



30-025-42636

Marathon
BC Operating, Inc.

Lea County, NM (NAD27 NME)
Battle 34 Federal
4H

OH / Job #61199

HOBBS OCD

APR 16 2018

RECEIVED

Survey: Phoenix MWD Surveys

Standard Survey Report

04 June, 2017

HOBBS OCD
APR 1 2018
RECEIVED



Company:	BC Operating, Inc.	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Site:	Battle 34 Federal	MD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Well:	4H	North Reference:	Grid
Wellbore:	OH / Job #61199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	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		Battle 34 Federal			
Site Position:		Northing:	525,599.65 usft	Latitude:	32° 26' 33.42596 N
From:	Map	Easting:	738,250.29 usft	Longitude:	103° 33' 39.77261 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.41 °

Well	4H					
Well Position	+N-S	0.00 usft	Northing:	525,719.42 usft	Latitude:	32° 26' 34.70534 N
	+E-W	0.00 usft	Easting:	736,929.66 usft	Longitude:	103° 33' 55.17227 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,671.00 usft	

Wellbore	OH / Job #61199				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/17/2017	6.85	60.37	48,305

Design	Surveys (Patterson 244)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	179.92	

Survey Program	Date 6/4/2017				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
83.21	1,610.00	Phoenix Gyro Surveys (OH / Job #61199)	SPT_GTD	Continuous north-seeking gyro	
1,610.00	15,953.00	Phoenix MWD Surveys (OH / Job #61199)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)	
1,610.00	2.19	224.98	1,609.69	-14.32	-20.63	14.29	0.00	0.00	0.00	
Tie In										
1,699.00	2.19	217.99	1,698.62	-16.86	-22.88	16.83	0.30	0.00	-7.85	
First Phoenix MWD Survey										
1,793.00	0.56	210.63	1,792.59	-18.67	-24.22	18.64	1.74	-1.73	-7.83	
1,887.00	0.44	187.97	1,886.59	-19.42	-24.50	19.39	0.24	-0.13	-24.11	
1,981.00	0.97	309.29	1,980.58	-19.28	-25.17	19.24	1.34	0.56	129.06	
2,076.00	0.82	303.53	2,075.57	-18.39	-26.36	18.36	0.18	-0.16	-6.06	
2,170.00	1.45	355.78	2,169.56	-16.83	-27.01	16.80	1.22	0.67	55.59	

Company:	BC Operating, Inc.	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Site:	Battle 34 Federal	MD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Well:	4H	North Reference:	Grid
Wellbore:	OH / Job #61199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

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)	
2,264.00	1.39	350.49	2,263.53	-14.52	-27.28	14.49	0.15	-0.06	-5.63	
2,359.00	1.36	358.40	2,358.50	-12.26	-27.50	12.22	0.20	-0.03	8.33	
2,453.00	1.25	0.42	2,452.48	-10.12	-27.53	10.08	0.13	-0.12	2.15	
2,547.00	1.21	2.64	2,546.45	-8.10	-27.48	8.07	0.07	-0.04	2.36	
2,641.00	1.41	0.56	2,640.43	-5.96	-27.42	5.92	0.22	0.21	-2.21	
2,736.00	1.35	14.39	2,735.40	-3.70	-27.13	3.67	0.36	-0.06	14.56	
2,830.00	1.59	28.24	2,829.37	-1.48	-26.24	1.44	0.45	0.26	14.73	
2,924.00	1.65	31.26	2,923.33	0.82	-24.92	-0.86	0.11	0.06	3.21	
3,018.00	1.55	38.36	3,017.30	2.98	-23.43	-3.01	0.24	-0.11	7.55	
3,112.00	1.31	41.11	3,111.27	4.78	-21.93	-4.82	0.27	-0.26	2.93	
3,207.00	1.50	47.35	3,206.24	6.45	-20.30	-6.47	0.26	0.20	6.57	
3,300.00	1.58	48.57	3,299.21	8.12	-18.45	-8.14	0.09	0.09	1.31	
3,394.00	0.61	29.19	3,393.19	9.41	-17.23	-9.44	1.09	-1.03	-20.62	
3,488.00	0.85	6.87	3,487.18	10.54	-16.90	-10.57	0.39	0.26	-23.74	
3,580.00	0.75	5.52	3,579.17	11.82	-16.76	-11.84	0.11	-0.11	-1.47	
3,675.00	0.81	354.84	3,674.16	13.11	-16.76	-13.13	0.17	0.06	-11.24	
3,769.00	0.83	1.76	3,768.15	14.45	-16.80	-14.47	0.11	0.02	7.36	
3,864.00	0.92	353.54	3,863.14	15.89	-16.87	-15.92	0.16	0.09	-8.65	
3,958.00	0.80	341.40	3,957.13	17.27	-17.16	-17.29	0.23	-0.13	-12.91	
4,053.00	0.54	312.94	4,052.13	18.20	-17.70	-18.22	0.44	-0.27	-29.96	
4,147.00	0.71	321.67	4,146.12	18.96	-18.39	-18.98	0.21	0.18	9.29	
4,241.00	0.90	306.20	4,240.11	19.85	-19.34	-19.88	0.31	0.20	-16.46	
4,335.00	1.00	308.01	4,334.10	20.79	-20.58	-20.82	0.11	0.11	1.93	
4,430.00	0.96	299.27	4,429.08	21.69	-21.93	-21.72	0.16	-0.04	-9.20	
4,524.00	1.30	288.95	4,523.07	22.42	-23.63	-22.46	0.42	0.36	-10.98	
4,618.00	1.21	287.15	4,617.04	23.06	-25.58	-23.10	0.10	-0.10	-1.91	
4,712.00	1.21	282.01	4,711.02	23.56	-27.50	-23.60	0.12	0.00	-5.47	
4,807.00	1.57	334.04	4,806.00	24.94	-29.05	-24.98	1.33	0.38	54.77	
4,900.00	1.74	334.63	4,898.96	27.36	-30.22	-27.40	0.18	0.18	0.63	
4,994.00	0.68	312.81	4,992.94	29.03	-31.24	-29.07	1.21	-1.13	-23.21	
5,089.00	0.63	305.68	5,087.93	29.72	-32.08	-29.76	0.10	-0.05	-7.51	
5,182.00	0.56	294.06	5,180.93	30.20	-32.91	-30.25	0.15	-0.08	-12.49	
5,277.00	0.51	294.53	5,275.92	30.57	-33.71	-30.61	0.05	-0.05	0.49	
5,304.00	0.51	301.58	5,302.92	30.68	-33.93	-30.73	0.23	0.00	26.11	
5,369.00	0.57	303.34	5,367.92	31.01	-34.44	-31.06	0.10	0.09	2.71	
5,464.00	0.53	309.50	5,462.91	31.55	-35.18	-31.60	0.08	-0.04	6.48	
5,558.00	0.54	288.49	5,556.91	31.96	-35.93	-32.01	0.21	0.01	-22.35	
5,652.00	0.67	297.62	5,650.90	32.36	-36.84	-32.41	0.17	0.14	9.71	
5,747.00	0.54	285.11	5,745.90	32.73	-37.76	-32.79	0.19	-0.14	-13.17	
5,842.00	0.57	287.82	5,840.89	32.99	-38.65	-33.05	0.04	0.03	2.85	
5,936.00	0.61	302.64	5,934.89	33.41	-39.51	-33.46	0.17	0.04	15.77	
6,031.00	0.61	283.67	6,029.88	33.80	-40.43	-33.86	0.21	0.00	-19.97	
6,125.00	0.51	278.74	6,123.88	33.98	-41.33	-34.04	0.12	-0.11	-5.24	

Company:	BC Operating, Inc.	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Site:	Battle 34 Federal	MD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Well:	4H	North Reference:	Grid
Wellbore:	OH / Job #61199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

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)	
6,220.00	0.60	290.19	6,218.87	34.22	-42.21	-34.28	0.15	0.09	12.05	
6,314.00	0.67	282.10	6,312.87	34.50	-43.21	-34.56	0.12	0.07	-8.61	
6,409.00	0.65	294.64	6,407.86	34.84	-44.25	-34.91	0.15	-0.02	13.20	
6,504.00	0.48	294.97	6,502.86	35.24	-45.10	-35.30	0.18	-0.18	0.35	
6,597.00	0.57	299.32	6,595.85	35.63	-45.85	-35.69	0.11	0.10	4.68	
6,691.00	0.49	279.56	6,689.85	35.92	-46.66	-35.99	0.21	-0.09	-21.02	
6,785.00	0.56	280.77	6,783.85	36.08	-47.50	-36.14	0.08	0.07	1.29	
6,880.00	0.65	284.53	6,878.84	36.30	-48.48	-36.37	0.10	0.09	3.96	
6,975.00	0.57	279.56	6,973.84	36.51	-49.47	-36.58	0.10	-0.08	-5.23	
7,069.00	0.51	262.78	7,067.83	36.54	-50.35	-36.61	0.18	-0.06	-17.85	
7,164.00	0.54	241.85	7,162.83	36.27	-51.16	-36.34	0.20	0.03	-22.03	
7,258.00	1.39	15.68	7,256.82	37.16	-51.24	-37.23	1.92	0.90	142.37	
7,352.00	1.10	22.51	7,350.80	39.09	-50.59	-39.16	0.35	-0.31	7.27	
7,447.00	0.89	17.27	7,445.78	40.64	-50.02	-40.71	0.24	-0.22	-5.52	
7,541.00	0.62	18.74	7,539.77	41.82	-49.64	-41.89	0.29	-0.29	1.56	
7,635.00	0.50	40.11	7,633.77	42.61	-49.21	-42.68	0.25	-0.13	22.73	
7,729.00	0.36	59.21	7,727.77	43.08	-48.69	-43.15	0.21	-0.15	20.32	
7,823.00	0.31	69.59	7,821.77	43.32	-48.20	-43.38	0.08	-0.05	11.04	
7,918.00	0.48	98.89	7,916.76	43.35	-47.57	-43.41	0.27	0.18	30.84	
8,012.00	0.54	88.57	8,010.76	43.30	-46.74	-43.36	0.12	0.06	-10.98	
8,107.00	0.46	82.33	8,105.76	43.36	-45.91	-43.42	0.10	-0.08	-6.57	
8,201.00	0.34	88.91	8,199.75	43.41	-45.26	-43.48	0.14	-0.13	7.00	
8,296.00	0.35	99.62	8,294.75	43.37	-44.69	-43.43	0.07	0.01	11.27	
8,390.00	0.21	142.40	8,388.75	43.19	-44.30	-43.25	0.26	-0.15	45.51	
8,485.00	0.28	115.45	8,483.75	42.95	-43.99	-43.01	0.14	0.07	-28.37	
8,578.00	0.34	140.32	8,576.75	42.64	-43.61	-42.70	0.16	0.06	26.74	
8,672.00	1.06	335.14	8,670.74	43.21	-43.79	-43.27	1.48	0.77	-175.72	
8,767.00	0.84	345.77	8,765.73	44.69	-44.33	-44.75	0.30	-0.23	11.19	
8,861.00	0.78	319.41	8,859.72	45.84	-44.92	-45.90	0.40	-0.06	-28.04	
8,955.00	1.14	302.51	8,953.71	46.83	-46.12	-46.89	0.48	0.38	-17.98	
9,049.00	1.49	315.05	9,047.68	48.19	-47.78	-48.26	0.48	0.37	13.34	
9,144.00	1.82	339.03	9,142.65	50.48	-49.19	-50.55	0.80	0.35	25.24	
9,238.00	1.34	329.02	9,236.61	52.81	-50.29	-52.88	0.59	-0.51	-10.65	
9,332.00	1.03	291.75	9,330.59	54.07	-51.64	-54.14	0.86	-0.33	-39.65	
9,426.00	0.61	263.91	9,424.58	54.33	-52.92	-54.40	0.60	-0.45	-29.62	
9,521.00	0.72	125.64	9,519.58	53.93	-52.94	-54.00	1.31	0.12	-145.55	
9,615.00	1.00	123.07	9,613.57	53.14	-51.77	-53.21	0.30	0.30	-2.73	
9,709.00	1.36	148.82	9,707.55	51.73	-50.51	-51.80	0.67	0.38	27.39	
9,803.00	0.95	156.30	9,801.53	50.07	-49.62	-50.14	0.46	-0.44	7.96	
9,897.00	0.71	157.44	9,895.52	48.81	-49.08	-48.88	0.26	-0.26	1.21	
9,992.00	1.31	137.34	9,990.51	47.47	-48.12	-47.54	0.72	0.63	-21.16	
10,099.00	1.31	136.96	10,097.48	45.68	-46.45	-45.74	0.01	0.00	-0.36	
10,193.00	1.25	138.97	10,191.45	44.12	-45.05	-44.18	0.08	-0.06	2.14	
10,287.00	1.30	136.49	10,285.43	42.57	-43.64	-42.63	0.08	0.05	-2.64	

Company:	BC Operating, Inc.	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Site:	Battle 34 Federal	MD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Well:	4H	North Reference:	Grid
Wellbore:	OH / Job #61199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

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)
10,382.00	1.27	157.02	10,380.41	40.82	-42.49	-40.88	0.48	-0.03	21.61
10,429.00	6.03	163.49	10,427.30	37.97	-41.58	-38.03	10.15	10.13	13.77
10,476.00	12.81	169.62	10,473.64	30.47	-39.94	-30.53	14.56	14.43	13.04
10,524.00	16.37	174.06	10,520.08	18.51	-38.28	-18.56	7.77	7.42	9.25
10,571.00	21.37	175.92	10,564.55	3.37	-36.98	-3.42	10.71	10.64	3.96
10,619.00	26.49	176.39	10,608.40	-16.05	-35.69	16.00	10.67	10.67	0.98
10,665.00	29.80	178.81	10,648.96	-37.72	-34.80	37.68	7.61	7.20	5.26
10,712.00	33.86	181.75	10,688.89	-62.50	-34.96	62.45	9.24	8.64	6.26
10,760.00	38.55	181.12	10,727.61	-90.84	-35.66	90.79	9.80	9.77	-1.31
10,807.00	43.09	180.84	10,763.17	-121.55	-36.18	121.50	9.67	9.66	-0.60
10,853.00	48.30	177.94	10,795.29	-154.44	-35.80	154.39	12.19	11.33	-6.30
10,900.00	53.65	177.83	10,824.87	-190.92	-34.45	190.87	11.38	11.38	-0.23
10,947.00	58.90	179.34	10,850.96	-229.98	-33.50	229.94	11.48	11.17	3.21
10,994.00	64.56	179.75	10,873.21	-271.36	-33.18	271.31	12.07	12.04	0.87
11,041.00	68.72	179.67	10,891.84	-314.50	-32.96	314.45	8.85	8.85	-0.17
11,089.00	71.56	179.97	10,908.15	-359.64	-32.82	359.59	5.95	5.92	0.63
11,136.00	75.55	179.84	10,921.45	-404.70	-32.74	404.66	8.49	8.49	-0.28
11,183.00	78.52	179.85	10,931.99	-450.50	-32.62	450.46	6.32	6.32	0.02
11,230.00	81.09	179.50	10,940.31	-496.75	-32.35	496.71	5.52	5.47	-0.74
11,324.00	87.31	180.32	10,949.81	-590.23	-32.21	590.18	6.67	6.62	0.87
11,417.00	90.16	181.14	10,951.86	-683.19	-33.40	683.14	3.19	3.06	0.88
11,512.00	90.31	179.94	10,951.47	-778.18	-34.29	778.13	1.27	0.16	-1.26
11,606.00	90.18	179.97	10,951.07	-872.18	-34.22	872.13	0.14	-0.14	0.03
11,700.00	89.40	180.70	10,951.41	-966.17	-34.77	966.13	1.14	-0.83	0.78
11,794.00	90.22	180.64	10,951.72	-1,060.17	-35.87	1,060.12	0.87	0.87	-0.06
11,888.00	89.75	179.86	10,951.75	-1,154.16	-36.28	1,154.11	0.97	-0.50	-0.83
11,983.00	91.30	179.94	10,950.88	-1,249.16	-36.11	1,249.11	1.63	1.63	0.08
12,077.00	88.74	180.13	10,950.85	-1,343.15	-36.17	1,343.10	2.73	-2.72	0.20
12,172.00	90.11	179.75	10,951.80	-1,438.14	-36.07	1,438.09	1.50	1.44	-0.40
12,266.00	88.92	179.38	10,952.59	-1,532.13	-35.35	1,532.08	1.33	-1.27	-0.39
12,361.00	89.10	179.10	10,954.24	-1,627.11	-34.09	1,627.06	0.35	0.19	-0.29
12,456.00	89.73	178.87	10,955.21	-1,722.09	-32.41	1,722.04	0.71	0.66	-0.24
12,551.00	89.31	179.65	10,956.00	-1,817.08	-31.18	1,817.03	0.93	-0.44	0.82
12,645.00	90.94	179.56	10,955.80	-1,911.07	-30.54	1,911.03	1.74	1.73	-0.10
12,739.00	90.72	179.51	10,954.44	-2,005.06	-29.77	2,005.02	0.24	-0.23	-0.05
12,834.00	89.39	179.15	10,954.34	-2,100.05	-28.66	2,100.01	1.45	-1.40	-0.38
12,929.00	90.34	178.47	10,954.57	-2,195.03	-26.69	2,194.99	1.23	1.00	-0.72
13,023.00	88.74	178.26	10,955.32	-2,288.99	-24.01	2,288.95	1.72	-1.70	-0.22
13,118.00	90.02	177.63	10,956.35	-2,383.92	-20.60	2,383.89	1.50	1.35	-0.66
13,212.00	89.64	179.01	10,956.63	-2,477.87	-17.85	2,477.85	1.52	-0.40	1.47
13,306.00	90.38	178.76	10,956.61	-2,571.85	-16.02	2,571.83	0.83	0.79	-0.27
13,401.00	86.69	179.13	10,959.04	-2,666.79	-14.27	2,666.77	3.90	-3.88	0.39
13,495.00	86.98	179.02	10,964.23	-2,760.63	-12.75	2,760.61	0.33	0.31	-0.12

Company:	BC Operating, Inc.	Local Co-ordinate Reference:	Well 4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Site:	Battle 34 Federal	MD Reference:	GL + KB @ 3699.50usft (Patterson 244)
Well:	4H	North Reference:	Grid
Wellbore:	OH / Job #61199	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Patterson 244)	Database:	Compass 5000 GCR

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)	
13,589.00	90.17	178.45	10,966.57	-2,854.57	-10.68	2,854.55	3.45	3.39	-0.61	
13,683.00	89.08	178.88	10,967.18	-2,948.54	-8.49	2,948.53	1.25	-1.16	0.46	
13,778.00	89.12	178.88	10,968.68	-3,043.51	-6.63	3,043.50	0.04	0.04	0.00	
13,872.00	90.71	178.76	10,968.82	-3,137.49	-4.70	3,137.48	1.70	1.69	-0.13	
13,992.00	89.11	179.57	10,969.00	-3,257.47	-2.95	3,257.46	1.49	-1.33	0.68	
14,087.00	88.26	179.33	10,971.18	-3,352.44	-2.04	3,352.43	0.93	-0.89	-0.25	
14,139.00	88.25	179.35	10,972.77	-3,404.41	-1.44	3,404.41	0.04	-0.02	0.04	
14,275.00	88.26	178.66	10,976.91	-3,540.33	0.92	3,540.33	0.51	0.01	-0.51	
14,369.00	91.89	179.11	10,976.79	-3,634.29	2.75	3,634.29	3.89	3.86	0.48	
14,463.00	93.34	179.65	10,972.50	-3,728.19	3.77	3,728.19	1.65	1.54	0.57	
14,558.00	91.41	180.44	10,968.56	-3,823.10	3.69	3,823.10	2.19	-2.03	0.83	
14,652.00	87.98	179.66	10,969.06	-3,917.08	3.61	3,917.09	3.74	-3.65	-0.83	
14,747.00	87.57	179.18	10,972.75	-4,012.01	4.57	4,012.01	0.66	-0.43	-0.51	
14,841.00	88.28	178.02	10,976.15	-4,105.92	6.87	4,105.92	1.45	0.76	-1.23	
14,936.00	88.69	177.60	10,978.66	-4,200.81	10.50	4,200.82	0.62	0.43	-0.44	
15,030.00	90.99	178.53	10,978.93	-4,294.75	13.67	4,294.77	2.64	2.45	0.99	
15,124.00	91.84	178.68	10,976.61	-4,388.69	15.96	4,388.71	0.92	0.90	0.16	
15,218.00	90.91	178.58	10,974.35	-4,482.64	18.20	4,482.66	1.00	-0.99	-0.11	
15,313.00	88.47	177.65	10,974.86	-4,577.58	21.33	4,577.60	2.75	-2.57	-0.98	
15,406.00	89.48	178.50	10,976.53	-4,670.51	24.45	4,670.54	1.42	1.09	0.91	
15,501.00	90.28	179.29	10,976.73	-4,765.49	26.28	4,765.52	1.18	0.84	0.83	
15,595.00	90.68	175.63	10,975.94	-4,859.38	30.45	4,859.42	3.92	0.43	-3.89	
15,689.00	90.95	176.06	10,974.60	-4,953.12	37.26	4,953.17	0.54	0.29	0.46	
15,784.00	89.99	179.66	10,973.82	-5,048.03	40.81	5,048.09	3.92	-1.01	3.79	
15,879.00	89.86	182.99	10,973.95	-5,143.00	38.61	5,143.04	3.51	-0.14	3.51	
Final Phoenix MWD Survey										
15,953.00	89.86	182.99	10,974.13	-5,216.90	34.75	5,216.94	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)	
1,610.00	1,609.69	-14.32	-20.63	Tie In
1,699.00	1,698.62	-16.86	-22.88	First Phoenix MWD Survey
15,879.00	10,973.95	-5,143.00	38.61	Final Phoenix MWD Survey
15,953.00	10,974.13	-5,216.90	34.75	Projection to TD