DIG

SUB-SURFACE DIRECTIONAL SURVEY REPORT

AMOCO PRODUCTION COMPANY
COMPANY

SHU NO. 143
WELL NAME

LEA COUNTY, NEW MEXICO
STATE AND COUNTY

CERTIFIED REPORT

USTOMER :AMOCO PRODUCTION COMPANY

ELL # :SHU WELL NO. 143

OCATION :LEA COUNTY, NEW MEXICO

ATE :12-15-83, 12-20-83, (EW)12-23-83

OB TYPE :MAG. MS, MAG. MS, (EW)MAG. MS

OB # :MS-1356, MS-1362, (EW)S0213

URVEYOR :A. HARBERT, A. HARBERT, (EW) T. ONEY

EPTHS :0'-1514', 1514'-3527', (EW)3527'-4306'

ECL. :10 DEGREES EAST

LEV. :0'

ILE # :WT-G11S

ETHOD :RADIUS OF CURVATURE

ECTION :N84.89E

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

Larry Messey

DIG REPRESENTATIVE

INAL STATION DATA!

MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES N/S feet E/W	CLOSURE DISTANCE FEET	CLOSURE DIRECTION DEGS.	DOG-LEG SEVERITY DG/100FT
4306.00	11.25	N 59.00 E	22.00	4276.82	345.63	149.80 N 333.61 E	365.70at	N 65.81 E	1.14

MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES N/S feet E/W	CLOSURE DISTANCE FEET	CLOSURE DIRECTION DEGS.	DOG-LEG SEVERITY DG/100FT
0.00	0.00	N 00.00 E	0.00	0.00	0.00	0.00 N 0.00 E	0.00	at N 00.00 E	0.00
81.00	0.00	N 00.00 E	81.00	81.00	0.00	0.00 N 0.00 E	0.00	at N 00.00 E	0.00
111.00	0.00	N 00.00 E	30.00	111.00	0.00	0.00 N 0.00 E	0.00	at N 00.00 E	0.00
172.00	.25	S 15.00 E	61.00	172.00	.02	.13 S .03 E	.13	at S 15.00 E	.41
233.00	.25	N 86.00 E	61.00	233.00	.21	.27 S .23 E	.36	at S 40.83 E	.52
294.00	0.00	N 00.00 E	61.00	294.00	.34	.26 S .37 E	.45	at S 54.50 E	.41
355.00	.25	S 45.00 E	61.00	355.00	.43	.36 S .46 E	.58	at S 52.33 E	.41
416.00	0.00	N 00.00 E	61.00	416.00	.51	.45 S .56 E	.71	at S 50.97 E	.41
477.00	.25	S 24.00 E	61.00	477.00	.56	.57 S .61 E	.84	at S 46.83 E	.41
538.00	.25	S 20.00 W	61.00	538.00	.54	.83 S .62 E	1.04	at S 36.65 E	.31
599.00	.25	S 14.00 E	61.00	599.00	.51	1.09 S .60 E	1.25	at S 28.95 E	.24
660.00	.25	S 10.00 W	61.00	660.00	.49	1.36 S .61 E	1.49	at S 24.34 E	.17
721.00	0.00	N 00.00 E	61.00	721.00	.46	1.49 S .59 E	1.60	at S 21.65 E	.41
782.00	0.00	N 00.00 E	61.00	782.00	.46	1.49 S .59 E	1.60	at S 21.65 E	0.00
843.00	.25	N 04.00 W	61.00	843.00	.46	1.36 S .58 E	1.47	at S 23.22 E	.41
904.00	.25	N 11.00 E	61.00	904.00	.50	1.09 S .60 E	1.24	at S 28.73 E	.11
965.00	.50	N 38.00 E	61.00	964.99	.69	.73 S .76 E	1.06	at S 46.20 E	.49
1026.00	1.00	N 40.00 E	61.00	1025.99	1.25	.11 S 1.26 E	1.27	at S 85.02 E	.82
1087.00	1.25	N 24.00 E	61.00	1086.98	1.97	.90 N 1.90 E	2.10	at N 64.56 E	.65
1148.00	1.25	N 30.00 E	61.00	1147.96	2.68	2.09 N 2.50 E	3.26	at N 50.14 E	.21
1209.00	1.50	N 32.00 E	61.00	1208.95	3.54	3.34 N 3.25 E	4.66	at N 44.24 E	.42
1270.00	1.25	N 40.00 E	61.00	1269.93	4.50	4.53 N 4.11 E	6.12	at N 42.27 E	.52
1331.00	1.25	N 40.00 E	61.00	1330.91	5.44	5.54 N 4.97 E	7.45	at N 41.86 E	0.00
1392.00	1.00	N 53.00 E	61.00	1391.90	6.38	6.37 N 5.84 E	8.64	at N 42.50 E	.58
1453.00	1.00	N 50.00 E	61.00	1452.89	7.27	7.03 N 6.67 E	9.69	at N 43.49 E	.09

MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES N/S feet E/W	CLOSURE DISTANCE FEET	CLOSURE DIRECTION DEGS.	DOG-LEG SEVERITY DG/100FT
1514.00	1.00	N 56.00 E	61.00	1513.88	8.17	7.67 N 7.52 E	10.74at	N 44.43 E	.17
(0'-1514' RESULT OF DIG SURVEY MS-1356)									
(1514'-3527' RESULT OF DIG SURVEY MS-1362)									
1583.00	.75	N 52.00 E	69.00	1582.87	9.08	8.29 N 8.37 E	11.78at	N 45.28 E	.37
1614.00	.75	N 48.00 E	31.00	1613.87	9.41	8.55 N 8.68 E	12.19at	N 45.43 E	.17
1676.00	.50	N 87.00 E	62.00	1675.87	10.04	8.80 N 9.30 E	12.80at	N 46.55 E	.77
1738.00	.75	S 89.00 E	62.00	1737.86	10.72	8.82 N 9.97 E	13.31at	N 48.51 E	.41
1800.00	1.00	N 90.00 E	62.00	1799.86	11.66	8.81 N 10.92 E	14.03at	N 51.10 E	.40
1862.00	.75	N 64.00 E	62.00	1861.85	12.59	9.02 N 11.83 E	14.88at	N 52.68 E	.75
1923.00	1.25	N 81.00 E	61.00	1922.84	13.63	9.34 N 12.84 E	15.88at	N 53.98 E	.94
1985.00	1.75	N 53.00 E	62.00	1984.82	15.15	9.97 N 14.32 E	17.45at	N 55.17 E	1.41
2047.00	2.00	N 74.00 E	62.00	2046.79	17.03	10.87 N 16.13 E	19.45at	N 56.03 E	1.17
2109.00	2.75	N 68.00 E	62.00	2108.73	19.53	11.70 N 18.56 E	21.94at	N 57.76 E	1.27
2170.00	3.25	N 66.00 E	61.00	2169.65	22.56	12.95 N 21.50 E	25.09at	N 58.93 E	.84
2232.00	4.00	N 67.00 E	62.00	2231.52	26.28	14.51 N 25.09 E	28.99at	N 59.95 E	1.21
2294.00	5.00	N 69.00 E	62.00	2293.33	30.94	16.33 N 29.60 E	33.81at	N 61.10 E	1.63
2356.00	5.75	N 69.00 E	62.00	2355.06	36.52	18.42 N 35.02 E	39.57at	N 62.26 E	1.21
2418.00	7.75	N 69.00 E	62.00	2416.63	43.53	21.03 N 41.83 E	46.81at	N 63.30 E	3.23
2479.00	8.50	N 70.00 E	61.00	2477.01	51.84	24.05 N 49.90 E	55.39at	N 64.27 E	1.25
2541.00	9.00	N 66.00 E	62.00	2538.29	60.87	27.58 N 58.64 E	64.80at	N 64.81 E	1.27
2603.00	9.25	N 68.00 E	62.00	2599.51	70.22	31.42 N 67.69 E	74.63at	N 65.10 E	.65
2665.00	10.00	N 65.00 E	62.00	2660.63	80.06	35.55 N 77.20 E	84.99at	N 65.27 E	1.45
2727.00	10.00	N 66.00 E	62.00	2721.69	90.21	40.02 N 87.00 E	95.76at	N 65.29 E	.28
2788.00	10.50	N 65.00 E	61.00	2781.72	100.45	44.52 N 96.87 E	106.61at	N 65.31 E	.87
2850.00	10.50	N 66.00 E	62.00	2842.68	111.11	49.20 N 107.15 E	117.91at	N 65.33 E	.29
2912.00	10.75	N 67.00 E	62.00	2903.62	121.96	53.76 N 117.64 E	129.34at	N 65.43 E	.50
2974.00	11.00	N 69.00 E	62.00	2964.50	133.15	58.14 N 128.48 E	141.03at	N 65.65 E	.73

MEASURED DEPTH FEET	INCL. ANGLE DEGS.	HOLE DIRECTION DEGS.	COURSE LENGTH FEET	TRUE VERTICAL DEPTH FEET	VERTICAL SECTION FEET	RECTANGULAR COORDINATES N/S feet E/W	CLOSURE DISTANCE FEET	CLOSURE DIRECTION DEGS.	DOG-LEG SEVERITY DG/100FT
3036.00	11.00	N 70.00 E	62.00	3025.36	144.56	62.29 N 139.56 E	152.83	at N 65.94 E	.31
3097.00	10.75	N 70.00 E	61.00	3085.27	155.68	66.22 N 150.38 E	164.31	at N 66.23 E	.41
3159.00	10.75	N 71.00 E	62.00	3146.18	166.88	70.08 N 161.28 E	175.85	at N 66.51 E	.30
3221.00	11.50	N 71.00 E	62.00	3207.01	178.49	73.98 N 172.59 E	187.78	at N 66.79 E	1.21
3283.00	11.00	N 74.00 E	62.00	3267.82	190.31	77.62 N 184.12 E	199.82	at N 67.14 E	1.24
3345.00	10.75	N 74.00 E	62.00	3328.71	201.79	80.84 N 195.37 E	211.43	at N 67.52 E	.40
3406.00	10.75	N 75.00 E	61.00	3388.64	212.98	83.88 N 206.33 E	222.73	at N 67.87 E	.31
3468.00	10.75	N 75.00 E	62.00	3449.55	224.38	86.87 N 217.50 E	234.21	at N 68.22 E	0.00
3499.00	10.50	N 76.00 E	31.00	3480.02	230.02	88.30 N 223.04 E	239.88	at N 68.40 E	1.00
3527.00	10.50	N 77.00 E	28.00	3507.55	235.06	89.50 N 228.00 E	244.93	at N 68.56 E	.65
(1541'-3527' RESULT OF DIC SURVEY MS-1362)									
(3527'-4306' RESULT OF EASTMAN WHIPSTOCK SURVEY S0213)									
3597.00	7.75	N 62.00 E	70.00	3576.66	245.74	93.37 N 238.37 E	256.00	at N 68.60 E	5.16
3660.00	7.50	N 61.00 E	63.00	3639.10	253.41	97.36 N 245.71 E	264.30	at N 68.38 E	.45
3722.00	7.75	N 62.00 E	62.00	3700.55	260.96	101.29 N 252.94 E	272.47	at N 68.17 E	.46
3785.00	7.75	N 60.00 E	63.00	3762.98	268.73	105.40 N 260.37 E	280.90	at N 67.96 E	.43
3847.00	8.50	N 57.00 E	62.00	3824.35	276.57	109.98 N 267.84 E	289.54	at N 67.67 E	1.39
3909.00	8.50	N 59.00 E	62.00	3885.67	284.75	114.84 N 275.61 E	298.58	at N 67.38 E	.48
3972.00	9.00	N 57.00 E	63.00	3947.94	293.29	119.92 N 283.74 E	308.04	at N 67.08 E	.93
4034.00	9.25	N 62.00 E	62.00	4009.16	302.17	124.91 N 292.21 E	317.79	at N 66.85 E	1.34
4097.00	9.75	N 59.00 E	63.00	4071.29	311.64	130.03 N 301.26 E	328.12	at N 66.65 E	1.12
4159.00	10.25	N 60.00 E	62.00	4132.35	321.37	135.49 N 310.54 E	338.81	at N 66.42 E	.85
4222.00	10.50	N 58.00 E	63.00	4194.32	331.58	141.33 N 320.26 E	350.06	at N 66.18 E	.70
4284.00	11.00	N 57.00 E	62.00	4255.23	341.84	147.55 N 330.01 E	361.49	at N 65.91 E	.86
(3527'-4306' RESULT OF EASTMAN WHIPSTOCK SURVEY S0213)									
4306.00	11.25	N 59.00 E	22.00	4276.82	345.63	149.80 N 333.61 E	365.70	at N 65.81 E	2.09

CLOSURE DISTANCE = 365.70 FEET.
CLOSURE DIRECTION = N 65.82 E

AMOCO PRODUCTION COMPANY

WELL # :
SHU WELL NO. 149

LOCATION :
LEA COUNTY, NEW MEXICO

DATE :
12-15-89, 12-20-89, (EW) 12-29-89

JOB TYPE :
MAG. MS, MAG. MS, (EW) MAG. MS

JOB # :
MS-1956, MS-1962, (EW) 90219

SURVEYOR :
A. HARBERT, A. HARBERT, (EW) T. ONEY

DEPTHS :
0'-1514', 1514'-9527', (EW) 9527'-4906'

DECL. :
10 DEGREES EAST

ELEV. :
0'

FILE # :
WT-G119

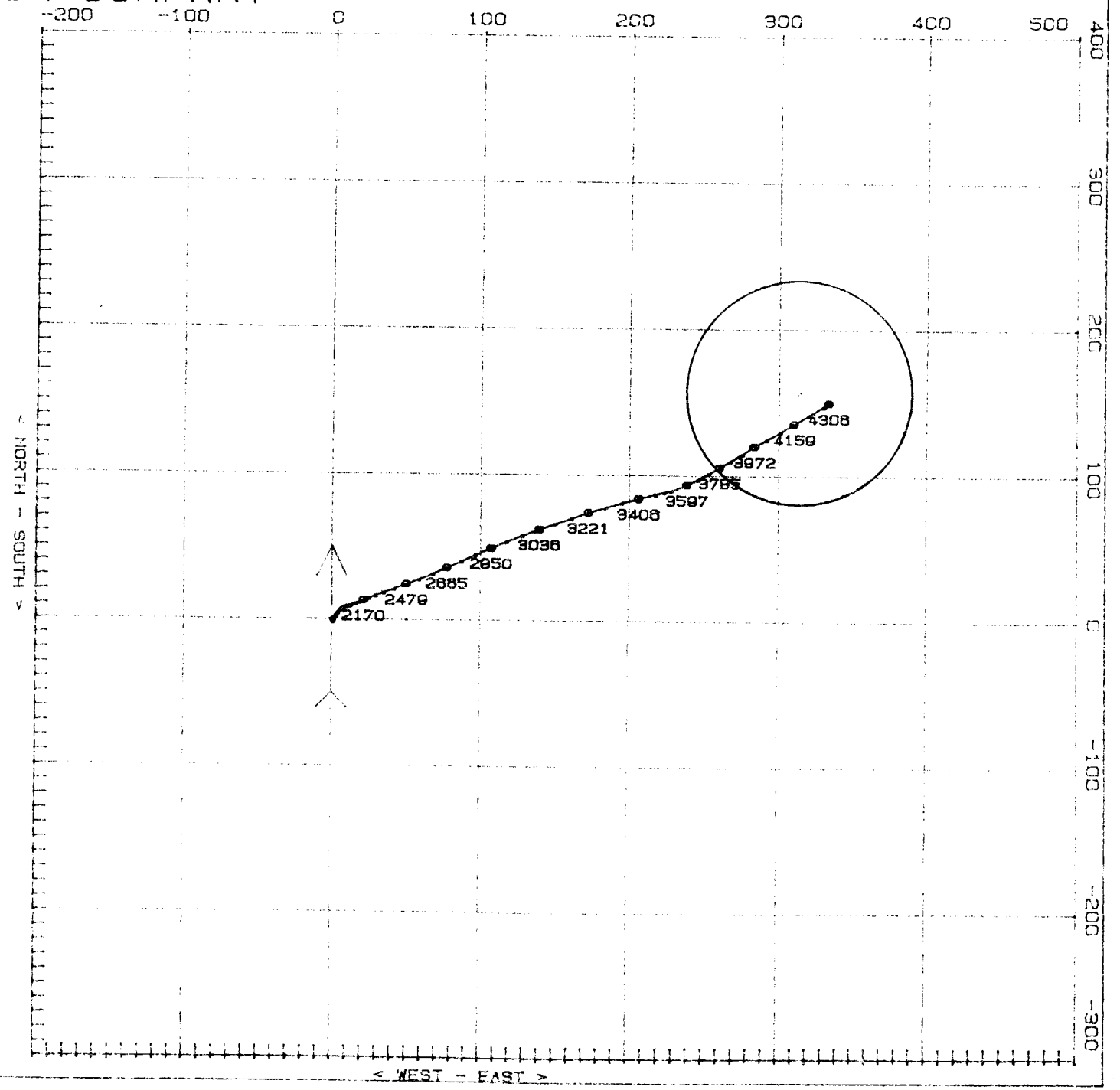
****

FINAL STATION DATA:

MD.	4306.00
TVD.	4276.82
N/S	149.80
E/W	333.61

CLOSURE DISTANCE
365.70 FEET
CLOSURE DIRECTION
N 65.82 E

1 IN. = 100 FT.



DIRECTIONAL
INVESTMENT
GUIDANCE, INC.

P. O. BOX 7238
MIDLAND, TEXAS 79703

SURVEY CERTIFICATION

STATE TEXAS

COUNTY OF MIDLAND

I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 12-15, 1983 through 12-15, 1983 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 0 feet to 1514 feet, with recordings of inclination being obtained at approximately intervals of 62 feet.

This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU WELL NO. 143, LEA County, State of NEW MEXICO in the _____ field.

The data for this survey were obtained by me according to standards and procedures as set forth by D.I.G., Inc., and is true and correct to the best of my knowledge.

D. A. HARBERT

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.

LARRY MASSEY

DIG DIRECTIONAL INVESTMENT GUIDANCE, INC.

P. O. BOX 7238
MIDLAND, TEXAS 79703

SURVEY CERTIFICATION

STATE TEXAS

COUNTY OF MIDLAND

I, D. A. HARBERT, in the employ of D.I.G., Inc., did on the days of 12-20, 19 83 through 12-20, 19 83 conduct or supervise the taking of a MAGNETIC MULTISHOT survey by the method of magnetic orientation from a depth of 1514 feet to 3527 feet, with recordings of inclination being obtained at approximately intervals of 62 feet.

This survey was conducted at the request of AMOCO PRODUCTION COMPANY for their SHU WELL NO. 143, LEA County, State of NEW MEXICO in the _____ field.

The data for this survey were obtained by me according to standards and procedures as set forth by D.I.G., Inc., and is true and correct to the best of my knowledge.

D. A. HARBERT

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.

LARRY MASSEY

Eastman Whipstock
A PETROLANE COMPANY
P. O. Box 5577/Midland, Texas 79704/(915) 563-0511

SURVEY CERTIFICATION SHEET

STATE OF TEXAS
COUNTY OF MIDLAND

I, Troy Oney, in the employ of Eastman Whipstock, Inc., did on the days of 12-23, 19 83 thru 12-23, 19 83 conduct or supervise the taking of a Magnetic Multi Shot survey by the method of magnetic orientation from a depth of 3527 feet to 4306 feet, with recordings of inclination and direction being obtained at approximate intervals of 63 feet.

This survey was conducted at the request of Amoco Production Company for their South Hobbs Unit Well No. 143 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.

Tim Stephens

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 12 TH day of JAN., 1984

Roy K. Stanke
Notary Public in and for the
County of Midland, Texas
My commission expires 7/9/85

NOTARY PUBLIC STATE OF FLORIDA COUNTY OF