	34.04 S	5.34 E	34.46	171.09	0.04	-0.04	0.20
	1400.00	1.50	156.68	100	1399.41	-36.44	36.44 S	6.34 E	36.99	170.12	0.04	0.02	-1.15
	1500.00	1.17	159.12	100	1499.39	-38.60	38.60 S	7.23 E	39.27	169.40	0.33	-0.33	2.44
	1600.00	1.04	159.25	100	1599.37	-40.40	40.40 S	7.91 E	41.17	168.92	0.13	-0.13	0.13
	1700.00	0.90	179.36	100	1699.35	-42.04	42.04 S	8.24 E	42.84	168.91	0.37	-0.14	20.11
	1800.00	0.72	193.49	100	1799.34	-43.43	43.43 S	8.10 E	44.18	169.43	0.27	-0.18	14.13
	1900.00	0.57	216.79	100	1899.34	-44.44	44.44 S	7.66 E	45.10	170.22	0.30	-0.15	23.30
	2000.00	0.58	231.59	100	1999.33	-45.15	45.15 S	6.97 E	45.69	171.23	0.15	0.01	14.80
	2100.00	0.44	262.65	100	2099.33	-45.52	45.52 S	6.19 E	45.94	172.26	0.30	-0.14	31.06
	2200.00	0.37	262.01	100	2199.33	-45.61	45.61 S	5.49 E	45.94	173.14	0.07	-0.07	-0.64
	2300.00	0.35	243.37	100	2299.32	-45.79	45.79 S	4.89 E	46.05	173.90	0.12	-0.02	-18.64
	2400.00	0.37	209.74	100	2399.32	-46.21	46.21 S	4.46 E	46.42	174.49	0.21	0.02	-33.63
	2500.00	0.50	270.07	100	2499.32	-46.49	46.49 S	3.86 E	46.65	175.25	0.45	0.13	60.33
	2600.00	0.52	277.22	100	2599.32	-46.43	46.43 S	2.98 E	46.53	176.33	0.07	0.02	7.15
	2700.00	0.61	248.59	100	2699.31	-46.57	46.57 S	2.03 E	46.61	177.50	0.29	0.09	-28.63
	2800.00	0.62	255.83	100	2799.31	-46.90	46.90 S	1.01 E	46.91	178.76	0.08	0.01	7.24
	2900.00	0.74	249.08	100	2899.30	-47.26	47.26 S	0.12 W	47.26	180.14	0.14	0.12	-6.75
	3000.00	0.78	260.88	100	2999.29	-47.60	47.60 S	1.39 W	47.62	181.67	0.16	0.04	11.80



Rig: Capstar 114

apstar 114

Long:

-103.90

Tie Into: _____

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
	3100.00	0.83	268.07	100	3099.28	-47.73	47.73 S	2.79 W	47.81	183.34	0.11	0.05	7.19
	3200.00	0.89	271.79	100	3199.27	-47.73	47.73 S	4.29 W	47.92	185.13	0.08	0.06	3.72
	3300.00	0.79	269.24	100	3299.26	-47.72	47.72 S	5.75 W	48.06	186.87	0.11	-0.10	-2.55
	3400.00	0.76	252.37	100	3399.25	-47.93	47.93 S	7.07 W	48.44	188.40	0.23	-0.03	-16.87
	3433.00	0.75	272.88	33	3432.25	-47.98	47.98 S	7.50 W	48.56	188.88	0.82	-0.03	62.15



NM OIL CONSERVATION

ARTESIA DISTRICT

SEP 02 2016

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

Tony Federal

#49D

OH / Job #1514801

Design: Surveys (Capstar 114)

** mwd + gyro
tie on*

Standard Survey Report

01 January, 2016





Phoenix Technology Services LP

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #49D
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3711.00usft (Capstar 114)
Site:	Tony Federal	MD Reference:	KB @ 3711.00usft (Capstar 114)
Well:	#49D	North Reference:	Grid
Wellbore:	OH / Job #1514801	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	Tony Federal		
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Site Position:		Northing:	666,516.20 usft	Latitude:	32° 49' 53.88921 N
From:	Map	Easting:	628,898.80 usft	Longitude:	103° 54' 49.29676 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.23 °

Well	#49D					
Well Position	+N/-S	0.00 usft	Northing:	666,697.70 usft	Latitude:	32° 49' 55.57846 N
	+E/-W	0.00 usft	Easting:	631,586.70 usft	Longitude:	103° 54' 17.78650 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,700.00 usft	

Wellbore	OH / Job #1514801				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/21/2015	7.63	60.77	48,531

Design	Surveys (Capstar 114)				
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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	269.64

Survey Program		Date	1/1/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	3,433.00	Phoenix Gyro Surveys (OH / Job #151480	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
3,547.00	6,445.00	Phoenix MWD Surveys (OH / Job #151480	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.33	104.06	100.00	-0.07	0.28	-0.28	0.33	0.33	0.00
200.00	0.55	146.29	200.00	-0.54	0.83	-0.82	0.38	0.22	42.23
300.00	1.23	176.26	299.98	-2.01	1.16	-1.15	0.80	0.68	29.97
400.00	1.95	175.76	399.95	-4.78	1.36	-1.33	0.72	0.72	-0.50
500.00	1.96	176.93	499.89	-8.18	1.57	-1.52	0.04	0.01	1.17
600.00	2.15	177.48	599.82	-11.76	1.75	-1.68	0.19	0.19	0.55
700.00	2.16	178.44	699.75	-15.52	1.88	-1.79	0.04	0.01	0.96
800.00	2.02	175.33	799.69	-19.16	2.08	-1.96	0.18	-0.14	-3.11
900.00	1.98	174.67	899.62	-22.64	2.38	-2.24	0.05	-0.04	-0.66



Phoenix Technology Services LP

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #49D
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB @ 3711.00usft (Capstar 114)
Site:	Tony Federal	MD Reference:	KB @ 3711.00usft (Capstar 114)
Well:	#49D	North Reference:	Grid
Wellbore:	OH / Job #1514801	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)
1,000.00	1.82	168.94	999.57	-25.92	2.85	-2.69	0.25	-0.16	-5.73
1,100.00	1.72	166.69	1,099.52	-28.94	3.50	-3.32	0.12	-0.10	-2.25
1,200.00	1.52	157.63	1,199.48	-31.62	4.35	-4.15	0.32	-0.20	-9.06
1,300.00	1.48	157.83	1,299.45	-34.04	5.34	-5.13	0.04	-0.04	0.20
1,400.00	1.50	156.68	1,399.41	-36.44	6.34	-6.12	0.04	0.02	-1.15
1,500.00	1.17	159.12	1,499.39	-38.60	7.23	-6.99	0.33	-0.33	2.44
1,600.00	1.04	159.25	1,599.37	-40.40	7.91	-7.66	0.13	-0.13	0.13
1,700.00	0.90	179.36	1,699.35	-42.04	8.24	-7.98	0.37	-0.14	20.11
1,800.00	0.72	193.49	1,799.34	-43.43	8.10	-7.83	0.27	-0.18	14.13
1,900.00	0.57	216.79	1,899.34	-44.44	7.66	-7.38	0.30	-0.15	23.30
2,000.00	0.58	231.59	1,999.33	-45.15	6.97	-6.69	0.15	0.01	14.80
2,100.00	0.44	262.65	2,099.33	-45.52	6.19	-5.91	0.30	-0.14	31.06
2,200.00	0.37	262.01	2,199.33	-45.61	5.49	-5.20	0.07	-0.07	-0.64
2,300.00	0.35	243.37	2,299.32	-45.79	4.89	-4.61	0.12	-0.02	-18.64
2,400.00	0.37	209.74	2,399.32	-46.21	4.46	-4.17	0.21	0.02	-33.63
2,500.00	0.50	270.07	2,499.32	-46.49	3.86	-3.58	0.45	0.13	60.33
2,600.00	0.52	277.22	2,599.32	-46.43	2.98	-2.69	0.07	0.02	7.15
2,700.00	0.61	248.59	2,699.31	-46.57	2.03	-1.74	0.29	0.09	-28.63
2,800.00	0.62	255.83	2,799.31	-46.90	1.01	-0.72	0.08	0.01	7.24
2,900.00	0.74	249.08	2,899.30	-47.26	-0.12	0.41	0.14	0.12	-6.75
3,000.00	0.78	260.88	2,999.29	-47.60	-1.39	1.69	0.16	0.04	11.80
3,100.00	0.83	268.07	3,099.28	-47.73	-2.79	3.08	0.11	0.05	7.19
3,200.00	0.89	271.79	3,199.27	-47.73	-4.29	4.58	0.08	0.06	3.72
3,300.00	0.79	269.24	3,299.26	-47.72	-5.75	6.05	0.11	-0.10	-2.55
3,400.00	0.76	252.37	3,399.25	-47.93	-7.07	7.37	0.23	-0.03	-16.87
3,433.00	0.75	272.88	3,432.25	-47.98	-7.50	7.80	0.82	-0.03	62.15
Tie In to Phoenix Gyro Surveys									
3,547.00	1.10	255.20	3,546.23	-48.22	-9.30	9.60	0.39	0.31	-15.51
First Phoenix MWD Survey									
3,589.00	1.50	248.90	3,588.22	-48.52	-10.20	10.50	1.01	0.95	-15.00
3,632.00	3.00	281.10	3,631.19	-48.51	-11.83	12.13	4.43	3.49	74.88
3,674.00	3.10	282.30	3,673.13	-48.06	-14.02	14.32	0.28	0.24	2.86
3,717.00	4.80	278.10	3,716.03	-47.55	-16.94	17.23	4.01	3.95	-9.77
3,760.00	6.20	275.30	3,758.83	-47.09	-21.03	21.32	3.31	3.26	-6.51
3,802.00	6.20	275.20	3,800.58	-46.67	-25.55	25.84	0.03	0.00	-0.24
3,845.00	6.20	274.50	3,843.33	-46.28	-30.18	30.46	0.18	0.00	-1.63
3,888.00	7.50	274.90	3,886.02	-45.86	-35.29	35.57	3.03	3.02	0.93
3,931.00	7.40	273.20	3,928.66	-45.46	-40.85	41.13	0.56	-0.23	-3.95
3,973.00	7.50	273.00	3,970.30	-45.17	-46.29	46.57	0.25	0.24	-0.48
4,016.00	9.00	273.40	4,012.86	-44.82	-52.45	52.72	3.49	3.49	0.93
4,058.00	10.20	276.90	4,054.27	-44.18	-59.42	59.69	3.18	2.86	8.33
4,101.00	10.20	277.20	4,096.59	-43.25	-66.97	67.24	0.12	0.00	0.70
4,229.00	10.20	275.40	4,222.57	-40.76	-89.50	89.75	0.25	0.00	-1.41



Phoenix Technology Services LP

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #49D
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3711.00usft (Capstar 114)
Site:	Tony Federal	MD Reference:	KB @ 3711.00usft (Capstar 114)
Well:	#49D	North Reference:	Grid
Wellbore:	OH / Job #1514801	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)	
4,357.00	9.80	276.00	4,348.62	-38.55	-111.62	111.86	0.32	-0.31	0.47	
4,485.00	10.60	275.90	4,474.60	-36.20	-134.16	134.39	0.63	0.63	-0.08	
4,613.00	10.50	275.50	4,600.43	-33.88	-157.48	157.69	0.10	-0.08	-0.31	
4,741.00	10.20	275.30	4,726.35	-31.71	-180.38	180.57	0.24	-0.23	-0.16	
4,869.00	10.40	275.50	4,852.29	-29.56	-203.16	203.34	0.16	0.16	0.16	
4,997.00	11.40	275.70	4,977.98	-27.19	-227.25	227.42	0.78	0.78	0.16	
5,125.00	11.20	274.80	5,103.50	-24.90	-252.23	252.38	0.21	-0.16	-0.70	
5,253.00	10.70	274.10	5,229.17	-23.01	-276.47	276.60	0.40	-0.39	-0.55	
5,381.00	10.60	273.70	5,354.96	-21.40	-300.07	300.19	0.10	-0.08	-0.31	
5,509.00	9.90	274.90	5,480.92	-19.70	-322.78	322.89	0.57	-0.55	0.94	
5,637.00	11.40	275.50	5,606.71	-17.55	-346.33	346.44	1.18	1.17	0.47	
5,765.00	11.30	274.90	5,732.21	-15.26	-371.42	371.51	0.12	-0.08	-0.47	
5,893.00	11.10	275.50	5,857.77	-13.01	-396.18	396.25	0.18	-0.16	0.47	
6,021.00	10.80	275.60	5,983.44	-10.66	-420.38	420.44	0.23	-0.23	0.08	
6,149.00	10.40	275.70	6,109.25	-8.34	-443.81	443.86	0.31	-0.31	0.08	
6,277.00	10.30	275.50	6,235.17	-6.10	-466.70	466.73	0.08	-0.08	-0.16	
6,385.00	10.20	274.50	6,341.45	-4.42	-485.84	485.86	0.19	-0.09	-0.93	
Final Phoenix MWD Survey										
6,445.00	10.20	274.50	6,400.50	-3.59	-496.44	496.45	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
3,433.00	3,432.25	-47.98	-7.50	Tie In to Phoenix Gyro Surveys	
3,547.00	3,546.23	-48.22	-9.30	First Phoenix MWD Survey	
6,385.00	6,341.45	-4.42	-485.84	Final Phoenix MWD Survey	
6,445.00	6,400.50	-3.59	-496.44	Projection to TD	