



PHOENIX
TECHNOLOGY SERVICES

February 9, 2016

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

Dear District 2 - Artesia

Attention: Regulatory Department

Re: Apache Corporation
NFE Federal Com #47H
Eddy County, NM
API #30-015-43507
Job No. 1610026

NM OIL CONSERVATION
ARTESIA DISTRICT
FEB 17 2016
RECEIVED

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	
Mike Miller	47H	4,396	8,995	01/16/16	01/20/16	MWD

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,

Claudia Carreon

Claudia Carreon
Operations Administrator

Certified mail receipt number: 7015 0640 0000 9907 5241

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER

1610026

OPERATOR

Apache

WELL NAME

NFE Federal COM #47H

COUNTY & STATE

Eddy County, NM

API WELL NUMBER

30-015-43507

PROPOSED DIRECTION

82.68

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
4,356. ft	4,355.42 ft	1.47	329.17	28.31 ft	-19.54 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
16-Jan-16	4,396.00 ft	1.90	309.60

SURVEY INSTRUMENT
TYPE

Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
20-Jan-16	8,995.00 ft	89.30	87.00

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
20-Jan-16	9,068.00 ft	89.30	87.00

Mike Miller

PRINT YOUR NAME ABOVE

Mike Miller

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.36
DECLINATION OR GRID	GRID

1/21/2016

TODAY'S DATE

MWD SUPERVISOR 1

Mike Miller

DIRECTIONAL DRILLER 1

Steven Hawkins

MWD SUPERVISOR 2

Bill Oehlert

DIRECTIONAL DRILLER 2

Brad Jones

12329 Cutten Rd., Houston, Texas 777066

(713)337-0600 (Voice), (713)337-0599 (Fax)



NM OIL CONSERVATION
ARTESIA DISTRICT
FEB 17 2016
RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal COM

#47H

OH / Job #1610026

Survey: Phoenix MWD Surveys

Standard Survey Report

21 January, 2016





Phoenix Technology Services LP

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #47H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3805.00usft (Capstar 119)
Site:	NFE Federal COM	MD Reference:	KB @ 3805.00usft (Capstar 119)
Well:	#47H	North Reference:	Grid
Wellbore:	OH / Job #1610026	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	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 COM		
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' 0.48036 N
		Longitude:	103° 53' 57.34966 W
		Grid Convergence:	0.24 °

Well	#47H		
Well Position	+N/-S	0.00 usft	Northing: 678,204.70 usft
	+E/-W	0.00 usft	Easting: 633,770.30 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 51' 49.35308 N
		Longitude:	103° 53' 51.63884 W
		Ground Level:	3,794.00 usft

Wellbore	OH / Job #1610026				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/31/2015	7.60	60.80	48,541

Design	Surveys (Capstar 119)			
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	82.68

Survey Program	Date	1/21/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	4,356.00	Phoenix Gyro Surveys (OH / Job #161002	PHX_SPT_GTD	PHX Continuous north-seeking gyro
4,396.00	9,068.00	Phoenix MWD Surveys (OH / Job #161002	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)
4,356.00	1.47	329.17	4,355.42	28.31	-19.54	-15.77	0.00	0.00	0.00
Tie In to Phoenix Gyro Surveys									
4,396.00	1.90	309.60	4,395.41	29.18	-20.31	-16.43	1.78	1.08	-48.93
First Phoenix MWD Survey									
4,439.00	2.50	9.10	4,438.38	30.56	-20.71	-16.65	5.22	1.40	138.37
4,482.00	6.00	40.80	4,481.26	33.19	-19.10	-14.71	9.51	8.14	73.72
4,524.00	10.60	47.20	4,522.81	37.47	-14.82	-9.93	11.15	10.95	15.24
4,567.00	15.40	49.50	4,564.70	43.87	-7.58	-1.92	11.23	11.16	5.35
4,609.00	20.10	51.00	4,604.69	52.04	2.28	8.89	11.24	11.19	3.57

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #47H
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Site:	NFE Federal COM	MD Reference:	KB @ 3805.00usft (Capstar 119)
Well:	#47H	North Reference:	Grid
Wellbore:	OH / Job #1610026	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	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)
4,652.00	25.20	52.60	4,644.36	62.26	15.30	23.11	11.95	11.86	3.72
4,694.00	30.80	54.00	4,681.43	74.02	31.12	40.29	13.42	13.33	3.33
4,737.00	36.00	57.30	4,717.31	87.33	50.67	61.39	12.81	12.09	7.67
4,780.00	40.70	60.50	4,751.03	101.07	73.52	85.80	11.86	10.93	7.44
4,822.00	45.60	63.30	4,781.67	114.56	98.86	112.66	12.52	11.67	6.67
4,865.00	50.60	64.50	4,810.37	128.63	127.60	142.95	11.81	11.63	2.79
4,907.00	55.80	63.90	4,835.52	143.26	157.87	174.84	12.43	12.38	-1.43
4,950.00	61.30	62.60	4,857.95	159.78	190.61	209.41	13.05	12.79	-3.02
4,992.00	67.10	62.50	4,876.22	177.20	224.15	244.90	13.81	13.81	-0.24
5,035.00	72.90	61.80	4,890.92	196.07	259.86	282.72	13.57	13.49	-1.63
5,077.00	76.30	61.30	4,902.08	215.36	295.45	320.49	8.18	8.10	-1.19
5,120.00	80.70	61.80	4,910.65	235.43	332.49	359.78	10.30	10.23	1.16
5,159.00	84.00	62.30	4,915.84	253.54	366.63	395.95	8.56	8.46	1.28
5,201.00	87.30	62.70	4,919.02	272.88	403.77	435.25	7.91	7.86	0.95
5,329.00	89.40	67.60	4,922.71	326.62	519.83	557.22	4.16	1.64	3.83
5,457.00	90.60	71.00	4,922.71	371.86	639.55	681.72	2.82	0.94	2.66
5,584.00	86.60	71.40	4,925.81	412.77	759.71	806.12	3.17	-3.15	0.31
5,712.00	87.50	73.60	4,932.40	451.21	881.62	931.93	1.85	0.70	1.72
5,840.00	86.50	78.30	4,939.10	482.23	1,005.58	1,058.84	3.75	-0.78	3.67
5,968.00	88.10	82.00	4,945.14	504.10	1,131.53	1,186.54	3.15	1.25	2.89
6,096.00	89.90	86.20	4,947.37	517.25	1,258.80	1,314.45	3.57	1.41	3.28
6,223.00	89.20	90.20	4,948.37	521.23	1,385.71	1,440.83	3.20	-0.55	3.15
6,351.00	89.70	90.60	4,949.60	520.34	1,513.70	1,567.66	0.50	0.39	0.31
6,479.00	89.10	90.20	4,950.94	519.45	1,641.69	1,694.49	0.56	-0.47	-0.31
6,606.00	88.30	89.40	4,953.82	519.89	1,768.65	1,820.48	0.89	-0.63	-0.63
6,734.00	87.90	87.40	4,958.06	523.46	1,896.52	1,947.77	1.59	-0.31	-1.56
6,862.00	88.80	87.80	4,961.75	528.82	2,024.36	2,075.24	0.77	0.70	0.31
6,990.00	89.10	87.90	4,964.09	533.62	2,152.24	2,202.70	0.25	0.23	0.08
7,117.00	91.40	88.80	4,963.54	537.28	2,279.18	2,329.06	1.94	1.81	0.71
7,245.00	90.90	89.60	4,960.97	539.06	2,407.14	2,456.21	0.74	-0.39	0.63
7,373.00	91.40	90.20	4,958.40	539.29	2,535.11	2,583.17	0.61	0.39	0.47
7,501.00	89.70	90.80	4,957.17	538.17	2,663.10	2,709.97	1.41	-1.33	0.47
7,628.00	91.00	91.30	4,956.40	535.84	2,790.07	2,835.61	1.10	1.02	0.39
7,756.00	89.70	91.00	4,955.62	533.27	2,918.04	2,962.21	1.04	-1.02	-0.23
7,884.00	89.00	89.10	4,957.07	533.16	3,046.03	3,089.13	1.58	-0.55	-1.48
8,012.00	90.00	88.60	4,958.19	535.73	3,173.99	3,216.38	0.87	0.78	-0.39
8,140.00	88.70	89.10	4,959.64	538.30	3,301.96	3,343.63	1.09	-1.02	0.39
8,268.00	89.50	90.30	4,961.65	538.97	3,429.93	3,470.65	1.13	0.63	0.94
8,398.00	87.80	89.80	4,964.71	538.86	3,559.89	3,599.54	1.36	-1.31	-0.38
8,525.00	89.00	90.80	4,968.26	538.19	3,686.84	3,725.36	1.23	0.94	0.79
8,653.00	89.30	88.00	4,970.16	539.53	3,814.80	3,852.46	2.20	0.23	-2.19
8,781.00	90.80	88.70	4,970.04	543.22	3,942.75	3,979.83	1.29	1.17	0.55
8,909.00	90.40	87.50	4,968.70	547.46	4,070.67	4,107.24	0.99	-0.31	-0.94



Phoenix Technology Services LP
Survey Report



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Site:	NFE Federal COM	MD Reference:	KB @ 3805.00usft (Capstar 119)
Well:	#47H	North Reference:	Grid
Wellbore:	OH / Job #1610026	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

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)
8,995.00	89.30	87.00	4,968.93	551.59	4,156.57	4,192.97	1.41	-1.28	-0.58
Final Phoenix MWD Survey									
9,068.00	89.30	87.00	4,969.82	555.41	4,229.46	4,265.76	0.00	0.00	0.00
Projection to TD									

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
4,356.00	4,355.42	28.31	-19.54	Tie In to Phoenix Gyro Surveys	
4,396.00	4,395.41	29.18	-20.31	First Phoenix MWD Survey	
8,995.00	4,968.93	551.59	4,156.57	Final Phoenix MWD Survey	
9,068.00	4,969.82	555.41	4,229.46	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-4720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1287 Fax: (505) 748-0720

DISTRICT III
1000 Reg. Bureau Road, Artesia, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 43507	Pool Code 96831	Pool Name Cedar Lake; Glorieta - Yeso
Property Code 308724 314794	Property Name NFE FEDERAL COM	Well Number 47H
OCRID No. 873	Operator Name APACHE CORPORATION	Elevation 3794'

Surface Location

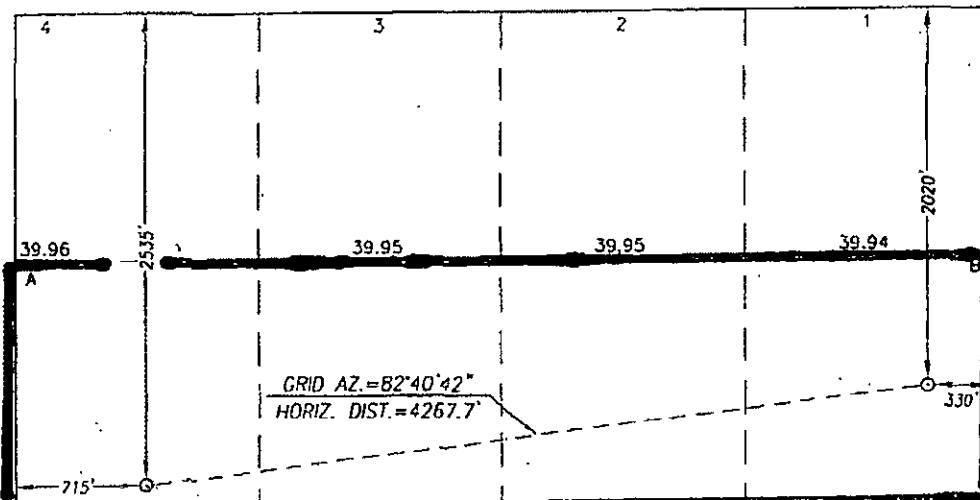
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	5	17-S	31-E		2535	NORTH	715	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	5	17-S	31-E		2020	NORTH	330	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Sorina L. Flores 3/5/15
Signature Date

Sorina L. Flores
Printed Name

Sorina.Flores@apacincorp.com
E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

FEBRUARY 9, 2015

Date of Survey
Signature & Seal of Professional Surveyor

Ronald J. Eidson 03/04/2015
Certificate Number Gary G. Eidson 12641
Ronald J. Eidson 3239

ACT. REV. 04/15 REL. W.O. 14111415 JWSC W.O. 15.13.0283

GEODETIC COORDINATES
NAD 27 NME
SURFACE LOCATION
Y=678204.7 N
X=633770.3 E
LAT.=32.863709° N
LONG.=103.897677° W
LAT.=32° 51' 49" N
LONG.=103° 53' 52" W

CORNER COORDINATES TABLE
NAD 27 NME

A - Y=679414.4 N, X=633048.7 E
B - Y=679450.7 N, X=638328.1 E
C - Y=678131.4 N, X=638335.7 E
D - Y=678094.7 N, X=633056.1 E

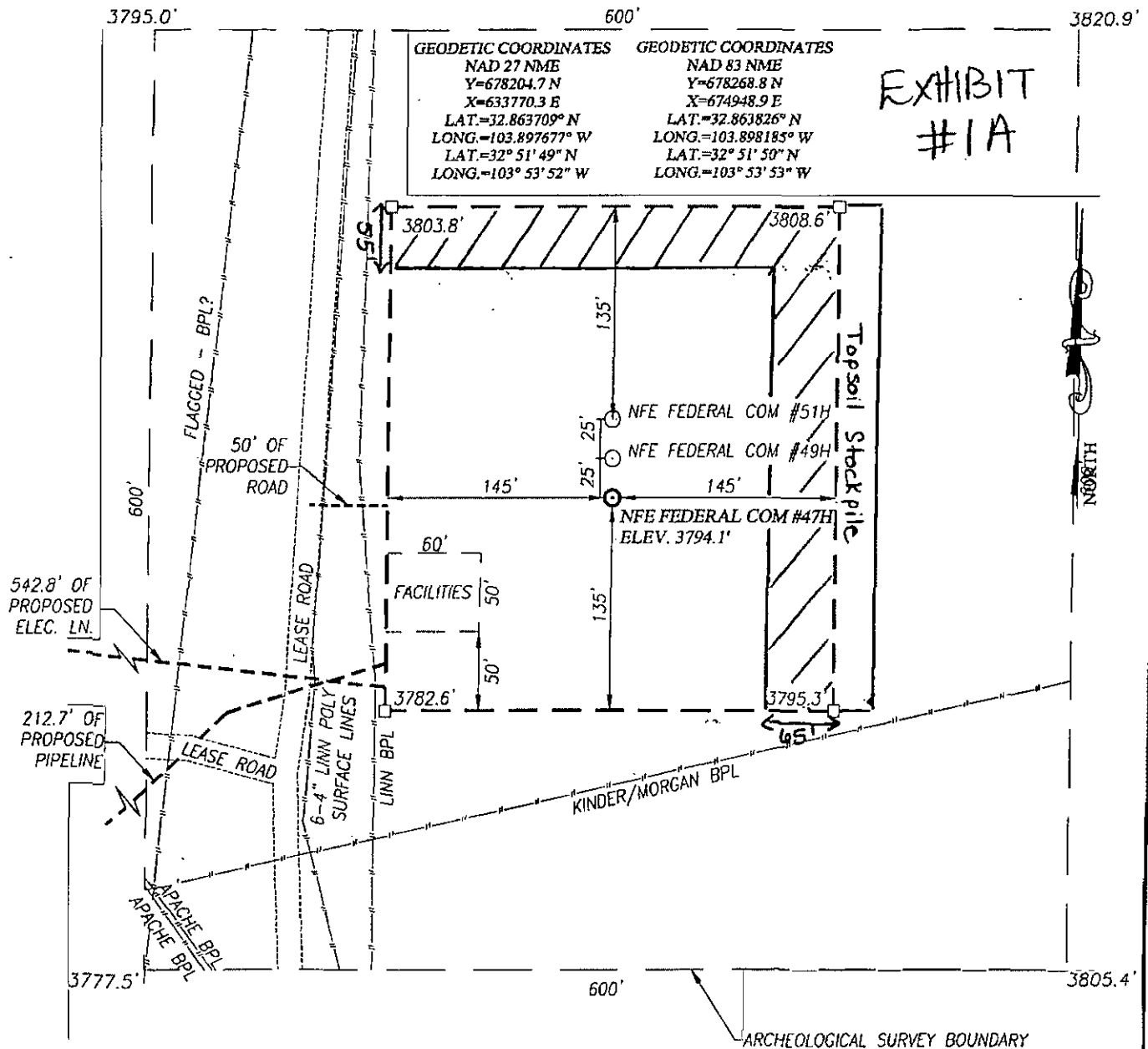
GEODETIC COORDINATES
NAD 27 NME
BOTTOM HOLE LOCATION
Y=678748.4 N
X=638002.2 E
LAT.=32.865155° N
LONG.=103.883888° W
LAT.=32° 51' 54" N
LONG.=103° 53' 02" W

GEODETIC COORDINATES
NAD 83 NME
SURFACE LOCATION
Y=678268.8 N
X=674948.9 E
LAT.=32.863826° N
LONG.=103.898185° W
LAT.=32° 51' 50" N
LONG.=103° 53' 53" W

CORNER COORDINATES TABLE
NAD 83 NME

A - Y=679478.5 N, X=674227.3 E
B - Y=679514.9 N, X=679506.7 E
C - Y=678195.5 N, X=679514.2 E
D - Y=678158.7 N, X=674234.7 E

GEODETIC COORDINATES
NAD 83 NME
BOTTOM HOLE LOCATION
Y=678812.5 N
X=679180.8 E
LAT.=32.865272° N
LONG.=103.884395° W
LAT.=32° 51' 55" N
LONG.=103° 53' 04" W

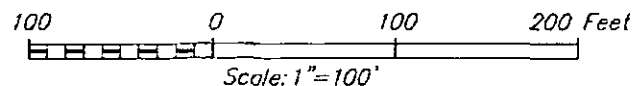


NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS
ROAD MAP" FOR PROPOSED ROAD
LOCATION.

 → Denotes Reclamation

DIRECTIONS TO NFE FEDERAL COM #47H:

FROM THE INTERSECTION OF U.S. HWY. 82 AND CO. RD. 221
(SKELLY RD.), GO NORTH ON CO. RD. 221 APPROX. 1.45 MILES.
TURN RIGHT AND GO NORTHEAST ON LEASE ROAD APPROX.
0.6 MILES. TURN RIGHT AND GO EAST APPROX. 0.6 MILES. TURN
LEFT AND GO NORTH APPROX. 1.2 MILES TO PROPOSED ROAD
SURVEY. FOLLOW STAKED ROAD 50 FEET EAST TO THIS LOCATION.



APACHE CORPORATION

NFE FEDERAL COM #47H WELL
LOCATED 2535 FEET FROM THE NORTH LINE
AND 715 FEET FROM THE WEST LINE OF SECTION 5,
TOWNSHIP 17 SOUTH, RANGE 31 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 2/9/15	CAD Date: 2/26/15	Drawn By: ACK
W.O. No.: 15130283	Rev: 3/4/15	Rel. W.O.: 14111415
Sheet 1 of 1		