



HOBBS OCD

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Chevron

Lea County NM (NAD27 NME)

Brininstool 25-23-33 USA

#2H

WB1/Job #1410164

Survey: Phoenix WB1 MWD Survey

Phoenix Final Survey Report

12 March, 2014





Phoenix Technology Services
Phoenix Final Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #2H
Project:	Lea County NM (NAD27 NME)	TVD Reference:	KB @ 3666.50usft (Ensign 153)
Site:	Brininstool 25-23-33 USA	MD Reference:	KB @ 3666.50usft (Ensign 153)
Well:	#2H	North Reference:	Grid
Wellbore:	WB1/Job #1410164	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	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	Brininstool 25-23-33 USA		
Site Position:		Northing:	467,370.00 usft
From:	Map	Easting:	748,971.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 16' 56.44870 N
		Longitude:	103° 31' 39.79327 W
		Grid Convergence:	0.43 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 56.44870 N
		Longitude:	103° 31' 39.79327 W
		Ground Level:	3,642.00 usft

Wellbore	WB1/Job #1410164				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	02/07/14	7.24	60.18	48,389

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	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	179.53

Survey Program	Date 03/12/14			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	1,346.00	Gyro Surveys (WB1/Job #1410164)	MWD	MWD - Standard
1,473.00	11,340.00	Phoenix WB1 MWD Survey (WB1/Job #14)	MWD	MWD - Standard

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	
1,346.00	0.03	97.67		1,345.92	-2.20	-11.79	2.10		0.00
1,473.00	0.60	92.80		1,472.92	-2.24	-11.09	2.15		0.45
1,652.00	0.60	67.00		1,651.91	-1.92	-9.29	1.84		0.15
1,831.00	0.80	75.40		1,830.90	-1.24	-7.22	1.18		0.13
2,010.00	1.20	79.50		2,009.87	-0.58	-4.17	0.54		0.23
2,189.00	1.40	77.80		2,188.82	0.23	-0.19	-0.23		0.11
2,368.00	1.60	75.40		2,367.76	1.32	4.37	-1.28		0.12
2,546.00	1.90	72.70		2,545.68	2.82	9.59	-2.74		0.17
2,725.00	2.40	70.10		2,724.55	4.98	15.95	-4.85		0.28
2,904.00	2.80	67.70		2,903.37	7.91	23.52	-7.72		0.23
3,083.00	1.70	89.70		3,082.23	9.59	30.22	-9.34		0.77



Phoenix Technology Services
Phoenix Final Survey Report



Company: Chevron
Project: Lea County NM (NAD27 NME)
Site: Brininstool 25-23-33 USA
Well: #2H
Wellbore: WB1/Job #1410164
Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3666.50usft (Ensign 153)
MD Reference: KB @ 3666.50usft (Ensign 153)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,262.00	1.90	82.90	3,261.14	9.97	35.82	-9.67	0.16
3,440.00	2.20	83.40	3,439.03	10.72	42.14	-10.38	0.17
3,619.00	1.50	74.00	3,617.93	11.77	47.81	-11.37	0.42
3,798.00	1.60	56.90	3,796.87	13.78	52.15	-13.35	0.26
3,977.00	2.00	60.90	3,975.78	16.66	56.97	-16.19	0.23
4,156.00	2.30	67.10	4,154.65	19.58	63.01	-19.06	0.21
4,335.00	3.00	74.10	4,333.46	22.26	70.83	-21.68	0.43
4,514.00	1.40	135.70	4,512.34	21.98	76.86	-21.34	1.47
4,693.00	1.80	126.30	4,691.27	18.75	80.65	-18.08	0.27
4,872.00	2.90	120.80	4,870.12	14.76	86.81	-14.05	0.63
5,051.00	1.40	68.90	5,049.00	13.23	92.74	-12.47	1.29
5,094.00	1.30	73.30	5,091.99	13.56	93.69	-12.79	0.33
5,289.00	1.20	79.70	5,286.95	14.56	97.82	-13.76	0.09
5,468.00	1.20	76.10	5,465.91	15.35	101.49	-14.51	0.04
5,647.00	1.00	37.10	5,644.88	17.04	104.25	-16.19	0.42
5,826.00	1.10	48.50	5,823.85	19.43	106.48	-18.55	0.13
6,005.00	1.20	44.40	6,002.81	21.91	109.08	-21.01	0.07
6,183.00	0.50	107.60	6,180.79	23.00	111.12	-22.09	0.60
6,362.00	0.80	136.10	6,359.78	21.87	112.73	-20.94	0.24
6,541.00	1.20	301.60	6,538.77	21.95	112.00	-21.03	1.11
6,720.00	1.50	295.80	6,717.72	23.95	108.29	-23.06	0.18
6,900.00	1.10	288.00	6,897.67	25.51	104.53	-24.65	0.24
7,079.00	1.10	291.90	7,076.64	26.68	101.30	-25.85	0.04
7,258.00	1.60	265.60	7,255.59	27.13	97.22	-26.33	0.44
7,437.00	1.80	255.80	7,434.51	26.25	92.00	-25.49	0.20
7,616.00	1.80	219.50	7,613.43	23.39	87.49	-22.67	0.63
7,795.00	1.70	207.80	7,792.35	18.87	84.46	-18.18	0.21
7,974.00	2.20	209.10	7,971.24	13.52	81.55	-12.85	0.28
8,153.00	2.20	195.60	8,150.11	7.21	78.96	-6.56	0.29
8,332.00	2.00	182.90	8,328.99	0.78	77.87	-0.14	0.28
8,511.00	2.20	167.60	8,507.88	-5.69	78.45	6.34	0.33
8,690.00	2.20	151.60	8,686.75	-12.07	80.82	12.74	0.34
8,869.00	2.80	129.10	8,865.58	-17.85	85.85	18.56	0.64
9,047.00	2.20	111.30	9,043.41	-21.84	92.41	22.59	0.55
9,226.00	2.80	116.20	9,222.24	-25.01	99.53	25.83	0.36
9,405.00	4.60	104.50	9,400.86	-28.74	110.41	29.65	1.09
9,583.00	5.40	97.80	9,578.18	-31.67	125.62	32.69	0.56
9,762.00	6.60	106.30	9,756.20	-35.70	143.83	36.87	0.83
9,941.00	5.30	119.00	9,934.24	-42.59	160.94	43.91	1.03
9,988.00	5.10	117.90	9,981.05	-44.62	164.68	45.97	0.48
10,167.00	5.80	109.20	10,159.24	-51.32	180.26	52.80	0.60
10,346.00	2.80	118.00	10,337.72	-56.35	192.66	57.93	1.71
10,524.00	3.00	109.10	10,515.49	-59.91	200.90	61.56	0.28
10,703.00	4.30	105.40	10,694.13	-63.23	211.80	64.96	0.74



Phoenix Technology Services
Phoenix Final Survey Report



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Site: Brininstool 25-23-33 USA
Well: #2H
Wellbore: WB1/Job #1410164
Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3666.50usft (Ensign 153)
MD Reference: KB @ 3666.50usft (Ensign 153)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: GCR DB

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
10,882.00	3.80	112.70	10,872.68	-67.30	223.74	69.13	0.40
11,061.00	3.40	107.50	11,051.33	-71.18	234.28	73.10	0.29
11,188.00	6.60	113.90	11,177.83	-75.27	244.54	77.28	2.55
11,288.00	8.50	119.10	11,276.96	-81.20	256.26	83.30	2.02
11,340.00	8.50	119.10	11,328.39	-84.94	262.97	87.09	0.00
PTB,WB1							

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,340.00	11,328.39	-84.94	262.97	PTB,WB1

Checked By: _____ Approved By: _____ Date: _____



Chevron

Lea County NM (NAD27 NME)

Brininstool 25-23-33 USA

#2H

WB2/Job #1410164

Survey: Phoenix WB2 MWD Survey

Phoenix Final Survey Report

12 March, 2014





Phoenix Technology Services
Phoenix Final Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #2H
Project:	Lea County NM (NAD27 NME)	TVD Reference:	KB @ 3666.50usft (Ensign 153)
Site:	Brininstool 25-23-33 USA	MD Reference:	KB @ 3666.50usft (Ensign 153)
Well:	#2H	North Reference:	Grid
Wellbore:	WB2/Job #1410164	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	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	Brininstool 25-23-33 USA		
Site Position:		Northing:	467,370.00 usft
From:	Map	Easting:	748,971.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 16' 56.44870 N
		Longitude:	103° 31' 39.79327 W
		Grid Convergence:	0.43 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 56.44870 N
		Longitude:	103° 31' 39.79327 W
		Ground Level:	3,642.00 usft

Wellbore	WB2/Job #1410164				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	02/07/14	7.24	60.18	48,389

Design	Surveys (Ensign 153)			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 10,524.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	179.43

Survey Program	Date 03/12/14			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	1,346.00	Gyro Surveys (WB1/Job #1410164)	MWD	MWD - Standard
1,473.00	10,524.00	Phoenix WB1 MWD Survey (WB1/Job #14)	MWD	MWD - Standard
10,524.00	15,630.00	Phoenix WB2 MWD Survey (WB2/Job #14)	MWD	MWD - Standard

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
10,524.00	3.00	109.10	10,515.49	-59.91	200.90	61.92	0.00
Tie-on to WB1							
10,600.00	6.10	163.80	10,591.27	-64.44	203.91	66.48	6.58
First Phoenix MWD Survey							
10,644.00	9.10	170.70	10,634.88	-70.12	205.13	72.17	7.11
10,689.00	13.40	175.60	10,679.01	-78.84	206.10	80.90	9.78
10,734.00	18.20	177.40	10,722.30	-91.07	206.82	93.13	10.72
10,779.00	22.30	176.50	10,764.51	-106.61	207.66	108.68	9.14
10,823.00	27.00	176.10	10,804.49	-124.92	208.85	127.00	10.69
10,867.00	33.80	177.30	10,842.41	-147.14	210.11	149.23	15.52



Phoenix Technology Services
Phoenix Final Survey Report



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Project: Lea County NM (NAD27 NME)
Site: Brininstool 25-23-33 USA
Well: #2H
Wellbore: WB2/Job #1410164
Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #2H
TVD Reference: KB @ 3666.50usft (Ensign 153)
MD Reference: KB @ 3666.50usft (Ensign 153)
North Reference: Grid
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Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
10,912.00	41.20	180.10	10,878.09	-174.50	210.67	176.60	16.87
10,957.00	46.20	185.80	10,910.63	-205.51	209.00	207.59	14.14
11,002.00	52.00	193.00	10,940.10	-239.00	203.36	241.02	17.66
11,046.00	59.30	197.20	10,964.92	-274.02	193.86	275.94	18.36
11,091.00	67.60	200.40	10,985.02	-312.07	180.86	313.86	19.51
11,138.00	75.70	203.00	10,999.81	-353.47	164.36	355.10	18.01
11,183.00	78.20	203.30	11,009.97	-393.78	147.12	395.23	5.59
11,228.00	80.40	202.90	11,018.32	-434.45	129.78	435.72	4.97
11,272.00	82.20	202.80	11,024.98	-474.52	112.89	475.63	4.10
11,317.00	83.30	202.50	11,030.66	-515.72	95.70	516.65	2.53
11,362.00	85.30	200.70	11,035.13	-557.35	79.22	558.11	5.97
11,407.00	88.20	198.00	11,037.68	-599.73	64.33	600.35	8.80
11,451.00	92.30	194.50	11,037.48	-641.96	52.03	642.45	12.25
11,496.00	91.90	192.10	11,035.84	-685.72	41.68	686.10	5.40
11,586.00	91.60	189.30	11,033.09	-774.10	24.98	774.32	3.13
11,675.00	91.70	186.20	11,030.52	-862.24	12.99	862.33	3.48
11,764.00	91.20	183.60	11,028.27	-950.88	5.39	950.89	2.97
11,854.00	90.20	180.70	11,027.17	-1,040.80	2.01	1,040.77	3.41
11,943.00	92.00	178.40	11,025.46	-1,129.77	2.71	1,129.74	3.28
12,033.00	92.60	177.50	11,021.85	-1,219.64	5.93	1,219.64	1.20
12,122.00	92.90	176.80	11,017.58	-1,308.43	10.35	1,308.47	0.85
12,212.00	91.80	178.30	11,013.89	-1,398.27	14.19	1,398.34	2.07
12,301.00	91.70	178.30	11,011.17	-1,487.19	16.83	1,487.28	0.11
12,390.00	92.50	180.30	11,007.91	-1,576.11	17.92	1,576.21	2.42
12,479.00	93.10	180.00	11,003.56	-1,665.01	17.68	1,665.10	0.75
12,569.00	93.40	179.20	10,998.46	-1,754.86	18.31	1,754.95	0.95
12,658.00	92.00	180.00	10,994.27	-1,843.76	18.93	1,843.85	1.81
12,748.00	91.70	179.40	10,991.36	-1,933.71	19.40	1,933.80	0.75
12,837.00	92.10	178.60	10,988.41	-2,022.64	20.95	2,022.75	1.00
12,927.00	92.40	178.10	10,984.88	-2,112.54	23.54	2,112.67	0.65
13,016.00	93.00	178.70	10,980.69	-2,201.40	26.03	2,201.55	0.95
13,105.00	91.70	180.20	10,977.04	-2,290.32	26.88	2,290.47	2.23
13,194.00	91.80	180.60	10,974.32	-2,379.27	26.26	2,379.42	0.46
13,284.00	90.00	182.20	10,972.90	-2,469.23	24.06	2,469.35	2.68
13,374.00	89.70	182.30	10,973.14	-2,559.16	20.53	2,559.24	0.35
13,463.00	89.90	182.20	10,973.45	-2,648.09	17.03	2,648.13	0.25
13,553.00	90.70	180.80	10,972.98	-2,738.06	14.68	2,738.07	1.79
13,642.00	91.00	180.70	10,971.66	-2,827.04	13.51	2,827.03	0.36
13,732.00	91.10	180.10	10,970.01	-2,917.02	12.88	2,917.00	0.68
13,821.00	92.00	179.60	10,967.60	-3,005.99	13.12	3,005.97	1.16
13,910.00	92.30	179.80	10,964.26	-3,094.92	13.58	3,094.90	0.41
14,000.00	92.70	179.70	10,960.34	-3,184.84	13.97	3,184.82	0.46
14,089.00	92.80	179.60	10,956.07	-3,273.73	14.52	3,273.71	0.16
14,179.00	91.70	179.90	10,952.53	-3,363.66	14.91	3,363.64	1.27



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Site: Brininstool 25-23-33 USA
Well: #2H
Wellbore: WB2/Job #1410164
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Local Co-ordinate Reference: Well #2H
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North Reference: Grid
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
14,268.00	89.50	180.20	10,951.60	-3,452.65	14.83	3,452.63	2.49
14,358.00	88.90	180.30	10,952.86	-3,542.64	14.44	3,542.61	0.68
14,447.00	89.30	179.60	10,954.26	-3,631.63	14.52	3,631.59	0.91
14,537.00	89.40	180.00	10,955.28	-3,721.62	14.83	3,721.58	0.46
14,626.00	89.00	179.50	10,956.52	-3,810.61	15.22	3,810.57	0.72
14,715.00	88.90	179.30	10,958.15	-3,899.59	16.15	3,899.56	0.25
14,805.00	89.20	179.60	10,959.64	-3,989.57	17.01	3,989.55	0.47
14,894.00	89.60	179.60	10,960.58	-4,078.57	17.64	4,078.54	0.45
14,984.00	89.80	179.10	10,961.05	-4,168.56	18.66	4,168.54	0.60
15,073.00	90.30	178.50	10,960.97	-4,257.54	20.52	4,257.53	0.88
15,163.00	90.20	178.00	10,960.58	-4,347.50	23.27	4,347.51	0.57
15,252.00	89.80	176.80	10,960.58	-4,436.40	27.31	4,436.45	1.42
15,342.00	90.20	177.70	10,960.58	-4,526.30	31.62	4,526.39	1.09
15,431.00	90.40	177.30	10,960.11	-4,615.21	35.51	4,615.34	0.50
15,521.00	90.50	176.20	10,959.40	-4,705.06	40.61	4,705.23	1.23
15,574.00	90.50	176.00	10,958.94	-4,757.94	44.21	4,758.14	0.38
Last Phoenix MWD Survey							
15,630.00	90.50	176.00	10,958.45	-4,813.80	48.12	4,814.04	0.00
Projection to TD							

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,524.00	10,515.49	-59.91	200.90	Tie-on to WB1
10,600.00	10,591.27	-64.44	203.91	First Phoenix MWD Survey
15,574.00	10,958.94	-4,757.94	44.21	Last Phoenix MWD Survey
15,630.00	10,958.45	-4,813.80	48.12	Projection to TD

Checked By: _____ Approved By: _____ Date: _____