

MAGNETIC DIRECTIONAL SURVEY
FOR

MAMCO PRODUCTION COMPANY

WELL NAME: SOUTH HOBBS UNIT #221 4-14-38

SURVEY DATE: 06/08/87

SURVEY ENGINEER: D.A. RODGERS

METHOD OF CALCULATION: THE RADIUS OF CURVATURE

VERTICAL SECTION: CALCULATED USING PROPOSAL OF N 25-41 E

COMMENTS: D.A.RODGERS MULTI SHOT 0'-1499'

 * THIS SURVEY IS CORRECT TO THE BEST OF MY *
 * KNOWLEDGE AND IS SUPPORTED BY ACTUAL FIELD DATA.*
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/ s /

 COMPANY REPRESENTATIVE

SCIENTIFIC DRILLING INT'L.
MIDLAND, TEXAS

JOB NUMBER: 132M687039

DATE: 06/08/87

INRUN SURVEY

BY

THE RADIUS OF CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. CFT	COURSE DEG	INC N S	BEARING N S	COORDINATES LATITUDE DEPARTURE	D-LEG FEET 100
73.00	73.00	.27	.32	0-30 N	56-0 E	.18 N .26 E	.68
135.00	135.00	.22	.54	0-30 S	10-0 W	.05 S .62 E	1.48
197.00	196.99	-.58	.91	1-0 S	46-0 W	.76 S .25 E	1.07
259.00	258.98	-1.62	1.08	1-0 S	36-0 W	1.58 S .46 W	.28
321.00	320.97	-2.80	1.22	1-15 S	4-0 E	2.72 S .79 W	1.30
383.00	382.96	-3.81	1.22	1-0 S	11-0 E	3.93 S .63 W	.46
445.00	444.95	-4.85	1.22	1-15 S	1-0 E	5.13 S .51 W	.51
507.00	506.93	-6.13	1.35	1-15 S	16-0 W	6.47 S .68 W	.60
569.00	568.92	-7.04	.95	0-30 S	7-0 W	7.40 S .87 W	1.23
631.00	630.92	-7.69	.68	0-45 S	9-0 W	8.07 S .96 W	.40
693.00	692.92	-8.26	.68	0-30 S	21-0 E	8.73 S .89 W	.65
755.00	754.91	-8.67	.54	0-30 S	9-0 E	9.26 S .76 W	.17
817.00	816.91	-9.22	.68	0-45 S	12-0 E	9.92 S .63 W	.41
879.00	878.90	-10.24	1.08	1-15 S	44-0 W	10.92 S .92 W	1.67
941.00	940.89	-11.15	.95	0-30 S	38-0 W	11.63 S 1.54 W	1.22

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEV.	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100
1003.00	1002.89	-11.76	.68	0-45 S	64- 0 W	12.06 S	2.06 W
1065.00	1064.89	-12.39	.68	0-30 S	24- 0 W	12.54 S	2.52 W
1127.00	1126.88	-12.79	.40	0-15 S	14- 0 W	12.92 S	2.65 W
1189.00	1188.88	-13.06	.27	0-15 S	26- 0 W	13.17 S	2.75 W
1251.00	1250.88	-13.31	.27	0-15 S	64- 0 W	13.36 S	2.93 W
1313.00	1312.88	-13.68	.40	0-30 S	30- 0 W	13.63 S	3.23 W
1375.00	1374.88	-14.22	.54	0-30 S	21- 0 W	14.12 S	3.46 W
1437.00	1436.88	-14.30	.40	0-15 N	57- 0 E	14.31 S	3.22 W
1499.00	1498.88	-14.10	.40	0-30 S	81- 0 W	14.04 S	3.32 W
1543.00	1542.87	-13.94	.38	0-30 N	30- 0 E	13.79 S	3.50 W
1605.00	1604.87	-13.40	.54	0-30 N	32- 0 E	13.32 S	3.22 W
1667.00	1666.87	-12.60	.81	1- 0 N	34- 0 E	12.64 S	2.78 W
1729.00	1728.86	-11.55	1.08	1- 0 N	46- 0 E	11.81 S	2.08 W
1791.00	1790.83	-10.03	1.62	2- 0 N	45- 0 E	10.68 S	.93 W
1853.00	1852.75	-6.83	3.24	4- 0 N	21- 0 E	7.98 S	.83 E

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MEAS. DEPTH	VERT. DEPTH	VERT. DEPTH	COURSE DEG.	INC D M	BEARING D M	COORDINATES LATITUDE	DEPARTURE	D-LEG PER 100
1915.00	1914.51	-1.46	5.40	6-- 0 N 16-- 0 E	2.88 S	2.63 E	3.25	
1977.00	1976.04	6.07	7.56	8-- 0 N 25-- 0 E	4.14 N	5.40 E	3.50	
2039.00	2037.28	15.77	9.70	10-- 0 N 25-- 0 E	12.93 N	9.50 E	3.23	
2101.00	2098.29	26.80	11.03	10--30 N 24-- 0 E	22.97 N	14.07 E	.86	
2163.00	2159.20	38.36	11.56	11-- 0 N 25-- 0 E	33.49 N	18.87 E	.86	
2225.00	2219.95	50.72	12.36	12-- 0 N 25-- 0 E	44.70 N	24.09 E	1.61	
2287.00	2280.48	64.14	13.42	13-- 0 N 26-- 0 E	56.81 N	29.87 E	1.65	
2349.00	2340.77	78.61	14.47	14-- 0 N 27-- 0 E	69.76 N	36.33 E	1.66	
2411.00	2400.72	94.39	15.78	15--30 N 28-- 0 E	83.76 N	43.62 E	2.45	
2473.00	2460.40	111.20	16.83	16-- 0 N 28-- 0 E	98.62 N	51.52 E	.81	
2535.00	2519.84	128.74	17.61	17-- 0 N 33-- 0 E	113.79 N	60.45 E	2.80	
2597.00	2579.13	146.74	18.13	17-- 0 N 32-- 0 E	129.08 N	70.19 E	.47	
2659.00	2638.26	165.33	18.64	18-- 0 N 28-- 0 E	145.22 N	79.51 E	2.52	
2721.00	2697.23	184.46	19.16	18-- 0 N 30-- 0 E	161.98 N	88.80 E	1.00	
2783.00	2756.28	203.29	18.90	17--30 N 31-- 0 E	178.26 N	98.39 E	.94	

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MEAS. DEPTH	VERT. DEPTH	VERT. DEPTH	COURSE DEG.	INC O M	BEARING D N	COORDINATES LATITUDE	DEPARTURE	D-LEG PER 100
2845.00	2815.41	221.84	18.64	17-30	N 32- 0 E	194.16 N	108.13 E	.48
2907.00	2874.54	240.35	18.64	17-30	N 33- 0 E	209.88 N	118.15 E	.48
2969.00	2933.75	258.57	18.39	17- 0	N 34- 0 E	225.21 N	128.30 E	.94
3031.00	2993.04	276.48	18.13	17- 0	N 35- 0 E	240.15 N	138.56 E	.47
3093.00	3052.48	293.85	17.61	16- 0	N 35- 0 E	254.58 N	148.66 E	1.61
3155.00	3112.08	310.69	17.09	16- 0	N 36- 0 E	268.49 N	158.59 E	.44
3217.00	3171.75	327.22	16.83	15-30	N 37- 0 E	282.02 N	168.60 E	.92
3279.00	3231.57	343.22	16.31	15- 0	N 37- 0 E	295.04 N	178.41 E	.81
3341.00	3291.46	358.89	16.05	15- 0	N 39- 0 E	307.69 N	188.29 E	.83
3403.00	3351.48	374.00	15.52	14- 0	N 39- 0 E	319.75 N	198.06 E	1.61
3465.00	3411.64	388.53	15.00	14- 0	N 41- 0 E	331.24 N	207.70 E	.78
3527.00	3472.11	401.66	13.68	11-30	N 43- 0 E	341.41 N	216.86 E	4.09
3589.00	3533.11	412.46	11.03	9- 0	N 31- 0 E	350.20 N	223.48 E	5.28
3651.00	3594.17	423.19	10.77	11- 0	N 16- 0 E	360.05 N	227.76 E	5.27
3713.00	3654.98	435.01	12.10	11-30	N 11- 0 E	371.80 N	230.59 E	1.77

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SEP 1 1967
OCC
HOBBS OFFICE

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MEAS. DEPTH	VERT. DEPTH	VERT. DEPTH	COURSE LCO	INC D M	BEARING D M	COORDINATES LATITUDE DEPARTURE	D-LEG PER 100
3775.00	3715.68	447.16	12.63	12- 0 N	9- 0 E	384.24 N 232.78 E	1.04
3837.00	3776.27	459.76	13.15	12-30 N	9- 0 E	397.23 N 234.84 E	.81
3899.00	3836.55	473.70	14.47	14-30 N	11- 0 E	411.48 N 237.35 E	3.31
3961.00	3896.22	490.05	16.83	17- 0 N	13- 0 E	427.94 N 240.85 E	4.13
4023.00	3955.01	509.34	19.67	20- 0 N	16- 0 E	446.98 N 245.77 E	5.07
4085.00	4012.89	531.38	22.22	22- 0 N	21- 0 E	468.05 N 252.82 E	4.33
4147.00	4069.85	555.77	24.47	24-30 N	21- 0 E	490.89 N 261.59 E	4.03
4209.00	4125.69	582.66	26.93	27- 0 N	24- 0 E	515.77 N 271.90 E	4.55
4271.00	4179.90	612.70	30.05	31- 0 N	24- 0 E	543.23 N 284.12 E	6.45
4333.00	4232.62	645.30	32.62	32-30 N	23- 0 E	573.14 N 297.13 E	2.56
4364.00	4258.54	662.27	17.00	34- 0 N	23- 0 E	588.79 N 303.77 E	4.84

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MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	COURSE DEVI.	INC. D M	BEARING D M	COORDINATES LATITUDE	DEPARTURE PER 100	D-LEGS
4384.00	4275.03	673.59	11.33	35- 0 N	23- 0 E	599.22 N	308.20 E	5.00

THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF

4384.00 FEET EQUALS 673.83 FEET AT N 27-13 E.

SCIENTIFIC DRILLING CONTROLS

SURVEY CERTIFICATION

COMPANY Amoco Production Company WELL NAME & NO. South Hobbs Unit # 221
DATE of CERTIFICATION June 25, 1987 LOCATION Lea County, New Mexico
TYPE of SURVEY Magnetic Multishot FROM 00' TO 1499'
JOB NUMBER 132M687039 TICKET NUMBER _____

THE ABOVE SURVEY WAS PERFORMED BY ME ON June 08, 1987
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.

David Moody
SURVEYOR

FILM TRANSFER RECEIPT

I HEREBY ACKNOWLEDGE RECEIPT OF ORIGINAL FILM OBTAINED ON THE ABOVE
SURVEY.

DATE RECEIVED 19____

COMPANY REPRESENTATIVE

SURVEY CONFIRMATION

I HAVE EXAMINED THE ABOVE SURVEY AND FOUND THE DATA AND RESULTS
ACCEPTABLE ACCORDING TO CURRENT SCIENTIFIC DRILLING CONTROLS STANDARDS.

Carolyn Hettli 8-28-87
Notary for Lector Co.
Comm Ex #87
David Moody
S.D.C. REPRESENTATIVE

SURVEY CERTIFICATION

GARRY HENDRIX / *[Signature]*
SURVEYOR / DIRECTIONAL DRILLER

FILM TRANSFER RECEIPT

COMPANY REPRESENTATIVE

SURVEY CONFIRMATION

JIM AGNEW
S.D.S. REPRESENTATIVE