



HOBSOCD

DEC 19 2014

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Chevron

Lea County NM (NAD27 NME)

Gramma Ridge 14-24-34

#2H

WB1/Job #1410440

Survey: Phoenix MWD Survey

Standard Survey Report

05 July, 2014



PHOENIX
TECHNOLOGY SERVICES

MAR 10 2015

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Phoenix Technology Services

Survey Report



Company: Chevron
 Project: Lea County NM (NAD27 NME)
 Site: Gramma Ridge 14-24-34
 Well: #2H
 Wellbore: WB1/Job #1410440
 Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #2H
 TVD Reference: KB @ 3532.50usft (Ensign 153)
 MD Reference: KB @ 3532.50usft (Ensign 153)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: GCR DB

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	Gramma Ridge 14-24-34		
Site Position:		Northing:	446,243.20 usft
From:	Map	Easting:	773,870.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 13' 25.45288 N
		Longitude:	103° 26' 51.79837 W
		Grid Convergence:	0.47 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing: 446,243.20 usft
	+E/-W	0.00 usft	Easting: 773,870.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 13' 25.45288 N
		Longitude:	103° 26' 51.79837 W
		Ground Level:	3,508.00 usft

Wellbore	WB1/Job #1410440		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	05/29/14	7.16
			Dip Angle
			60.13
			Field Strength
			48,333

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
			(°)
			175.57

Survey Program	Date 07/05/14		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
30.00	1,154.00	MS Gyro Survey (WB1/Job #1410440)	NS-GYRO-MS
1,376.00	15,642.00	Phoenix MWD Survey (WB1/Job #141044)	PHX+MWD+IGRF
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+IGRF v3:standard declination

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)
	1,154.00	0.90	2.57	1,153.88	4.26	-9.41	-4.97	0.00	0.00	0.00
Tie-on to MS Gyro Survey	1,376.00	1.29	337.57	1,375.84	8.31	-10.29	-9.08	0.27	0.18	-11.26
First Phoenix MWD Survey	1,555.00	1.13	345.81	1,554.80	11.88	-11.49	-12.74	0.13	-0.09	4.60
	1,734.00	0.97	334.03	1,733.77	14.96	-12.58	-15.88	0.15	-0.09	-6.58
	1,913.00	0.99	331.23	1,912.74	17.67	-13.99	-18.70	0.03	0.01	-1.56
	2,092.00	1.60	324.79	2,091.70	21.07	-16.18	-22.26	0.35	0.34	-3.60
	2,271.00	1.22	320.14	2,270.64	24.58	-18.84	-25.96	0.22	-0.21	-2.60



Phoenix Technology Services

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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)
2,449.00	1.23	315.16	2,448.60	27.39	-21.40	-28.96	0.06	0.01	-2.80
2,629.00	1.30	306.56	2,628.56	29.97	-24.40	-31.77	0.11	0.04	-4.78
2,808.00	1.47	319.28	2,807.51	32.92	-27.53	-34.95	0.20	0.09	7.11
2,987.00	1.28	345.82	2,986.46	36.60	-29.52	-38.77	0.37	-0.11	14.83
3,165.00	1.30	358.09	3,164.41	40.55	-30.07	-42.75	0.16	0.01	6.89
3,344.00	1.10	356.65	3,343.37	44.29	-30.24	-46.49	0.11	-0.11	-0.80
3,523.00	1.37	14.14	3,522.33	48.08	-29.82	-50.24	0.26	0.15	9.77
3,702.00	1.74	31.95	3,701.27	52.46	-27.86	-54.46	0.34	0.21	9.95
3,881.00	1.60	41.09	3,880.18	56.89	-24.57	-58.61	0.16	0.03	5.11
4,061.00	0.89	43.45	4,060.13	60.03	-21.75	-61.53	0.51	-0.51	1.31
4,239.00	0.33	62.48	4,238.12	61.27	-20.35	-62.66	0.33	-0.31	10.69
4,419.00	0.48	76.59	4,418.11	61.69	-19.15	-62.98	0.10	0.08	7.84
4,597.00	3.39	96.33	4,595.99	61.28	-13.20	-62.12	1.65	1.63	11.09
4,776.00	3.74	82.65	4,774.65	61.44	-2.15	-61.42	0.51	0.20	-7.64
4,955.00	3.91	84.24	4,953.25	62.80	9.72	-61.86	0.11	0.09	0.89
5,134.00	3.07	72.23	5,131.92	64.88	20.35	-63.11	0.62	-0.47	-6.71
5,303.00	2.55	52.75	5,300.72	68.53	27.65	-66.19	0.64	-0.31	-11.53
5,505.00	2.19	45.87	5,502.55	73.94	34.00	-71.09	0.23	-0.18	-3.41
5,684.00	2.02	88.04	5,681.44	76.43	39.61	-73.14	0.85	-0.09	23.56
5,863.00	1.31	169.97	5,860.38	74.52	43.12	-70.97	1.26	-0.40	45.77
6,042.00	1.13	174.49	6,039.34	70.75	43.65	-67.17	0.11	-0.10	2.53
6,221.00	1.26	189.26	6,218.30	67.05	43.50	-63.49	0.19	0.07	8.25
6,400.00	0.73	183.58	6,397.28	63.97	43.11	-60.45	0.30	-0.30	-3.17
6,579.00	0.79	186.24	6,576.26	61.61	42.90	-58.11	0.04	0.03	1.49
6,758.00	0.80	183.33	6,755.24	59.13	42.70	-55.66	0.02	0.01	-1.63
6,937.00	0.59	202.72	6,934.23	57.04	42.27	-53.60	0.17	-0.12	10.83
7,116.00	0.67	187.31	7,113.22	55.15	41.78	-51.76	0.10	0.04	-8.61
7,294.00	0.46	167.98	7,291.21	53.42	41.80	-50.03	0.16	-0.12	-10.86
7,473.00	0.75	183.39	7,470.20	51.54	41.88	-48.16	0.18	0.16	8.61
7,652.00	0.76	183.05	7,649.18	49.19	41.74	-45.82	0.01	0.01	-0.19
7,831.00	0.87	167.14	7,828.17	46.68	41.98	-43.30	0.14	0.06	-8.89
8,010.00	0.65	170.32	8,007.15	44.35	42.46	-40.94	0.13	-0.12	1.78
8,189.00	0.36	178.85	8,186.14	42.79	42.64	-39.37	0.17	-0.16	4.77
8,367.00	0.49	173.78	8,364.14	41.47	42.73	-38.05	0.08	0.07	-2.85
8,546.00	0.59	231.85	8,543.13	40.14	42.09	-36.77	0.30	0.06	32.44
8,725.00	0.47	234.13	8,722.12	39.14	40.77	-35.88	0.07	-0.07	1.27
8,904.00	0.54	250.97	8,901.12	38.44	39.38	-35.28	0.09	0.04	9.41
9,083.00	0.48	228.40	9,080.11	37.67	38.02	-34.62	0.12	-0.03	-12.61
9,262.00	0.64	283.84	9,259.10	37.41	36.49	-34.48	0.30	0.09	30.97
9,441.00	0.72	240.25	9,438.09	37.09	34.54	-34.31	0.29	0.04	-24.35
9,621.00	0.99	223.04	9,618.07	35.39	32.50	-32.77	0.21	0.15	-9.56
9,799.00	0.94	246.62	9,796.05	33.69	30.11	-31.26	0.22	-0.03	13.25
9,978.00	2.04	218.92	9,974.99	30.63	26.76	-28.47	0.72	0.61	-15.47



Phoenix Technology Services

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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)
10,158.00	2.43	221.53	10,154.85	25.28	22.22	-23.49	0.22	0.22	1.45
10,337.00	1.50	208.90	10,333.74	20.39	18.57	-18.89	0.57	-0.52	-7.06
10,516.00	1.51	234.55	10,512.68	16.97	15.52	-15.72	0.37	0.01	14.33
10,592.00	1.09	228.30	10,588.66	15.90	14.16	-14.76	0.58	-0.55	-8.22
10,690.00	8.11	168.33	10,686.31	8.50	14.86	-7.33	7.78	7.16	-61.19
10,735.00	14.22	166.13	10,730.44	0.02	16.83	1.28	13.61	13.58	-4.89
10,780.00	19.13	167.04	10,773.53	-12.54	19.81	14.03	10.93	10.91	2.02
10,825.00	24.26	170.26	10,815.33	-28.85	23.03	30.54	11.70	11.40	7.16
10,870.00	26.58	169.27	10,855.97	-47.85	26.47	49.75	5.24	5.16	-2.20
10,914.00	30.92	169.01	10,894.54	-68.63	30.46	70.78	9.87	9.86	-0.59
10,959.00	34.12	169.27	10,932.48	-92.39	35.02	94.82	7.12	7.11	0.58
11,004.00	36.38	170.89	10,969.22	-117.97	39.48	120.67	5.43	5.02	3.60
11,049.00	39.81	172.06	11,004.63	-145.42	43.58	148.35	7.79	7.62	2.60
11,093.00	43.23	172.90	11,037.57	-174.33	47.39	177.47	7.87	7.77	1.91
11,138.00	46.62	173.47	11,069.43	-205.88	51.16	209.22	7.59	7.53	1.27
11,183.00	50.20	174.12	11,099.30	-239.34	54.79	242.85	8.03	7.96	1.44
11,228.00	54.14	174.58	11,126.89	-274.70	58.29	278.38	8.79	8.76	1.02
11,272.00	60.11	174.82	11,150.76	-311.48	61.69	315.31	13.58	13.57	0.55
11,317.00	66.49	174.73	11,170.97	-351.49	65.36	355.49	14.18	14.18	-0.20
11,362.00	71.60	174.82	11,187.06	-393.33	69.18	397.50	11.36	11.36	0.20
11,407.00	76.26	175.64	11,199.51	-436.41	72.77	440.73	10.50	10.36	1.82
11,451.00	80.79	175.71	11,208.26	-479.39	76.02	483.83	10.30	10.30	0.16
11,496.00	83.85	175.36	11,214.28	-523.85	79.49	528.43	6.84	6.80	-0.78
11,586.00	88.63	174.99	11,220.18	-613.31	87.05	618.20	5.33	5.31	-0.41
11,675.00	87.77	173.75	11,222.97	-701.84	95.77	707.14	1.69	-0.97	-1.39
11,765.00	87.63	173.78	11,226.59	-791.23	105.54	797.02	0.16	-0.16	0.03
11,854.00	87.52	175.57	11,230.35	-879.77	113.79	885.93	2.01	-0.12	2.01
11,943.00	87.68	176.64	11,234.08	-968.48	119.83	974.84	1.21	0.18	1.20
12,033.00	89.27	176.89	11,236.47	-1,058.30	124.91	1,064.79	1.79	1.77	0.28
12,122.00	87.43	176.44	11,239.04	-1,147.11	130.08	1,153.73	2.13	-2.07	-0.51
12,211.00	88.60	176.66	11,242.12	-1,235.89	135.44	1,242.66	1.34	1.31	0.25
12,301.00	90.14	177.99	11,243.11	-1,325.79	139.64	1,332.61	2.26	1.71	1.48
12,390.00	88.60	177.35	11,244.09	-1,414.70	143.25	1,421.54	1.87	-1.73	-0.72
12,480.00	88.07	175.93	11,246.70	-1,504.51	148.53	1,511.49	1.68	-0.59	-1.58
12,569.00	89.08	174.46	11,248.92	-1,593.16	155.98	1,600.45	2.00	1.13	-1.65
12,659.00	90.95	174.42	11,248.89	-1,682.74	164.70	1,690.43	2.08	2.08	-0.04
12,748.00	89.97	173.09	11,248.18	-1,771.20	174.38	1,779.38	1.86	-1.10	-1.49
12,838.00	91.34	174.12	11,247.15	-1,860.63	184.40	1,869.32	1.90	1.52	1.14
12,927.00	90.89	175.65	11,245.42	-1,949.26	192.34	1,958.29	1.79	-0.51	1.72
13,017.00	90.89	173.83	11,244.02	-2,038.87	200.58	2,048.27	2.02	0.00	-2.02
13,106.00	91.73	174.57	11,241.98	-2,127.39	209.58	2,137.22	1.26	0.94	0.83
13,196.00	91.76	175.59	11,239.24	-2,217.01	217.29	2,227.17	1.13	0.03	1.13
13,285.00	89.92	176.73	11,237.94	-2,305.80	223.25	2,316.15	2.43	-2.07	1.28
13,375.00	89.72	176.45	11,238.22	-2,395.64	228.60	2,406.14	0.38	-0.22	-0.31



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13,464.00	90.14	175.62	11,238.33	-2,484.42	234.76	2,495.13	1.05	0.47	-0.93
13,554.00	90.36	174.70	11,237.94	-2,574.10	242.35	2,585.13	1.05	0.24	-1.02
13,643.00	89.16	176.11	11,238.31	-2,662.81	249.48	2,674.12	2.08	-1.35	1.58
13,733.00	88.41	178.04	11,240.22	-2,752.67	254.07	2,764.07	2.30	-0.83	2.14
13,822.00	87.93	178.04	11,243.06	-2,841.57	257.12	2,852.94	0.54	-0.54	0.00
13,912.00	88.04	177.25	11,246.23	-2,931.44	260.81	2,942.83	0.89	0.12	-0.88
14,002.00	87.24	176.84	11,249.93	-3,021.24	265.45	3,032.72	1.00	-0.89	-0.46
14,091.00	88.86	176.64	11,252.96	-3,110.04	270.50	3,121.64	1.83	1.82	-0.22
14,180.00	88.69	175.82	11,254.86	-3,198.83	276.36	3,210.62	0.94	-0.19	-0.92
14,270.00	87.71	175.54	11,257.69	-3,288.53	283.13	3,300.57	1.13	-1.09	-0.31
14,359.00	88.52	175.78	11,260.62	-3,377.22	289.86	3,389.52	0.95	0.91	0.27
14,449.00	89.27	177.33	11,262.35	-3,467.04	295.27	3,479.49	1.91	0.83	1.72
14,538.00	88.44	177.68	11,264.13	-3,555.94	299.14	3,568.42	1.01	-0.93	0.39
14,628.00	87.77	176.92	11,267.11	-3,645.79	303.38	3,658.33	1.13	-0.74	-0.84
14,717.00	88.30	176.86	11,270.16	-3,734.60	308.21	3,747.25	0.60	0.60	-0.07
14,806.00	88.55	176.87	11,272.61	-3,823.44	313.07	3,836.20	0.28	0.28	0.01
14,896.00	88.83	176.87	11,274.66	-3,913.28	317.98	3,926.15	0.31	0.31	0.00
14,985.00	89.75	176.79	11,275.77	-4,002.14	322.90	4,015.12	1.04	1.03	-0.09
15,075.00	91.26	176.93	11,274.97	-4,091.99	327.83	4,105.09	1.68	1.68	0.16
15,164.00	92.37	176.94	11,272.15	-4,180.82	332.59	4,194.02	1.25	1.25	0.01
15,254.00	92.37	177.00	11,268.43	-4,270.62	337.34	4,283.92	0.07	0.00	0.07
15,343.00	92.21	176.83	11,264.88	-4,359.42	342.13	4,372.82	0.26	-0.18	-0.19
15,433.00	90.08	176.47	11,263.08	-4,449.24	347.39	4,462.78	2.40	-2.37	-0.40
15,522.00	89.25	175.63	11,263.60	-4,538.03	353.52	4,551.77	1.33	-0.93	-0.94
15,585.00	88.99	175.41	11,264.57	-4,600.83	358.44	4,614.77	0.54	-0.41	-0.35
Last Phoenix MWD Survey									
15,642.00	88.99	175.41	11,265.57	-4,657.63	363.00	4,671.76	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)	
1,154.00	1,153.88	4.26	-9.41	Tie-on to MS Gyro Survey
1,376.00	1,375.84	8.31	-10.29	First Phoenix MWD Survey
15,585.00	11,264.57	-4,600.83	358.44	Last Phoenix MWD Survey
15,642.00	11,265.57	-4,657.63	363.00	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



August 20, 2014

Chevron North America Exploration
Attention: Regulatory Department
1400 Smith Street
Houston, TX 77002

Re: Chevron North America Exploration
Gramma Ridge 14-24-34 #2H
Lea County, NM
API #30-025-41731
Job No. 1410440

Dear Regulatory Department;

Phoenix Technology Services, Inc. has filed the survey certification, surveys, and lease plat for the above referenced well with the State of New Mexico Oil Conservation Division – District 1 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	
Zak Dawson	2H	1,376	15,585	06/18/14	07/04/14	MWD

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

Best Regards,

Dana Robinson

Dana Robinson
Operations Administrator

PHOENIX TECHNOLOGY SERVICES SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1410440

OPERATOR Chevron

WELL NAME Gramma Ridge 14-24-34 #2H

COUNTY & STATE

Lea County, NM

API WELL NUMBER	30-025-41731
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PROPOSED DIRECTION	175.57
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TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
1,154 ft	1153.88 ft	0.90	2.57	4.26	-9.41	GYRO

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
18-Jun-14	1,376 ft	1.29	337.57

SURVEY INSTRUMENT TYPE
APS/QDT

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
4-Jul-14	15,585 ft	88.99	175.41

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
4-Jul-14	15,642 ft	88.99	175.41

Zak Dawson

PRINT YOUR NAME ABOVE

Zak Dawson

SIGN YOUR NAME ABOVE

7/5/2014

TODAY'S DATE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	6.69
DECLINATION OR GRID	GRID

MWD SUPERVISOR 1 Zak Dawson

DIRECTIONAL DRILLER 1

Keith Scheppler

MWD SUPERVISOR 2 Brian Pina

DIRECTIONAL DRILLER 2

Craig Cannon

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