



PHOENIX
TECHNOLOGY SERVICES

August 5, 2014

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

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 07 2014

RECEIVED

Dear District 2 - Artesia

Attention: Regulatory Department

Re: Apache Corporation
Crow Federal #34H
Eddy County, NM
API #30-015-42139
Job No. 1410976

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	
Brad Hill	34H	694	10,520	06/28/14	07/09/14	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,

Dana Robinson

Dana Robinson
Operations Administrator
Certified mail receipt number: _____

7011 1570 0001 4365 2292

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER

1410978

OPERATOR

Apache Corporation

WELL NAME

Crow Federal 34H

COUNTY & STATE

Eddy, NM

API WELL NUMBER

30-015-42139

PROPOSED DIRECTION

269.59

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
600 ft	599.98 ft	.88 ft	127.6 ft	3.47 ft	2.43 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
28-Jun-14	694 ft	0.2	332.5

SURVEY INSTRUMENT
TYPE

Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
9-Jul-14	10,520 ft	89.4	270.0

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
9-Jul-14	10,587 ft	89.4	270.0

Brad Hill

PRINT YOUR NAME ABOVE

Brad Hill

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	
	7.27
DECLINATION OR GRID	GRID

7/9/2014

TODAY'S DATE

MWD SUPERVISOR 1

Brad Hill

DIRECTIONAL DRILLER 1

Richard Thurman

MWD SUPERVISOR 2

Shelby Johnson

DIRECTIONAL DRILLER 2

Aaron Kinney

1805 Brittmore Road

Houston, Texas 77043

(713)3370609 (Voice), (713)337-0599 (Fax)

NM OIL CONSERVATION
ARTESIA DISTRICT

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
Rt 1 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, 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

AUG 07 2014
RECEIVED

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-42139	Pool Code 26770	Pool Name Fren; Glorieta - Yeso
Property Code 308711	Property Name CROW FEDERAL	Well Number 34H
GRID No. 873	Operator Name APACHE CORPORATION	Elevation 3930'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	3	17-S	31-E		905	SOUTH	570	WEST	EDDY

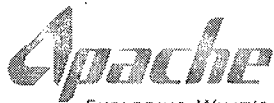
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	4	17-S	31-E		905	SOUTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			10523 3-3

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

CORNER COORDINATES TABLE ① - Y=676812.0 N, X=638343.2 E ② - Y=676849.1 N, X=643624.5 E ③ - Y=675492.7 N, X=638350.7 E ④ - Y=675566.2 N, X=648912.5 E DETAIL 3929.5' 3931.7' 600' 3926.8' 3929.1' GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=676439.0 N X=644196.8 E LAT.=32.858733" N LONG.=103.863747" W LAT.=32° 51' 31" N LONG.=103° 51' 49" W BOTTOM HOLE LOCATION Y=676399.8 N X=638675.5 E	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. <i>Sorina L Flores</i> 12/11/13 Signature Date <i>Sorina L. Flores</i> Printed Name <i>Sorina.flores@apachecorp.com</i> 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. MAY 2, 2012 Date of Survey Signature & Seal of Professional Surveyor: Certificate Number: Gary C. Edison 12641 Ronald E. Edison 3239 DSS JWSC W.O.: 12.11.0834
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EXPLORING WHAT'S POSSIBLE

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 07 2014

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#34H

WB1/Job #1410978

Survey: Phoenix MWD Surveys

Standard Survey Report

10 July, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #34H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3941.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3941.00usft (Capstar 114)
Well:	#34H	North Reference:	Grid
Wellbore:	WB1/Job #1410978	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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
From:	Map	Easting:	643,906.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 50' 38.92796 N
		Longitude:	103° 51' 53.16689 W
		Grid Convergence:	0.25 °

Well	#34H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 51' 31.43913 N
		Longitude:	103° 51' 49.49107 W
		Ground Level:	3,930.00 usft

Wellbore	WB1/Job #1410978		
Magnetics	Model Name	Sample Date	Declination
	BGGM2013	06/10/14	7.53
			Dip Angle
			60.64
			Field Strength
			48,637

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
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			269.59

Survey Program	Date 07/09/14		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	600.00	Gyro Surveys (WB1/Job #1410978)	NS-GYRO-MS
694.00	10,587.00	Phoenix MWD Surveys (WB1/Job #14109)	PHX+MWD+BGGM
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+BGGM v3: standard declination

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
600.00	0.88	127.62	599.97	3.87	2.43	-2.45	0.00	0.00	0.00	
694.00	0.20	332.50	693.97	3.58	2.92	-2.95	1.13	-0.72	-165.02	
Fist Phoenix MWD Survey										
822.00	0.30	306.10	821.97	3.97	2.55	-2.58	0.12	0.08	-20.63	
951.00	0.40	340.70	950.97	4.60	2.13	-2.16	0.18	0.08	26.82	
1,079.00	0.50	219.40	1,078.96	4.59	1.62	-1.66	0.61	0.08	-94.77	
1,207.00	0.80	197.10	1,206.96	3.30	1.01	-1.03	0.30	0.23	-17.42	
1,335.00	1.40	201.30	1,334.93	0.99	0.18	-0.18	0.47	0.47	3.28	
1,463.00	1.60	199.70	1,462.89	-2.15	-0.99	1.01	0.16	0.16	-1.25	
1,592.00	2.20	200.00	1,591.82	-6.17	-2.45	2.49	0.47	0.47	0.23	



Phoenix Technology Services

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #34H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3941.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3941.00usft (Capstar 114)
Well:	#34H	North Reference:	Grid
Wellbore:	WB1/Job #1410978	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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)
1,720.00	1.60	195.50	1,719.75	-10.20	-3.77	3.84	0.48	-0.47	-3.52
1,848.00	1.20	204.30	1,847.71	-13.15	-4.79	4.89	0.35	-0.31	6.88
1,976.00	0.60	237.80	1,975.69	-14.72	-5.91	6.02	0.60	-0.47	26.17
2,107.00	0.50	350.00	2,106.69	-14.53	-6.59	6.70	0.70	-0.08	85.65
2,236.00	0.70	344.90	2,235.68	-13.21	-6.90	6.99	0.16	0.16	-3.95
2,364.00	1.00	351.40	2,363.67	-11.35	-7.27	7.35	0.25	0.23	5.08
2,492.00	1.00	345.00	2,491.65	-9.17	-7.72	7.79	0.09	0.00	-5.00
2,620.00	0.80	332.90	2,619.63	-7.29	-8.42	8.47	0.21	-0.16	-9.45
2,749.00	1.00	324.30	2,748.62	-5.58	-9.49	9.53	0.19	0.16	-6.67
2,877.00	1.00	306.70	2,876.60	-4.00	-11.03	11.06	0.24	0.00	-13.75
3,005.00	0.90	305.00	3,004.58	-2.76	-12.75	12.77	0.08	-0.08	-1.33
3,134.00	1.10	288.70	3,133.56	-1.78	-14.76	14.77	0.27	0.16	-12.64
3,262.00	0.80	306.50	3,261.54	-0.86	-16.64	16.64	0.33	-0.23	13.91
3,390.00	0.70	287.70	3,389.53	-0.09	-18.10	18.10	0.21	-0.08	-14.69
3,450.00	0.70	292.20	3,449.53	0.16	-18.79	18.79	0.09	0.00	7.50
3,594.00	0.50	294.40	3,593.52	0.75	-20.18	20.17	0.14	-0.14	1.53
3,722.00	0.30	92.10	3,721.52	0.97	-20.35	20.34	0.61	-0.16	123.20
3,850.00	1.20	89.00	3,849.51	0.98	-18.67	18.67	0.70	0.70	-2.42
3,978.00	1.40	88.50	3,977.47	1.05	-15.77	15.76	0.16	0.16	-0.39
4,106.00	1.40	89.30	4,105.43	1.11	-12.64	12.64	0.02	0.00	0.63
4,234.00	1.30	91.80	4,233.40	1.08	-9.63	9.62	0.09	-0.08	1.95
4,362.00	1.30	94.10	4,361.37	0.93	-6.73	6.72	0.04	0.00	1.80
4,491.00	1.20	103.30	4,490.34	0.52	-3.96	3.95	0.17	-0.08	7.13
4,619.00	0.70	102.80	4,618.32	0.04	-1.89	1.89	0.39	-0.39	-0.39
4,752.00	0.60	109.10	4,751.31	-0.37	-0.44	0.44	0.09	-0.08	4.74
4,832.00	2.60	269.40	4,831.29	-0.53	-1.86	1.86	3.96	2.50	200.38
4,874.00	7.10	270.30	4,873.13	-0.52	-5.41	5.41	10.72	10.71	2.14
4,917.00	12.40	273.30	4,915.49	-0.25	-12.68	12.68	12.38	12.33	6.98
4,960.00	18.40	274.50	4,956.93	0.55	-24.06	24.06	13.97	13.95	2.79
5,003.00	24.80	273.10	4,996.89	1.58	-39.85	39.84	14.93	14.88	-3.26
5,046.00	30.90	272.10	5,034.89	2.47	-59.91	59.89	14.23	14.19	-2.33
5,088.00	37.50	270.90	5,069.61	3.06	-83.50	83.47	15.80	15.71	-2.86
5,131.00	44.40	269.70	5,102.06	3.19	-111.66	111.63	16.15	16.05	-2.79
5,174.00	50.10	268.60	5,131.24	2.71	-143.22	143.19	13.39	13.26	-2.56
5,217.00	54.20	269.30	5,157.62	2.09	-177.16	177.14	9.62	9.53	1.63
5,260.00	58.20	270.10	5,181.54	1.91	-212.88	212.86	9.43	9.30	1.86
5,302.00	62.40	269.90	5,202.34	1.91	-249.36	249.34	10.01	10.00	-0.48
5,345.00	66.50	269.80	5,220.88	1.81	-288.14	288.12	9.54	9.53	-0.23
5,388.00	70.00	269.50	5,236.81	1.56	-328.07	328.06	8.17	8.14	-0.70
5,431.00	72.60	269.50	5,250.60	1.21	-368.80	368.78	6.05	6.05	0.00
5,473.00	76.70	269.10	5,261.72	0.71	-409.29	409.27	9.80	9.76	-0.95
5,516.00	81.00	268.80	5,270.03	-0.06	-451.46	451.45	10.02	10.00	-0.70
5,559.00	83.80	269.20	5,275.72	-0.80	-494.07	494.07	6.58	6.51	0.93



Phoenix Technology Services Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #34H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3941.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3941.00usft (Capstar 114)
Well:	#34H	North Reference:	Grid
Wellbore:	WB1/Job #1410978	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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)
5,602.00	88.00	269.50	5,278.79	-1.29	-536.95	536.95	9.79	9.77	0.70
5,645.00	91.70	270.40	5,278.90	-1.33	-579.94	579.94	8.86	8.60	2.09
5,773.00	92.00	270.10	5,274.77	-0.77	-707.87	707.86	0.33	0.23	-0.23
5,901.00	92.00	270.10	5,270.30	-0.55	-835.80	835.78	0.00	0.00	0.00
6,030.00	90.60	268.00	5,267.38	-2.69	-964.73	964.73	1.96	-1.09	-1.63
6,158.00	90.20	265.70	5,266.48	-9.72	-1,092.53	1,092.57	1.82	-0.31	-1.80
6,292.00	91.60	268.00	5,264.38	-17.08	-1,226.30	1,226.39	2.01	1.04	1.72
6,421.00	90.40	269.60	5,262.13	-19.78	-1,355.24	1,355.35	1.55	-0.93	1.24
6,548.00	90.00	269.70	5,261.68	-20.56	-1,482.24	1,482.35	0.32	-0.31	0.08
6,676.00	89.80	271.40	5,261.91	-19.33	-1,610.23	1,610.33	1.34	-0.16	1.33
6,804.00	91.00	271.00	5,261.01	-16.65	-1,738.20	1,738.27	0.99	0.94	-0.31
6,932.00	90.30	270.30	5,259.56	-15.20	-1,866.18	1,866.24	0.77	-0.55	-0.55
7,060.00	90.90	270.10	5,258.22	-14.75	-1,994.17	1,994.22	0.49	0.47	-0.16
7,188.00	90.80	269.50	5,256.32	-15.20	-2,122.15	2,122.21	0.48	-0.08	-0.47
7,317.00	90.40	268.50	5,254.97	-17.45	-2,251.12	2,251.19	0.83	-0.31	-0.78
7,445.00	91.50	269.40	5,252.85	-19.79	-2,379.08	2,379.16	1.11	0.86	0.70
7,573.00	91.40	268.90	5,249.61	-21.69	-2,507.03	2,507.12	0.40	-0.08	-0.39
7,702.00	91.20	271.00	5,246.68	-21.80	-2,635.99	2,636.07	1.63	-0.16	1.63
7,830.00	91.10	270.10	5,244.11	-20.58	-2,763.95	2,764.03	0.71	-0.08	-0.70
7,958.00	91.60	270.10	5,241.10	-20.35	-2,891.92	2,891.99	0.39	0.39	0.00
8,087.00	91.40	269.80	5,237.72	-20.46	-3,020.87	3,020.94	0.28	-0.16	-0.23
8,215.00	91.20	270.20	5,234.82	-20.46	-3,148.84	3,148.90	0.35	-0.16	0.31
8,352.00	90.00	268.90	5,233.38	-21.54	-3,285.82	3,285.89	1.29	-0.88	-0.95
8,480.00	89.60	268.30	5,233.83	-24.67	-3,413.78	3,413.87	0.56	-0.31	-0.47
8,611.00	89.70	268.40	5,234.63	-28.44	-3,544.73	3,544.84	0.11	0.08	0.08
8,739.00	90.50	269.00	5,234.40	-31.34	-3,672.69	3,672.82	0.78	0.63	0.47
8,867.00	91.00	268.30	5,232.73	-34.36	-3,800.64	3,800.79	0.67	0.39	-0.55
8,996.00	91.30	269.50	5,230.14	-36.84	-3,929.59	3,929.75	0.96	0.23	0.93
9,124.00	91.40	269.20	5,227.12	-38.29	-4,057.55	4,057.72	0.25	0.08	-0.23
9,252.00	90.30	269.50	5,225.23	-39.74	-4,185.52	4,185.70	0.89	-0.86	0.23
9,380.00	90.90	270.20	5,223.89	-40.07	-4,313.51	4,313.69	0.72	0.47	0.55
9,508.00	90.40	269.20	5,222.43	-40.74	-4,441.50	4,441.68	0.87	-0.39	-0.78
9,637.00	90.20	269.50	5,221.76	-42.21	-4,570.49	4,570.68	0.28	-0.16	0.23
9,765.00	89.80	270.40	5,221.76	-42.32	-4,698.49	4,698.67	0.77	-0.31	0.70
9,896.00	89.60	269.50	5,222.44	-42.43	-4,829.49	4,829.67	0.70	-0.15	-0.69
10,025.00	89.50	271.00	5,223.46	-41.87	-4,958.48	4,958.65	1.17	-0.08	1.16
10,153.00	89.70	271.70	5,224.35	-38.85	-5,086.44	5,086.59	0.57	0.16	0.55
10,282.00	89.40	271.10	5,225.36	-35.70	-5,215.39	5,215.52	0.52	-0.23	-0.47
10,410.00	89.80	270.40	5,226.26	-34.03	-5,343.38	5,343.49	0.63	0.31	-0.55
10,520.00	89.40	270.00	5,227.03	-33.64	-5,453.38	5,453.48	0.51	-0.36	-0.36
Last Phoenix MWD Survey									
10,587.00	89.40	270.00	5,227.73	-33.64	-5,520.37	5,520.47	0.00	0.00	0.00
Projection to TD									



Phoenix Technology Services

Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #34H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3941.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3941.00usft (Capstar 114)
Well:	#34H	North Reference:	Grid
Wellbore:	WB1/Job #1410978	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
	599.97			Tie-on to Gyro Survey
694.00	693.97	3.58	2.92	Fist Phoenix MWD Survey
10,520.00	5,227.03	-33.64	-5,453.38	Last Phoenix MWD Survey
10,587.00	5,227.73	-33.64	-5,520.37	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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