

*REPORT OF*  
*SUB-SURFACE*  
*DIRECTIONAL*  
*SURVEY*



**REPORT  
of  
SUB-SURFACE  
DIRECTIONAL  
SURVEY**

GREENHILL PETROLEUM  
COMPANY

LOVINGTON Paddock NO. 87  
WELL NAME

LEA COUNTY, NEW MEXICO  
LOCATION

<u>JOB NUMBER</u>	<u>TYPE OF SURVEY</u>	<u>DATE</u>
430-1359	GYROSCOPIC MULTI SHOT	3-09-91
430-1359	MAGNETIC MULTI SHOT	3-19-91

SURVEY BY  
TIM STEPHENS, RALPH RICE

OFFICE  
WEST TEXAS



GREENHILL PETROLEUM  
HOVINGTON PADDOCK NO 87  
IFA COUNTY, NEW MEXICO

DATE PRINTED : 21-MAR-91  
OUR REF. NO. : S01473.4GP  
PBHL : S 42 59 E  
JOB NUMBER :

PAGE NO. 2

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	COORDINATES	CLD SUR E DISTANCE	DIRECTION D M	DOUGLASS SEVERITY
0.00	0	0 N 0	0.00	0.00	0.00	0.00 N	0.00	S 90 0 E	0.00
100.00	0 15 S 80	0 E 100.00	100.00	100.00	0.17	0.04 S	0.21	S 80 0 E	0.25
200.00	0 30 S 52	0 E 100.00	100.00	200.00	0.78	0.34 S	0.77	S 66 0 E	0.30
300.00	0 30 N 16	0 W 100.00	100.00	300.00	0.82	0.19 S	1.00	S 79 1 E	0.00
400.00	0 15 S 22	0 E 100.00	100.00	399.99	0.64	0.02 N	0.96	N 88 36 E	0.70
500.00	0 30 N 73	0 E 100.00	100.00	499.99	1.03	0.05 S	1.46	S 87 59 E	0.54
600.00	0 0 N 73	0 E 100.00	100.00	599.99	1.22	0.08 N	1.87	N 87 40 E	0.50
700.00	0 30 S 48	0 E 100.00	100.00	699.99	1.66	0.22 S	2.20	S 84 24 E	0.50
800.00	0 15 S 32	0 E 100.00	100.00	799.99	2.31	0.69 S	2.64	S 75 18 E	0.27
900.00	0 0 S 32	0 E 100.00	100.00	899.99	2.52	0.88 S	2.75	S 72 20 E	0.25
1000.00	0 30 S 45	0 E 100.00	100.00	999.99	2.96	1.19 S	3.06	S 68 50 E	0.50
1100.00	0 30 S 53	0 E 100.00	100.00	1099.98	3.82	1.76 S	3.72	S 64 43 E	0.07
1200.00	0 30 S 1	0 E 100.00	100.00	1199.98	4.58	2.46 S	4.08	S 58 56 E	0.44
1300.00	1 0 S 3	0 W 100.00	100.00	1299.97	5.51	3.76 S	4.04	S 47 1 E	0.50
1400.00	1 0 S 17	0 E 100.00	100.00	1399.96	6.90	5.47 S	4.25	S 37 50 E	0.35
1500.00	0 45 S 8	0 E 100.00	100.00	1499.94	8.22	6.95 S	4.59	S 33 27 E	0.28
1600.00	1 30 S 2	0 E 100.00	100.00	1599.92	9.74	8.91 S	4.73	S 27 58 E	0.00
1700.00	0 45 S 22	0 W 100.00	100.00	1699.90	11.01	10.82 S	4.53	S 22 43 E	0.00
1800.00	1 0 S 31	0 W 100.00	100.00	1799.89	11.52	12.18 S	3.84	S 17 29 E	0.28
1900.00	1 0 S 17	0 W 100.00	100.00	1899.88	12.20	13.76 S	3.13	S 12 49 E	0.24
2000.00	0 45 S 17	0 W 100.00	100.00	1999.87	12.97	15.22 S	2.69	S 10 0 E	0.25
2100.00	0 30 S 41	0 W 100.00	100.00	2099.86	13.34	16.18 S	2.21	S 7 46 E	0.36
2200.00	1 0 S 66	0 W 100.00	100.00	2199.85	13.10	16.86 S	1.12	S 3 49 E	0.59
2300.00	0 45 S 71	0 W 100.00	100.00	2299.84	12.55	17.43 S	0.29	S 0 58 W	0.26
2400.00	0 45 S 48	0 W 100.00	100.00	2399.83	12.27	18.08 S	1.40	S 4 25 W	0.30
2500.00	0 15 N 16	0 E 100.00	100.00	2499.83	12.15	18.31 S	1.82	S 5 41 W	0.97
2600.00	1 0 N 13	0 E 100.00	100.00	2599.82	11.55	17.25 S	1.57	S 5 11 W	0.75
2700.00	1 0 N 8	0 E 100.00	100.00	2699.81	10.51	15.53 S	1.25	S 4 36 W	0.09
2800.00	1 30 N 8	0 E 100.00	100.00	2799.78	9.14	13.37 S	0.95	S 4 3 W	0.50
2900.00	1 15 N 7	0 E 100.00	100.00	2899.75	7.61	10.99 S	0.63	S 3 17 W	0.25

EASTMAN

GREENHILL PETROLEUM  
LOVINGTON PADDOCK NO 87  
LEA COUNTY, NEW MEXICO

DATE PRINTED : 21-MAR-91  
OUR REF. NO. : S01473.4GP  
JOB NUMBER :

PAGE NO. 3

PBHL : S 42 59 E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	RECT AN G U L A R		C L O S U R E DISTANCE	DIRECTION D M	DOGLEG SEVERITY
						C O R D I N A T E S				
3000.00	1 0 N 10	0 E	100.00	2999.74	6.39	9.05 S	0.35 W	9.06 S	2 11 W	0.26
3100.00	0 45 N 23	0 E	100.00	3099.72	5.59	7.59 S	0.06 E	7.59 S	0 28 E	0.32
3200.00	1 0 N 44	0 E	100.00	3199.71	5.28	6.36 S	0.92 E	6.43 S	8 16 E	0.40
3300.00	0 15 S 85	0 E	100.00	3299.71	5.40	5.75 S	1.75 E	6.01 S	16 54 E	0.4
3400.00	0 45 S 90	0 E	100.00	3399.70	6.01	5.77 S	2.62 E	6.34 S	24 25 E	0.50
3500.00	0 30 S 83	0 E	100.00	3499.70	6.79	5.82 S	3.71 E	6.90 S	32 28 E	0.26
3600.00	0 30 N 47	0 E	100.00	3599.69	7.12	5.58 S	4.46 E	7.14 S	38 38 E	0.42
3700.00	0 0 N 47	0 E	100.00	3699.69	7.12	5.28 S	4.78 E	7.12 S	42 8 E	0.50
3750.00	0 15 S 30	0 E	50.00	3749.69	7.23	5.38 S	4.83 E	7.23 S	41 57 E	0.50
3783.00	0 15 N 10	0 E	33.00	3782.69	7.25	5.37 S	4.88 E	7.25 S	42 17 E	1.42
3814.00	0 15 S 81	0 E	31.00	3813.69	7.27	5.31 S	4.96 E	7.27 S	43 2 E	1.13
3875.00	1 0 S 15	0 E	61.00	3874.69	7.84	5.85 S	5.23 E	7.84 S	41 48 E	1.52
3937.00	1 0 S 22	0 E	62.00	3936.68	8.82	6.87 S	5.57 E	8.85 S	39 2 E	0.20
3998.00	1 45 S 31	0 E	61.00	3997.66	10.23	8.16 S	6.25 E	10.28 S	37 26 E	1.28
4060.00	3 15 S 27	0 E	62.00	4059.60	12.85	10.54 S	7.54 E	12.96 S	35 34 E	2.43
4122.00	3 30 S 26	0 E	62.00	4121.49	16.35	13.81 S	9.16 E	16.57 S	33 34 E	0.41
4183.00	3 45 S 15	0 E	61.00	4182.37	19.89	17.41 S	10.50 E	20.33 S	31 5 E	1.0
4245.00	4 15 S 22	0 E	62.00	4244.22	23.83	21.50 S	11.88 E	24.56 S	28 56 E	1.1
4307.00	5 0 S 25	0 E	62.00	4306.02	28.54	26.08 S	13.88 E	29.54 S	28 2 E	1.27
4368.00	4 0 S 34	0 E	61.00	4366.83	33.17	30.25 S	16.20 E	34.31 S	28 10 E	2.00
4430.00	3 0 S 36	0 E	62.00	4428.71	36.92	33.35 S	18.36 E	38.07 S	28 50 E	1.62
4492.00	2 30 S 42	0 E	62.00	4490.64	39.88	35.67 S	20.22 E	41.00 S	29 33 E	0.93
4553.00	4 0 S 41	0 E	61.00	4551.54	43.34	38.27 S	22.50 E	44.39 S	30 28 E	2.46
4615.00	6 0 S 37	0 E	62.00	4613.30	48.72	42.49 S	25.87 E	49.74 S	31 20 E	3.27
4676.00	8 15 S 30	0 E	61.00	4673.83	56.16	48.82 S	29.98 E	57.29 S	31 33 E	3.95
4738.00	10 0 S 33	0 E	62.00	4735.04	65.79	57.19 S	35.14 E	67.12 S	31 34 E	2.92
4800.00	11 0 S 33	0 E	62.00	4796.00	76.92	66.67 S	41.29 E	78.42 S	31 46 E	1.61
4861.00	13 15 S 34	0 E	61.00	4855.64	89.56	77.34 S	48.37 E	91.22 S	32 1 E	3.70
4923.00	15 0 S 33	0 E	62.00	4915.76	104.48	89.96 S	56.71 E	106.35 S	32 14 E	2.85
4985.00	16 0 S 33	0 E	62.00	4975.51	120.80	103.86 S	65.74 E	122.92 S	32 20 E	1.61

EASTMAN

CLIPPER

GREENHILL PETROLEUM  
JOVINGTON PADDOCK NO 87  
JFA COUNTY, NEW MEXICO

DATE PRINTED : 21-MAR-91  
OUR REF. NO. : S01473.46P  
JOB NUMBER :

PAGE NO. 4

FBHL : S 42 59 E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES	CLOSURE DISTANCE	DIRECTION D M	DOGLEG SEVERITY
5046.00	17 45	S 36 0 E	61.00	5033.88	138.31	118.43 S	75.78 E	140.61 S 32 37 E	3.20
5108.00	18 0	S 36 0 E	62.00	5092.88	157.20	133.83 S	86.97 E	159.61 S 33 1 E	0.40
5159.00	19 45	S 35 0 E	51.00	5141.14	173.56	147.27 S	96.54 E	176.09 S 33 15 E	3.49
5231.00	20 45	S 35 0 E	72.00	5203.69	198.23	167.68 S	110.84 E	201.00 S 33 28 E	1.7
5293.00	21 0	S 36 0 E	62.00	5266.62	220.14	185.66 S	123.67 E	223.08 S 33 40 E	0.70
5354.00	22 0	S 36 0 E	61.00	5323.37	242.33	203.75 S	136.81 E	245.42 S 33 53 E	1.64
5416.00	22 0	S 37 0 E	62.00	5380.86	265.40	222.42 S	150.62 E	268.62 S 34 6 E	0.60
5478.00	21 45	S 37 0 E	62.00	5438.40	288.38	240.87 S	164.52 E	291.69 S 34 20 E	0.40
5539.00	21 45	S 37 0 E	61.00	5495.05	310.86	258.92 S	178.13 E	314.28 S 34 32 E	0.00
5601.00	21 30	S 38 0 E	62.00	5552.69	333.60	277.05 S	192.04 E	337.10 S 34 44 E	0.72
5662.00	22 0	S 40 0 E	61.00	5609.35	356.15	294.61 S	206.26 E	359.64 S 35 0 E	1.47
5724.00	21 30	S 39 0 E	62.00	5666.93	379.08	312.33 S	220.88 E	382.54 S 35 16 E	1.00
5786.00	22 15	S 39 0 E	62.00	5724.47	402.13	330.29 S	235.41 E	405.60 S 35 29 E	1.21
5847.00	22 0	S 39 0 E	61.00	5780.98	425.04	348.14 S	249.87 E	428.53 S 35 40 E	0.41
5909.00	22 15	S 40 0 E	62.00	5838.41	448.35	366.16 S	264.73 E	451.83 S 35 52 E	0.73
5971.00	21 30	S 39 0 E	62.00	5895.95	471.41	383.98 S	279.42 E	474.89 S 36 3 E	1.35
6032.00	22 15	S 41 0 E	61.00	5952.56	494.10	401.38 S	294.03 E	497.56 S 36 13 E	1.7
6094.00	22 0	S 40 0 E	62.00	6009.99	517.43	419.14 S	309.20 E	520.85 S 36 25 E	0.7
6156.00	21 45	S 40 0 E	62.00	6067.53	540.50	436.83 S	324.05 E	543.90 S 36 34 E	0.40
6217.00	22 0	S 42 0 E	61.00	6124.14	563.21	453.98 S	338.96 E	566.56 S 36 45 E	1.29
6273.00	22 0	S 39 0 E	56.00	6176.06	584.16	469.93 S	352.58 E	587.49 S 36 53 E	2.01
6340.00	22 15	S 40 0 E	67.00	6238.13	609.35	489.40 S	368.63 E	612.70 S 36 59 E	0.67
6402.00	22 0	S 41 0 E	62.00	6295.56	632.68	507.16 S	383.79 E	636.01 S 37 7 E	0.73

CLOSURE - DISTANCE : 636.01  
DIRECTION : S 37 7 E

REPORT UNITS : Feet

SURVEY CALCULATION METHOD : Minimum curvature

Accepted by :  
Checked by :

SURVEY RUN INFORMATION

EASTMAN

SURVEYOR: RALPH RICE

(0'-3750')

**EASTMAN**  
**KODAK**

SURVEY RUN INFORMATION - (CONTINUED)

=====

430-1359

(3750'-6402')

MAGNETIC MULTI-SHOT SURVEY

SURVEYOR: TIM STEPHENS



Submit to Appropriate  
District Office  
State Lease - 4 copies  
Fee Lease - 3 copies

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised 1-1-89

OIL CONSERVATION DIVISION

P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88240

DISTRICT II  
P.O. Drawer DD, Artesia, NM 88210

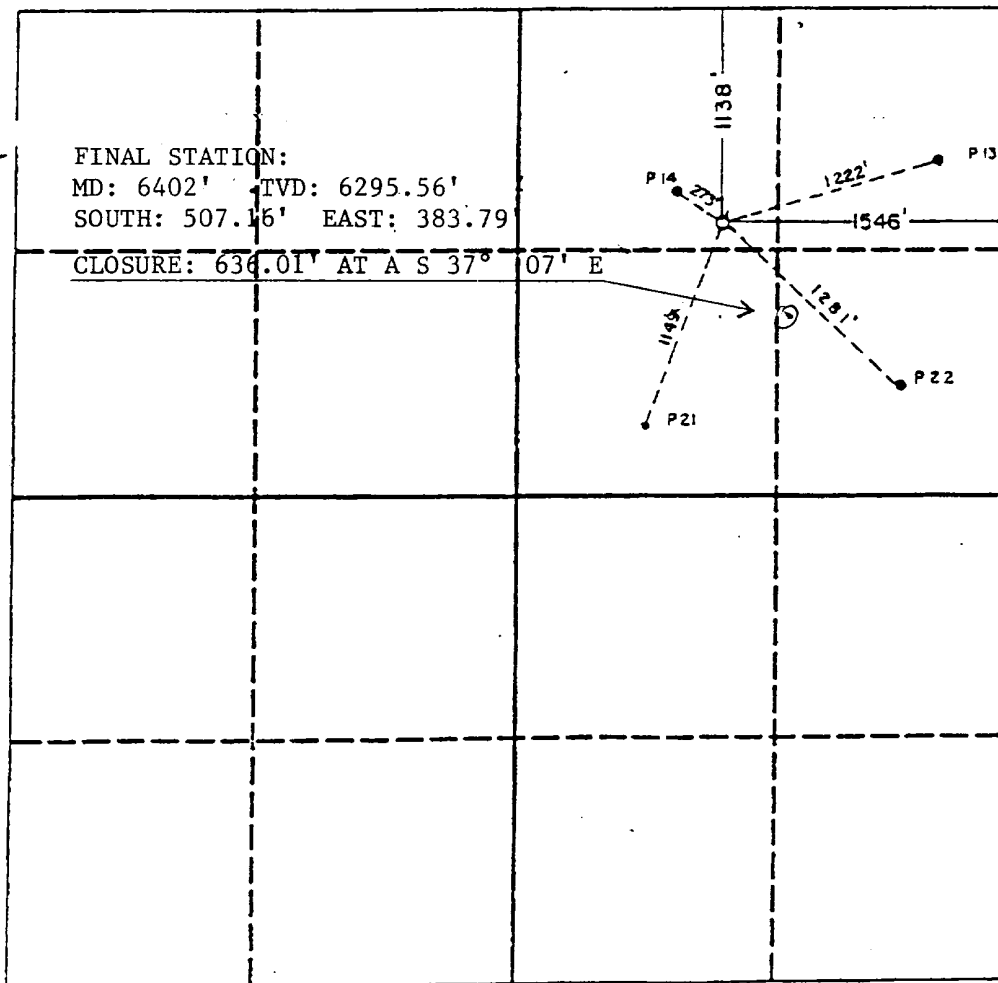
DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator GREENHILL PETROLEUM CORP.			Lease LOVINGTON PADDOCK UNIT		Well No. 87
Unit Letter B	Section 36	Township 16 SOUTH	Range 36 EAST	County LEA	
Actual Footage Location of Well: 1138 feet from the NORTH line and 1546 feet from the EAST line					
Ground level Elev. 3939.2		Producing Formation		Pool Dedicated Acreage: Acres	

1. Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc?  
☐ Yes ☐ No If answer is "yes" type of consolidation \_\_\_\_\_  
If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)  
No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to best of my knowledge and belief.

Signature

Printed Name

Position

Company

Date

SURVEYOR CERTIFICATION

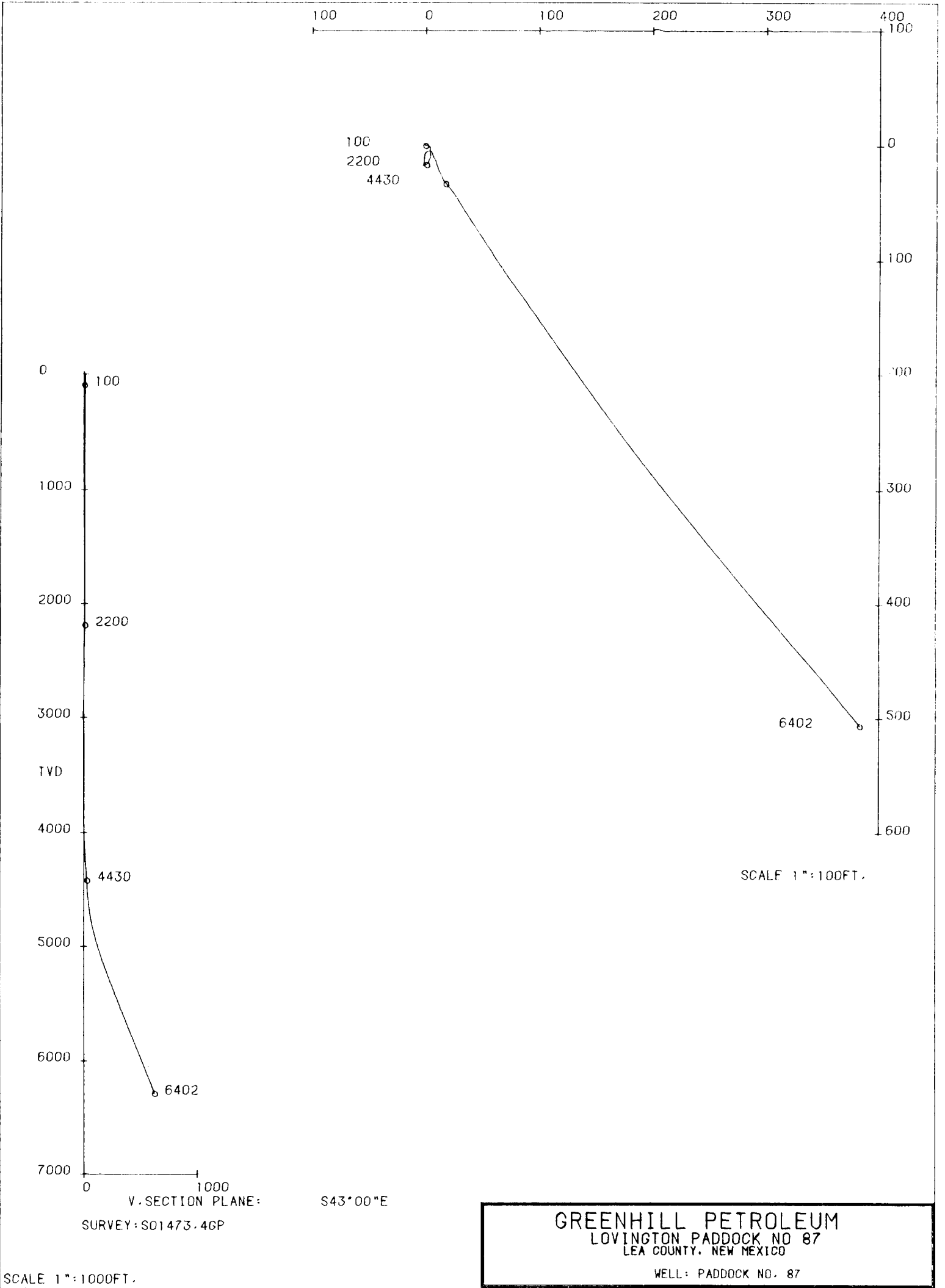
I hereby certify that the well location shown on this plat was plotted from field notes actual surveys made by me or under supervision and that this same is true correct to the best of my knowledge and belief.

Date Surveyed

Signature & Seal of  
Professional Surveyor

Certificate No. JOHN W. WEST, 5

RONALD J. EIDSON, 50





**EASTMAN  
CHRISTENSEN**

A Baker Hughes company

2103 Market, Midland, TEXAS 79703; Phone: (915) 694-9517, Fax: (915) 694-5648

**SURVEY CERTIFICATION SHEET**

**STATE OF TEXAS  
COUNTY OF MIDLAND**

I, Ralph Rice, in the employ of Eastman Christensen, Inc. did on the days of March 09, 1991 thru March 09 1991 conduct or supervise the taking of a Gyroscopic Multi-Shot survey by the method of magnetic orientat0on from a depth of 0 feet to 3,750 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of Greenhill Petroleum for their Lovington Paddock #87, Lea County, State of New Mexico, in the \_\_\_\_\_ field.

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

Ralph Rice

Directional Supervisor/Surveyor

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

Harry DeSpain



**EASTMAN  
CHRISTENSEN**

A Baker Hughes company

2103 Market, Midland, TEXAS 79703; Phone: (915) 694-9517, Fax: (915) 694-5648

**SURVEY CERTIFICATION SHEET**

**STATE OF TEXAS  
COUNTY OF MIDLAND**

I, Tim Stephens, in the employ of Eastman Christensen, Inc. did on the days of March 19, 1991 thru March 19 1991 conduct or supervise the taking of a Magnetic Multi-Shot survey by the method of magnetic orientat0on from a depth of 3750 feet to 6402 feet, with recordings of inclination and direction being obtained at approximate intervals of 61 feet.

This survey was conducted at the request of Greenhill Petroleum for their Lovington Paddock 87, 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 Christensen, Inc. and is true and correct to the best of my knowledge,

Tim Stephens

Directional Supervisor/Surveyor

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

Ray DeSpain