

HOBBS OCD

MAY 28 2015

30-025-42318

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER

1512932

OPERATOR

CHEVRON

WELL NAME

Antelope Ridge 11-24-34 Federal #3H

COUNTY & STATE

Lea County, NM

API WELL NUMBER

30-025-42318

PROPOSED DIRECTION

359.69

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
1,222 ft	1,221.10 ft	1.0 ft	58.8 ft	5.64 N	42.07 E	Teledrift

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
15-Feb-15	1283	1.02	83.87

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
7-Mar-15	14480	93.33	0.32

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
7-Mar-15	14540	93.33	0.32

Edward LaGarce

PRINT YOUR NAME ABOVE

Edward LaGarce

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	6.77
DECLINATION OR GRID	GRID

3/7/2015

TODAY'S DATE

MWD SUPERVISOR 1

Edward LaGarce

DIRECTIONAL DRILLER 1

Craig Cannon

MWD SUPERVISOR 2

Michael Chrismer

DIRECTIONAL DRILLER 2

Justin Jackson

1805 Brittmore Road

Houston, Texas 77043

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

JUN 01 2015

jm

Chevron



HOBBS OCD

MAY 28 2015

RECEIVED

30-025-42318

Chevron

Lea County, NM (NAD27 NME)
Antelope Ridge 11-24-34 Federal
#3H

WB1 Job #1512932

Survey: Phoenix MWD Surveys

Standard Survey Report

09 March, 2015



PHOENIX
TECHNOLOGY SERVICES



Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3531.50usft (Ensign 153)
Site:	Antelope Ridge 11-24-34 Federal	MD Reference:	RKB @ 3531.50usft (Ensign 153)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1 Job #1512932	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	Database:	Compass 5000 GCR

Project:	Lea 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:	Antelope Ridge 11-24-34 Federal		
Site Position:		Northing:	446,908.00 usft
From:	Map	Easting:	774,505.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 31.97943 N
		Longitude:	103° 26' 44.35348 W
		Grid Convergence:	0.47 °

Well:	#3H		
Well Position	+N-S	0.00 usft	Northing: 446,908.00 usft
	+E-W	0.00 usft	Easting: 774,505.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 31.97943 N
		Longitude:	103° 26' 44.35348 W
		Ground Level:	3,507.00 usft

Wellbore:	WB1 Job #1512932		
Magnetics	Model Name	Sample Date	Declination
	BGGM2014	2/13/2015	7.25
			Dip Angle
			60.11
			Field Strength
			48,218

Design:	Surveys (Ensign 153)		
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	359.54
		(°)	

Survey Program	Date	3/9/2015		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
481.00	1,222.00	Teledrift Surveys (WB1 Job #1512932)	NS-GYRO-MS	North sensing gyrocompassing m/s
1,283.00	14,540.00	Phoenix MWD Surveys (WB1 Job #15129)	PHX+MWD+BGGM	PHX+MWD+BGGM v3:standard declination

Survey	Measured Depth	Inclination	Azimuth	Vertical Depth	+N-S	+E-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
	(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
	1,222.00	1.00	58.80	1,221.10	5.64	42.07	5.30	0.00	0.00	0.00
	Tie-In to Teledrift Surveys									
	1,283.00	1.02	83.87	1,282.09	5.97	43.06	5.63	0.72	0.03	41.10
	First Phoenix MWD Survey									
	1,482.00	1.06	90.50	1,461.06	6.13	46.30	5.76	0.07	0.02	3.70
	1,641.00	1.17	94.56	1,640.02	5.97	49.78	5.57	0.08	0.06	2.27
	1,820.00	0.37	139.80	1,819.01	5.36	51.98	4.97	0.53	-0.45	25.27
	1,999.00	0.14	159.84	1,998.01	4.74	52.42	4.32	0.14	-0.13	11.25
	2,178.00	0.09	324.33	2,177.01	4.64	52.42	4.22	0.13	-0.03	91.84



Survey Report



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Site:	Antelope Ridge 11-24-34 Federal	MD Reference:	RKB @ 3531.50usft (Ensign 153)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1 Job #1512932	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	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)
2,357.00	0.28	318.87	2,356.00	5.09	52.05	4.87	0.11	0.11	-3.18
2,536.00	0.47	344.97	2,535.00	6.12	51.57	5.71	0.14	0.11	14.69
2,715.00	0.62	344.89	2,713.99	7.77	51.12	7.36	0.08	0.08	-0.04
2,894.00	0.88	356.70	2,892.88	10.08	50.79	9.67	0.17	0.15	6.60
3,073.00	1.18	2.68	3,071.85	13.29	50.80	12.88	0.18	0.17	3.34
3,252.00	1.68	332.45	3,250.89	17.46	49.67	17.06	0.50	0.28	-16.89
3,431.00	1.20	303.54	3,429.84	20.82	46.90	20.44	0.48	-0.27	-16.15
3,610.00	1.28	281.09	3,608.80	22.24	43.37	21.89	0.27	0.04	-12.54
3,789.00	1.72	276.61	3,787.74	22.93	38.74	22.62	0.25	0.25	-2.50
3,968.00	2.04	278.79	3,966.64	23.73	32.93	23.46	0.18	0.18	1.22
4,147.00	2.33	279.07	4,145.51	24.79	26.18	24.58	0.16	0.16	0.16
4,326.00	1.81	266.74	4,324.40	25.22	20.08	25.06	0.46	-0.40	-8.89
4,504.00	0.89	212.35	4,502.37	24.17	17.01	24.04	0.75	-0.52	-30.56
4,683.00	0.62	143.87	4,681.36	22.48	17.00	22.34	0.41	-0.04	-38.26
4,862.00	0.91	117.36	4,860.35	21.04	16.84	20.89	0.25	0.16	-14.81
5,041.00	1.70	102.58	5,039.30	19.81	22.69	19.83	0.48	0.44	-8.26
5,151.00	1.87	109.80	5,149.25	18.91	25.79	18.71	0.19	-0.03	6.56
5,308.00	1.77	122.28	5,307.18	16.83	30.02	16.59	0.24	0.06	7.90
5,498.00	1.26	161.75	5,496.12	13.30	33.14	13.03	0.60	-0.27	20.88
5,688.00	0.47	183.45	5,686.10	10.54	33.75	10.27	0.44	-0.42	11.42
5,868.00	0.62	181.58	5,864.09	8.85	33.68	8.58	0.08	0.08	-1.05
6,046.00	0.59	202.39	6,044.08	7.02	33.30	6.75	0.12	-0.02	11.56
6,225.00	0.23	179.25	6,223.07	5.80	32.95	5.54	0.22	-0.20	-12.93
6,404.00	0.41	287.98	6,402.07	5.84	32.35	5.38	0.30	0.10	60.74
6,582.00	0.84	308.72	6,580.06	6.66	30.72	6.41	0.27	0.24	11.65
6,761.00	0.73	306.03	6,759.04	8.15	28.78	7.92	0.08	-0.06	-1.50
6,940.00	1.14	298.18	6,938.02	9.66	26.28	9.45	0.24	0.23	-4.39
7,119.00	1.01	324.56	7,116.99	11.78	23.80	11.59	0.28	-0.07	14.74
7,298.00	0.49	255.74	7,295.98	12.88	22.14	12.70	0.53	-0.29	-38.45
7,477.00	0.82	262.17	7,474.97	12.56	20.44	12.40	0.08	0.07	3.59
7,656.00	0.30	232.55	7,653.96	12.14	19.11	11.99	0.22	-0.18	-16.55
7,835.00	0.58	217.82	7,832.96	11.14	18.16	11.00	0.17	0.16	-8.23
8,014.00	0.57	155.09	8,011.95	9.62	18.00	9.48	0.33	-0.01	-35.04
8,193.00	0.29	184.66	8,190.94	8.36	18.34	8.21	0.19	-0.16	16.52
8,372.00	0.36	236.89	8,369.94	7.60	17.83	7.46	0.16	0.04	29.18
8,551.00	0.51	321.30	8,548.94	7.92	16.86	7.78	0.33	0.08	47.16
8,730.00	0.46	342.95	8,727.93	9.23	16.16	9.10	0.11	-0.03	12.09
8,909.00	0.53	268.35	8,906.93	9.89	15.12	9.77	0.34	0.04	-41.68
9,088.00	0.66	239.45	9,085.92	9.34	13.40	9.23	0.18	0.07	-16.15
9,267.00	0.22	266.01	9,264.91	8.79	12.17	8.70	0.26	-0.25	14.84
9,446.00	0.44	334.29	9,443.91	9.39	11.53	9.30	0.23	0.12	38.15
9,624.00	1.55	280.59	9,621.88	10.45	8.87	10.38	0.75	0.62	-30.17
9,803.00	1.59	258.47	9,800.82	10.40	4.05	10.36	0.34	0.02	-12.36



Survey Report



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Site:	Antelope Ridge 11-24-34 Federal	MD Reference:	RKB @ 3531.50usft (Ensign 153)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1 Job #1512932	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	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)
9,983.00	1.76	267.84	9,980.74	9.79	-1.18	9.80	0.18	0.09	5.21
10,163.00	1.18	323.75	10,160.69	11.18	-5.01	11.22	0.82	-0.32	31.08
10,342.00	1.23	328.51	10,339.65	14.31	-7.11	14.36	0.06	0.03	2.66
10,511.00	0.83	324.90	10,508.82	16.81	-8.59	16.68	0.36	-0.36	-2.14
10,614.00	6.75	345.91	10,611.36	22.95	-10.39	23.04	5.99	5.94	20.40
10,659.00	13.75	351.51	10,655.82	30.82	-11.82	30.91	15.68	15.58	12.44
10,704.00	19.48	353.86	10,698.72	43.58	-13.42	43.69	12.82	12.73	5.22
10,748.00	25.09	355.69	10,739.42	60.19	-14.91	60.31	12.85	12.75	4.16
10,793.00	29.37	358.68	10,779.43	80.75	-15.88	80.87	9.98	9.51	6.64
10,838.00	31.24	359.32	10,818.28	103.45	-16.27	103.58	4.22	4.16	1.42
10,882.00	31.60	357.41	10,855.82	126.37	-16.93	126.51	2.41	0.82	-4.34
10,927.00	37.49	355.20	10,892.88	151.82	-18.61	151.97	13.38	13.09	-4.91
10,972.00	44.14	354.55	10,926.91	181.10	-21.24	181.26	14.81	14.78	-1.44
11,017.00	44.23	357.00	10,959.19	212.37	-23.55	212.55	3.80	0.20	5.44
11,061.00	45.89	359.09	10,990.27	243.50	-24.61	243.69	5.05	3.77	4.75
11,106.00	47.87	315	11,021.03	276.32	-23.95	276.50	7.92	4.40	9.02
11,151.00	52.88	309	11,049.72	310.82	-22.06	311.09	11.13	11.13	-0.13
11,195.00	60.89	115	11,073.74	347.72	-20.73	347.87	18.57	18.20	-4.41
11,240.00	67.34	358.82	11,093.38	388.18	-20.76	388.33	15.07	14.33	-5.18
11,285.00	77.13	357.25	11,107.09	430.85	-22.24	431.11	22.01	21.76	-3.49
11,305.00	81.53	356.92	11,110.79	450.57	-23.24	450.75	22.06	22.00	-1.65
11,342.00	88.96	356.30	11,113.86	487.36	-25.42	487.54	20.15	20.08	-1.68
11,432.00	90.73	355.36	11,114.10	577.11	-31.97	577.35	2.23	1.97	-1.04
11,521.00	90.39	355.04	11,113.23	665.80	-39.42	666.09	0.52	-0.38	-0.36
11,611.00	90.11	355.16	11,112.84	755.47	-47.10	755.82	0.34	-0.31	0.13
11,700.00	91.15	355.07	11,111.86	844.14	-54.68	844.55	1.17	1.17	-0.10
11,790.00	93.81	355.75	11,107.97	933.76	-61.88	934.22	3.05	2.98	0.76
11,879.00	94.54	356.36	11,101.49	1,022.31	-67.98	1,022.82	1.07	0.82	0.69
11,969.00	92.97	358.05	11,095.59	1,112.00	-72.36	1,112.55	2.56	-1.74	1.88
12,058.00	92.32	359.10	11,091.49	1,200.88	-74.57	1,201.44	1.38	-0.73	1.18
12,148.00	92.54	0.08	11,087.67	1,290.79	-75.22	1,291.36	1.12	0.24	1.09
12,237.00	92.99	1.10	11,083.38	1,378.68	-74.30	1,380.24	1.25	0.51	1.15
12,327.00	94.42	1.57	11,077.56	1,469.47	-72.21	1,470.00	1.67	1.59	0.52
12,416.00	94.51	1.78	11,070.63	1,558.16	-69.61	1,558.67	0.26	0.10	0.24
12,506.00	94.99	1.93	11,063.18	1,647.80	-66.71	1,648.29	0.56	0.53	0.17
12,595.00	94.95	3.41	11,055.47	1,736.37	-62.58	1,736.82	1.66	-0.04	1.66
12,685.00	94.28	4.35	11,048.24	1,825.87	-58.51	1,826.27	1.29	-0.77	1.04
12,774.00	92.75	3.43	11,042.80	1,914.50	-50.48	1,914.84	1.99	-1.70	-1.03
12,864.00	92.21	2.99	11,038.91	2,004.27	-45.45	2,004.57	0.77	-0.60	-0.49
12,953.00	93.38	2.56	11,034.57	2,093.06	-41.15	2,093.32	1.40	1.31	-0.48
13,043.00	92.57	2.62	11,029.90	2,182.85	-37.08	2,183.07	0.90	-0.90	0.07
13,132.00	92.77	1.98	11,025.75	2,271.88	-33.52	2,271.87	0.75	0.22	-0.72
13,221.00	93.95	1.53	11,020.53	2,360.48	-30.80	2,360.65	1.42	1.33	-0.51
13,311.00	92.88	2.75	11,015.17	2,450.26	-27.44	2,450.40	1.80	-1.19	1.36



Survey Report



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Site:	Antelope Ridge 11-24-34 Federal	MD Reference:	RKB @ 3531.50usft (Ensign 153)
Well:	#3H	North Reference:	Grid
Wellbore:	WB1 Job #1512932	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	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)
13,400.00	92.63	1.62	11,010.90	2,539.09	-24.05	2,539.20	1.30	-0.28	-1.27
13,490.00	93.39	0.70	11,006.17	2,628.94	-22.23	2,629.04	1.32	0.84	-1.02
13,580.00	92.24	0.63	11,001.75	2,718.83	-21.19	2,718.91	1.28	-1.28	-0.08
13,669.00	94.54	359.57	10,996.49	2,807.66	-21.03	2,807.74	2.84	2.58	-1.19
13,759.00	93.70	359.47	10,990.02	2,897.43	-21.78	2,897.51	0.94	-0.93	-0.11
13,848.00	92.52	359.96	10,985.19	2,986.29	-22.23	2,986.37	1.44	-1.33	0.55
13,938.00	92.83	359.52	10,980.99	3,076.19	-22.63	3,076.28	0.60	0.34	-0.49
14,027.00	93.47	359.84	10,976.10	3,165.06	-23.13	3,165.14	0.80	0.72	0.36
14,116.00	93.81	359.69	10,970.45	3,253.88	-23.49	3,253.96	0.42	0.38	-0.17
14,206.00	93.50	0.35	10,964.71	3,343.69	-23.46	3,343.77	0.81	-0.34	0.73
14,296.00	93.97	0.86	10,958.85	3,433.50	-22.51	3,433.57	0.77	0.52	0.57
14,385.00	93.56	1.16	10,953.01	3,522.29	-20.95	3,522.34	0.57	-0.46	0.34
14,480.00	93.33	0.32	10,947.30	3,617.11	-19.72	3,617.15	0.82	-0.24	-0.88
Final Phoenix MWD Survey									
14,540.00	93.33	0.32	10,943.81	3,677.01	-19.39	3,677.04	0.00	0.00	0.00
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,222.00	1,221.10	5.97	43.06	Tie-in to Teledrift Surveys
1,283.00	1,282.09	3,617.11	-19.72	First Phoenix MWD Survey
14,480.00	10,947.30	3,677.01	-19.39	Final Phoenix MWD Survey
14,540.00	10,943.81			Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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