



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

AMOCO PRODUCTION COMPANY
COMPANY

SOUTH HOBBS UNIT COOP. WELL NO. 13
WELL NAME

LEA COUNTY, NEW MEXICO BD2-145
LOCATION

<u>JOB NUMBER</u>	<u>TYPE OF SURVEY</u>	<u>DATE</u>
WT1184-S0098	MAGNETIC MULTI SHOT SURVEY	21-NOV-84
WT1184-S0105	" "	25-NOV-84
132-M-1284-120	" "	29-NOV-84

SURVEY BY
GARY DeSPAIN
GARY DeSPAIN
EDWARD PAINTER

OFFICE
WEST TEXAS

AMOCO PRODUCTION COMPANY
SOUTH HOBBS COOP 13
LEA COUNTY, NEW MEXICO BD2-145

EASTMAN WHIPSTOCK INC.	
MAGNETIC MULTI-SHOT SURVEY	WT1184-S0098
SURVEYOR: GARY DESPAIN	(0'-1607')
MAGNETIC MULTI-SHOT SURVEY	WT1184-S0105
SURVEYOR: GARY DESPAIN	(1607'-3406')
AMF / SCIENTIFIC DRILLING	
MAGNETIC MULTI SHOT SURVEY	132-M-1284-120
SURVEYOR: EDWARD PAINTER	(3479'-4353')



VERTICAL SECTION CALCULATED IN PLANE OF SECTION
DIRECTION: N 18° D 3 MIN W

RECORD OF SURVEY

RADIUS OF CURVATURE METHOD

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE		VERTICAL SECTION FEET	R E C T A N G U L A R C O O R D I N A T E S		DOGLEG SEVERITY DG/100FT
				VERTICAL DEPTH FEET	VERTICAL SECTION FEET				
0.	0 0	0	0.	0.00	0.00	0.00	0.00	0.00	0.00
77.	1 0	N 45 E	77.	77.00	0.40	0.47 N	0.47 E	1.30	1.30
107.	0 45	N 36 E	30.	106.99	0.71	0.82 N	0.77 E	0.95	0.95
167.	1 0	S 79 E	60.	166.99	0.91	1.14 N	1.58 E	1.61	1.61
228.	1 15	S 80 E	61.	227.97	0.53	0.92 N	2.76 E	0.41	0.41
288.	1 0	S 78 E	60.	287.96	0.14	0.70 N	3.91 E	0.42	0.42
348.	1 0	S 86 E	60.	347.95	-0.15	0.55 N	4.95 E	0.23	0.23
409.	1 0	S 82 E	61.	408.94	-0.41	0.44 N	6.01 E	0.11	0.11
469.	1 15	S 68 E	60.	468.93	-0.87	0.14 N	7.14 E	0.62	0.62
529.	1 0	S 64 E	60.	528.92	-1.49	0.34 S	8.22 E	0.44	0.44
589.	1 0	S 42	60.	588.91	-2.23	0.97 S	9.05 E	0.64	0.64
650.	1 0	S 48	60.	649.90	-3.93	1.72 S	9.80 E	0.17	0.17
710.	1 0	S 39	60.	709.89	-3.93	2.48 S	10.52 E	0.26	0.26
770.	1 0	S 49	60.	769.88	-3.93	3.23 S	11.25 E	0.29	0.29
831.	1 0	S 35 E	61.	830.87	-3.93	4.02 S	11.96 E	0.40	0.40
891.	1 0	S 37 E	60.	890.87	-6.58	4.87 S	12.58 E	0.06	0.06
951.	0 45	S 7 E	60.	950.86	-7.46	5.71 S	12.92 E	0.86	0.86
1011.	1 0	S 1 E	60.	1010.85	-8.37	6.62 S	12.98 E	0.44	0.44
1072.	1 0	S 16 W	61.	1071.84	-9.40	7.67 S	12.84 E	0.48	0.48
1132.	1 0	S 15 W	60.	1131.83	-10.36	8.68 S	12.56 E	0.03	0.03
1192.	1 15	S 28 W	60.	1191.82	-11.38	9.78 S	12.13 E	0.59	0.59
1252.	1 0	S 41 W	60.	1251.81	-12.25	10.75 S	11.46 E	0.59	0.59
1313.	1 0	S 36 W	61.	1312.80	-12.98	11.58 S	10.80 E	0.14	0.14
1373.	1 0	S 46 W	60.	1372.79	-13.66	12.37 S	10.12 E	0.29	0.29
1433.	1 0	S 48 W	60.	1432.78	-14.26	13.08 S	9.35 E	0.06	0.06
1463.	0 45	S 71 W	30.	1462.78	-14.44	13.31 S	8.96 E	1.42	1.42
1524.	1 0	S 60 W	61.	1523.77	-14.70	13.70 S	8.11 E	0.49	0.49
1584.	1 0	S 50 W	60.	1583.76	-15.17	14.30 S	7.26 E	0.29	0.29
1607.	1 15	S 46 W	23.	1606.76	-15.43	14.60 S	6.92 E	1.14	1.14
1675.	1 0	S 71 W	68.	1674.74	-15.95	15.29 S	5.79 E	0.80	0.80

Eastman
Whipstock

VERTICAL ANGLE CORRECTION

TIME DATE

14:05:13 04-DEC-84

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	R E C T A N G U L A R C O O R D I N A T E S FEET	DOGLEG SEVERITY DG/100FT
1737.	0 15	S 85 W	62.	1736.74	-16.00	15.43 S 5.13 E	1.23
1798.	1 0	N 50 W	61.	1797.74	-15.72	15.24 S 4.51 E	1.38
1860.	2 0	N 53 W	62.	1859.71	-14.54	14.23 S 3.24 E	1.62
1922.	5 0	N 24 W	62.	1921.59	-11.31	11.30 S 0.91 E	5.47
1983.	6 45	N 9 W	61.	1982.27	-5.16	5.33 S 0.86 W	3.79
2045.	7 45	N 4 W	62.	2043.77	2.66	2.44 N 1.74 W	1.91
2107.	9 0	N 1 W	62.	2105.11	11.65	11.46 N 2.14 W	2.14
2168.	10 0	N 2 W	61.	2165.27	21.65	21.53 N 2.40 W	1.66
2230.	12 0	N 0 W	62.	2226.13	33.39	33.36 N 2.61 W	3.28
2292.	13 30	N 1 W	62.	2286.60	46.96	47.04 N 2.73 W	2.45
2353.	14 45	N 0	62.	2342.15	11.71	11.92 N 2.86 W	2.09
2415.	15 30	N 1 W	61.	2400.85	16.96	16.99 N 3.00 W	1.28
2477.	16 0	N 1 W	62.	2452.8	94.45	94.45 N 3.29 W	0.81
2538.	17 0	N 1 W	61.	2519.7	63.74	63.75 N 3.59 W	1.64
2600.	17 15	N 0 W	62.	2585.4	129.74	130.50 N 3.75 W	0.62
2662.	17 15	N 1 W	62.	2642.23	147.97	148.89 N 3.91 W	0.48
2723.	17 15	N 1 W	61.	2700.48	165.92	166.97 N 4.23 W	0.00
2785.	17 30	N 0 W	62.	2759.65	184.27	185.49 N 4.39 W	0.63
2847.	17 45	N 0 W	62.	2818.74	202.86	204.26 N 4.39 W	0.40
2908.	18 0	N 1 E	61.	2876.80	221.38	222.98 N 4.23 W	0.65
2970.	17 45	N 1 E	62.	2935.81	240.17	242.01 N 3.89 W	0.40
3032.	17 45	N 0 W	62.	2994.86	258.86	260.91 N 3.73 W	0.49
3093.	17 45	N 1 E	61.	3052.95	277.25	279.51 N 3.57 W	0.50
3155.	18 0	N 0 W	62.	3111.96	296.07	298.53 N 3.40 W	0.64
3217.	17 45	N 0 W	62.	3170.97	314.91	317.56 N 3.40 W	0.40
3279.	17 30	N 0 W	62.	3230.06	333.50	336.34 N 3.40 W	0.40
3340.	17 15	N 0 W	61.	3288.27	351.54	354.55 N 3.40 W	0.41
3406.	17 0	N 1 W	66.	3351.35	370.80	373.99 N 3.57 W	0.59



TIME DATE
14:05:13 04-DEC-84

MEASURED DEPTH FEET	DRIFT ANGLE D M	DRIFT DIRECTION D	COURSE LENGTH FEET	TRUE		VERTICAL DEPTH FEET	VERTICAL SECTION FEET	R E C T A N G U L A R C O O R D I N A T E S		DOGLEG SEVERITY DG/100FT
				VERTICAL DEPTH FEET	VERTICAL SECTION FEET			FEET	FEET	
3479.	16 30	N 2 W	73.	3421.25	391.70	395.02 N	4.12 W	0.79		
3540.	16 0	N 3 W	61.	3479.81	408.69	412.07 N	4.87 W	0.94		
3601.	15 0	N 3 W	61.	3538.59	424.93	428.35 N	5.72 W	1.64		
3662.	14 0	N 5 W	61.	3597.65	440.16	443.58 N	6.78 W	1.83		
3723.	13 30	N 5 W	61.	3656.90	454.64	458.03 N	8.05 W	0.82		
3784.	12 15	N 5 W	61.	3716.37	468.22	471.57 N	9.23 W	2.05		
3845.	7 45	N 20 W	61.	3776.42	478.74	481.88 N	11.52 W	8.46		
3906.	6 0	N 56 W	61.	3836.98	484.97	487.54 N	15.94 W	7.47		
3967.	5 45	N 65 W	61.	3897.66	488.77	490.61 N	21.37 W	1.56		
4089.	5 45	N 64 W	122.	4019.05	495.52	495.87 N	32.40 W	0.08		
4150.	5 45	N 63			498.99	498.60 N	37.87 W	0.16		
4211.	5 30	N 66			501.17	501.17 N	43.27 W	0.63		
4272.	5 15	N 65			505.37	505.37 N	48.47 W	0.44		
4353.	5 30	N 65			508.75	508.75 N	55.34 W	0.31		



FINAL CLOSURE - DIRECTION: N 6 DEGS 14 MINS W
DISTANCE: 509.76 FEET

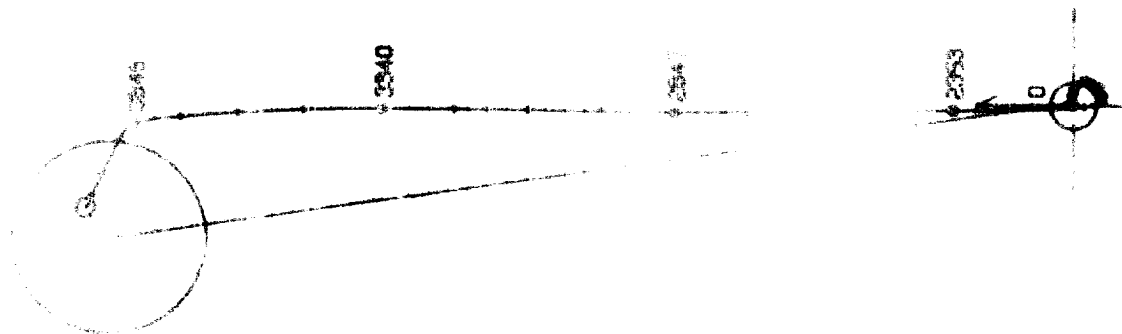
GUNCO PRODUCTION COMPANY
 SOUTH LEBES COUP 13
 LEA COUNTY, NEW MEXICO

SD2-145

SECTION 44P5000CH. INC.

Z LINE PROJECTION:
 DEPTH 4353 MD. 4261.82 TVD
 NORTH 506.74 WEST 55.34
 CLOSURE 508.75 N 8 13 57 W

HORIZONTAL PROJECTION
 SCALE 1 IN. = 100 FEET
 DEPTH INDICATOR: MD





P.O. Box 6341/Midland, Texas 79711-0341/(915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

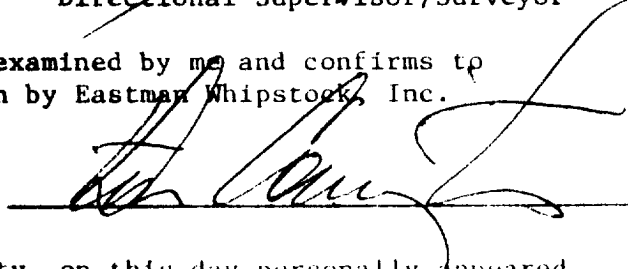
I, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of November 20, 1984 thru November 21, 1984 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 0 feet to 1607 feet, with recordings of inclination and direction being obtained at approximate intervals of 61 feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit Coop. Well 13, Lea County, County, State of New Mexico, in the field.

This data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Eastman Whipstock, Inc. and is true and correct to the best of my knowledge.

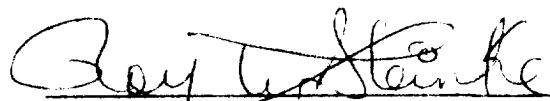

Directional Supervisor/Surveyor

The data for this survey has been examined by me and confirms to principles and procedures set forth by Eastman Whipstock, Inc.



Before me, the undersigned authority, on this day personally appeared Gary DeSpain, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that this information is a true statement of facts therein recited.

Subscribed and sworn to before me on this 21st day of DEC., 1984.


Notary Public in and for the
County of Midland, Texas



ROY L. STEINKE
Notary Public, State of Texas
My Commission Expires July 9, 1985



P.O. Box 6341/Midland, Texas 79711-0341/(915) 563-0511

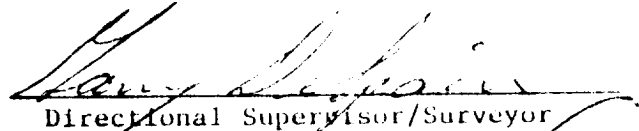
SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

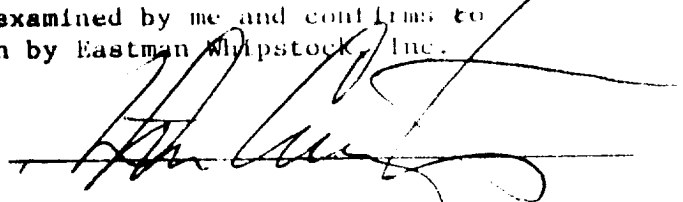
I, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of November 25, 1984 thru November 25, 1984 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 1607 feet to 3406 feet, with recordings of inclination and direction being obtained at approximate intervals of 62 feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit Coop. No. 13, Lea County, State of New Mexico, in the _____ field.

This data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Eastman Whipstock, Inc. and is true and correct to the best of my knowledge.


Directional Supervisor/Surveyor

The data for this survey has been examined by me and confirms to principles and procedures set forth by Eastman Whipstock, Inc.



Before me, the undersigned authority, on this day personally appeared Gary DeSpain, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that this information is a true statement of facts therein recited.

Subscribed and sworn to before me on this 2/11 day of DEC., 1984.


Notary Public in and for the
County of Midland, Texas



ROY L. STENKE
Notary Public, State of Texas
My Commission Expires July 2, 1985

SCIENTIFIC DRILLING CONTROLS

SURVEY CERTIFICATION

COMPANY Amoco Production WELL NAME & NO. SHU Coop #13
DATE of CERTIFICATION 12-4-84 LOCATION Lea County, New Mexico
TYPE of SURVEY Mag. Directional FROM 3406 TO 4353
JOB NUMBER 132M1284120 TICKET NUMBER 10044

THE ABOVE SURVEY WAS PERFORMED BY ME ON November 29 19 84
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.



SURVEYOR

Troy Duncan

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.



S.D.C. REPRESENTATIVE

Troy Duncan