



30-005-29082

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MAR 06 2009

HOBBSOCD

Mack Energy

Chaves County

Tom State

Tom State #2

OH

Plan: Plan #1

Pathfinder X & Y Survey Report

17 February, 2009

PATHFINDER
ENERGY SERVICES



Pathfinder X & Y Survey Report

PATHFINDER
ENERGY SERVICES

Company:	Mack Energy	Local Co-ordinate Reference:	Well Tom State #2
Project:	Chaves County	TVD Reference:	WELL @ 4441.00ft (18' RKB)
Site:	Tom State	MD Reference:	WELL @ 4441.00ft (18' RKB)
Well:	Tom State #2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Project:	Chaves County		
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		Tom State									
Site Position:		Northing:		730,635.600 ft		Latitude:		33° 0' 27.082 N			
From:		Map		Easting:		657,750.500 ft		Longitude:		103° 49' 7.496 W	
Position Uncertainty:		0.00 ft		Slot Radius:		"		Grid Convergence:		0.28 °	

Well		Tom State #2				
Well Position	+N/-S	0.00 ft	Northing:	729,295.200 ft	Latitude:	33° 0' 14.040 N
	+E/-W	0.00 ft	Easting:	653,129.300 ft	Longitude:	103° 50' 1.836 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,423.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	02/17/2009	8.03	60.93	49,309

Design		Plan #1		
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	89.74

Survey Tool Program		Date 02/17/2009		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	13,142.72	Plan #1 (OH)	MWD	MWD - Standard



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Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
0.00	0.00	0.00	0.00	-4,441.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
100.00	0.00	0.00	100.00	-4,341.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
200.00	0.00	0.00	200.00	-4,241.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
300.00	0.00	0.00	300.00	-4,141.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
400.00	0.00	0.00	400.00	-4,041.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
500.00	0.00	0.00	500.00	-3,941.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
600.00	0.00	0.00	600.00	-3,841.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
700.00	0.00	0.00	700.00	-3,741.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
800.00	0.00	0.00	800.00	-3,641.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
900.00	0.00	0.00	900.00	-3,541.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,000.00	0.00	0.00	1,000.00	-3,441.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,100.00	0.00	0.00	1,100.00	-3,341.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,200.00	0.00	0.00	1,200.00	-3,241.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,300.00	0.00	0.00	1,300.00	-3,141.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,400.00	0.00	0.00	1,400.00	-3,041.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,500.00	0.00	0.00	1,500.00	-2,941.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,600.00	0.00	0.00	1,600.00	-2,841.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,700.00	0.00	0.00	1,700.00	-2,741.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,800.00	0.00	0.00	1,800.00	-2,641.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
1,900.00	0.00	0.00	1,900.00	-2,541.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,000.00	0.00	0.00	2,000.00	-2,441.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,100.00	0.00	0.00	2,100.00	-2,341.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,200.00	0.00	0.00	2,200.00	-2,241.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,300.00	0.00	0.00	2,300.00	-2,141.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,400.00	0.00	0.00	2,400.00	-2,041.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,500.00	0.00	0.00	2,500.00	-1,941.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,600.00	0.00	0.00	2,600.00	-1,841.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	



Pathfinder X & Y Survey Report



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
2,700.00	0.00	0.00	2,700.00	-1,741.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,800.00	0.00	0.00	2,800.00	-1,641.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
2,900.00	0.00	0.00	2,900.00	-1,541.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,000.00	0.00	0.00	3,000.00	-1,441.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,100.00	0.00	0.00	3,100.00	-1,341.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,200.00	0.00	0.00	3,200.00	-1,241.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,300.00	0.00	0.00	3,300.00	-1,141.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,400.00	0.00	0.00	3,400.00	-1,041.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,500.00	0.00	0.00	3,500.00	-941.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,600.00	0.00	0.00	3,600.00	-841.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,700.00	0.00	0.00	3,700.00	-741.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,800.00	0.00	0.00	3,800.00	-641.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
3,900.00	0.00	0.00	3,900.00	-541.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,000.00	0.00	0.00	4,000.00	-441.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,100.00	0.00	0.00	4,100.00	-341.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,200.00	0.00	0.00	4,200.00	-241.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,300.00	0.00	0.00	4,300.00	-141.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,400.00	0.00	0.00	4,400.00	-41.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,500.00	0.00	0.00	4,500.00	59.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,600.00	0.00	0.00	4,600.00	159.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,700.00	0.00	0.00	4,700.00	259.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,800.00	0.00	0.00	4,800.00	359.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
4,900.00	0.00	0.00	4,900.00	459.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,000.00	0.00	0.00	5,000.00	559.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,100.00	0.00	0.00	5,100.00	659.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,200.00	0.00	0.00	5,200.00	759.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,300.00	0.00	0.00	5,300.00	859.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	



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5,400.00	0.00	0.00	5,400.00	959.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,500.00	0.00	0.00	5,500.00	1,059.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,600.00	0.00	0.00	5,600.00	1,159.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,700.00	0.00	0.00	5,700.00	1,259.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,800.00	0.00	0.00	5,800.00	1,359.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
5,900.00	0.00	0.00	5,900.00	1,459.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,000.00	0.00	0.00	6,000.00	1,559.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,100.00	0.00	0.00	6,100.00	1,659.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,200.00	0.00	0.00	6,200.00	1,759.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,300.00	0.00	0.00	6,300.00	1,859.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,400.00	0.00	0.00	6,400.00	1,959.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,500.00	0.00	0.00	6,500.00	2,059.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,600.00	0.00	0.00	6,600.00	2,159.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,700.00	0.00	0.00	6,700.00	2,259.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,800.00	0.00	0.00	6,800.00	2,359.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
6,900.00	0.00	0.00	6,900.00	2,459.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,000.00	0.00	0.00	7,000.00	2,559.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,100.00	0.00	0.00	7,100.00	2,659.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,200.00	0.00	0.00	7,200.00	2,759.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,300.00	0.00	0.00	7,300.00	2,859.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,400.00	0.00	0.00	7,400.00	2,959.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,500.00	0.00	0.00	7,500.00	3,059.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,600.00	0.00	0.00	7,600.00	3,159.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,700.00	0.00	0.00	7,700.00	3,259.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,800.00	0.00	0.00	7,800.00	3,359.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
7,900.00	0.00	0.00	7,900.00	3,459.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
8,000.00	0.00	0.00	8,000.00	3,559.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	



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8,100.00	0.00	0.00	8,100.00	3,659.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
8,200.00	0.00	0.00	8,200.00	3,759.00	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
8,241.50	0.00	0.00	8,241.50	3,800.50	0.00	0.00	0.00	0.00	729,295.20	653,129.30	
KOP-8241.50°MD,0.00°INC,0.00°AZI											
8,250.00	1.02	89.74	8,250.00	3,809.00	0.00	0.08	0.08	12.00	729,295.20	653,129.38	
8,275.00	4.02	89.74	8,274.97	3,833.97	0.01	1.17	1.17	12.00	729,295.21	653,130.47	
8,300.00	7.02	89.74	8,299.85	3,858.85	0.02	3.58	3.58	12.00	729,295.22	653,132.88	
8,325.00	10.02	89.74	8,324.58	3,883.58	0.03	7.28	7.28	12.00	729,295.23	653,136.58	
8,350.00	13.02	89.74	8,349.07	3,908.07	0.06	12.27	12.27	12.00	729,295.26	653,141.57	
8,375.00	16.02	89.74	8,373.27	3,932.27	0.08	18.54	18.54	12.00	729,295.28	653,147.84	
8,400.00	19.02	89.74	8,397.11	3,956.11	0.12	26.06	26.06	12.00	729,295.32	653,155.36	
8,425.00	22.02	89.74	8,420.52	3,979.52	0.16	34.82	34.82	12.00	729,295.36	653,164.12	
8,450.00	25.02	89.74	8,443.44	4,002.44	0.20	44.80	44.80	12.00	729,295.40	653,174.10	
8,475.00	28.02	89.74	8,465.81	4,024.81	0.25	55.96	55.96	12.00	729,295.45	653,185.26	
8,500.00	31.01	89.74	8,487.56	4,046.56	0.31	68.27	68.27	12.00	729,295.51	653,197.57	
8,525.00	34.01	89.74	8,508.64	4,067.64	0.37	81.71	81.71	12.00	729,295.57	653,211.01	
8,550.00	37.01	89.74	8,528.99	4,087.99	0.44	96.23	96.23	12.00	729,295.64	653,225.53	
8,575.00	40.01	89.74	8,548.54	4,107.54	0.51	111.79	111.80	12.00	729,295.71	653,241.09	
8,600.00	43.01	89.74	8,567.26	4,126.26	0.58	128.36	128.36	12.00	729,295.78	653,257.66	
8,625.00	46.01	89.74	8,585.09	4,144.09	0.66	145.89	145.89	12.00	729,295.86	653,275.19	
8,650.00	49.01	89.74	8,601.97	4,160.97	0.75	164.32	164.32	12.00	729,295.95	653,293.62	
8,675.00	52.01	89.74	8,617.87	4,176.87	0.83	183.61	183.61	12.00	729,296.03	653,312.91	
8,700.00	55.01	89.74	8,632.73	4,191.73	0.92	203.71	203.71	12.00	729,296.12	653,333.01	
8,725.00	58.01	89.74	8,646.53	4,205.53	1.02	224.56	224.56	12.00	729,296.22	653,353.86	
8,750.00	61.01	89.74	8,659.21	4,218.21	1.12	246.10	246.10	12.00	729,296.32	653,375.40	
8,775.00	64.01	89.74	8,670.75	4,229.75	1.22	268.27	268.27	12.00	729,296.42	653,397.57	
8,800.00	67.01	89.74	8,681.11	4,240.11	1.32	291.02	291.02	12.00	729,296.52	653,420.32	



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8,825.00	70.01	89.74	8,690.27	4,249.27	1.43	314.28	314.28	12.00	729,296.63	653,443.58	
8,850.00	73.01	89.74	8,698.20	4,257.20	1.53	337.98	337.99	12.00	729,296.73	653,467.28	
8,875.00	76.01	89.74	8,704.87	4,263.87	1.64	362.07	362.08	12.00	729,296.84	653,491.37	
8,900.00	79.01	89.74	8,710.28	4,269.28	1.75	386.48	386.48	12.00	729,296.95	653,515.78	
8,925.00	82.01	89.74	8,714.40	4,273.40	1.87	411.13	411.14	12.00	729,297.07	653,540.43	
8,950.00	85.01	89.74	8,717.23	4,276.23	1.98	435.97	435.97	12.00	729,297.18	653,565.27	
8,975.00	88.01	89.74	8,718.75	4,277.75	2.09	460.92	460.92	12.00	729,297.29	653,590.22	
8,985.29	89.24	89.74	8,719.00	4,278.00	2.14	471.21	471.21	11.99	729,297.34	653,600.51	
EOC-8985.29' MD, 89.24° INC, 89.74° AZI, 12.00° DLS, 471.21' VS, 2.14' N, 471.21' E											
8,985.37	89.24	89.74	8,719.00	4,278.00	2.14	471.28	471.29	0.00	729,297.34	653,600.58	
9,000.00	89.24	89.74	8,719.20	4,278.20	2.21	485.91	485.92	0.00	729,297.41	653,615.21	
9,100.00	89.24	89.74	8,720.52	4,279.52	2.66	585.90	585.91	0.00	729,297.86	653,715.20	
9,200.00	89.24	89.74	8,721.85	4,280.85	3.11	685.90	685.90	0.00	729,298.31	653,815.20	
9,300.00	89.24	89.74	8,723.17	4,282.17	3.57	785.89	785.89	0.00	729,298.77	653,915.19	
9,400.00	89.24	89.74	8,724.50	4,283.50	4.02	885.88	885.88	0.00	729,299.22	654,015.18	
9,500.00	89.24	89.74	8,725.83	4,284.83	4.47	985.87	985.88	0.00	729,299.67	654,115.17	
9,514.14	89.24	89.74	8,726.00	4,285.00	4.54	1,000.00	1,000.01	0.00	729,299.74	654,129.30	
LT#1 - 9514.14' MD, 89.24° INC, 89.74° AZI, 8726.00' TVD, 1000.01' VS, 4.54' N, 1000.00' E - LT1(TS#2) - 1000' VS											
9,522.00	89.08	89.74	8,726.12	4,285.12	4.58	1,007.86	1,007.87	2.00	729,299.78	654,137.16	
9,600.00	89.08	89.74	8,727.36	4,286.36	4.93	1,085.85	1,085.86	0.00	729,300.13	654,215.15	
9,700.00	89.08	89.74	8,728.96	4,287.96	5.38	1,185.84	1,185.85	0.00	729,300.58	654,315.14	
9,800.00	89.08	89.74	8,730.57	4,289.57	5.84	1,285.82	1,285.84	0.00	729,301.04	654,415.12	
9,900.00	89.08	89.74	8,732.17	4,291.17	6.29	1,385.81	1,385.83	0.00	729,301.49	654,515.11	
10,000.00	89.08	89.74	8,733.77	4,292.77	6.75	1,485.80	1,485.81	0.00	729,301.95	654,615.10	
10,100.00	89.08	89.74	8,735.37	4,294.37	7.20	1,585.78	1,585.80	0.00	729,302.40	654,715.08	
10,200.00	89.08	89.74	8,736.97	4,295.97	7.65	1,685.77	1,685.79	0.00	729,302.85	654,815.07	
10,300.00	89.08	89.74	8,738.57	4,297.57	8.11	1,785.76	1,785.77	0.00	729,303.31	654,915.06	



Pathfinder X & Y Survey Report



Company:	Mack Energy	Local Co-ordinate Reference:	Well Tom State #2
Project:	Chaves County	TVD Reference:	WELL @ 4441.00ft (18' RKB)
Site:	Tom State	MD Reference:	WELL @ 4441.00ft (18' RKB)
Well:	Tom State #2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
10,400.00	89.08	89.74	8,740.17	4,299.17	8.56	1,885.74	1,885.76	0.00	729,303.76	655,015.04	
10,500.00	89.08	89.74	8,741.77	4,300.77	9.02	1,985.73	1,985.75	0.00	729,304.22	655,115.03	
10,514.27	89.08	89.74	8,742.00	4,301.00	9.08	2,000.00	2,000.02	0.00	729,304.28	655,129.30	
LT#2 -10514.27°MD,89.08°INC,89.74°AZI, 8742.00°TVD, 2000.02°VS, 9.08°N, 2000.00°E - LT2(TS#2)- 2000°VS											
10,528.67	89.08	89.74	8,742.23	4,301.23	9.15	2,014.40	2,014.42	0.00	729,304.35	655,143.70	
10,600.00	89.08	89.74	8,743.37	4,302.37	9.47	2,085.71	2,085.74	0.00	729,304.67	655,215.01	
10,700.00	89.08	89.74	8,744.97	4,303.97	9.92	2,185.70	2,185.72	0.00	729,305.12	655,315.00	
10,800.00	89.08	89.74	8,746.57	4,305.57	10.38	2,285.69	2,285.71	0.00	729,305.58	655,414.99	
10,900.00	89.08	89.74	8,748.17	4,307.17	10.83	2,385.67	2,385.70	0.00	729,306.03	655,514.97	
11,000.00	89.08	89.74	8,749.78	4,308.78	11.28	2,485.66	2,485.68	0.00	729,306.48	655,614.96	
11,100.00	89.08	89.74	8,751.38	4,310.38	11.74	2,585.64	2,585.67	0.00	729,306.94	655,714.94	
11,200.00	89.08	89.74	8,752.98	4,311.98	12.19	2,685.63	2,685.66	0.00	729,307.39	655,814.93	
11,300.00	89.08	89.74	8,754.58	4,313.58	12.65	2,785.62	2,785.65	0.00	729,307.85	655,914.92	
11,400.00	89.08	89.74	8,756.18	4,315.18	13.10	2,885.60	2,885.63	0.00	729,308.30	656,014.90	
11,500.00	89.08	89.74	8,757.78	4,316.78	13.55	2,985.59	2,985.62	0.00	729,308.75	656,114.89	
11,514.41	89.08	89.74	8,758.01	4,317.01	13.62	3,000.00	3,000.03	0.00	729,308.82	656,129.30	
LT#3 -11514.41°MD,89.08°INC,89.74°AZI, 8758.01°TVD, 3000.03°VS, 13.62°N, 3000.00°E - LT3(TS#2) - 3000°VS											
11,517.31	89.14	89.74	8,758.04	4,317.04	13.62	3,002.90	3,002.93	2.00	729,308.82	656,132.20	
11,600.00	89.14	89.74	8,759.29	4,318.29	14.00	3,085.58	3,085.61	0.00	729,309.20	656,214.88	
11,700.00	89.14	89.74	8,760.78	4,319.78	14.45	3,185.56	3,185.60	0.00	729,309.65	656,314.86	
11,800.00	89.14	89.74	8,762.28	4,321.28	14.91	3,285.55	3,285.59	0.00	729,310.11	656,414.85	
11,900.00	89.14	89.74	8,763.78	4,322.78	15.36	3,385.54	3,385.58	0.00	729,310.56	656,514.84	
12,000.00	89.14	89.74	8,765.28	4,324.28	15.81	3,485.53	3,485.56	0.00	729,311.01	656,614.83	
12,100.00	89.14	89.74	8,766.78	4,325.78	16.27	3,585.52	3,585.55	0.00	729,311.47	656,714.82	
12,200.00	89.14	89.74	8,768.28	4,327.28	16.72	3,685.50	3,685.54	0.00	729,311.92	656,814.80	
12,300.00	89.14	89.74	8,769.78	4,328.78	17.18	3,785.49	3,785.53	0.00	729,312.38	656,914.79	
12,400.00	89.14	89.74	8,771.28	4,330.28	17.63	3,885.48	3,885.52	0.00	729,312.83	657,014.78	



Pathfinder X & Y Survey Report



Company:	Mack Energy	Local Co-ordinate Reference:	Well Tom State #2
Project:	Chaves County	TVD Reference:	WELL @ 4441.00ft (18' RKB)
Site:	Tom State	MD Reference:	WELL @ 4441.00ft (18' RKB)
Well:	Tom State #2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey										
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
12,500.00	89.14	89.74	8,772.78	4,331.78	18.08	3,985.47	3,985.51	0.00	729,313.28	657,114.77
12,514.54	89.14	89.74	8,773.00	4,332.00	18.15	4,000.00	4,000.04	0.00	729,313.35	657,129.30
LT#4 - 12514.54' MD, 89.14° INC, 89.74° AZI, 8773.00' TVD, 4000.05' VS, 18.15° N, 4000.00' E - LT4(TS#2) - 4000' VS										
12,517.22	89.09	89.75	8,773.04	4,332.04	18.16	4,002.69	4,002.73	2.00	729,313.36	657,131.99
12,600.00	89.09	89.75	8,774.36	4,333.36	18.52	4,085.45	4,085.50	0.00	729,313.72	657,214.75
12,700.00	89.09	89.75	8,775.95	4,334.95	18.96	4,185.44	4,185.48	0.00	729,314.16	657,314.74
12,800.00	89.09	89.75	8,777.54	4,336.54	19.40	4,285.43	4,285.47	0.00	729,314.60	657,414.73
12,900.00	89.09	89.75	8,779.14	4,338.14	19.84	4,385.41	4,385.46	0.00	729,315.04	657,514.71
13,000.00	89.09	89.75	8,780.73	4,339.73	20.28	4,485.40	4,485.44	0.00	729,315.48	657,614.70
13,100.00	89.09	89.75	8,782.32	4,341.32	20.71	4,585.39	4,585.43	0.00	729,315.91	657,714.69
13,142.72	89.09	89.75	8,783.00	4,342.00	20.90	4,628.10	4,628.15	0.00	729,316.10	657,757.40
TD at 13142.72 - PBHL OH(TS#2)										



Pathfinder X & Y Survey Report

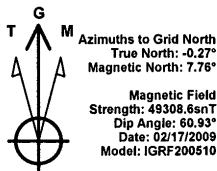


Company:	Mack Energy	Local Co-ordinate Reference:	Well Tom State #2
Project:	Chaves County	TVD Reference:	WELL @ 4441.00ft (18' RKB)
Site:	Tom State	MD Reference:	WELL @ 4441.00ft (18' RKB)
Well:	Tom State #2	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
LT2(TS#2)- 2000'VS - plan hits target - Point	0.00	0.00	8,742.00	9.08	2,000.00	729,304.280	655,129.300	33° 0' 14.035 N	103° 49' 38.351 W
PBHL OH(TS#2) - plan hits target - Point	0.00	0.00	8,783.00	20.90	4,628.10	729,316.100	657,757.400	33° 0' 14.026 N	103° 49' 7.490 W
LT1(TS#2)- 1000'VS - plan hits target - Point	0.00	0.00	8,726.00	4.54	1,000.00	729,299.740	654,129.300	33° 0' 14.037 N	103° 49' 50.094 W
LT3(TS#2)- 3000'VS - plan hits target - Point	0.00	0.00	8,758.00	13.61	3,000.00	729,308.810	656,129.300	33° 0' 14.032 N	103° 49' 26.608 W
LT4(TS#2)- 4000'VS - plan hits target - Point	0.00	0.00	8,773.00	18.15	4,000.00	729,313.350	657,129.300	33° 0' 14.029 N	103° 49' 14.866 W

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
		(ft)	(ft)	
8,241.50	8,241.50	0.00	0.00	KOP-8241.50°MD,0.00°INC,0.00°AZI
8,985.29	8,719.00	2.14	471.21	EOC-8985.29°MD,89.24°INC,89.74°AZI,12.00°DLS, 471.21°VS, 2.14°N,
9,514.14	8,726.00	4.54	1,000.00	LT#1 -9514.14°MD,89.24°INC,89.74°AZI, 8726.00°TVD, 1000.01°VS, 4.54°N,
10,514.27	8,742.00	4.58	1,007.86	LT#2 -10514.27°MD,89.08°INC,89.74°AZI, 8742.00°TVD, 2000.02°VS, 9
11,514.41	8,758.00	9.08	2,000.00	LT#3 -11514.41°MD,89.08°INC,89.74°AZI, 8758.01°TVD, 3000.03°VS, 1
12,514.54	8,773.00	9.15	2,014.40	LT#4 -12514.54°MD,89.14°INC,89.74°AZI, 8773.00°TVD, 4000.05°VS, 1
13,142.72	8,783.00	13.61	3,000.00	TD at 13142.72

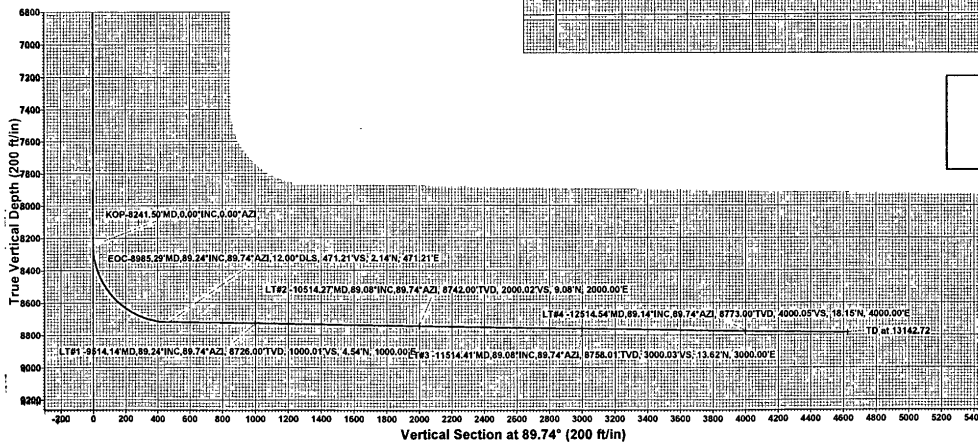
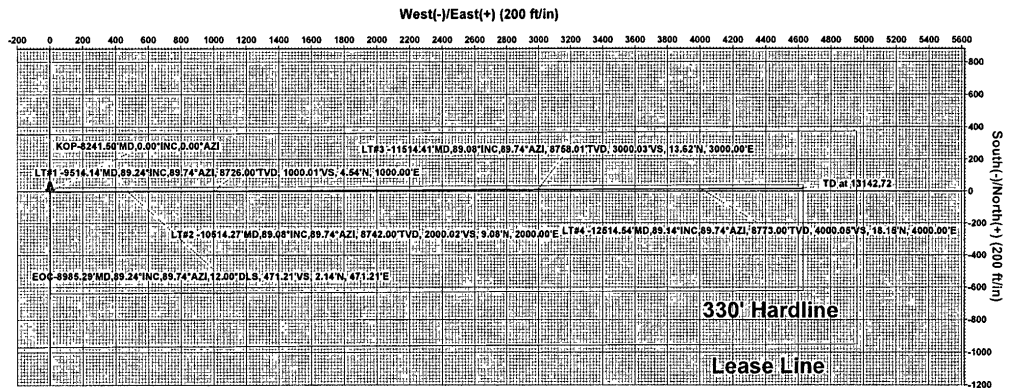
Checked By: _____ Approved By: _____ Date: _____



PROJECT DETAILS: Chaves County
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLog	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8241.50	0.00	0.00	8241.50	0.00	0.00	0.00	0.00	0.00	
3	8985.29	89.24	89.74	8719.00	2.14	471.20	12.00	89.74	471.21	
4	9011.33	89.24	89.74	8719.35	2.26	497.25	0.01	0.00	497.25	
5	9514.14	89.24	89.74	8726.00	4.54	1000.00	0.00	0.00	1000.01	LT1(TS#2) - 1000'VS
6	9522.08	89.08	89.74	8726.12	4.58	1007.94	2.00	173.96	1007.95	
7	10514.27	89.08	89.74	8742.00	9.08	2000.00	0.00	0.00	2000.02	LT2(TS#2) - 2000'VS
8	10528.82	89.08	89.74	8742.23	9.15	2014.55	0.00	0.00	2014.57	
9	11514.41	89.08	89.74	8758.00	13.61	3000.00	0.00	0.00	3000.03	LT3(TS#2) - 3000'VS
10	11517.31	89.14	89.74	8758.04	13.62	3002.90	2.00	0.00	3002.93	
11	12514.54	89.14	89.74	8773.00	18.15	4000.00	0.00	0.00	4000.04	LT4(TS#2) - 4000'VS
12	12517.22	89.09	89.75	8773.04	18.16	4002.69	2.00	170.06	4002.73	
13	13142.72	89.09	89.75	8783.00	20.90	4628.10	0.00	0.00	4628.10	PBHL OH(TS#2)

WELLBORE TARGET DETAILS				
Name	TVD	+N-S	+E-W	Shape
LT1(TS#2) - 1000'VS	8726.00	4.54	1000.00	Point
LT2(TS#2) - 2000'VS	8742.00	9.08	2000.00	Point
LT3(TS#2) - 3000'VS	8758.00	13.61	3000.00	Point
LT4(TS#2) - 4000'VS	8773.00	18.15	4000.00	Point
PBHL OH(TS#2)	8783.00	20.90	4628.10	Point



WELL DETAILS: Tom State #2					
Ground Elevation: 4423.00					
RKB Elevation: WELL @ 4441.00N (18' RKB)					
Rig Name: 18' RKB					
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.00	0.00	726295.200	653129.300	33° 0' 14.040 N	103° 00' 1.836 W

Project: Chaves County
Site: Tom State
Well: Tom State #2
Wellbore: OH
Plan: Plan #1 (Tom State #2/OH)

Plan: Plan #1 (Tom State #2/OH)	
Created By: Nate Bingham	Date: 9 Feb, February 17 2009
Checked: _____	Date: _____