

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER

1411417

OPERATOR

Chevron

WELL NAME

Hayhurst 16-25-27 #3H

COUNTY & STATE

Eddy Co., New Mexico

API WELL NUMBER

30-015-42491

PROPOSED DIRECTION

179.79°

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
0ft	.00 ft	0.00	0.00	.00 ft	.00 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
15-Aug-14	185.00 ft	0.90	256.43

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
31-Aug-14	12,253.00 ft	92.70	172.30

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
31-Aug-14	12,315.00 ft	92.70	172.30

Jon Buhland

PRINT YOUR NAME ABOVE

Jon Buhland

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	
	7.41
DECLINATION OR GRID	GRID

9/1/2014

TODAY'S DATE

MWD SUPERVISOR 1

Jon Buhland

DIRECTIONAL DRILLER 1

Phillip Darley

MWD SUPERVISOR 2

Michael Rachal

DIRECTIONAL DRILLER 2

Brooks Valentine

12329 Cutten Rd., Houston, Texas 777066

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



Chevron

Eddy County NM (NAD27 NME)

Hayhurst 16-25-27 State

#3H

WB1/Job #1411417

Survey: Phoenix MWD Survey

Standard Survey Report

02 September, 2014





Phoenix Technology Services

Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County NM (NAD27/NME)	TVD Reference:	KB @ 3250.00usft (Ensign 767)
Site:	Hayhurst 16-25-27 State	MD Reference:	KB @ 3250.00usft (Ensign 767)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1/Job #1411417	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 767)	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:	Hayhurst 16-25-27 State		
Site Position:		Northing:	413,517.00 usft
From:	Map	Easting:	543,787.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 8' 12.46493 N
		Longitude:	104° 11' 30.73979 W
		Grid Convergence:	0.08 °

Well:	#3H		
Well Position	+N-S	0.00 usft	Northing:
	+E-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 8' 12.20441 N
		Longitude:	104° 12' 4.39851 W
		Ground Level:	3,219.00 usft

Wellbore:	WB1/Job #1411417		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	07/31/14	7.48
			Dip Angle
			(°)
			Field Strength
			(nT)
			48,184

Design:	Surveys (Ensign 767)		
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
			179.79

Survey Program	Date 09/02/14		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
185.00	12,315.00	Phoenix MWD Survey (WB1/Job #1411417)	PHX+MWD+IGRF
			Description
			PHX+MWD+IGRF 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185.00	0.90	256.43	184.99	-0.34	-1.41	0.34	0.49	0.49	0.00
First Phoenix MWD Survey									
365.00	1.20	247.83	364.96	-1.38	-4.53	1.37	0.19	0.17	-4.78
513.00	1.60	248.23	512.92	-2.73	-7.89	2.71	0.27	0.27	0.27
693.00	1.70	244.53	692.84	-4.82	-12.63	4.77	0.08	0.06	-2.06
876.00	1.70	242.23	875.76	-7.25	-17.48	7.18	0.04	0.00	-1.26
1,063.00	2.10	247.03	1,062.66	-9.88	-23.09	9.79	0.23	0.21	2.57
1,252.00	2.20	260.93	1,251.53	-11.80	-29.86	11.69	0.28	0.05	7.35
1,443.00	0.80	229.03	1,442.46	-13.25	-34.49	13.13	0.83	-0.73	-16.70
1,632.00	0.50	182.73	1,631.45	-14.94	-35.53	14.81	0.31	-0.16	-24.50



Phoenix Technology Services

Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3250.00usft (Ensign 767)
Site:	Hayhurst 16-25-27 State	MD Reference:	KB @ 3250.00usft (Ensign 767)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1/Job #1411417	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 767)	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)
1,823.00	1.50	118.73	1,822.42	-16.98	-33.37	16.85	0.71	0.52	-33.51
2,013.00	2.00	100.33	2,012.33	-18.77	-27.93	18.66	0.39	0.26	-9.68
2,102.00	1.80	95.63	2,101.28	-19.18	-25.01	19.09	0.28	-0.22	-5.28
2,285.00	1.80	92.73	2,284.19	-19.60	-19.28	19.53	0.05	0.00	-1.58
2,474.00	1.90	93.83	2,473.10	-19.95	-13.19	19.90	0.06	0.05	0.58
2,664.00	1.90	43.93	2,663.00	-17.89	-7.86	17.86	0.84	0.00	-26.26
2,852.00	2.10	41.03	2,850.89	-13.05	-3.44	13.04	0.12	0.11	-1.54
3,042.00	1.70	31.53	3,040.78	-8.02	0.32	8.02	0.27	-0.21	-5.00
3,232.00	1.70	34.93	3,230.70	-3.31	3.41	3.32	0.05	0.00	1.79
3,422.00	1.70	36.93	3,420.62	1.26	6.72	-1.23	0.03	-0.00	1.05
3,613.00	1.70	51.03	3,611.53	5.30	10.62	-5.26	0.22	0.00	7.38
3,803.00	1.70	52.53	3,801.45	8.79	15.05	-8.73	0.02	0.00	0.79
3,991.00	1.60	51.23	3,989.37	12.13	19.31	-12.06	0.06	-0.05	-0.69
4,181.00	1.40	52.33	4,179.31	15.21	23.21	-15.12	0.11	-0.11	0.58
4,371.00	1.30	57.83	4,369.26	17.77	26.88	-17.68	0.09	-0.05	2.89
4,562.00	0.40	248.13	4,560.24	18.68	28.09	-18.58	0.89	-0.47	-88.85
4,752.00	0.60	233.83	4,750.23	17.85	26.67	-17.75	0.12	0.11	-7.53
4,943.00	0.60	208.13	4,941.22	16.37	25.39	-16.28	0.14	0.00	-13.46
5,132.00	0.60	177.63	5,130.21	14.51	24.97	-14.42	0.17	0.00	-16.14
5,322.00	1.00	174.83	5,320.20	11.87	25.16	-11.77	0.21	0.21	-1.47
5,513.00	1.20	176.13	5,511.16	8.21	25.44	-8.12	0.11	0.10	0.68
5,702.00	1.10	201.93	5,700.12	4.55	24.90	-4.46	0.28	-0.05	13.65
5,893.00	1.20	287.13	5,891.10	3.44	22.30	-3.36	0.82	0.05	44.61
6,083.00	2.80	252.63	6,080.98	2.64	15.97	-2.58	1.02	0.84	-18.16
6,273.00	2.60	261.53	6,270.77	0.62	7.28	-0.60	0.24	-0.11	4.68
6,463.00	1.10	287.63	6,460.67	0.54	1.28	-0.54	0.89	-0.79	13.74
6,653.00	1.70	273.33	6,650.61	1.26	-3.27	-1.27	0.36	0.32	-7.53
6,843.00	2.30	271.83	6,840.50	1.54	-9.90	-1.58	0.32	0.32	-0.79
6,915.00	2.80	258.43	6,912.42	1.23	-13.06	-1.28	1.08	0.69	-18.61
7,003.00	3.70	193.43	7,000.31	-1.96	-15.83	1.90	4.06	1.02	-73.86
7,035.00	6.10	178.93	7,032.19	-4.66	-16.04	4.60	8.38	7.50	-45.31
7,067.00	8.70	174.43	7,063.92	-8.77	-15.77	8.72	8.32	8.13	-14.06
7,099.00	11.40	176.73	7,095.43	-14.34	-15.35	14.28	8.53	8.44	7.19
7,129.00	12.80	172.63	7,124.76	-20.60	-14.76	20.54	5.47	4.67	-13.67
7,161.00	15.00	171.23	7,155.82	-28.21	-13.67	28.16	6.95	6.88	-4.38
7,193.00	19.60	172.43	7,186.37	-37.62	-12.33	37.58	14.42	14.38	3.75
7,225.00	23.40	174.63	7,216.13	-49.28	-11.03	49.23	12.14	11.88	6.88
7,256.00	25.50	169.83	7,244.36	-61.97	-9.28	61.94	9.32	6.77	-15.48
7,289.00	29.50	170.43	7,273.62	-76.98	-6.67	76.96	12.15	12.12	1.82
7,321.00	33.70	171.43	7,300.87	-93.54	-4.04	93.52	13.23	13.13	3.13
7,353.00	37.60	171.23	7,326.87	-111.97	-1.22	111.97	12.19	12.19	-0.63
7,384.00	42.40	171.63	7,350.61	-131.67	1.74	131.68	15.51	15.48	1.29
7,416.00	46.50	172.23	7,373.45	-153.85	4.88	153.87	12.88	12.81	1.88



Phoenix Technology Services

Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3250.00usft (Ensign 767)
Site:	Hayhurst 16-25-27 State	MD Reference:	KB @ 3250.00usft (Ensign 767)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1/Job #1411417	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 767)	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)
7,446.00	50.80	172.93	7,393.26	-176.18	7.78	176.21	14.44	14.33	2.33
7,479.00	55.60	174.93	7,413.03	-202.45	10.56	202.49	15.33	14.55	6.06
7,511.00	60.30	175.53	7,430.00	-229.47	12.81	229.52	14.77	14.69	1.88
7,543.00	64.80	176.53	7,444.75	-257.79	14.78	257.84	14.33	14.06	3.13
7,574.00	69.90	177.53	7,456.69	-286.35	16.25	286.41	16.72	16.45	3.23
7,606.00	74.60	178.03	7,466.44	-316.80	17.43	316.86	14.76	14.69	1.56
7,637.00	78.90	178.53	7,473.54	-346.95	18.33	347.02	13.96	13.87	1.61
7,669.00	84.40	178.93	7,478.19	-378.59	19.04	378.66	17.23	17.19	1.25
7,733.00	92.60	179.33	7,479.86	-442.51	20.01	442.58	12.83	12.81	0.63
7,828.00	92.70	179.63	7,475.47	-537.40	20.87	537.48	0.33	0.11	0.32
7,923.00	93.10	180.33	7,470.66	-632.28	20.90	632.35	0.85	0.42	0.74
8,018.00	90.80	180.73	7,467.43	-727.22	20.02	727.28	2.46	-2.42	0.42
8,113.00	91.10	181.20	7,465.85	-822.19	18.42	822.25	0.59	0.32	0.49
8,208.00	91.80	181.13	7,463.45	-917.14	16.49	917.19	0.74	0.74	-0.07
8,303.00	92.60	181.43	7,459.80	-1,012.04	14.37	1,012.09	0.90	0.84	0.32
8,398.00	92.20	182.53	7,455.83	-1,106.90	11.09	1,106.94	1.23	-0.42	1.16
8,493.00	89.70	181.13	7,454.25	-1,201.83	8.06	1,201.85	3.02	-2.63	-1.47
8,588.00	90.30	181.13	7,454.25	-1,296.81	6.19	1,296.83	0.63	0.63	0.00
8,683.00	90.40	181.43	7,453.67	-1,391.79	4.06	1,391.79	0.33	0.11	0.32
8,778.00	90.60	182.13	7,452.84	-1,486.74	1.11	1,486.73	0.77	0.21	0.74
8,873.00	89.00	183.23	7,453.17	-1,581.63	-3.33	1,581.60	2.04	-1.68	1.16
8,968.00	88.00	182.03	7,455.66	-1,676.49	-7.69	1,676.45	1.64	-1.05	-1.26
9,063.00	88.30	178.23	7,458.73	-1,771.42	-7.90	1,771.38	4.01	0.32	-4.00
9,158.00	88.50	178.23	7,461.38	-1,866.34	-4.97	1,866.31	0.21	0.21	0.00
9,253.00	89.00	177.93	7,463.45	-1,961.27	-1.79	1,961.25	0.61	0.53	-0.32
9,348.00	90.10	178.93	7,464.20	-2,056.22	0.82	2,056.21	1.56	1.16	1.05
9,443.00	90.60	178.93	7,463.62	-2,151.21	2.59	2,151.20	0.53	0.53	0.00
9,538.00	91.00	179.33	7,462.29	-2,246.19	4.03	2,246.18	0.60	0.42	0.42
9,634.00	91.00	179.63	7,460.62	-2,342.17	4.90	2,342.17	0.31	0.00	0.31
9,729.00	91.70	179.63	7,458.38	-2,437.14	5.52	2,437.14	0.74	0.74	0.00
9,823.00	92.60	179.70	7,454.85	-2,531.07	6.07	2,531.07	0.96	0.96	0.07
9,919.00	91.70	179.00	7,451.25	-2,626.99	7.15	2,627.00	1.19	-0.94	-0.73
10,013.00	91.80	179.30	7,448.38	-2,720.94	8.55	2,720.95	0.34	0.11	0.32
10,106.00	89.40	179.30	7,447.41	-2,813.92	9.68	2,813.94	2.58	-2.58	0.00
10,201.00	89.60	180.00	7,448.24	-2,908.91	10.26	2,908.93	0.77	0.21	0.74
10,296.00	89.40	180.40	7,449.06	-3,003.91	9.93	3,003.93	0.47	-0.21	0.42
10,391.00	89.60	180.70	7,449.89	-3,098.90	9.02	3,098.91	0.38	0.21	0.32
10,486.00	89.90	180.40	7,450.31	-3,193.90	8.11	3,193.90	0.45	0.32	-0.32
10,582.00	90.10	180.70	7,450.31	-3,289.89	7.19	3,289.90	0.38	0.21	0.31
10,677.00	90.10	180.70	7,450.14	-3,384.88	6.03	3,384.88	0.00	0.00	0.00
10,772.00	90.10	181.10	7,449.98	-3,479.87	4.53	3,479.87	0.42	0.00	0.42
10,867.00	90.40	181.40	7,449.56	-3,574.85	2.46	3,574.83	0.45	0.32	0.32
10,962.00	90.40	181.40	7,448.90	-3,669.82	0.14	3,669.79	0.00	0.00	0.00



Phoenix Technology Services
Survey Report



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Site:	Hayhurst 16-25-27 State	MD Reference:	KB @ 3250.00usft (Ensign 767)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1/Job #1411417	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 767)	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)
11,057.00	90.60	181.40	7,448.07	-3,764.79	-2.18	3,764.75	0.21	0.21	0.00
11,152.00	88.90	182.10	7,448.48	-3,859.74	-5.08	3,859.69	1.94	-1.79	0.74
11,247.00	88.70	182.50	7,450.47	-3,954.64	-8.89	3,954.58	0.47	-0.21	0.42
11,342.00	89.20	182.50	7,452.21	-4,049.53	-13.04	4,049.46	0.53	0.53	0.00
11,437.00	88.50	182.80	7,454.12	-4,144.41	-17.43	4,144.32	0.80	-0.74	0.32
11,532.00	86.00	180.40	7,458.68	-4,239.25	-20.08	4,239.15	3.65	-2.63	-2.53
11,627.00	85.70	179.00	7,465.55	-4,334.00	-19.58	4,333.90	1.50	-0.32	-1.47
11,722.00	86.00	177.60	7,472.43	-4,428.70	-16.77	4,428.61	1.50	0.32	-1.47
11,817.00	86.20	175.80	7,478.89	-4,523.32	-11.32	4,523.25	1.90	0.21	-1.89
11,912.00	87.60	171.90	7,484.03	-4,617.62	-1.15	4,617.58	4.36	1.47	-4.11
12,007.00	90.80	171.20	7,485.36	-4,711.56	12.80	4,711.58	3.45	3.37	-0.74
12,103.00	91.70	171.60	7,483.26	-4,806.46	27.16	4,806.53	1.03	0.94	0.42
12,253.00	92.70	172.30	7,477.51	-4,954.87	48.15	4,955.01	0.81	0.67	0.47
Last Phoenix MWD Survey									
12,315.00	92.70	172.30	7,474.58	-5,016.24	56.44	5,016.42	0.00	0.00	0.00
Parojection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
185.00	184.99	-0.34	-1.41	First Phoenix MWD Survey
12,253.00	7,477.51	-4,954.87	48.15	Last Phoenix MWD Survey
12,315.00	7,474.58	-5,016.24	56.44	Parojection to TD

Checked By: _____ Approved By: _____ Date: _____