



**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

AMOCO PRODUCTION COMPANY
COMPANY

SOUTH HOBBS UNIT NO. 197
WELL NAME

34-18-38

LEA COUNTY, NEW MEXICO
LOCATION

<u>JOB NUMBER</u>	<u>TYPE OF SURVEY</u>	<u>DATE</u>
WT1185-S0469	MAGNETIC MULTI SHOT SURVEY	11/19/85
WT1185-S0473	MAGNETIC MULTI SHOT SURVEY	11/24/85
132-M-1285-069	MAGNETIC MULTI SHOT SURVEY	11/29/85

SURVEY BY
TROY ONEY, GARY DESPAIN
MIKE CHRISTENSEN

OFFICE
WEST TEXAS

EASTMAN WHIPSTOCK, INC.

RECORD OF SURVEY

FOR

* OPERATOR : AMOCO PRODUCTION COMPANY *
* WELL NAME : SOUTH HOBBS UNIT NO. 15 *
* LOCATION : LEA COUNTY, NEW MEXICO *
* JOB NUMBER : *
* RIG : CACTUS RIG NO. 67 *
* DECLINATION : 10.00 E *
* * *
* PLANE OF VERTICAL SECTION *
* * *
* DIRECTION : N 16 42 W *
* * *

EW DISTRICT : WEST TEXAS DISTRICT

AMOCO PRODUCTION COMPANY
SOUTH HOBBS UNIT NO. 197
LEA COUNTY, NEW MEXICO

DATE PRINTED : 03-DEC-85
OUR REF. NO. : S01020.4AM
JOB NUMBER :

PAGE NO. 2

PBHL : N 16 42 W

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
0.00	0 0	N 0	0.00	0.00	0.00	0.00 N 0.00 E	0.00
48.00	0 15	S 32	48.00	48.00	-0.10	0.09 S 0.06 E	0.52
107.00	0 30	S 43	59.00	107.00	-0.46	0.39 S 0.29 E	0.44
165.00	0 30	S 52	58.00	165.00	-0.88	0.84 S 0.26 E	1.27
224.00	0 45	S 24	59.00	223.99	-1.25	1.35 S 0.14 W	0.66
283.00	0 15	S 61	59.00	282.99	-1.51	1.72 S 0.48 W	0.97
342.00	1 0	S 49	59.00	341.99	-1.71	2.09 S 1.00 W	1.28
401.00	1 0	S 25	59.00	400.98	-2.32	2.90 S 1.62 W	0.70
431.00	1 0	S 19	30.00	430.97	-2.72	3.39 S 1.82 W	0.35
492.00	0 45	S 48	61.00	491.97	-3.31	4.16 S 2.32 W	0.82
553.00	0 45	S 20	61.00	552.96	-3.81	4.81 S 2.77 W	0.59
614.00	0 45	S 46	61.00	613.96	-4.38	5.48 S 3.20 W	0.55
675.00	1 0	S 26	61.00	674.95	-4.89	6.22 S 3.74 W	0.64
736.00	1 0	S 37	61.00	735.94	-5.60	7.13 S 4.30 W	0.31
797.00	1 15	S 56	61.00	796.93	-6.13	7.95 S 5.16 W	0.73
858.00	1 0	S 64	61.00	857.92	-6.41	8.55 S 6.20 W	0.48
918.00	1 30	S 74	60.00	917.90	-6.51	9.02 S 7.42 W	0.91
979.00	1 45	S 86	61.00	978.88	-6.31	9.32 S 9.12 W	0.69
1040.00	1 30	S 80	61.00	1039.85	-6.01	9.53 S 10.84 W	0.50
1101.00	1 15	S 82	61.00	1100.83	-5.82	9.76 S 12.28 W	0.42
1162.00	1 45	S 76	61.00	1161.81	-5.66	10.06 S 13.85 W	0.86
1223.00	1 0	S 75	61.00	1222.79	-5.60	10.43 S 15.27 W	1.23
1284.00	1 30	S 77	61.00	1283.78	-5.54	10.75 S 16.56 W	0.82
1345.00	1 0	S 89	61.00	1344.77	-5.32	10.91 S 17.88 W	0.92
1406.00	1 0	S 66	61.00	1405.76	-5.24	11.14 S 18.91 W	0.65
1467.00	1 0	S 79	61.00	1466.75	-5.25	11.46 S 19.92 W	0.37
1497.00	0 30	S 54	30.00	1496.74	-5.30	11.62 S 20.28 W	1.95
1520.00	0 30	S 79	23.00	1519.74	-5.32	11.70 S 20.46 W	0.94
1592.00	0 45	S 15	72.00	1591.74	-5.65	12.20 S 21.00 W	0.97
1654.00	0 45	S 65	62.00	1653.73	-6.09	12.81 S 21.51 W	1.02

CONTINUED ON NEXT PAGE ...

AMOCO PRODUCTION COMPANY
SOUTH HOBBS UNIT NO. 197
LEA COUNTY, NEW MEXICO

DATE PRINTED : 03-DEC-85
OUR REF. NO. : S01020.4AM
JOB NUMBER :

PAGE NO. 3

PBHL : N 16 42 W

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O O R D I N A T E S	DOGLEG SEVERITY
1716.00	0 30	S 64	62.00	1715.73	-6.19	13.10 S 22.12 W	0.40
1778.00	0 45	S 36	62.00	1777.73	-6.45	13.53 S 22.63 W	0.63
1840.00	1 0	N 28	62.00	1839.72	-6.17	13.47 S 23.42 W	2.40
1902.00	4 0	N 1	62.00	1901.65	-3.50	10.88 S 24.09 W	5.07
1964.00	6 0	N 10	62.00	1963.41	1.80	5.51 S 24.61 W	3.46
2025.00	7 30	N 10	61.00	2023.99	8.92	1.56 N 25.86 W	2.46
2087.00	9 0	N 11	62.00	2085.35	17.76	10.30 N 27.48 W	2.43
2149.00	10 30	N 10	62.00	2146.45	28.20	20.63 N 29.39 W	2.43
2211.00	12 15	N 11	62.00	2207.23	40.36	32.65 N 31.62 W	2.84
2273.00	14 0	N 12	62.00	2267.61	54.38	46.44 N 34.43 W	2.85
2335.00	15 0	N 11	62.00	2321.63	69.84	61.66 N 37.52 W	1.66
2397.00	15 45	N 11	62.00	2387.41	86.19	77.79 N 40.66 W	1.21
2459.00	16 0	N 9	62.00	2447.05	103.04	94.49 N 43.60 W	0.97
2521.00	17 0	N 10	62.00	2508.49	120.51	111.86 N 46.51 W	1.68
2583.00	16 45	N 10	62.00	2565.82	138.38	129.58 N 49.63 W	0.40
2645.00	17 0	N 10	62.00	2625.15	156.26	147.31 N 52.76 W	0.40
2707.00	16 30	N 9	62.00	2684.52	173.98	164.93 N 55.71 W	0.93
2769.00	16 30	N 9	62.00	2743.97	191.43	182.32 N 58.46 W	0.00
2831.00	16 30	N 8	62.00	2803.42	208.86	199.74 N 61.07 W	0.46
2893.00	16 30	N 8	62.00	2862.86	226.27	217.18 N 63.52 W	0.00
2955.00	16 15	N 7	62.00	2922.35	243.52	234.51 N 65.80 W	0.61
3016.00	16 15	N 8	61.00	2980.91	260.37	251.43 N 68.03 W	0.46
3078.00	15 45	N 9	62.00	3040.51	277.29	268.33 N 70.55 W	0.92
3140.00	15 30	N 9	62.00	3100.22	293.84	284.83 N 73.16 W	0.40
3179.00	15 15	N 10	39.00	3137.82	304.10	295.02 N 74.87 W	0.93
3279.00	15 15	N 8	100.00	3234.30	330.16	321.00 N 78.99 W	0.53
3341.00	15 30	N 8	62.00	3294.08	346.41	337.28 N 81.27 W	0.40
3403.00	15 0	N 8	62.00	3353.90	362.53	353.43 N 83.54 W	0.81
3465.00	15 0	N 8	62.00	3413.79	378.39	369.32 N 85.78 W	0.00
3527.00	14 15	N 9	62.00	3473.78	393.89	384.80 N 88.09 W	1.28

CONTINUED ON NEXT PAGE ...

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LEA COUNTY, NEW MEXICO

DATE PRINTED : 03-DEC-85
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PAGE NO. 4

MEASURED DEPTH	D R I F T A N G L E D M	D R I F T D I R E C T I O N D M	C O U R S E L E N G T H	T R U E V E R T I C A L D E P T H	V E R T I C A L S E C T I O N	R E C T A N G U L A R C O O R D I N A T E S	D O G L E G S E V E R I T Y
3589.00	14 0	N 8 0 W	62.00	3533.90	408.86	399.77 N 90.33 W	0.56
3651.00	13 45	N 12 0 W	62.00	3594.09	423.63	414.41 N 92.91 W	1.60
3713.00	13 45	N 9 0 W	62.00	3654.32	438.27	428.90 N 95.59 W	1.15
3775.00	13 45	N 11 0 W	62.00	3714.54	452.91	443.41 N 98.15 W	0.77
3837.00	13 15	N 10 0 W	62.00	3774.83	467.30	457.64 N 100.79 W	0.89
3899.00	13 30	N 8 0 W	62.00	3835.14	481.51	471.80 N 103.03 W	0.85
3961.00	14 0	N 10 0 W	62.00	3895.37	496.11	486.36 N 105.34 W	1.11
4023.00	14 0	N 12 0 W	62.00	3955.53	511.04	501.08 N 108.20 W	0.78
4085.00	13 45	N 8 0 W	62.00	4015.72	525.80	515.72 N 110.78 W	1.60
4147.00	14 30	N 8 0 W	62.00	4075.84	540.76	530.70 N 112.89 W	1.21
4209.00	14 45	N 9 0 W	62.00	4135.83	556.25	546.18 N 115.20 W	0.57
4271.00	15 15	N 8 0 W	62.00	4197.72	572.13	562.06 N 117.57 W	0.91
4333.00	16 15	N 11 0 W	62.00	4259.39	588.83	578.65 N 120.35 W	2.08
4363.00	17 0	N 10 0 W	30.00	4284.14	597.36	587.09 N 121.91 W	2.68

CLOSURE - DISTANCE : 599.62
DIRECTION : N 11 44 W

REPORT UNITS : Feet
SURVEY CALCULATION METHOD : Radius of curvature

SURVEY RUN INFORMATION

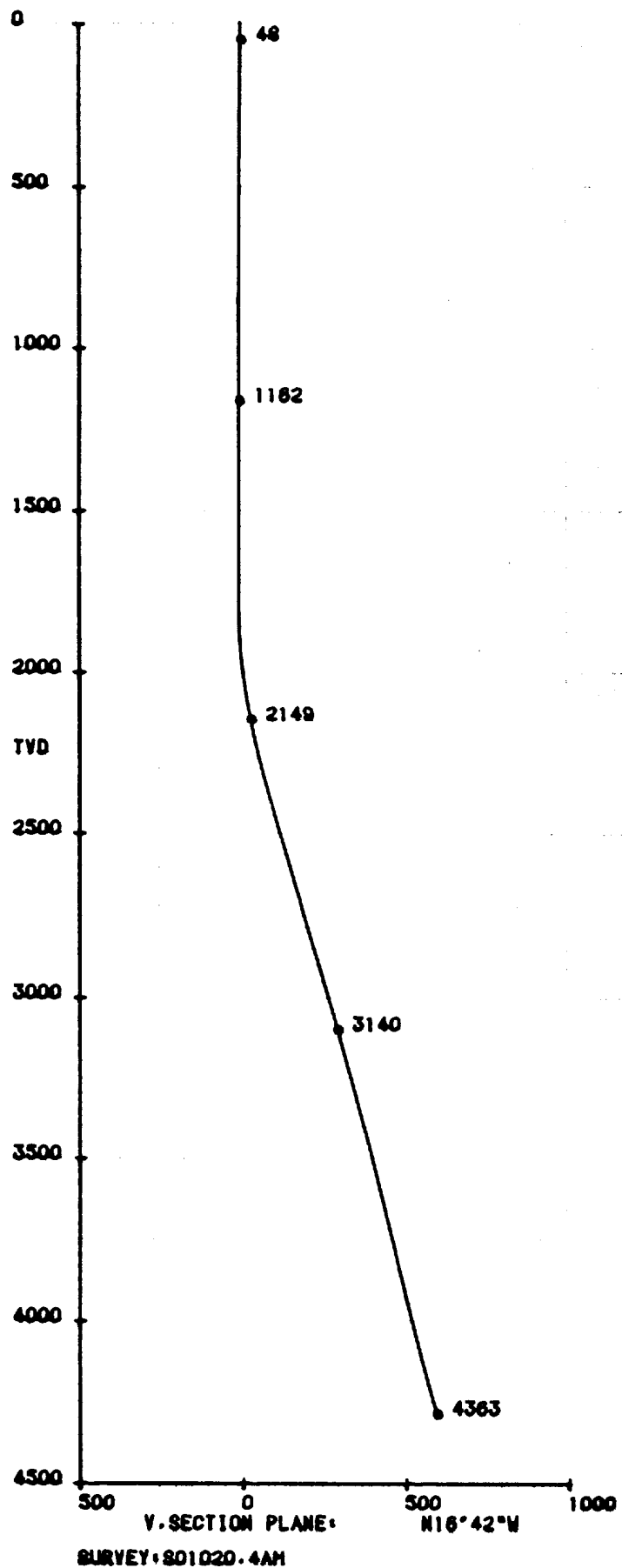
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MAGNETIC MULTI SHOT SURVEY WT1185-S0469
SURVEYOR: TROY ONEY (0'-1520')

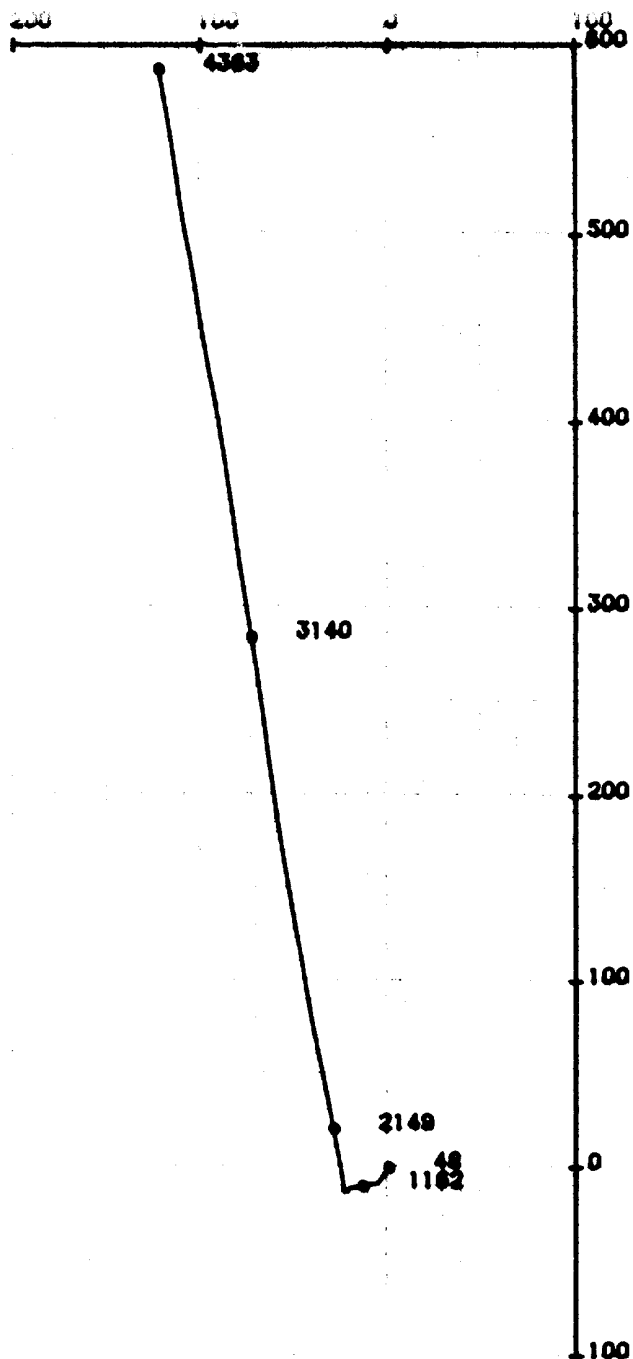
MAGNETIC MULTI SHOT SURVEY WT1185-S0473
SURVEYOR: GARY DESPAIN (1520'-3179')

MAGNETIC MULTI-SHOT SURVEY 132-M-1285-069
SURVEYOR: MIKE R. CHRISTENSEN (3179'-4363')

THIS SURVEY WAS RUN BY AMF SCIENTIFIC DRILLING INTERNATIONAL
IT IS INCLUDED IN THIS REPORT TO GIVE A BOTTOM HOLE LOCATION



SCALE 1"=500FT.



AMOCO PRODUCTION COMPANY

SOUTH HOBBS UNIT NO. 187

LEA COUNTY, NEW MEXICO

WELL: SHU NO. 187

SLOT: 1



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

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Troy Oney, in the employ of Eastman Whipstock, Inc., did on the days of 11-18, 19 85 thru 11-19, 19 85 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 0 feet to 1570 feet, with recordings of inclination and direction being obtained at approximate intervals of 60 feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit Well No. 198 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.

Troy Oney
Directional Supervisor/Surveyor

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

Before me, the undersigned authority, on this day personally appeared Troy Oney, 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 instrument is a true statement of facts therein recited.

Subscribed and sworn to before me on this 04 day of December, 19 85



Timothy R. Stephens
Notary Public, State of Texas
My Commission Expires 4-1-89

Timothy R. Stephens
Notary Public in and for the
County of Midland, Texas
My commission expires _____



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

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Gary DeSpain, in the employ of Eastman Whipstock, Inc., did on the days of Nov 23, 19 85 thru Nov. 24, 19 85 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 1520 feet to 3179 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 No. 197, 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.

Gary DeSpain
Directional Supervisor / Surveyor

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

Neil S. Barnaby

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 instrument is a true statement of facts therein recited.

Subscribed and sworn to before me on this 01 day of December, 19 85



Timothy R. Stephens
Notary Public, State of Texas
My Commission Expires 4-1-89

Timothy R. Stephens
Notary Public in and for the
County of Midland, Texas
My commission expires _____

SCIENTIFIC DRILLING CONTROLS

SURVEY CERTIFICATION

COMPANY AMOCO PRODUCTION CO. WELL NAME & NO. SOUTH HOBBS UNIT#197
DATE of CERTIFICATION 11-29-85 LOCATION Lea County New Mexico
TYPE of SURVEY Mag. Multishot FROM 11-28-85 TO 11-29-85
JOB NUMBER 132-M-1285-069 TICKET NUMBER 102560

THE ABOVE SURVEY WAS PERFORMED BY ME ON 11-28 to 11-29 1985
THE RESULTS OBTAINED FROM ACTUAL FIELD DATA CONFORM TO ESTABLISHED
STANDARDS AND ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE.


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.


S.D.C. REPRESENTATIVE