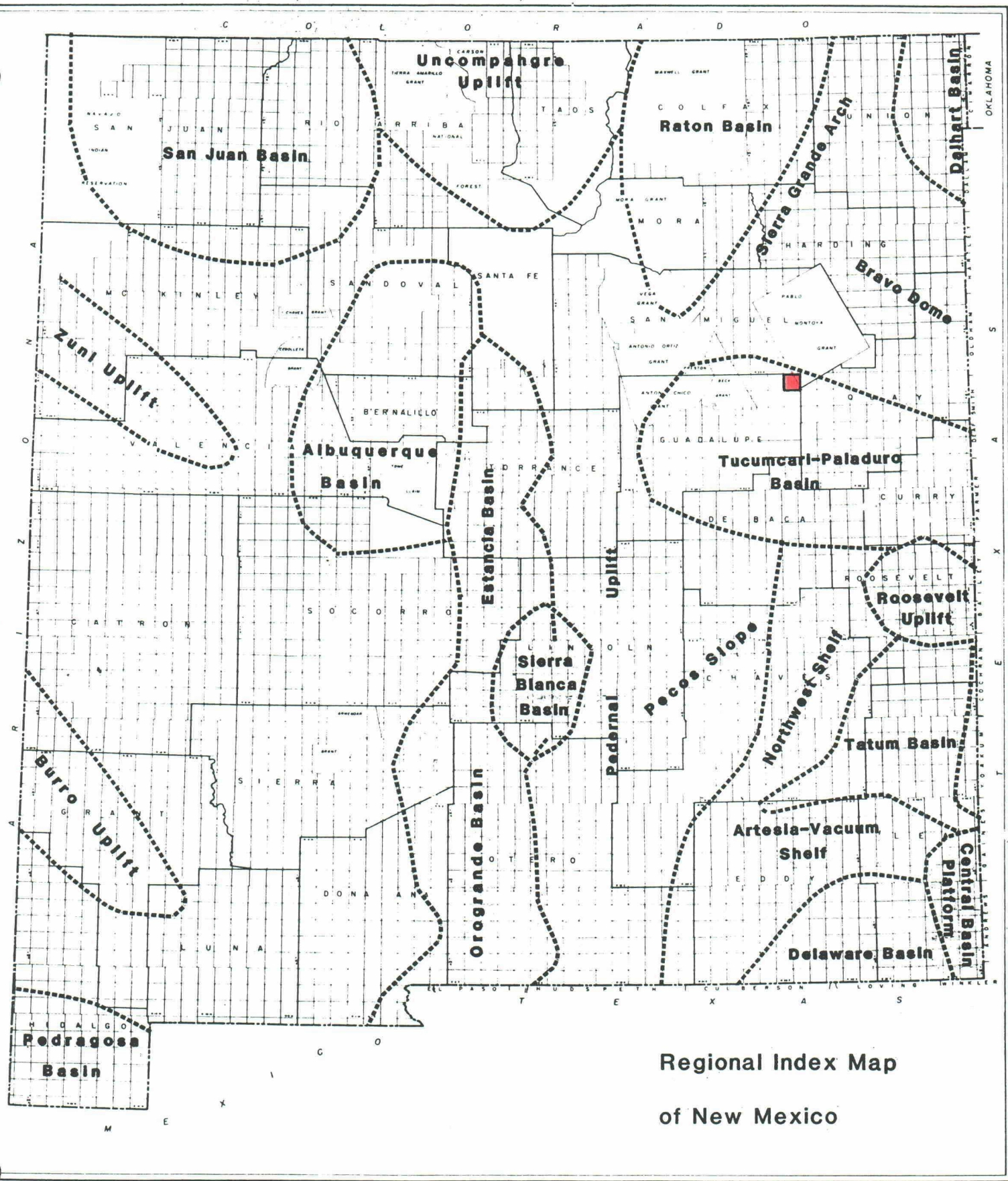
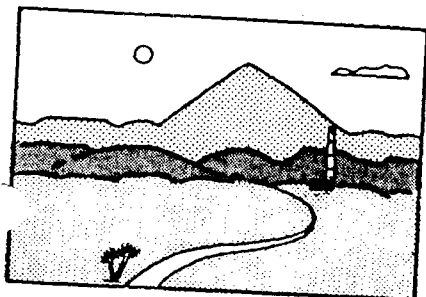


T-4 RANCH HEAVY OIL FIELD
GUADALUPE CO., NEW MEXICO

George L. Scott
May 22, 1984

BEFORE EXAMINER STOKER	
OIL CONSERVATION DIVISION	
EXHIBIT NO.	/
CASE NO.	8230





George L. Scott

CONSULTING GEOLOGIST
SUITE 648 PETROLEUM BLDG.
ROSWELL, NEW MEXICO 88201

PHONE OFF. 505-622-5891
PHONE RES. 505-622-5627

T-4 RANCH HEAVY OIL FIELD GUADALUPE CO., NEW MEXICO

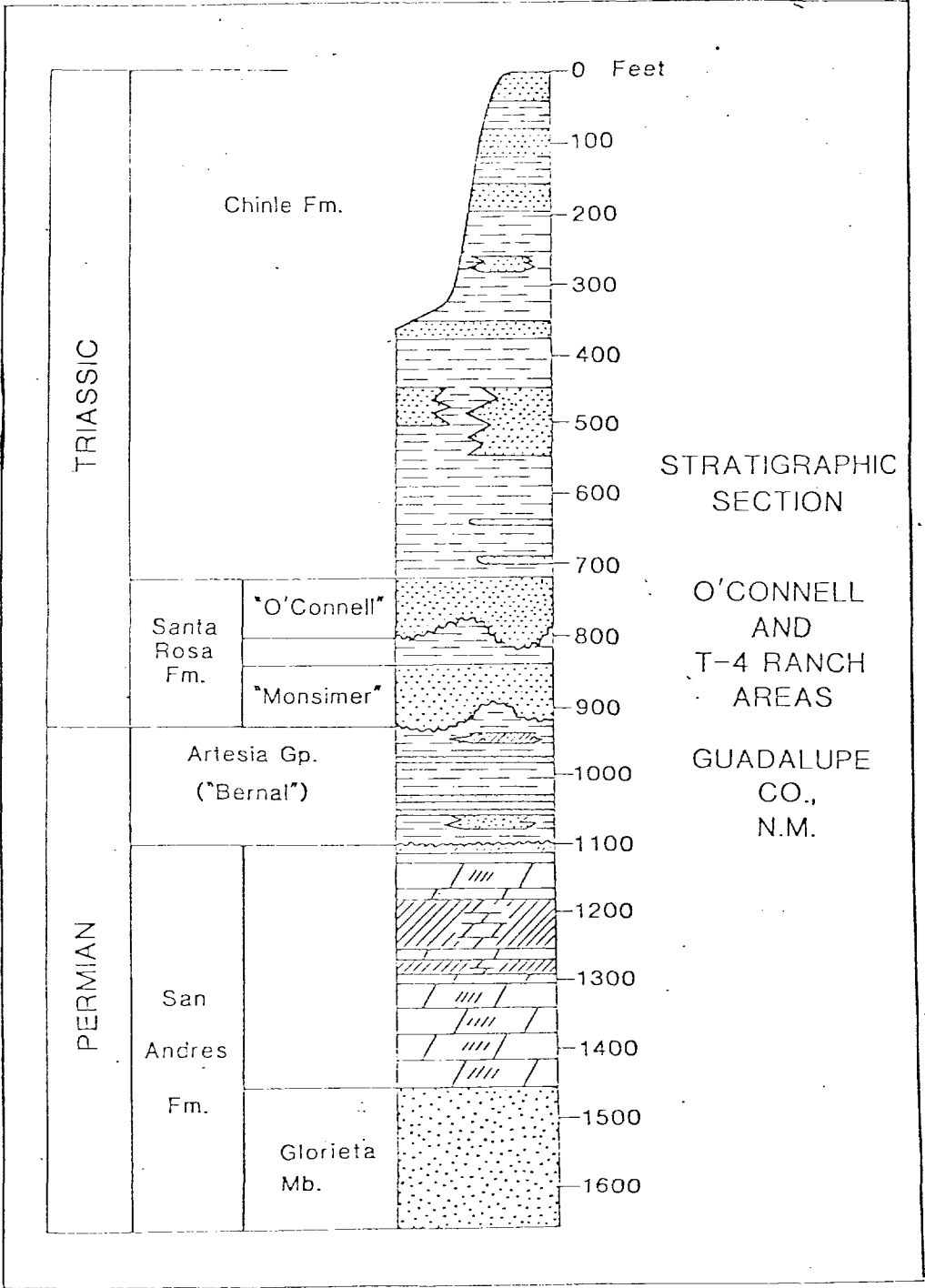
INTRODUCTION

This report will summarize the geology and heavy oil accumulation in the vicinity of the T-4 Ranch located about thirteen miles north of Newkirk in northeastern Guadalupe County, New Mexico. This oil accumulation will be referred to as the T-4 Ranch field in the remainder of this report.

Rio Petro, Ltd. (formerly Public Lands Exploration, and later Corona Oil Co.) has explored this area by drilling 18 wells during the past three and one half years. Evaluation has been primarily with cores and core analysis.

STRUCTURE AND STRATIGRAPHY

Oil saturation in the T-4 field occurs in the "O'Connell sandstone" of the Santa Rosa formation (see attached stratigraphic section) at an approximate depth of 800 feet. The "O'Connell sandstone" bed consists of fine-grained, friable, slightly calcareous sandstone, and was deposited as a point bar of stream channel origin. The O'Connell was cored in all of the Rio Petro wells and net pay determinations were made on the basis of core analysis. Porosities average about 20%, permeability about 200 md., and net pay varies from 20 to 70 feet. The oil should be similar to that recovered at the O'Connell Ranch pilot steamflood



three miles to the west, where gravities range from 15° to 17° API and viscosities are 1400 cp. at 71°. The areal extent of the field is shown on the accompanying net pay isopach map.

The field is situated near the east end of the east-west trending Newkirk anticline (see accompanying structural map). Oil entrapment appears to be related both to the restricted, lenticular configuration of the O'Connell sandstone and to structural position.

A log and core analysis is included for the type well, the Rio Petro, Ltd. # 1 Barbara (2030' FS & EL, Sec 17-T11N-R26E).

PILOT STEAM FLOODS

Rio Petro is operating a pilot steam flood in the NE/4 NW/4 Section 17 in an attempt to recover the viscous oil. The pilot project was initiated in October 1982. It presently appears that insufficient steam has been injected to initiate a response. Based on our engineering studies however response should be occurring later this year.

It is the intention of Rio Petro to begin one or more additional pilot steam projects in the field within the near future. These will be placed in the thickest part of the net pay section, probably in the NE/4 NE/4 Section 17 or in the NW/4 NW/4 of Section 16 (see attached isopach of net pay).

An estimate of the oil in place in the T-4 Ranch field is presented below, together with an estimate of the oil recoverably by steam flooding methods.¹

Acre feet.....	38,664.30
Average porosity.....	20%
Oil Saturation.....	55%

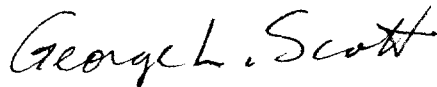
1. Computations are by Mr. Charles Joy, Petroleum Engineer, Artesia, New Mexico.

Oil In Place, Barrels..... 32,995,340.

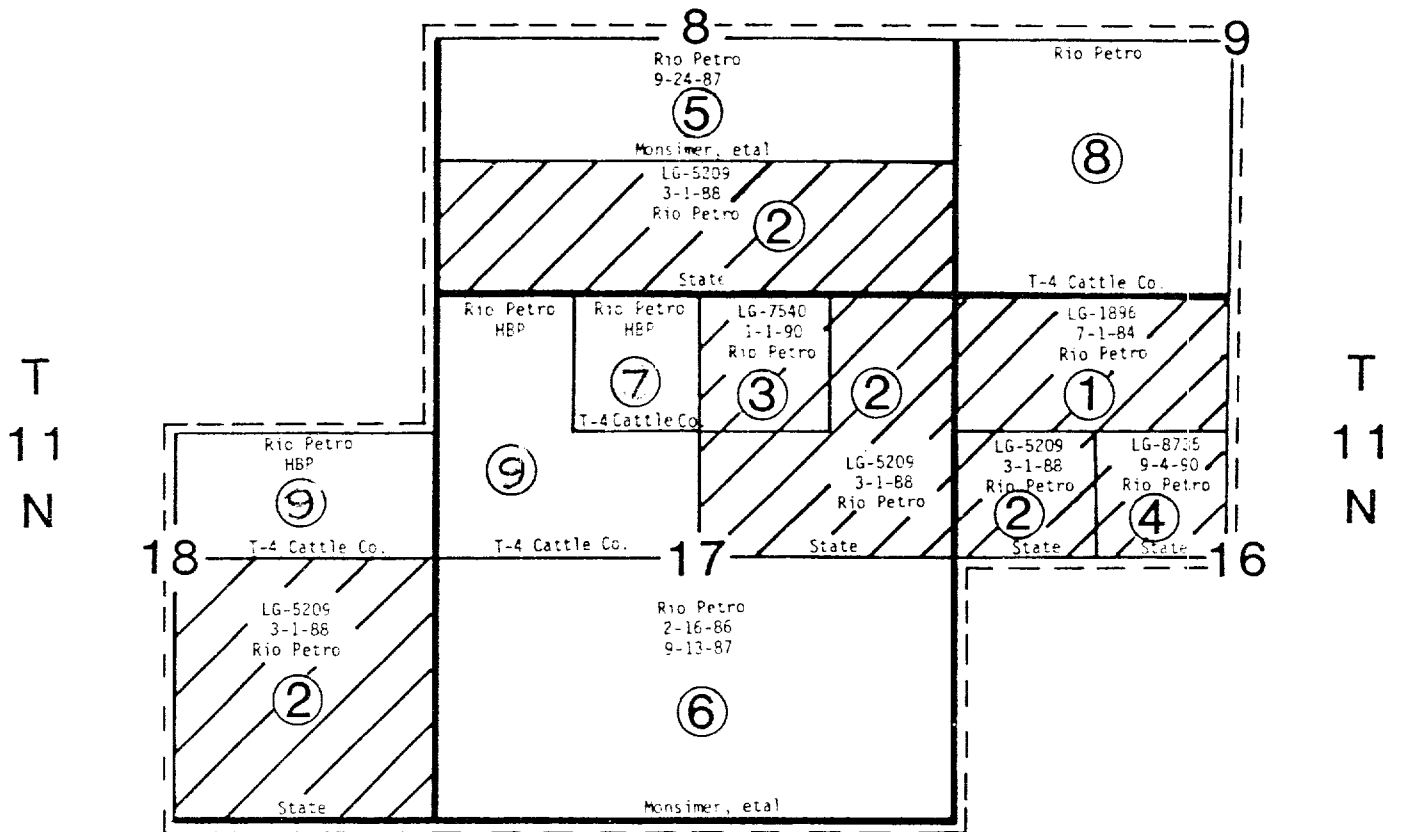
Recoverable Oil (48% recovery of
original oil in place), Barrels. 15,837,763.

CONCLUSIONS

1. There is a large accumulation of oil in the T-4 Ranch field area. Engineering studies indicate that steam flooding will recover a significant part of this oil.
2. In view of the probability that one or more additional pilot steam flood projects will need to be initiated and that they will be followed by larger scale development program the field area should be unitized. Unit participation should be on the basis of net acre feet of pay.


George L. Scott

R-26-E

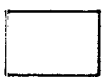


R-26-E

----- Unit Outline



State of New Mexico Lands
640.00 Acres



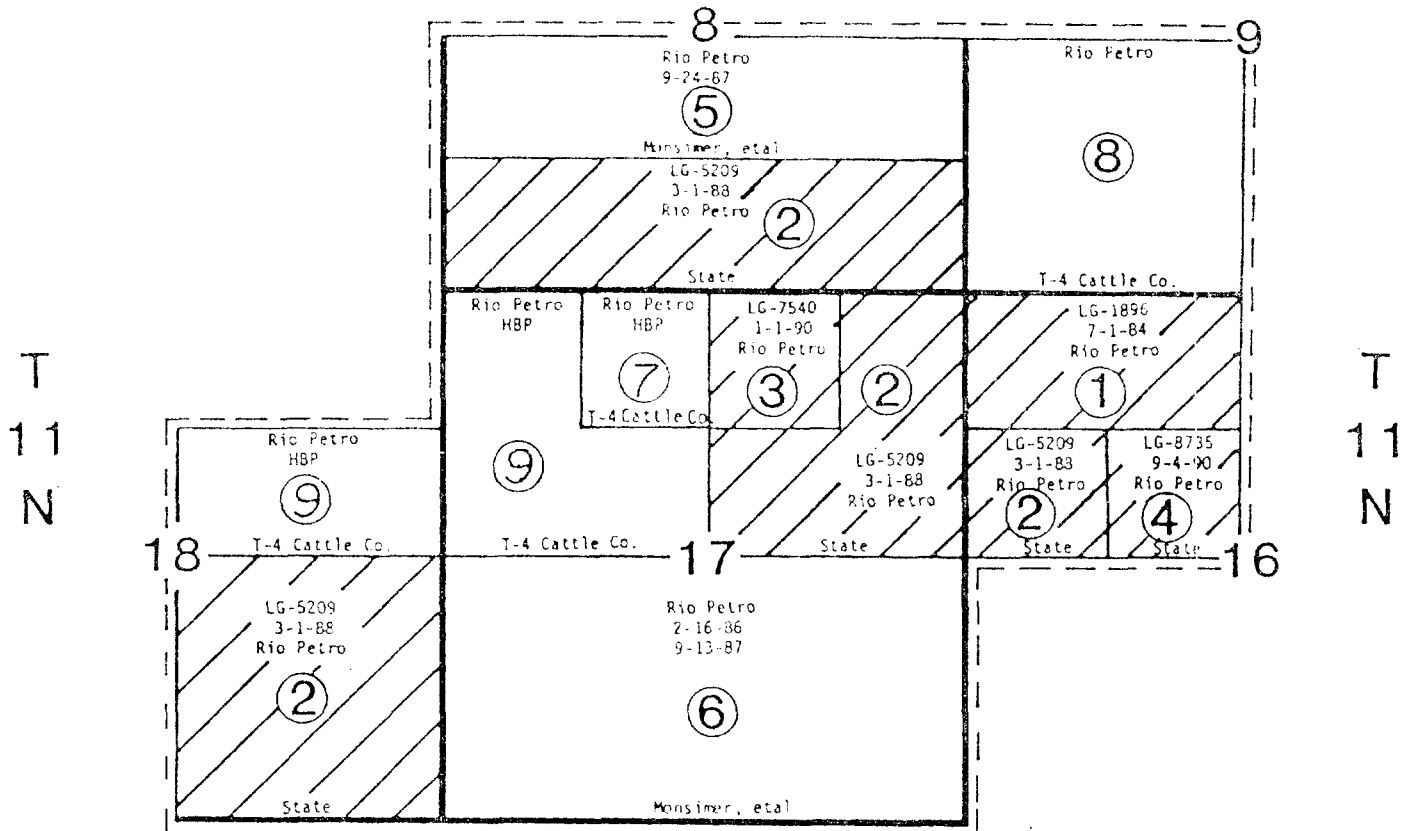
Fee (Patented) Lands
880.00 Acres



Tract Number

EXHIBIT "A"
T-4 Unit Area
1,520.00 Acres
Guadalupe County, N.M.

R-26-E

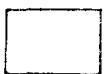


R-26-E

----- Unit Outline



State of New Mexico Lands
640.00 Acres



Fee (Patented) Lands
880.00 Acres



Tract Number

EXHIBIT "A"
T-4 Unit Area
1,520.00 Acres
Guadalupe County, N.M.

EXHIBIT "B"

Schedule Showing All Lands And Leases
Within The T-4 Unit Area
Guadalupe County, New Mexico

ALL LANDS ARE IN
T-11-N, R-26-E, NMPM

State of New Mexico Lands

TRACT
NO. DESCRIPTION OF LANDS

1. Section 16: N $\frac{1}{2}$ NW $\frac{1}{4}$

TRACT 1 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE
80.00	LG-1896-2 7-1-84	State 12.5	Rio Petro, Ltd. 100%	Los Siete Exploration, Inc. 2.5 % Newkirk Royalty Trust 7.625%	Rio Petro, Ltd. 57.50% John R. Black, Jr. 2.50% Brown Energy, Inc. 5.00% Andrew Clendenen 2.00% Robert P. Creson 2.00% John A. Perkins 3.25% Jack Shelton 1.00% Paul N. Temple 7.50% Dan W. Varel 5.00% Barbara Varel 5.00% Los Siete Exploration, Inc. 1.00% James A. Whittenburg, III 8.25% Energy Capital Development Corp. -0- *
					100.00

*See note, page 4, this Exhibit.

TRACT
NO. DESCRIPTION OF LANDS

2. Section 8: S $\frac{1}{2}$ S $\frac{1}{2}$
Section 16: SW $\frac{1}{4}$ NW $\frac{1}{4}$
Section 17: NE $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$
Section 18: SE $\frac{1}{4}$

TRACT 2 (cont').

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE				
480.00	LG-5209 3-1-88	State	12.5	Samedan Oil Corp- ration	100%	Los Siete Explo- ration, Inc.	1.500%	Rio Petro, Ltd. Samedan Oil Corporation & NICOR Exploration Company	57.50%
				Newkirk Royalty Trust	2.625%	John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Exploration, Inc.	-0- 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00%		
				Samedan Oil Corp. & NICOR Explora- tion Company	6.000%**	**Option to convert to working interest at payout. Upon conversion, OKR interest of Los Siete will increase to 2.5% and Newkirk to 4.528125%.		James A. Whittenburg, III Energy Capital Develop- ment Corp.	8.25% -0- 100%

*See Note, page 4, this Exhibit.

TRACT NO. DESCRIPTION OF LANDS

3. Section 1/: NW¹/₄NE¹/₄

TRACT 3 (cont)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE	
40.00	LG-7540-2 1-1-90	State	12.5	Rio Petro. Ltd. 100%	Los Siete Exploration, Inc. 2.500% Newkirk Royalty Trust 7.625%	Rio Petro, Ltd. 57.50% John R. Black, Jr. 2.50% Brown Energy, Inc. 5.00% Andrew Clendenen 2.00% Robert P. Creson 2.00% John A. Perkins 3.25% Jack Shelton 1.00% Paul N. Temple 7.50% Dan W. Varel 5.00% Barbara Varel 5.00% Los Siete Exploration, Inc. 1.00% James A. Whittenburg, III 8.25% Energy Capital Develop- ment Corp. -0-*
					<u>100.00</u>	

*See note, page 4, this Exhibit.

TRACT
NO. DESCRIPTION OF LANDS

4. Section 16: SE $\frac{1}{4}$ NW $\frac{1}{4}$

TRACT 4 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE
40.00	LG-8735-1 9-4-90	State 12.5	Rio Petro, Ltd. 100%	Los Siete Explo- ration, Inc. Newkirk Royalty Trust 2.50% 5.25%	Rio Petro, Ltd. John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Exploration, Inc. James A. Whittenburg, III Energy Capital Develop- ment Corp. 57.50% 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00% 1.00% 8.25% -0-*
					100.00

Total, 640.00 Acres State of New Mexico Lands, 42.00% of Surface Area of Unit

*After Rio Petro, Ltd., has recovered certain expenditures, Energy Capital Development Corporation will participate as working interest owner. See Article XV.C., page 15.

Patented (Fee) Lands

TRACT NO. DESCRIPTION OF LANDS

5. Section 8: N¹/₂S¹/₂

TRACT 5 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE		
160.00	Fee 9-24-87	Harold G. Monsimer Pearl M. Hawley	6.25	Rio Petro, Ltd. John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Exploration, Inc.	65.75% 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00% 1.00%	Los Siete Exploration, Inc. Newkirk Royalty Trust Samedan Oil Corp. & NICOR Exploration Company 6.000%** **Option to convert to working interest at payout. Upon conversion, OKR interest of Los Siete will increase to 2.5% and Newkirk to 4.528125%. Rio Petro, Ltd. Samedan Oil Corporation & NICOR Exploration Company John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Exploration, Inc.	65.75% 1.500% 2.625% -0- 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00% 1.00%
					<u>100.00</u>		

TRACT
NO. DESCRIPTION OF LANDS

6. Section 17: S $\frac{1}{2}$

TRACT 6 (cont)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE
320.00	Fee				
9-13-87	1.) Lillian Brooks McCoy	5.0 x 12.5	Same as Tract 5	Same as Tract 5	Rio Petro, Ltd. 65.75%
9-13-87	) Wilma Ruth Stratton	5.0 x 12.5	"	"	Samedan Oil Corpor- ation & NICOR Ex- ploration Company
9-30-87	) Lucile M. Swain	5.0 x 12.5	"	"	John R. Black Jr. Brown Energy, Inc.
9-30-87	) Virginia M. White, et vir	5.0 x 12.5	"	"	Robert P. Creson John A. Perkins
9-30-87	) Jesse T. Swain	5.0 x 12.5	"	"	Jack Shelton Paul N. Temple
10-8-87	) Danny R. Swain and Dona Deckert	10.0 x 12.5	"	"	Barbara Varel Dan W. Varel
9-24-87	) Harold G. Monsimer and Pearl M. Hawley	50.0 x 12.5	"	"	Los Siete Exploration, Inc. Andrew Clendenen
2-16-86	2.) Bruce A. Wilbanks, et ux	1.875 x 18.75	"	Los Siete Exploration 2.50	1.00% 2.00% 100.00%
4-2-86	) Barry Antweil and Mark Antweil	0.51558 x 18.75	"	"	
4-2-86	) Julie Antweil Silver- man, et vir	0.25779 x 18.75	"	"	
3-13-86	) Evelyn M. Hudgens	0.15588 x 18.75	"	"	
4-2-86	) A. Gayle Hudgens	0.30875 x 18.75	"	"	
unleased	3.) M. McDonold, Jr.	9.375	"	"	
unleased	) Horace F. McKay, Jr.	2.500	"	"	
unleased	) Phillip Berry	0.006	"	"	
unleased	) Dan C. Berry, III	0.006	"	"	

Note: Due to diverse mineral and leasehold ownership, this tract divided into three parts. Samedan and NICOR have no interest in leases grouped under 2.), and Newkirk Royalty Trust has no overriding royalty under these 2.) leases.

TRACT
NO. DESCRIPTION OF LANDS

7. Section 17: NE $\frac{1}{4}$ NW $\frac{1}{4}$

TRACT 7 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE	
40.00	Fee HBP	T-4 Cattle Company, Albuquerque National Bank, Trustee, & Thomas B. Hoover, et ux 12.5	Rio Petro, Ltd. John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Explor- ation, Inc. James A. Whitten- burg, III	57.50% 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00% 1.00% 8.25%	Los Siete Explor- ation, Inc. Amoco Production Company Newkirk Royalty Trust Rio Petro, Ltd. John R. Black, Jr. Brown Energy, Inc. Andrew Clendenen Robert P. Creson John A. Perkins Jack Shelton Paul N. Temple Dan W. Varel Barbara Varel Los Siete Exploration, Inc. James A. Whittenburg, III Energy Capital Dev. Corp.	57.50% 2.50% 5.00% 2.00% 2.00% 3.25% 1.00% 7.50% 5.00% 5.00% 1.00% 8.25% -0-* 100.00

*See note, page 4, this Exhibit.

TRACT NO. DESCRIPTION OF LANDS

8. Section 9: SW $\frac{1}{4}$

TRACT 8 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE
160.00	Fee unleased	T-4 Cattle Company, Ltd.	(Lease on this tract presently being negotiated)		
TRACT NO.	DESCRIPTION OF LANDS				

9. Section 17: NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$
Section 18: S $\frac{1}{2}$ NE $\frac{1}{4}$

TRACT 9 (con't)

ACRES	SERIAL NO. AND EXP. DATE	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD AND PERCENTAGE	OVERRIDING ROYALTY AND PERCENTAGE	WORKING INTEREST AND PERCENTAGE
200.00	Fee Held by Continuous Operations	T-4 Cattle Company, Albuquerque National Bank, Trustee & Thomas B. Hoover, et ux	Amoco Production Co. 100%	None	Amoco Production Co. 100%
			12.5	(Note: This Tract 9 segregated from Tract 7, above, pursuant to unrecorded Contribution Agreement. Ownership as to Lessee of Record, overriding royalty and working interest will ultimately be the same as Tract 7, above.)	

Total, 880.00 Fee (Patented) Lands, 58% of Surface Area of Unit

Recapitulation; Surface Area of Unit	
640.00 Acres State Land	42.00%
880.00 " Fee	58.00%
1520.00	100.00%

EXHIBIT "C"

Schedule of Participation
By Tracts (Tract Participation)
Within the T-4 (Enhanced Recovery)

Tract Participation (Percentage) based on net acre feet of pay.

<u>Tract No.</u>	<u>Acres</u>	<u>Working Interest Owner</u>	<u>Basic Mineral Owner</u>	<u>Tract Participation</u>
1.	80	Rio Petro, Ltd.	State of New Mexico	8.4132%
2.	480	Rio Petro, Ltd.	State of New Mexico	34.5386%
3.	40	Rio Petro, Ltd.	State of New Mexico	5.4508%
4.	40	Rio Petro, Ltd.	State of New Mexico	.5227%
5.	160	Rio Petro, Ltd.	Monsimer, et al	2.4609%
6.	320	Rio Petro, Ltd.	Monsimer, et al	28.6802%
7.	240		T-4 Cattle Co.	12.5242%
8.	160		T-4 Cattle Co.	7.4094%
	<u>1520</u>			<u>100.0000%</u>

Sub of Sec 9 → T-4 Cattle Co.

EXHIBIT "C" Continued
Schedule of Participation by Tracts
And Schedule of Participation Within
The Unit Area -- T-4 (Enhanced Recovery)
Guadalupe County, New Mexico

(Individual Participation shown as to Royalty and Overriding Royalty only).

<u>Tract No. & Tract Percentage</u>	<u>Tract Ownership and Percentage</u>	<u>Individual and Total Tract Participation in Unit</u>	
1. 8.4132	State of New Mexico Los Siete Exploration, Inc. Newkirk Royalty Trust Working Interest	12.500 BR* 2.500 ORR* " 7.625 <u>77.375</u> 100.000	1.051650 .210330 .641507 <u>6.509713</u> 8.413200
			*BR-Basic Royalty *ORR-Overriding Royalty
2. 34.5386	State of New Mexico Los Siete Exploration, Inc. Newkirk Royalty Trust Samedan Oil Corp. and NICOR Expl. Co. Working Interest	12.500 BR 1.500 ORR " 2.625 " 6.000 <u>77.375</u> 100.000	4.317325 .518079 .906638 2.072316 <u>26.724242</u> 34.538600
			Note: Interest of Samedan and NICOR Exploration, throughout this Exhibit, shown in "before payout" status. Overriding royalty shown hereon can be converted to working interest.
3. 5.4508	State of New Mexico Los Siete Exploration, Inc. Newkirk Royalty Trust Working Interest	12.500 BR 2.500 ORR " 7.625 <u>77.375</u> 100.000	.681350 .136270 .415624 <u>4.217556</u> 5.450800

4.	0.5227	State of New Mexico Los Siete Exploration, Inc. Newkirk Royalty Trust Working Interest	12.500 BR 2.500 ORR 5.250 " <u>79.750</u> 100.000	.065338 .013068 .027441 <u>.416853</u> .522700
5.	2.4609	Harold G. Monsimer Pearl M. Hawley Los Siete Exploration, Inc. Newkirk Royalty Trust Samedan Oil Corp. and NICOR Expl. Co. Working Interest	6.250 BR 6.250 BR 1.500 ORR 2.625 " 6.000 " <u>77.375</u> 100.000	.153806 .153806 .036914 .064598 .147654 <u>1.904122</u> 2.460900
6.	28.6802	(1) Lillian Brooks McCoy Wilma Ruth Stratton Lucile M. Swain Virginia M. White Jesse T. Swain Danny R. Swain Dona Deckert Harold G. Monsimer Pearl M. Hawley Samedan Oil Corp. and NICOR Expl. Co. Los Siete Exploration, Inc. Newkirk Royalty Trust Working Interest	.625 BR .625 " .625 " .625 " .625 " .625 " .625 " .625 " 3.125 " 3.125 " 3.125 " 5.100 ORR 1.275 " 2.231 " 65.769 " <u>85.000</u>	.179251 .179251 .179251 .179251 .179251 .179251 .179251 .179251 .896256 .896256 .896256 1.462690 .365673 .639855 <u>18.862681</u> 24.378168

6.
(cont)

(2)	A. Gayle Hudgens	.057891	BR	.016603
	Bruce A. Wilbanks	.351563	"	.100829
	Barry Antweil and Mark Antweil	.096671	"	.027725
	Julie A. Silverman	.048336	"	.013863
	Evelyn M. Hudgens	.029223	"	.008382
	Los Siete Exploration, Inc.	.077825	ORK	.022321
	Newkirk Royalty Trust	.140961	"	.040429
	Working Interest	<u>2.310530</u>		<u>.662665</u>
		3.113000		.892817

(3)	M. McDonnold *	1.757813	BR	.504144
	H.F. McKay, Jr.*	.468750	"	.134438
	Phillip Berry*	.001125	"	.000323
	Dan C. Berry, III*	.001125	"	.000323
	*Unleased minerals treated for purposes hereof as leased with 3/16 Royalty.			
	Working Interest	<u>9.658187</u>		<u>2.769987</u>
		11.887000		3.409215

<u>Recapitulation, Tract 6</u>				
(1)	85.000	24.378168		
(2)	3.113	.892817		
(3)	<u>11.887</u>	<u>3.409215</u>		
	100.000	28.680200	= Tract Participation in Unit	

7. & 9.
12.5242

T-4 Cattle Co., Albuquerque National
Bank, Trustee, & Thomas B. Hoover,
et ux.
Los Siete Exploration, Inc.
Newkirk Royalty Trust
Amoco Production Co.
Working Interest

12.500000	BR	1.565525
2.500000	OKR	.313105
.328125	"	.041095
9.375000	"	1.174144
<u>75.296875</u>		<u>9.430331</u>
100.000000		12.524200

8.
7.4094

T-4 Cattle Co., Albuquerque National
Bank, Trustee, & Thomas B. Hoover,
et ux.
Working Interest

12.500000	BR	.926175
<u>87.500000</u>		<u>6.483225</u>
100.000000		7.409400

Recapitulation: Total of Tracts:

1.	8.4132	%
2.	34.5386	
3.	5.4508	
4.	.5227	
5.	2.4609	
6.	28.6802	
7.	12.5242	
8.	<u>7.4094</u>	
	100.0000	%

Recapitulation: Percentage of Participation in Production, Total Unit Area*

Working Interest	71.498150
State of New Mexico	6.115663
T-4 Cattle Co. (Royalty)	1.565525
T-4 Cattle Co. (unleased minerals)	7.409400
Samedan Oil Co. & NICOR Exploration	3.682660
Newkirk Royalty Trust	2.777187
Los Siete Exploration	1.615760
H.G. Monsimer	1.050062
Pearl M. Hawley	1.050062
Amoco Production Co.	1.174144
Lillian Brooks McCoy	.179251
Wilma Ruth Stratton	.179251
Lucile M. Swain	.179251
Virginia M. White	.179251
Jesse T. Swain	.179251
Danny R. Swain	.179251
Dona Deckert	.179251
Gayle Hudgens	.016603
B. Wilbanks	.100829
B. & M. Antweil	.027725
Julie Silverman	.013863
Evelyn Hudgens	.008382
M. McDonnold (Royalty)	.504144
H. McKay (Royalty)	.134438
P. and D. Berry (Royalty)	.000646
	100.000000

Note: Calculated upon basis of 100% Commitment to the Unit. Percentage of participation subject to change if Unit not 100% committed.

*Total of interest from each Tract.

