

DOYLE HARTMAN

Oil Operator

500 N. MAIN

P.O. BOX 10426

MIDLAND, TEXAS 79702

(915) 684-4011

May 9, 1990

BEFORE EXAMINER CATANACH

Oil Conservation Division

Exhibit No. 10

Case No. 9994

Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Attention: Mr. David L. Wacker

Re: Proposed Jalmat Infill Well  
Boren-State "E" Com No. 1  
SE/4 Section 17 and  
NE/4 Section 20  
T-22-S, R-36-E  
Lea County, New Mexico  
(320 acres)

Gentlemen:

According to our records, Conoco is the owner of the currently non-producing non-dedicated 160-acre Jalmat Gas Pool parcel consisting of the SE/4 Section 17, T-22-S, R-36-E, Lea County, New Mexico. As shown on the enclosed acreage ownership plat, Conoco's 160-acre parcel is contiguous (to the north) with our currently non-producing non-dedicated 160-acre Jalmat Gas Pool tract consisting of the NE/4 Section 20, T-22-S, R-36-E.

As a result of low gas prices and low allowables for both the Eumont and Jalmat Gas Pools, and for the purposes of justifying the drilling of a new Jalmat infill gas well, we propose to form a new stand-up 320-acre non-standard Jalmat Gas Pool proration unit consisting of the SE/4 Section 17 and the NE/4 Section 20, T-22-S, R-36-E with the newly proposed Boren-State "E" Com Jalmat infill well to be located in the NE/4 SE/4 of Section 17. A new infill Jalmat well is needed at this time on the subject acreage in order to efficiently and effectively drain any remaining Jalmat Gas Pool reserves underlying the currently non-producing non-dedicated 320-acre tract. Moreover, due to the present low allowable levels for the Jalmat Gas Pool coupled with the estimated high cost (a combined total of \$603,634.00) associated with drilling and completing the proposed well plus connecting the proposed well to a gas pipeline, we believe that a new infill well can be justified only on the basis of an enlarged 320-acre proration unit (AF of 2.0).

Additionally, we are proposing that the new infill well be drilled in the NE/4 Section 17 T-22-S, R-37-E because of the severe corrosion and water leakage problems that have been reported by Conoco corresponding

to the Conoco-operated Eunice South Unit Waterflood project and the astounding loss (out of the zone) of approximately 40,000,000 barrels (i.e.,  $65\% \times 60,000,000 = 40,000,000$  barrels) of injection water into the Jalmat Gas Pool "gas thief zone" (Jalmat dry gas rights were not unitized as part of the Eunice South Unit waterflood interval). Correspondingly, in an effort to increase the odds of achieving a water-free Jalmat dry gas completion, it appears highly prudent and much less risky to drill the proposed new infill well on the north half of the proposed stand-up 320-acre Jalmat proration unit away from the Conoco-operated Eunice South water injection wells situated in Section 20, T-22-S, R-36-E. Copies of your previous correspondence to us discussing the Eunice South Unit corrosion and water leakage problems is enclosed herein.

Therefore, we invite Conoco to join us in the drilling of our newly proposed Boren-State "E" Com No. 1 infill well and enclose herewith an Authority for Expenditure and Detail Well estimate that covers both the estimated cost of drilling and completing the proposed infill well (\$417,786.00) as well as the cost of connecting the well to an available pipeline facility (\$186,148.00). In the event that you elect to join in the drilling of the proposed infill well, we will forward to you an Operating Agreement for your review. However, if Conoco does not wish to participate as a working interest owner in the drilling of our proposed infill well, we hereby offer you the following additional alternatives as a means of cooperating with the drilling of the subject well:

1. For a cash consideration of \$128,000.00 (\$800.00/acre), and corresponding to the Jalmat Gas Pool interval, Doyle Hartman to purchase all of Conoco's working interest in the 160-acre Jalmat tract consisting of the SE/4 Section 17, T-22-S, R-36-E.
2. On the basis of a 70% effective net revenue, Doyle Hartman to take a Jalmat Gas Pool farmout from Conoco in the SE/4 Section 17 with Conoco retaining a net 8.75% ORRI in the newly proposed stand-up 320-acre communitized area consisting of the SE/4 Section 17 and NE/4 Section 20 [i.e.,  $.50 \times (87.5\% - 70.0\%) = 8.75\%$ ].
3. In addition to the above mentioned alternatives, and as suggested in your letter to us of February 19, 1990 (copy enclosed), we are also willing to enter into an exchange of acreage with Conoco. We believe such an exchange of acreage will not only satisfy your desire to acquire additional gas reserves (per your letter of February 19, 1990), but will also be a positive step toward resolving any damages resulting from the loss of substantial quantities of both South Eunice Unit injection water and Langlie Jack Unit injection water into the non-unitized overlying Jalmat Gas Pool interval "gas thief zone".

A. Doyle Hartman to Assign to Conoco the following producing acreage and wells in which Conoco already owns an interest and which assignment equates to a net 420 MMCF of proven gas reserves and a net 95.7 MBO of proven oil reserves:

- 1) A net 4.476155% working interest in the Conoco-operated South Eunice Waterflood Unit Seven River Queen unitized interval;
- 2) A net 1.89913% working interest in the 1920-acre Conoco-operated Northwest Crosby Unit Custer Devonian and Fusselman acreage consisting of all or parts of Sections 7 and 18, T-25-S, R-37-E and Sections 12 and 13, T-25-S, R-36-E;
- 3) A net 1.269069% working interest in the Arco-operated 1920-acre Langlie Deep Unit Langlie Strawn, Devonian, and Ellenberger acreage consisting of all or parts of Sections 20, 21, 27, and 28, T-22-S, R-36-E; and
- 4) A net 2.812558% working interest in the 716-acre Citation-operated Jalmat Deep Unit consisting of parts of Sections 25, 26, 35 and 36, T-24-S, R-36-E and parts of Section 31, T-24-S, R-37-E in which is located the Citation-operated State "B" Com No. 1 and No. 2 Custer Devonian and Ellenberger wells situated in Section 36, T-24-S, R-36-E.
- 5) A net .0031569 net profits interest in the 160-acre Exxon-operated S. W. Harrison No. 9 Custer Devonian well situated in the W/2 Section 25, T-24-S, R-36-E.

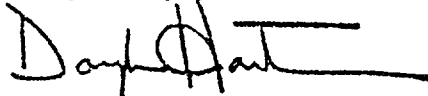
B. Conoco to Assign to Hartman its interest in the following currently non-producing or highly marginal acreage (590 net acres):

- 1) SE/4 Section 17, T-22-S, R-36-E (Conoco - State "E" 160-acre abandoned Jalmat tract)
- 2) E/2 W/2 Section 9, T-21-S, R-36-E (NMFU - Meyer "B-9" 160-acre abandoned Eumont tract/Conoco 25% WI)
- 3) S/2 SE/4 and SW/4 Section 18, T-21-S, R-36-E (NMFU - Lockhart "A-18" 240-acre abandoned Eumont tract/Conoco 25% WI)
- 4) NE/4 Section 30, T-21-S, R-36-E (NMFU - Lockhart "A-30" 160-acre abandoned Eumont tract/Conoco 25% WI)

- 5) N/2 SW/4 and SE/4 SW/4 Section 8, T-24-S, R-37-E  
(Conoco - Cooper "8" 120-acre abandoned Jalmat tract/Conoco 100% WI)
- 6) E/2 NE/4 Section 12, T-24-S, R-36-E (Conoco - Vaughn  
"B" 80-acre abandoned Jalmat tract/Conoco 25% WI)
- 7) SW/4 and W/2 SE/4 and SE/4 SE/4 Section 35, T-23-S, R-  
36-E (Conoco - Stevens "A" 280-acre highly marginal Jalmat  
tract/Conoco 25% WI)
- 8) N/2 Section 27, T-23-S, R-36-E (Conoco - Lynn "A-27"  
320-acre highly marginal Jalmat tract/Conoco 25% WI)

It is requested that you give your earliest possible attention to the foregoing proposal as it is imperative that we begin the drilling the proposed infill well within two months in order to have the new well connected to an available pipeline facility prior to the peak gas marketing season. Inasmuch as time is of the essence, we will shortly need to proceed with all regulatory procedures required for the drilling of the subject well. Therefore, we respectfully request that you select on the enclosed ballot page the manner in which you desire to cooperate with the drilling of our proposed infill well and then return, in the enclosed envelope, by June 1, 1990, a copy of your completed ballot along with an executed AFE (if applicable).

Very truly yours,



Doyle Hartman

DH/ps  
1862:CON00509

Enclosures

cc: Mr. David Stropple  
Land Supervisor  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Mr. Jay Vashler  
Production Engineer  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Conoco, Inc.  
May 9, 1990  
Page 5

Mr. Dave Lindroos  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Mr. Charles Taylor  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Mr. Mike Zimmerman  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Mr. Ceal Yarbrough  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88250

Mr. Dan Nutter  
105 East Alicante  
Santa Fe, New Mexico 87501

Mr. J. E. Gallegos  
Gallegos Law Firm  
141 East Palace Avenue  
Santa Fe, New Mexico 87501

BALLOT PAGE

TO

MAY 9, 1990 LETTER FROM

DOYLE HARTMAN TO CONOCO, INC.

To cooperate with the further development of the Jalmat Gas Pool interval corresponding to the proposed 320-acre Jalmat Gas Pool Proration Unit consisting of the SE/4 Section 17 and NE/4 Section 20, T-22-S, R-36-E, Lea County, New Mexico, Conoco hereby selects the following option:

\_\_\_\_\_ Join

\_\_\_\_\_ Sell

\_\_\_\_\_ Farmout

\_\_\_\_\_ Trade

CONOCO, INC.

By: \_\_\_\_\_

Date: \_\_\_\_\_

Typed Name: \_\_\_\_\_

Title: \_\_\_\_\_

1862:ConocoBP

DOYLE HARTMAN  
OIL OPERATOR  
500 N. MAIN STREET  
MIDLAND, TEXAS

Revised 5-15-82

AUTHORIZATION FOR EXPENDITURE AND DETAIL WELL ESTIMATE

LEASE NAME Boren-State E Com WELL NO. 1 W.I. 100%

COUNTY Lea STATE New Mexico FIELD Jalpat (Gas)

LOCATION: 1650' FSL & 660' FEL Section 17, T-22-S, R-36-E

DRILLING INTANGIBLES:				PRODUCER	DRY HOLE
1.	Drilling Cost	3900	Feet @ \$11.00 Per Foot	42900	42900
2.	Day Work	2 days @ \$3500/day			
				7000	7000
3.	Coring Service		Well Surveys OH Logs	10200	10200
4.	Bits and Reamers				
5.	Testing				
6.	Directional Drilling				
7.	Fuel		Water	8000	5500
8.	Mud	4700	Mud Logging 1800	6500	6500
9.	Cementing Service		Cement Floats	12000	3200
10.	Company Labor		Contract Labor	1500	1500
11.	Surface Damages and Right-of-Way			2500	2500
12.	Digging Pits		Filling Pits	500	500
13.	Pit Lining			500	500
14.	Roads & Bridges	1500	Dredging & Grading 7500	9000	
15.	Acidizing	6500	Fracturing 145000 Perforating 2000	153500	
16.	Plugging				4500
17.	Trucking Cost			3000	1500
18.	Development Superintendence	12/7 days @ \$ 500 /day		6000	3500
19.	Rental Equipment: BOP, frac tanks			5300	1300
20.	Swabbing and Testing			6500	
21.	Legal and Professional Expenses:				
	Product Price Determination	NGPA file		750	
	Regulatory Hearings	State filings	Other Location Stake	1200	1200
22.	Abstracts and Title Opinions			7500	7500
23.	Geological, Geophysical and Land Support			2200	2200
24.	Other Costs				
25.	Contingency @ 10 %			28655	10200
			Total Intangibles	315205	112200

WELL EQUIPMENT:					
26.	Casing	450	Ft. of 9-5/8" @ 12.00 Per Ft. (Used)		
		3900	Ft. of 7" @ 8.50 Per Ft. (LS)		
				38550	5400
27.	Tubing	3850	Ft. of 2-3/8" @ 2.30 Per Ft.	8855	
28.	Casing Head			1350	1350
29.	Xmas Tree or Pumping Connections			5600	
30.	Pumping Unit			15000	
31.	Engine/Motor Controller and Power System			7800	
32.	Sucker Rods			4000	
33.	Pump			1800	
34.	Tank Battery			3500	
35.	Separator or Dehydration Equip.			3300	
36.	Metering Equipment				
37.	Flow Lines			2100	
38.	Guards and Fences			800	
39.	Other Costs		anchors	600	
40.	Contingency @ 10 %			9326	675
			Total Tangibles	102581	7425
				417786	119625
	TOTAL COST OF WELL				
	Conoco's Proportional	Share at 50.0 %		208893	59812

REMARKS:

Originated by Mike Stewart Title Engineer Date 5-7-90  
Approved \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

DOYLE HARTMAN  
OIL OPERATOR  
500 N. MAIN STREET  
MIDLAND, TEXAS

Revised 5-15-82

AUTHORIZATION FOR EXPENDITURE AND DETAIL PIPELINE ESTIMATE

ITEM		WELL		WFE NUMBER	
Boren-State E Com					
LOCATION Sections 3, 9, 10, 16 and 17, T-22-S, R-36-E, Lea County, New Mexico					
WORK REQUIRED Ditch, lay and bury 6" SDR poly gas gathering line to NNG facilities					
WELL CONNECTION EVALUATION					
WELL OPERATOR	WELL NAME Boren-State "E" Com No. 1				
	LOCATION 1650' FSL and 660' FEL Section 17, T-22-S, R-36-E				
	COUNTY Lea, New Mexico				
PIPE SYSTEM	CONNECTION LENGTH 12,500'		SIZE LINE REQUIRED 6" SDR 11 polyethylene		ESTIMATED COST OF CONNECTION
	ESTIMATED RESERVES		ESTIMATED INITIAL PROD. RATE		PRICE DIFFERENTIAL (CURRENT)
FUTURE EQUIP.	FUTURE NET REVENUE		R.O.I. AT AVERAGE DIFF.		PAYOUT
					MONTH
INTANGIBLES					
	ROW & DAMAGES	12500	\$20/rod	15152	
	SURVEY & STAKE ROW			475	
	INSTALLATION COST - PIPE	12500	\$2.10/Ft	26250	
	INSTALLATION COST - OTHER Materials/Comp			2500	
	LINE INSPECTION SERVICE				
	LEGAL SERVICES			100	
	CONSULTANT SERVICES				
	X-RAY SERVICES				
	CATHODIC PROTECTION SERVICE				
	MISC. SERVICES & CONTINGENCIES			4873	
SUB-TOTAL INTANGIBLES				53598	
TANGIBLES					
	LINE PIPE - UNDER 4"				
	LINE PIPE - 4" AND OVER	12500	\$3.90/Ft	49250	
	TANKS				
	SEPARATION EQUIPMENT				
	DRIPS				
	METER RUNS & METERS	1-NNG, 1-Check	6500, 3650	10150	
	PIG LAUNCHER & RECEIVER FAC.				
	VALVES - 4" & OVER			750	
	VALVES - UNDER 4"				
	FITTINGS - ELLS, TEES, ETC.			1400	
	RIVER WEIGHTS				
	ROAD CROSSINGS				
	CATHODIC EQUIPMENT				
	FENCES				
	RIVER CROSSINGS				
	BUILDINGS & STRUCTURES				
	MISC. EQUIPMENT & CONTINGENCIES Electric Power			6500	
	GAS COMPRESSORS	175 HP		65000	
	GAS DEHYDRATION				
SUB-TOTAL TANGIBLES				132550	
TOTALS				186148	

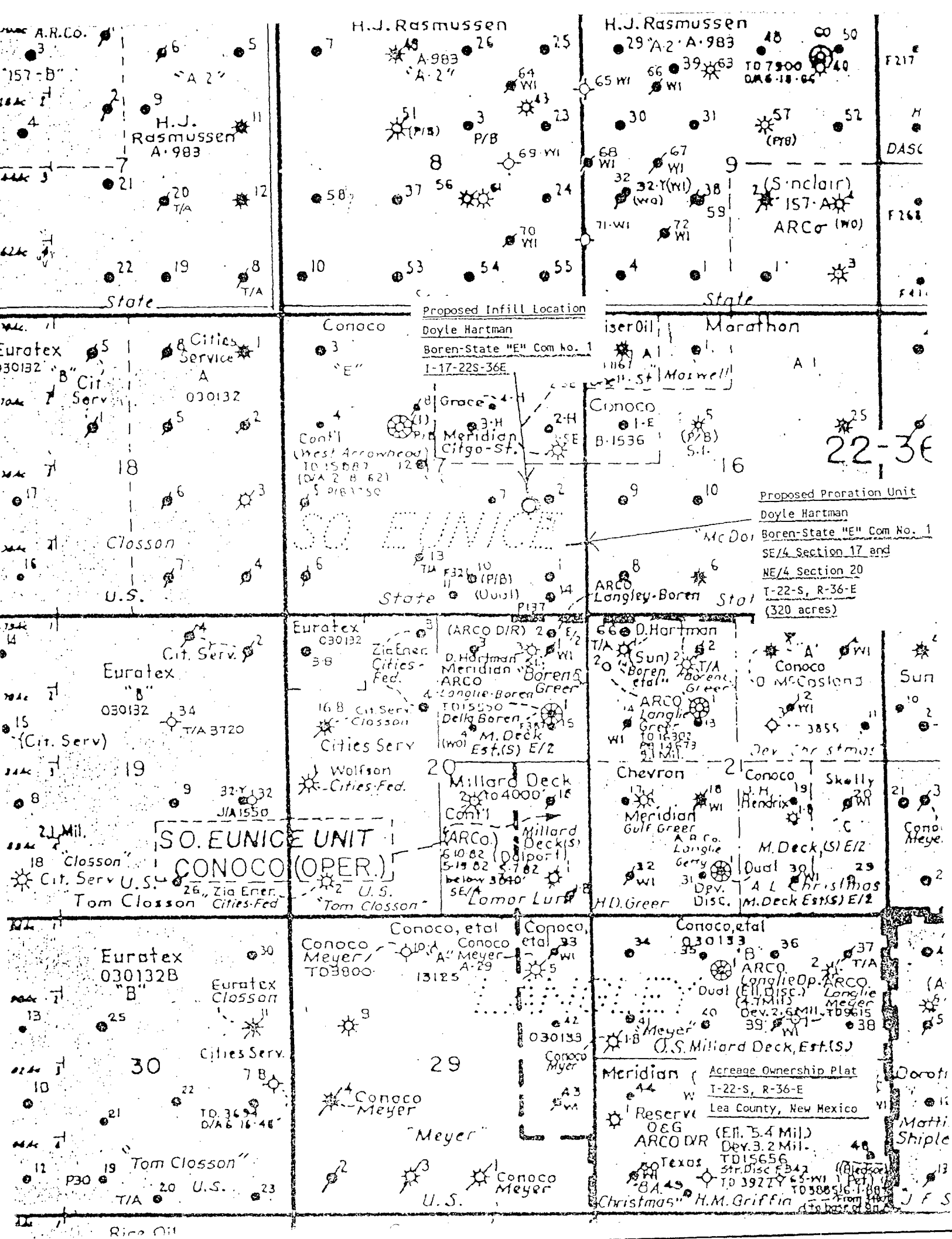
Conoco's Proportional Share at 50 % \$93,074

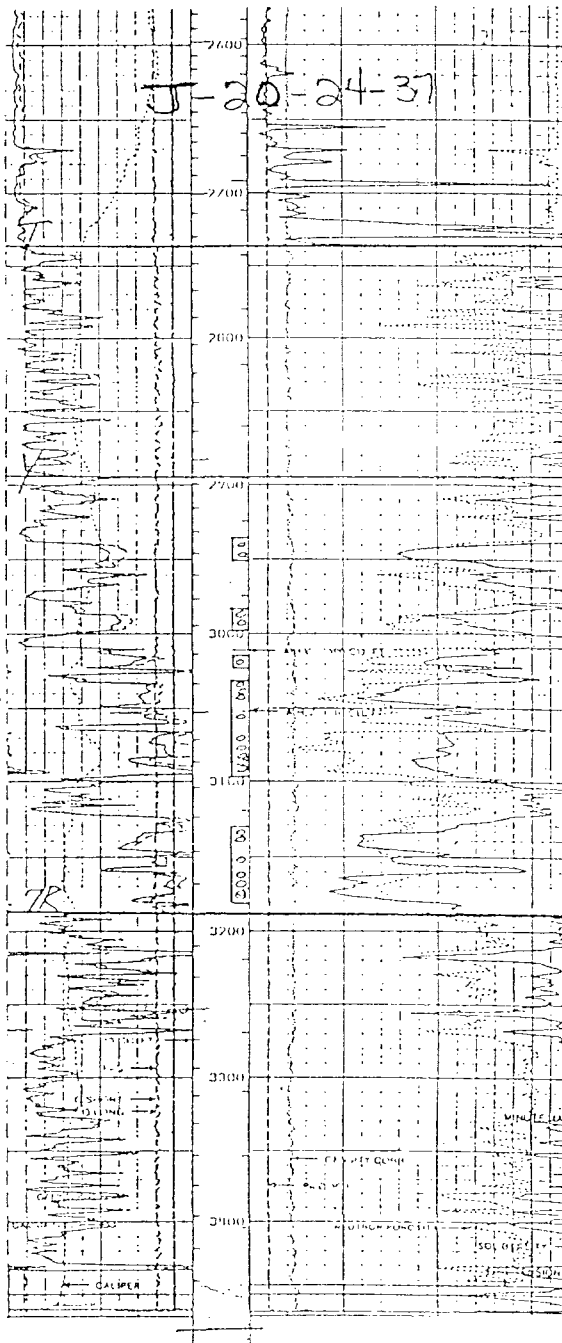
REMARKS:

Originated by Mike Stewart Title Engineer Date 5-8-90

Approved Title Date







COMPANY Doyle Hartman

WELL Jack "A-20" No. 11

FIELD Jalmat (gas)

LOCATION 2180' FSL & 1980' FEL (J)  
Section 20, T-24-S, R-37-E

COUNTY Lea

STATE New Mexico

ELEVATIONS: KB 3281.5'  
 DF \_\_\_\_\_  
 GL 3245.5'

COMPLETION RECORD

SPJD DATE 10-24-89 COMP. DATE \_\_\_\_\_

TD 3472 PBD \_\_\_\_\_

CASING RECORD 9 5/8 @ 467 w/350  
7 @ 3469 w/430

PERFORATING RECORD Perf: 2943 - 3178

STIMULATION A/6500  
SWF/238,000 + 516,000

IP \_\_\_\_\_

GOR \_\_\_\_\_ GR \_\_\_\_\_

TF \_\_\_\_\_ CP \_\_\_\_\_

CHOKE \_\_\_\_\_ TUBING \_\_\_\_\_ @ \_\_\_\_\_

REMARKS 11-13-89: Well test  
499 MCFPD + 179 BWPD on a  
38/64" Choke. FCP = 51 PSIG.



Hobbs Division  
Exploration and Production, North America

Conoco Inc.  
726 East Michigan  
P.O. Box 460  
Hobbs, NM 88241  
(505) 397-5800

February 19, 1990

Mr. Doyle Hartman  
P.O. Box 10426  
Midland, TX 79702

Ladies and Gentlemen:

N. W. Crosby Unit No. 1  
Section 7, T25S, R37E  
Lea County, New Mexico  
Conoco Lease Code 6816911

The ever changing natural gas market places many requirements on a well operator. Some working interest owners remain dedicated to El Paso Natural Gas Company, others are dedicated but participate in a release program, while others are permanently released from their contracts. These situations also change over time. Currently, the N.W. Crosby Unit No. 1 produces 1,200 MCFPD. In an effort to treat all owners equitably, Conoco requests that the attached questionnaire be filled out and returned to this office no later than Friday, March 9. Failure to respond may result in your interest being held in suspense.

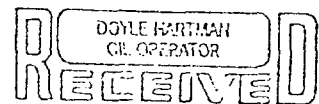
Over/short gas statements will then be prepared which will show past sales for your account and your under or overproduced status. After the statements are prepared, you will be contacted to develop a plan to get all owners in balance.

Conoco Inc. would like to buy your working interest and/or gas imbalance when calculated. If you would like to discuss the sale of your interest, please contact Dave Strople at (505) 397-5910.

Should you have any questions or need any additional information, please contact Mike Zimmermann at (505) 397-5820 or Geal Yarbrough at (505) 397-5825. Our facsimile number is (505) 397-5917 or 397-5918.

Yours very truly,

David L. Wacker  
Division Manager



MWZ:dw

FEB 23 1990

El Paso Contract # 53461

Artiz 13 JCA dtd 9-12-80

N. W. Crosby Unit No. 1  
Questionnaire

Hartman v. BNTI, dtd 12-28-83

C.V. 7 MD-87-CA-313

eff 7-15-89

1. Is your entitlement currently dedicated to El Paso Natural Gas Company.

YES or NO

2. A. If your entitlement is dedicated, when does your contract expire?

- B. Do you plan to cancel your contract at this time?

YES or NO

- C. If "NO" was answered to 2B, will you rededicate your entitlement to El Paso?

YES or NO

3. A. If your entitlement is currently dedicated to El Paso, are you participating in a release program?

YES or NO

- B. If you are participating in a release program, what type of program is it?

Month-to-Month \_\_\_\_\_

6 Month \_\_\_\_\_ Effective from \_\_\_\_\_ to \_\_\_\_\_

1 Year \_\_\_\_\_ Effective from \_\_\_\_\_ to \_\_\_\_\_

Other: \_\_\_\_\_

4. If your entitlement is released, do you desire to have Conoco market your entitlement and disburse revenue to you?

YES or NO

5. A. If you are permanently released, please provide documentation to this effect.

- B. If you answered "NO" to 5B what are your plans for your entitlement? \_\_\_\_\_

- C. Comments \_\_\_\_\_

DOYLE HARTMAN

Oil Operator

500 N. MAIN

P.O. BOX 10426

MIDLAND, TEXAS 79702

(915) 684-4011

February 26, 1990

Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88241

Attention: Mr. David L. Wacker

Re: N.W. Crosby Unit No. 1  
Section 7, T-25-S, R-37-E  
Lea County, New Mexico  
(Conoco Lease 6816911)

Gentlemen:

Reference is made to your letter of February 19, 1990, relative to the marketing of gas from the captioned lease.

Hartman's interest (WI = .0189913; NRI = .0155922) was acquired by purchase from Sun Oil Company and it is our understanding that products from this lease have been and continue to be sold pursuant to Article XIII of Operating Agreement dated September 12, 1980. It is our further understanding that this lease is covered by El Paso Natural Gas Company Contract No. 53461.

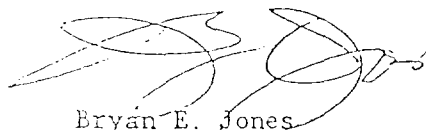
By virtue of Settlement Agreement dated December 28, 1988 and effective February 15, 1989 of Civil Action MO-87-CA-313 styled Hartman vs. BNI, et al, all gas contracts between Hartman and El Paso Natural Gas Company were terminated. However, inasmuch as Conoco holds the basic division order and disburses on this lease, it is requested Hartman's proportionate part of the marketable gas continue to be marketed pursuant to Article XIII of that certain Operating Agreement dated September 15, 1980 covering the captioned property.

We encourage Conoco to calculate our gas imbalance, if any, and place a value thereon, including our working interest in the unit.

Please advise if you have any questions relative to this matter.

Very truly yours,

DOYLE HARTMAN

  
Bryan E. Jones  
Landman

BEJ/lr  
490:CON00226

DOYLE HARTMAN

*Oil Operator*

500 N. MAIN

P.O. BOX 10426

MIDLAND, TEXAS 79702

(915) 684-4011

May 18, 1988

Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Attention: Mr. Dave Wacker  
Division Manager

Re: Negligent Water Injection  
Conoco, Inc.  
South Eunice Unit Waterflood  
T-22-S, R-36-E  
Lea County, New Mexico

Gentlemen:

Reference is made to our past correspondence and discussions pertaining to water production problems corresponding to the Jalmat gas pool interval within the unit boundary of Conoco's South Eunice Unit waterflood project in Lea County, New Mexico. Reference is also made to your letter dated May 2, 1988 and the attached South Eunice Unit waterflood progress report. Conoco (and its staff) are to be commended for their recent review and evaluation of South Eunice Unit water injection profiles and now for their desire to correct the existing situations where South Eunice Unit injection water is being lost outside of the floodable oil productive interval (150' to 270' subsea) and into the overlying non-unitized Jalmat gas interval. For the situations where injection water is entering non-waterflood gas zones above 150' subsea rather than the floodable oil interval, not only are the owners of the South Eunice Unit being denied the benefits to be derived from their substantial waterflood investment, but irreparable damage is also occurring to highly productive and irreplaceable gas reserves.

As you may be aware, for more than ten years, Doyle Hartman has specialized in infill drilling in the Jalmat and Eumont gas pools of Lea County, New Mexico. Since 1976, we have grown from a start-up operation to one of the larger gas producers in Lea County. Doyle Hartman owns a substantial amount of Jalmat gas acreage within the unit boundaries of Conoco's South Eunice Unit. Most of these properties were acquired in mid-1984, at an investment approaching \$1,000,000.00, for the purpose of infill drilling the remaining recoverable gas reserves underlying the acquired leases. In light of this large financial investment and upon receiving your letter of May 2, 1988, we have performed an immediate comprehensive review of

Conoco, Inc.  
May 18, 1988  
Page 2

Hartman's South Eunice Unit area Jalmat gas properties and key Conoco South Eunice Unit water injection wells in an effort to determine if our Jalmat properties in the South Eunice Unit area have been damaged by Conoco's recently acknowledged water injection profile problems. We believe the following examples to be demonstrative of the damage experienced by Hartman as a result of Conoco's imprudent water injection operations.

B. A. Christmas No. 1

The Doyle Hartman-B. A. Christmas No. 1 Jalmat gas lease is a 160-acre tract situated in the SW/4 Section 28, T-22-S, R-36-E, Lea County, New Mexico. The subject tract is offset to the north by Conoco's SEU No. 41 water injection well and to the west by Conoco's SEU No. 43 water injection well. Both the SEU No. 41 and SEU No. 43 were discussed in Conoco's May 2, 1988 letter as problem South Eunice Unit water injection wells.

The Conoco SEU No. 41 well is located in the center of the SW/4 NW/4 Section 28 and is a twin to Conoco's Meyer "B-28" No. 1 Jalmat gas well situated 330' south and 330' west of the SEU No. 41 well. The Meyer "B-28" No. 1 was completed open hole as a Jalmat gas well on May 21, 1956 over the Jalmat Yates-Seven Rivers interval between 3061' and 3648' (including the "Bowers Sand" lower Seven Rivers portion of the Jalmat gas interval) for a stabilized producing rate of 2600 MCFPD. From 1956 through July, 1972, the Meyer "B-28" No. 1 had a cumulative gas recovery in excess of 2.78 BCF of gas and the well produced at an average rate of 41 MCFPD during 1971 and 1972. The 160-acre tract consisting of the NW/4 Section 28, T-22-S, R-36-E including the "Bowers Sand" lower Seven Rivers Jalmat gas interval was dedicated to the Meyer "B-28" No. 1 Jalmat gas well on May 28, 1956.

On February 28, 1957, Conoco's SEU No. 41 (formerly the Meyer "B-28" No. 10) was completed as a Eunice South producer over the producing interval from 3606' to 3782'. Despite the fact that the Jalmat gas interval as to the NW/4 Section 28 had previously been dedicated to Conoco's Meyer "B-28" No. 1, Conoco completed and simultaneously dedicated the Meyer "B-28" No. 10 over a producing interval between 3606' and 3782' including the previously dedicated Meyer "B-28" No. 1 "Bowers Sand" Jalmat gas interval.

On July 30, 1972, the Meyer "B-28" No. 10 (SEU No. 41) was converted from a producing well to a water injection well in the South Eunice Unit waterflood between 3606' and 3782' (87' to 263' subsea) with the injection packer being set at 3548' (29' subsea). At the time the well was converted to a water injection well, the records reflect that no apparent attempt was made by Conoco to shut off the gas productive Meyer "B-28" No. 10 perforations above 150' subsea corresponding to the non-unitized "Bowers Sand" Jalmat gas interval and also open in the Meyer "B-28" No. 1 Jalmat gas well. Cumulative water injection

in the SEU No. 41 has been 2,436,523 barrels through February, 1988. As acknowledged in Conoco's May 2, 1988 letter, almost all of the total water injected to date into the SEU No. 41 has gone outside of the Engineering Sub-Committee designated and approved waterflood interval (150' to 270' subsea) and into the overlying non-unitized Jalmat gas interval.

On May 15, 1983, Conoco filed with the USGS a sundry notice reporting a water problem corresponding to its Meyer "B-28" No. 1. The notice also described Conoco's plans for plugging back a portion of the open hole section in the Meyer "B-28" No. 1 well between 3580' and 3648' ("Bowers Sand"). No subsequent sundry notices pertaining the plugback have been filed. Being that Conoco's SEU No. 41 and Meyer "B-28" No. 1 wellbores were both originally completed in the "Bowers Sand" portion of the lower Seven Rivers Jalmat gas interval and also since the two wells are located only 466' apart, there can be no doubt that the source of the water problem in Conoco's Meyer "B-28" No. 1 Jalmat gas well has been caused by negligent South Eunice Unit water injection into the non-unitized lower Seven Rivers Jalmat gas interval in the SEU No. 41. This disastrous situation has been made even worse by the fact that the Meyer "B-28" No. 1 well is an open hole completion and South Eunice Unit injection water has been unrestricted for many years to crossflow within the Meyer "B-28" No. 1 wellbore from the "Bowers Sand" breakthrough zone into all other productive Jalmat gas zones open to the wellbore.

In its May 2, 1988 letter, Conoco reported that a four-inch steel liner has now been installed in the SEU No. 41 well and that South Eunice Unit injection water is no longer entering the "Bowers Sand" Jalmat gas "thief zone". Unfortunately, prior to Conoco's recent rework of the SEU No. 41, approximately 2,500,000 barrels of water was imprudently injected by Conoco into the lower Seven Rivers Jalmat gas interval in the SEU No. 41. Not only has Conoco's improper water injection and the probable inner-wellbore crossflow in the Meyer "B-28" No. 1 well most likely endangered the Jalmat gas reserves underlying Conoco's 160-acre Meyer "B-28" No. 1 New Mexico Federal Unit Jalmat gas tract, but Conoco's operations no doubt have also seriously impacted offsetting Jalmat gas tracts including the 160-acre Hartman-B. A. Christmas No. 1 lease situated just 330 feet south of the Meyer "B-28" No. 1 well and 660 feet south of Conoco's SEU No. 41 well.

Offsetting the Hartman-B. A. Christmas No. 1 lease 660 feet to the west is Conoco's SEU No. 43 water injection well. The SEU No. 43 was completed on September 24, 1957 as the Conoco-Meyer "A-29" No. 8 from an interval between 3636' and 3788' including the non-unitized "Bowers Sand" lower Seven Rivers Jalmat gas zone. On September 15, 1972, the well was converted to water injection in the South Eunice Unit waterflood over the interval from 3636' to 3788' (108' to 260' subsea). As with the SEU No. 41, prior to water injection, no apparent attempt was made by



Conoco to isolate the gas productive zones above 150' subsea within the SEU No. 43 wellbore. Cumulative injection into the SEU No. 43 was 2,313,461 barrels of water through February, 1988.

Conoco's May 2, 1988 letter reveals that most of the water injected to date into the SEU No. 43 has been lost to the non-unitized "Bowers Sand" lower Seven Rivers Jalmat gas strata. As part of a well rework performed in December, 1987, a 3 1/2-inch fiberglass liner was installed in the SEU No. 43 well to correct the improper water injection profile. However, a tracer survey performed after the December rework indicates that 60% of the SEU injection water (or approximately 225 BWPD) is still being lost to the overlying and non-unitized lower Seven Rivers Jalmat gas interval. Just as with Conoco's SEU No. 41, it is most obvious that severe damage may have occurred to Jalmat gas properties offsetting the SEU No. 43 (including the Hartman-B. A. Christmas No. 1 lease).

#### B. A. Christmas No. 2 Lease

The Doyle Hartman-B. A. Christmas No. 2 Jalmat gas well was drilled in the NE/4 SE/4 Section 28, T-22-S, R-36-E, by R. Olsen in 1953 and was completed open hole (below a Sweet formation packer set at 3450') from the lower Seven Rivers portion of the Jalmat interval. Since May, 1955, the B. A. Christmas No. 2 has been classified by the New Mexico Oil Conservation Division as a Jalmat gas well with the 160-acre tract consisting of the SE/4 Section 28, T-22-S, R-36-E being designated as the proration unit.

From 1955 through August, 1974, the B. A. Christmas No. 2 produced as a lower Seven Rivers Jalmat gas producer. By August, 1974, the well had produced in excess of 1.8 BCF of gas from the lower Seven Rivers Jalmat gas interval and for the years of 1972, 1973 and 1974 produced at a stabilized producing rate of 80 MCFPD.

In January, 1974, Conoco drilled its SEU No. 65 as a South Eunice Unit water injection well in the SW/4 SE/4 Section 28. The SEU No. 65 was drilled as a diagonal offset to the B. A. Christmas No. 2 well and is situated on the 160-acre Jalmat gas proration unit dedicated to the B. A. Christmas No. 2 well. Upon completion of the SEU No. 65, Conoco included as part of the completion interval for the SEU No. 65 well a portion of the non-unitized lower Seven Rivers Jalmat gas interval already open in the B. A. Christmas No. 2 Jalmat gas well. Conoco's inclusion in 1974 of the previously dedicated lower Seven Rivers portion of the Jalmat gas interval in its SEU No. 65 completion amounted to the simultaneous dedication of the same acreage and interval to two separate proration units and was also a violation of the NMOCD approved Unit Agreement for the South Eunice Unit. Section 2-(G) on Page 3 of the Unit Agreement for the South Eunice Unit specifically states that unitized lands

Conoco, Inc.

May 18, 1988

Page 5

"shall not include the dry gas and associated hydrocarbons produced from gas wells within the Unit Area which are completed in and produce from the vertical limits of the Jalmat gas pool, as defined by Commission Order No. R-1670."

The SEU No. 65 well was sand fractured with 18,600 gallons of gelled water and 40,000 pounds of frac sand and the well began water injection on February 6, 1974 at the rate of 400 BHPD at 150 psi surface injection pressure. In August, 1974, water broke through to the B. A. Christmas No. 2 destroying the gas producing capability of the well from the lower Seven Rivers portion of the Jalmat gas interval, substantially reducing the total remaining recoverable Jalmat gas reserves from the B. A. Christmas No. 2. Upon water breakthrough, recorded annual shut-in pressures for the B. A. Christmas No. 2 well anomalously jumped from slightly more than 200 psi to more than 1000 psi. In early 1977, the lower Jalmat interval was abandoned in the B. A. Christmas No. 2 and the well was recompleted as a gas producer in the upper part of the Jalmat interval.

Since water breakthrough in the B. A. Christmas No. 2, Conoco has continued to inject water into the lower portion of the Jalmat gas interval in the SEU No. 65 and has obviously continued to endanger any remaining lower Seven Rivers Jalmat gas reserves underlying the SE/4 Section 28 and surrounding acreage. Through February, 1988, a total of 1,235,226 barrels of water have been injected into the SEU No. 65 with the majority of the water most likely entering the non-unitized lower Seven Rivers portion of the Jalmat gas interval.

#### Gulf Greer No. 1 Lease

The Hartman Gulf-Greer No. 1 well was drilled in the spring of 1978 as a replacement Jalmat gas producer on the 160-acre proration unit consisting of SW/4 Section 21, T-22-S, R-36-E. The subject 160-acre gas proration unit was previously dedicated to Gulf Oil Corporation's H. D. Greer No. 1 Jalmat gas well. The Hartman Gulf-Greer No. 1 replacement well was completed on May 20, 1978 from the lower Seven Rivers portion of the Jalmat gas interval between 3479' and 3585' for an initial producing rate of 652 MCFPD plus 36 BHPD. Prior to the final completion of the well, the Jalmat interval from 3286' to 3419' tested water comparable to South Eunice Unit injection water and was squeeze-cemented.

However, if Doyle Hartman, at the time of completion, had restricted the completion interval to a depth above 3468' as demanded by Conoco in its letter to Hartman dated April 5, 1978 (copy enclosed), the Gulf-Greer No. 1 would have been an immediate financial disaster. In discussing the unitized interval, Conoco's letter of April 5, 1978 wantonly disregarded Hartman's property rights and deceptively omitted the critical fact that the unitized interval within the South Eunice Waterlood excludes the Jalmat dry gas zone, and that Hartman in

1978 actually had every right to complete his proposed Jalmat gas well over the entire Jalmat dry gas interval including that portion below Conoco's improperly demanded depth restriction of 3468'. Conoco's letter also conveniently neglected to point out that the South Eunice Unit Engineering Sub-Committee had determined the floodable oil interval to be 150' subsea to 270' subsea and that the stratigraphic section above 150' subsea (3696' in L-21-22S-36E) is gas productive.

Since completion of the Gulf-Greer No. 1, the well has continued to produce water from the interval between 3479' and 3585', and during early 1988 averaged 67 BWPD. Corresponding to the South Eunice Unit injection water and corrosion problems discussed in Conoco's May 2, 1988 letter, the water produced from the Hartman Gulf-Greer No. 1 Jalmat gas zone is also highly corrosive which, over the life of the Gulf-Greer No. 1, has created for Doyle Hartman expensive corrosion and scale problems. Despite an on-going and closely monitored wellbore chemical treatment program, during 1987, the highly corrosive water produced by the Gulf-Greer No. 1 necessitated both an expensive well cleanout and the installation of an all new tubing string. Due in substantial part to the 1987 repair work, the Gulf-Greer No. 1 for the year 1987 had a net operating loss of \$76,000.

In addition to the high operating costs associated with the Gulf-Greer No. 1, a close examination of the rate-time and rate-cum plots for the Gulf-Greer No. 1 reveals that the ultimate recoverable gas reserves from the Gulf-Greer No. 1 have been greatly reduced by water damage resulting from Conoco's improper South Eunice Unit water injection into the overlying non-unitized Jalmat gas interval. This fact can be substantiated by comparing the rate-time and rate-cum plots for the Hartman Gulf-Greer No. 1 to the pressure-cum plot for Gulf's H. D. Greer No. 1 well (the original Jalmat gas producer in the SW/4 Section 21). The rate-cum plot for the Hartman Gulf-Greer No. 1 reveals a probable ultimate Jalmat gas recovery of 0.75 BCF. Gulf's H. D. Greer No. 1 pressure-cum plot indicated remaining recoverable reserves of 1.40 BCF at the time it was abandoned as to the Jalmat gas interval and the wellbore was transferred to Conoco's South Eunice Unit waterflood in 1973. The computed difference between the projected remaining gas reserves for Gulf's H. D. Greer No. 1 at the time the Jalmat was abandoned in 1973 versus the anticipated ultimate gas recovery from the Hartman Gulf-Greer No. 1 is 0.65 BCF of gas and represents gas that Doyle Hartman has lost as a result of Conoco's improper South Eunice Unit water injection. The current discounted future net value of the lost gas reserves over the life of the Gulf-Greer No. 1 lease is a minimum of \$1,067,000.00 (net to Hartman's interest).

Offsetting the Hartman Gulf-Greer No. 1 lease 660 feet to the south in the NE/4 NW/4 Section 28, T-22-S, R-36-E is Conoco's SEU No. 35 well. The SEU No. 35 was originally completed as the

Meyer "B-28" No. 7 on November 26, 1956. The SEU No. 35 was completed and simultaneously dedicated over the producing interval from 3542' to 3793' including the "Bowers Sand" portion of the non-unitized Jalmat gas interval previously dedicated to the Conoco Meyer "B-28" No. 1 Jalmat gas proration unit consisting of the NW/4 Section 28. The well was converted to a water injection well on August 7, 1972 over the same interval from 3612' to 3793' (68' to 249' subsea) with the injection packer being set at 3576' (32' subsea). Through February, 1988, cumulative water injection into the SEU No. 35 has amounted to 2,491,220 barrels of water. Prior to water injection, no apparent attempt was made by Conoco to isolate the gas productive SEU No. 35 wellbore perforations above 150' subsea.

Conoco's May 2, 1988 letter states that a 3 1/2-inch steel liner was set in the SEU No. 35 in March of 1985, with the new liner perforations being restricted solely to a Eunice South completion interval between 3684' and 3756' (140' to 212' subsea). The May 2, 1988 letter also implies that prior to the installation of the 3 1/2-inch steel liner, 90% (or approximately 2,000,000 barrels) of the total water previously injected into the SEU No. 35 entered the lower Seven Rivers portion of the Jalmat gas interval and that after the subject rework, 95% of the injection water is now being confined to the approved waterflood interval.

With our recently acquired knowledge of the results of Conoco's SEU No. 35 rework, it is now easy to understand why the Gulf-Greer No. 1 has experienced severe water problems and why Conoco, in April, 1978, did not want Hartman to complete the Gulf-Greer No. 1 well below a depth of 3468'. For sixteen years, almost all of the water that was injected into the offsetting SEU No. 35 entered the non-unitized Gulf-Greer No. 1 lower Seven Rivers Jalmat gas pay section above 150' subsea instead of the approved South Eunice Unit waterflood interval (150' to 270' subsea).

An evaluation of South Eunice Unit production totals also supports Conoco's admission that a large portion of the total South Eunice Unit water injection to date (or a total of about 40,000,000 barrels of water) has been injected out of zone and into the overlying non-unitized Jalmat gas interval. During November, 1987, the average water production rate for a South Eunice Unit oil well was 24 BWPD. This compares to a water production rate of almost 70 BWPD for the Hartman Gulf-Greer No. 1 Jalmat gas well. The much higher water production rate for the Gulf-Greer No. 1 Jalmat gas producer can only be explained by the fact that unit-wide 60% to 70% of the total water injected to date for the South Eunice Unit has been negligently injected outside of the approved waterflood limits (150' to 270' subsea).

From a brief review of the Revised Secondary Recovery Study for Conoco's South Eunice Unit dated October 10, 1968, it is not

difficult to ascertain that the South Eunice Unit Engineering Sub-Committee believed that a waterflood was feasible over the 2720-acre "proposed unit area within the vertical limits of 150 feet and 270 feet below sea level" and corresponding to the geologic interval "extending from the base of the Queen formation to 232 feet above the top of the Queen formation." The study further states: "The floodable interval is confined by a high gas saturated zone above 150 feet subsea depth and a high water saturation zone below 270 feet subsea. Within these vertical limits, 2375 acres with an average pay thickness of 15 feet can be flooded." (Page 3, Revised Secondary Recovery Study, Proposed South Eunice Unit, emphasis added).

As to a water-oil contact within the South Eunice Unit area, the geological section of the report concludes: "A depth of 270' subsea cannot be considered a water-oil contact; nevertheless, caution should be exercised in attempting to waterflood zones below this depth" (Page 11, Revised Secondary Recovery Unit, South Eunice Unit). Concerning the 150' subsea gas-oil contact, the report reads: "It is concluded that zones above 150' subsea may have contributed some oil production but contain an above average gas saturation and are basically gas productive" (Page 12, Revised Secondary Recovery Study, Proposed South Eunice Unit, emphasis added).

Finally, on the subject of required remedial work, the Revised Secondary Recovery Study on Page 22 reads: "Additional remedial work may be required on injection wells which are completed above 150' subsea. Prior to performing this work, it is planned to isolate these zones with the injection packer. However, if communication exists behind the casing, it will be necessary to squeeze the zones."

Presently, and for the past few years, both the gas purchase prices and the takes by El Paso Natural Gas Company in the Jalmat Pool have been so arbitrary and unreliable that any increased operational or repair costs occasioned by the intrusion of illegally injected water economically precludes dry gas production. From the foregoing discussions concerning the Hartman B. A. Christmas No. 1, B. A. Christmas No. 2 and Gulf-Greer No. 1 leases, within the South Eunice Unit, it is clear that Conoco, or Conoco's conduct combined with that of El Paso, has destroyed for Hartman the economic benefit of his already developed Jalmat gas reserves and has impeded planned development by Hartman of his currently non-producing non-unitized South Eunice Unit area Jalmat dry gas leases. This damage has resulted from Conoco's negligent water injection into zones overlying the approved South Eunice Unit waterflood interval (150' and 270' subsea) constituting a trespass and giving rise to strict liability for the resultant damage.

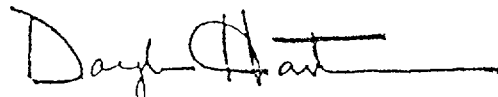
Summarizing the shocking admissions contained in Conoco's letter dated May 2, 1988, approximately 40,000,000 (or 65% of 60,000,000) barrels of water have been injected into the gas strata overlying the designated waterflood interval. Because of Conoco's failure to implement the Engineering Sub-Committee waterflood plans originally approved by the South Eunice Unit working interest owners and royalty owners, and contrary to previous statements made by Conoco's

Conoco, Inc.  
May 18, 1988  
Page 9

management, 60% to 70% of the 60,000,000 barrels of water injected to date in the South Eunice Unit has been outside of the designated waterflood limits (150' and 270' subsea) while portions of the originally approved waterflood interval have not yet experienced effective waterflooding.

Although we commend Conoco and its present staff for now attempting to correct the serious situation discussed herein, the fact still remains that Conoco has not timely reported its South Eunice Unit water injection problems and as a consequence, Doyle Hartman has been needlessly damaged. In an effort to preserve our past business relationship with Conoco and also to avoid for both parties costly and time consuming litigation, Doyle Hartman proposes as an equitable remedy to this most unfortunate situation a trade to Conoco of his South Eunice Unit area properties in exchange for certain Jalmat and Eumont gas properties to be assigned by Conoco to Hartman. We are in the process of compiling a list of proposed trade properties, which will be forwarded to Conoco within a few days by separate letter. In the interim, we will contact you to arrange a meeting to discuss this situation. Due to certain time constraints imposed on us by our present antitrust litigation against El Paso Natural Gas Company, your reply no later than May 28, 1988 is respectfully requested.

Very truly yours,

  
Doyle Hartman

DH/rw

Enclosures

cc: Mr. Jay Vashler  
Conoco, Inc.  
Post Office Box 460  
Hobbs, New Mexico 88240

Mr. Jerry Hardin  
Land Director  
Post Office Box 460  
Hobbs, New Mexico 88240

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
November 18, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil  
Company for a unit agreement, Lea  
County, New Mexico.

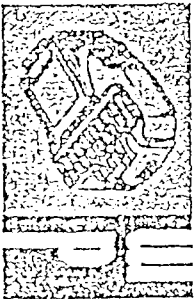
Case 4458

Application of Continental Oil  
Company for a waterflood project,  
Lea County, New Mexico.

Case 4459

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING



unitized formation as we have defined it herein extends 132 feet above the top of the South Eunice Pool boundaries. It was necessary to do this in order to include all of the perforations in the oil wells which will be a part of the unit area.

MR. UTZ: Just a moment. Base of the Queen, and where did the 232 come in now?

A 232 feet above the top of the Queen.

MR. UTZ: Okay.

Q (By Mr. Kellahin) Are all of the substances unitized in this interval?

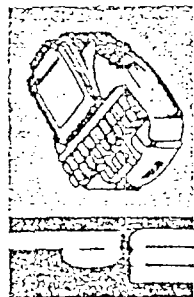
A No, sir. In Paragraph "G", we have defined unitized substances as being the oil gas, gaseous substances, et cetera, produced from the land, but it specifically excludes dry gas and associated hydro carbons so that we have -- that is from Jalmat gas wells so that we have excluded Jalmat gas wells within the unit area.

Q But you do include all of the oil produced from the South Eunice Pool?

A Yes, sir.

Q Is that correct? And from the lower limits of the Jalmat Oil Pool?

A That is correct.





UNIT AGREEMENT  
FOR THE DEVELOPMENT AND OPERATION  
OF THE SOUTH EUNICE UNIT  
LEA COUNTY, NEW MEXICO

THIS AGREEMENT, entered into as of the 15th day of June, 1970, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as "parties hereto".

WITNESSETH: That,

WHEREAS, the parties hereto are the owners of working, royalty, or other oil or gas interests in the Unit Area subject to this Agreement; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by law (Chap. 72, Laws of 1935, as amended by Chap. 193, Laws of 1937, Chap. 166, Laws of 1941, and Chap. 168, Laws of 1949, Chap. 65, Art. 3, Sec. 14, N.M.S., 1953 anno) to approve this Agreement, and the conservation provisions hereof, and

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sections 181 et seq., authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating a cooperative or unit plan of development or operation of any oil or gas pool, field or like area, or any part thereof for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest; and

WHEREAS, the parties hereto hold sufficient interests in the South Eunice Unit Area covering the land hereinafter described to give reasonably effective control of operations therein; and

WHEREAS, it is the purpose of the parties hereto to enable institution and consummation of secondary recovery operations, conserve natural resources, prevent waste and secure the other benefits obtainable through development and operation of the area subject to this Agreement under the terms, conditions, and limitations herein set forth;

15-18-70

(c) "Secretary" is defined as the Secretary of the Interior of the United States of America, or his duly authorized delegate.

(d) "Department" is defined as the Department of the Interior of the United States of America.

(e) "Supervisor" is defined as the Oil and Gas Supervisor of the United States Geological Survey.

(f) "Unitized Formation" is defined as the interval between the base of the Queen formation to a point 232 feet above the top of the Queen formation; provided, that in no event shall the Unitized formation extend below a depth of 4000 feet from the surface of the ground. The top and the base of the Queen formation are shown at the depths of 3821' and 4023' respectively, on the Gamma-Ray-Sonic log run in the Continental Oil Company West Arrowhead Deep Unit Well No. 1, located 1920 feet from the North line and 1980 feet from the West line of Section 17, Township 22 South, Range 36 East, N. M. P. M.

(g) "Unitized Substances" is defined as and shall mean all oil, gas, gaseous substances, sulphur contained in gas, condensate, and all associated and constituent liquid or liquefiable hydrocarbons produced from the Unitized Formation of the Unitized Land. However, it shall not include the dry gas and associated hydrocarbons produced from gas wells within the Unit Area which are completed in and produce from the vertical limits of the Jalmat gas pool, as defined by Commission Order No. R-1670.

(h) "Tract" is defined as each parcel of land described as such and given a Tract number in Exhibit B.

(i) "Tract Participation" is defined as that percentage of Unitized Substances produced from the Unitized Formation which is allocated to a Tract under this Agreement.

(j) "Unit Participation," of each Working Interest Owner, is defined as the sum of the percentages obtained by multiplying such Working Interest Owner's fractional Working Interest in each tract by the Tract Participation of such Tract.

(k) "Working Interest" is defined as the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title, under an oil and gas lease, or otherwise held.



David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 393-4141

May 2, 1988

Doyle Hartman  
P.O. Box 10426  
500 N. Main  
Midland, TX 79702

Dear Mr. Hartman:

Recently Conoco began a major remedial project to improve the performance of the South Eunice Unit waterflood. Attached is a brief explanation of the purpose of the project and the proposed work necessary to maximize production. A history of the SEU flood is discussed along with present operations and future plans. Also enclosed is the first quarterly report and summary detailing the progress of the project to date. If at any time you have any questions regarding the South Eunice Unit, please feel free to contact Jay Vashler at (505) 393-4141, ext. 166. We appreciate your concern and timely support for this project.

Yours very truly,

A handwritten signature in cursive script that reads "David L. Wacker".  
David L. Wacker

JDV/cln

Attachment

cc: L. Nermeyr  
D. Hartman  
J. Alfred  
B. Hodge

MAY 9 1988

## South Eunice Unit

### Waterflood Improvement Project

#### Purpose:

The purpose of this project is to revamp the South Eunice Unit waterflood to maximize flood performance. This project consists of three major operations to be completed simultaneously over the next two years: 1) modification of the injection profiles of the existing injection wells; 2) conversion of four producing wells to injectors; 3) stimulation of all the producing wells. The estimated cost for this entire project is \$2 million gross and will add 1.2 MM BOE gross reserves to the unit over a 14 year life. Completion of the repair work is expected by early 1990 with peak flood response ( $\pm 600$  BOPD) occurring in 1991.

#### History:

The South Eunice Unit began injection in 1972. During the mid 1970's, this flood did not respond to injection as well as had been predicted. Several injection surveys run during this period of time indicated that an increasing amount of injection water was being lost to non-productive zones outside of the intended flood interval. The majority of the losses were found to occur in a gas thief zone that lies directly above the oil interval. Further investigation revealed that severely corroded casing below the injection packers was the reason for the water losses. In 1981 a source for less corrosive injection water was found, however, most of the damage to the injectors had already been done.

Tracer surveys run from 1980 to 1984 again emphasized that 60 to 70 percent of all injected water was being lost out of zone with several wells losing 100% to thief zones. Various production and reservoir studies were conducted during 1984 to 1987 to determine what recoverable reserves were left in the unitized area and what method of repairing these wells would be most productive and economical. Setting liners across the thief zones and then stimulating the flood interval to injection appears to be the best method of modifying the injection profiles.

In March of 1984, a 3-1/2" steel liner was set in SEU No. 35 to divert water away from the thief zone in this well. The well was returned to injection, and the subsequent profile survey showed that this well was now injecting 95%+ of its water into the desired interval, where before it was losing 90%+ to the gas cap. Within 3 months production rose in all 4 of the offset producers without any remedial work having been performed on them. The total increase in these wells stabilized at approximately 30 BOPD higher than before the SEU No. 35 repair job. To date they have cummed 17,000 barrels of incremental oil over their previous historical decline.

South Eunice Unit  
Page 2  
February 19, 1988

In December of 1986, a 4" steel liner was run in SEU No. 41 which was losing 100% of its water out of zone. Again, the post-repair injection profile showed 90%+ of the injected water was now entering productive pay. In addition, the 4 offset producers were also stimulated. Approximately 3 months after the repair of SEU No. 41, these offset producers responded to injection. Total production from this pattern has since risen 20 BOPD.

Present Operations:

Most recently a fiberglass liner has been set in SEU No. 43 (12/87) to shut off injection to the thief zone. This liner is now being tested for its success. SEU No. 9 has been converted to injection to help sweep Section 22 more efficiently as there has been no previous injection support in this area. Offset producers (SEU Nos. 8, 10, and 22) have also been stimulated to prepare them for response to injection from SEU No. 9. Results from these acid jobs (and low water production rates) reveal very low bottom hole pressures in this area which would indicate that this section of the flood has never been subject to secondary recovery operations. Approval for remedial work on the rest of the wells in this section is currently being sought.

Future Plans:

Three more wells (SEU Nos. 32, 52, and 58) are proposed to be converted to injection as soon as possible to complete waterflood patterns and more effectively sweep the areas surrounding these wells. Nine additional injection wells will be repaired using liners while eighteen injectors will be stimulated and surveyed. The producing wells will have all pay opened in the pay interval and be stimulated to maximize production. Approximately one half of all injector and producer work is scheduled for 1988 with the remaining procedures to be done in 1989 to early 1990. Work in areas where injection support has been minimal (Sections 22 and 33) will be emphasized first with remedial work in all other areas to follow. Quarterly reports will also be written to detail the progress and response of this project.

# TYPICAL LOG

## SEU NO. 38

SECTION 28 - 22 - 36

TOP  
UNITIZED  
INTERVAL

232'

GAMMA RAY

NEUTRON

TOP SEVEN RIVERS

TOP QUEEN

5-1/2"

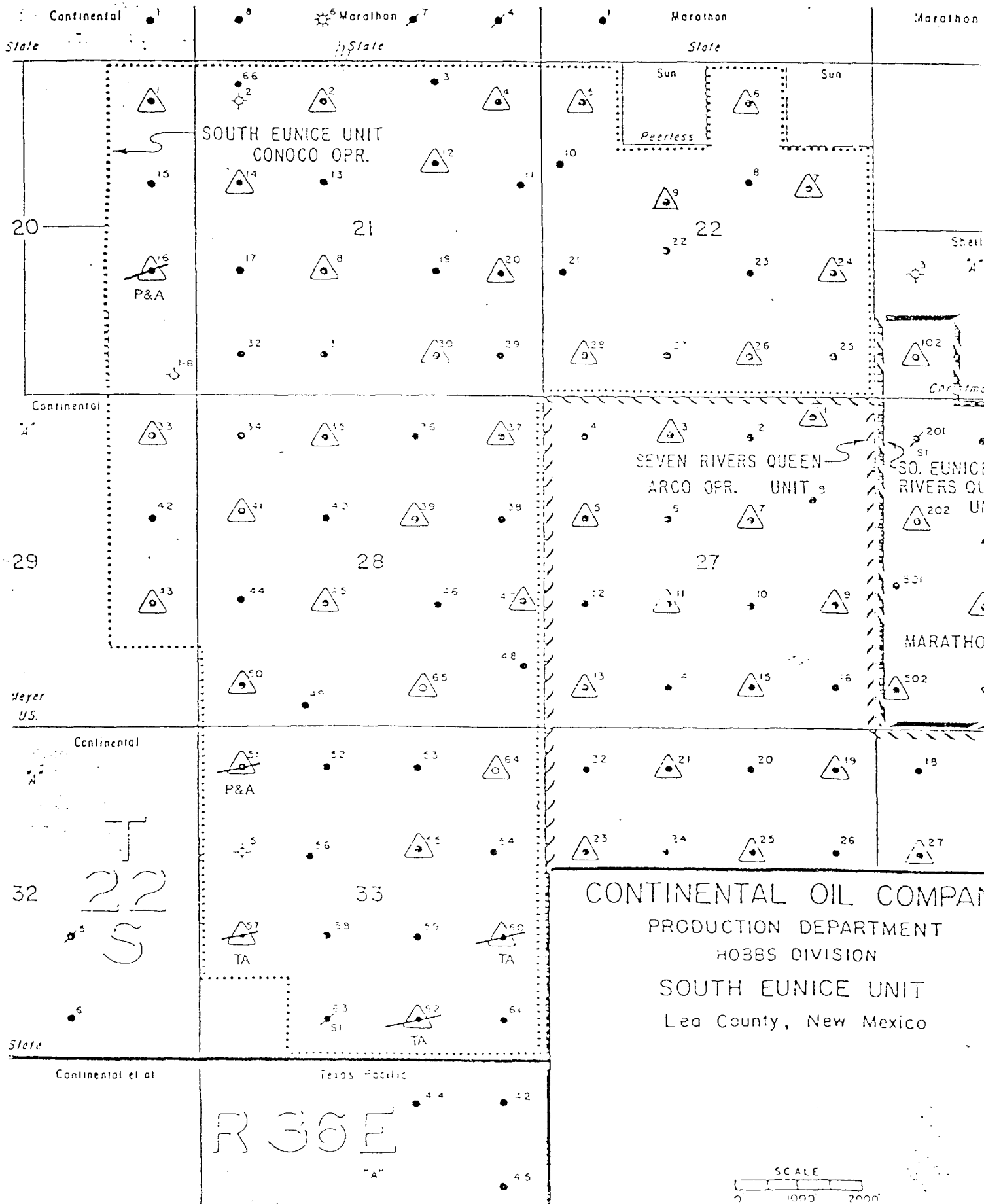
ZONE

ZONE 2

ZONE

FLOAT COLLAR

ZONE 4



SOUTH EUNICE UNIT

IMPROVED WATERFLOOD PROJECT

Quarterly Report

January-March 1988

The following is a summary of all waterflood improvement work done this quarter in the South Eunice Unit. Also attached is a summary of wells repaired with before and after tests. If there are any questions concerning the South Eunice Unit Project, please call Jay Vashler at (505) 393-4141, ext. 166.

December 1987

SEU No. 43:

3 feet of additional pay were opened to injection along with all of the floodable pay being reperfed. A 3-1/2" fiberglass liner was then run across the upper thief zone to shut off injection above the desired flood interval. The flood zone was then stimulated with 120 bbls of 15% HCl acid. The well was returned to injection with a stabilized rate of 375 BWPD and a surface injection pressure of 520 psi. An injection profile survey was run on 2-17-88, which indicated 60% of the injected fluid still entering the thief zone. A procedure to squeeze this liner leak is currently seeking approval.

January 1988

SEU No. 13:

This well was cleaned out to TD and a Gamma Ray-Neutron log was run across the open hole flood interval. The well was then acidized with 90 bbls of 15% HCl acid. The well was then returned to production.

SEU No. 9:

The producing equipment was removed from this well and it was cleaned out to PBTD. The flood interval was acidized with 100 bbls of 15% HCl. An injection packer and plastic coated tbg were run back into the well to convert it to an injector. The subsequent injection survey revealed 80% of the injected water entering Zone 4 and 20% entering Zone 1.

February 1988

SEU No. 22:

28 feet of additional pay were perforated. The flood zone was then acidized with 120 bbls of 15% HCl acid. The well was returned to production.



SEU No. 8:

This well was acidized with 120 bbls of 15% HCl acid. The well was returned to production.

SEU No. 10:

24 feet of additional pay were perforated. The entire flood zone was acidized with 130 bbls of 15% HCl acid before returning the well to production.

SEU No. 5:

This well was checked for fill and acidized with 90 bbls of 15% HCl acid. The well was then returned to injection and stabilized at a rate of 430 BWPd at 360 psi surface pressure. The post repair tracer survey indicated 50% of the fluid entering Zone 1 with the remaining 50% entering Zone 2.

March 1988

SEU No. 6:

29 feet of additional pay were opened to injection in this well. The entire flood interval was acidized with 90 bbls of 15% HCl before returning the well to injection. A tracer survey will be run as soon as a stabilized rate and pressure are obtained.

SEU No. 7:

50 feet of fill were removed from this well and 22 feet of additional pay were then opened. A casing leak was noted before the well was acidized and it was discovered that the majority of the casing in this well was severely corroded. This well was then temporarily abandoned pending further evaluation.

SEU Total Production

December 1987 - 259 BOPD, 790 BWPd, 300 MCFPD

March 1988 - 257 BOPD, 730 BWPd, 300 MCFPD

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	Test Before Remedial		Test After Remedial		3 Month Average		6 Month Average		9 Month Average		12 Month Average	
	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD
SEU No. 13 (1/88)	3	45	8	75								
SEU No. 22 (2/88)	16	8	18	34								
SEU No. 8 (2/88)	10	25	10	18								
SEU No. 10 (2/88)	5	110	5	80								

# SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	Test Before Remedial			Test After Remedial			3 Month Average		6 Month Average		9 Month Average	
	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	BWPD	Pres. PSI	BWPD	Pres. PSI
SEU No. 43 (12-87)	230	700	100%	375	520	60% <sup>a</sup>						
SEU No. 9 (1-88)	---	---	---	430	0	80% <sup>b</sup>						
SEU No. 5 (2-88)	600	650	75% <sup>c</sup>	430	360	0% <sup>d</sup>						
SEU No. 6 (3-88)	285	680	0%	415	400	N/A <sup>e</sup>						
SEU No. 7 (3-88)	265	660	100% <sup>e</sup>	0	0	0 <sup>f</sup>						

a: pending squeeze procedure

b: to Zone 4

c: to Zone 1

d: 50% Zone 1; 50% Zone 2

e: between Zones 1 & 2

f: TA due to bad casing

WORKING INTEREST OWNERS - SOUTH EUNICE UNIT

Amoco Production Co.  
P. O. Box 4072  
Odessa, Texas 79760  
ATTN: Joint Interest

Chevron USA Inc.  
P. O. Box 670  
Hobbs, NM 88240  
ATTN: Joint Interest

Doyle Hartman  
P. O. Box 10426  
Midland, TX 79702

Texaco Production Inc.  
P. O. Box 728  
Hobbs, NM 88240  
ATTN: Joint Interest

✓cc: LN  
B Wilcox  
B Nodge

APR 20 1988

ARCO Oil and Gas Company  
Central District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 688 5200



Graham E. King  
Joint Interest Superintendent

April 14, 1988

Mr. David L. Wacker  
Conoco Inc.  
P. O. Box 460  
Hobbs, NM 88240

Dear Mr. Wacker:

Thank you for your letter of February 23, 1988 outlining Conoco's plans for remedial work in the subject unit. We found this information to be very beneficial to our understanding of the Unit's ongoing operations and it provided additional justification for the numerous workovers recently conducted on this property.

As stated in your letter, Conoco plans to workover sixty-four (64) wells during the next two years at an estimated cost of \$2,000,000. It is our opinion that this scope of work should be submitted to the Working Interest Owners under a project AFE, rather than through individual well requests, as this would more clearly define the objectives of the remedial program and would establish the overall economic benefits of this work to the Unit. Therefore, we respectfully request that the remaining work associated with this program be consolidated into a formal project AFE and submitted to the WIO's at your earliest convenience.

ARCO is supportive of Conoco's efforts to improve the waterflood performance of the South Eunice Unit and this request is not intended to impede the progress of these efforts. If you have questions regarding ARCO's position in this matter, please contact Mr. Jack Lane at (915) 688-5583.

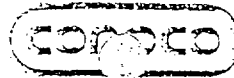
Your early consideration and response to this request would be sincerely appreciated.

Very truly yours,

G. E. King  
Joint Interest Superintendent

GEK/JRL:elt

cc: Working Interest Owners (see attached Distribution List)



David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 393-4141

February 23, 1988

Mr. Jack Lane  
ARCO Oil and Gas Co.  
P.O. Box 1610  
Midland, Texas 79702

RECEIVED  
FEB 26 1988

JOINT INTEREST  
OPERATIONS

Dear Mr. Lane:

This letter is in response to your telephone conversation with Jay Vashler on February 18, 1988 regarding Conoco's plans for remedial work in the South Eunice Unit waterflood. We are currently in the process of revamping the entire flood to correct problems that have developed in the past and maximize flood performance.

Briefly, over the next two years, we plan to modify the injection profiles of all the SEU injection wells to correct out of zone water losses and increase the sweep efficiency across the desired flood interval. In addition, wells #9, 32, 52 and 58 will be converted to injection wells to complete flood patterns and sweep previously non-flooded areas. The SEU producing wells will also be opened to all floodable pay and stimulated to maximize production. This entire project is anticipated to cost \$2 million gross and add 1.2 MMBOE gross reserves to the South Eunice Unit over a 14 year life.

Recent tracer surveys run in the SEU injection wells have revealed that 60 to 70 percent of the injected water is being lost out of the intended flood zone due mainly to corroded casing. The majority of losses occur in a thief zone that lies directly on top of the flood interval. The most effective method of diverting injection from the upper thief zone has been through the use of liners installed across the thief area. In 1984 and 1986, liners were installed in SEU Nos. 35 and 41 respectively. Previous to the repair work both of these injectors were losing 90% of their water out of the zone. Tracer surveys run since the liners were installed indicate that 90%+ of the injected water is now entering the desired flood zone. In both cases, response in the offset producers occurred within 3 months of repairing the injection wells. An estimated 20,000 barrels of incremental oil have thus far been produced over the previous historical decline of the offset producers.

This revamp work was initiated in December of 1987, with the liner installation in the SEU #43. We anticipate working on 32 wells during 1988 with the remaining 32 wells being done in 1989. During the next 12 months, we anticipate having all paperwork out to partners.

Mr. Jack Lane  
Page 2  
February 23, 1988

We also plan to prepare quarterly reports to the working interest owners detailing our progress, present activity and future plans concerning this SEU improvement project. The first of these reports will be sent by April 15, 1988. If at any time you have any questions regarding the South Eunice Unit, please feel free to contact Jay Vashler at 505-393-4141, ext. 166. We appreciate your concern and timely support for this project.

Yours very truly,

  
David L. Wacker  
Division Manager

JDV/tm



Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 393-4141

February 11, 1988

Working Interest Owners

Gentlemen:

SEU No. 14 - Clean out, log, acidize and install liner MRR No. 88008

Enclosed is our MRR requesting Working Interest Owners approval for the above referenced well.

Please indicate your approval of this project by signing and returning one copy of the attached MRR to the address above. Any engineering questions should be directed to Jay Vashler and administrative questions to Mike Zimmermann.

Sincerely,

*July A. McLamore*

*for* William W. Baker  
Administrative Supervisor

MWZ/dan  
Enclosure



FEB 17 1988

cc SF



MRR# 88008  
DIST.

## MAINTENANCE &amp; REMEDIAL REQUEST

LEASE NAME South Eunice Unit WELL NO. 14 CONOCO W.I. 0.356065  
OBJECTIVE OF WORK Clean Out, Log, Install a Liner, and Acidize  
LOCATION 1980' FNL & 660' FWL, Sec. 21, T-22S, R-36E, LEA COUNTY, NEW MEXICO  
DIVISION Hobbs FIELD NMFU DATE

WELL CLASSIFICATION	WELL STATUS	TD 3830'	MEASURING POINT
( ) OIL (X) INJECT.	(X) ACTIVE	FBTD —	9' FT. ABOVE
( ) GAS ( ) SERVICE	( ) SHUT-IN	TOC —	(X) GL ( ) LF

SURFACE & PRODUCTION CASING					LINER			TUBING		PACKER	
SZ	GR	WT	SET @	SX GMT	CEM. ( ) YES ( ) NO	BIM	SIZE	WT.	SZ	SET @	TYPE SET @
13"		40#	209'	250	TOP				2-3/8"	3537'	Baker 3537'
9-5/8"		36#	1499'	450							AD-1
7"		24#	3709'	300							

FORMATION	PERF/CH	TOP	BIM	NEP	FORMATION	PERF/CH	TOP	BIM	NEP
7R-Queen	CH	3709'	3830'						

MISC. DATA (COLLAPSED CASING, BRIDGE PLUG, ETC.)	PROBLEM	RECURRING
	( ) RES. BEHAVIOR	( ) YES
	(X) MECHANICAL	(X) NO

ALLOWABLE	PRESENT PROD.	EXPECTED INCREASE	ESTIMATED PAYOUT
DATE	NA BOPD	NA BOPD	PERIOD :
BOPD	NA MCFD	NA MCFD	OIL PRICE:
MCFD	NA EWPD	NA EWPD	GAS PRICE:

## JUSTIFICATION

Funds of \$59,200 gross (\$21,000 Conoco Net) are requested to clean out, log, install a liner, and stimulate South Eunice Unit No. 14 in order to modify its injection profile.

This injection well currently has no well log on file. In order to evaluate the injection profile of the well, it is proposed to run a Gamma Ray-Neutron log through the flood interval. The last tracer survey run in 1984 indicated fluid leaving the wellbore substantially above the casing shoe. If the log indicates, any additional oil pay found behind pipe will be perforated. A 5-1/2" steel liner will then be installed to shut off fluid loss into the upper thief zone.

Based on historical decline, current reserves for the four direct offset producing wells (SEU Nos. 13, 15, 17, and 66) are 10,000 BO. By modifying the injection profile of SEU No. 14, 70,000 barrels of incremental oil are expected from these offset producers based on reservoir analysis and response seen with analogous work in Section 28. Initial response is expected to occur within four to six months after repair. Economics have been based on a total offset production increase of 30 BOPD following flood response. This work will be done along with other proposed remedial work on the offset producers designed to maximize production.

NON-OPERATOR'S APPROVAL	
For _____	
By _____	
Date _____	

ESTIMATED GROSS COST: \$62,200	ESTIMATED NET COST: \$22,100	PREPARED BY: JUV
APPROVED: _____	DATE: _____	CHARGE: F-16
		MRR: 88008

*E. J. Galt*

2-9-88

SEU NO. 14

Estimated Costs

Pulling Unit (14 days)	\$15,400
Rentals	9,000
Packer, Liner and Equipment	14,000
Wireline (Caliper, Bailer & Perf)	5,000
Acid	7,300
Cement	2,000
Water	2,500
Injection Survey	4,000
Misc	<u>3,000</u>
TOTAL	\$62,200

Conoco Net (35.6%) \$22,100



Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 393-4141

February 17, 1988

Working Interest Owners

Gentlemen:

SEU No. 24 - Clean out, reperf, install liner, and acidize No. 88013

Enclosed is our MRR requesting Working Interest Owners approval for the above referenced well.

Please indicate your approval of this project by signing and returning one copy of the attached MRR to the address above. Any engineering questions should be directed to Jay Vashler and administrative questions to Mike Zimmermann.

Sincerely,

William W. Baker  
Administrative Supervisor

MWZ/dan  
Enclosure



FEB 18 1988

cc SF

MRR# 88013  
DIST. \_\_\_\_\_

## MAINTENANCE &amp; REMEDIAL REQUEST

LEASE NAME South Eunice Unit WELL NO. 24 CONOCO W.I. 0.356065  
OBJECTIVE OF WORK Clean out, reperf, install a liner, and acidize  
LOCATION 1980' FSL & 660' FEL, Sec. 22, T22S, R36E Lea COUNTY        NM STATE         
DIVISION Hobbs FIELD NMFU DATE 1-29-88

WELL CLASSIFICATION	WELL STATUS	TD 3825'	MEASURING POINT
( ) OIL ( X ) INJECT.	( X ) ACTIVE	PBTD --	9 FT. ABOVE
( ) GAS ( ) SERVICE	( ) SHUT-IN	TOC 2075'	( ) GL ( X ) LF

SURFACE & PRODUCTION CASING					LINER		TUBING	PACKER
SZ	GR	WT	SET @	SX CMT	CEM. ( ) YES ( ) NO	SZ	SET @	TYPE SET @
8-5/8"	J-55	24#	357'	325	TOP BTM	2-3/8"	3440'	Baker AD-1 3440'
5-1/2"	J-55	14#	3824'	900				

FORMATION	PERF/OH	TOP	BTM	NEP	FORMATION	PERF/OH	TOP	BTM	NEP
7R	Perf	3648'	3784'	99'					

MISC. DATA (COLLAPSED CASING, BRIDGE PLUG, ETC.)	PROBLEM	RECURRING
	( ) RES. BEHAVIOR	( ) YES
	( X ) MECHANICAL	( X ) NO

ALLOWABLE	PRESENT PROD.	EXPECTED INCREASE	ESTIMATED PAYCUT
DATE	NA BOPD	NA BOPD	PERIOD :
BOPD	NA MCFD	NA MCFD	OIL PRICE:
MCFD	NA BWPD	NA BWPD	GAS PRICE:

## JUSTIFICATION

Funds of \$51,500 gross (\$18,300 Conoco net) are requested to clean out, reperf, install a liner, and acidize South Eunice Unit No. 24 in order to modify its injection profile.

The last tracer survey run in this well in 1984 indicates 95%+ of all injected water is leaving the wellbore above the intended flood zone through corroded casing. The majority of the floodable pay in this well has never accepted water due to perfs in the gas cap being open. This procedure proposes to clean the well out of any fill, reperf the flood zone, install a liner to shut off injection to the thief zone, and acidize the flood interval to stimulate injection.

Based on historical decline, current reserves for the three offset producing wells, SEU Nos. 8, 23, and 25, are 25,000 BO. By modifying the injection profile of SEU No. 24, 25,000 barrels of incremental oil are expected to be produced based on reservoir analysis and analogous work previously performed in the flood. Initial response is expected to occur four to six months after repair. Economics have been based on a total offset production increase of 15 BOPD following flood response. This work will be done along with remedial work on the offset producers designed to maximize production.

An additional \$2,700 gross (\$1,000 Conoco net) is requested to purchase 9 jts of 3-1/2" fiberglass casing and will be cleared to Investment-New Work.

NON-OPERATOR'S APPROVAL
For _____
By _____
Date _____

ESTIMATED GROSS COST: \$54,200	ESTIMATED NET COST: \$19,300	PREPARED BY: JDV
APPROVED: <i>E. L. Plant</i>	DATE: 2-15-88	CHARGE: F-16
	DIST:	MRR: 88013

SEU No. 24

Estimated Costs

Pulling Unit (12 days)	\$ 13,200
Rentals	8,000
Liner, Packer, & Equipment	9,500
Wireline (Caliper, Bailer, & Perf)	4,500
Acid	5,500
Cement	3,000
Water	2,500
Injection Survey	4,000
Misc.	<u>4,000</u>

TOTAL	\$ 54,200
Conoco Net (35.6%)	\$ 19,300



mw

South Eunice  
Unit  
AFE's  
for all  
wells

David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 397-5800

June 8, 1988

Doyle Hartman  
P.O. Box 10426  
500 N. Main  
Midland, TX 79702

Dear Mr. Hartman:

As you are aware, Conoco has begun an extensive remedial project to maximize production in the South Eunice Unit Waterflood in Lea County, New Mexico. In order to expedite completion of the remaining 1988 project work, a single maintenance AFE is attached for your approval. This AFE includes funds to cover all remaining 1988 SEU remedial work and will replace the need for individual procedure approvals.

An additional AFE to cover 1989 maintenance costs will be released later this year. The estimated 1989 maintenance funds required are \$630,000 gross. These funds will allow us to complete the remedial project by the beginning of 1990.

A list of the wells to be repaired in 1988 is included with the following AFE as well as a location map of the SEU. A similar 1989 remedial list will be included with the 1989 AFE. If you have questions, please contact Jay Vashler at (505)397-5866. Your timely response would be appreciated.

Very truly yours,

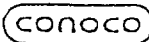
*Michael L. Norman*

for David L. Wacker

JDV/cln

cc: ELG, WWB, JDV, FILE

JUN 14 1988



Conoco Inc.  
Production & Exploration

Authority for  
Expenditure

Maintenance

Department		Production		Division		Hobbs	
APF Identification		D-Code		D-Code		APF No.	
1 - 213		415		81		9	
40		61		5319			
Field or Block		NMFU		TD and Obj. Horizon(s)			
Land Lease No.							

(1) Location, Geological Province (2) Division of Interest (3) Justification

(1) 2,720 acres located in Sections 20-22, 28, 29, and 33, T22S, R36E, Lea County, N.M.

(2) See Attachment

(3) See Attachment

All Costs incurred will be cleared to Lease Expense - Feature 16.

Description	CC	FFire	Gross S	CC	FFire	Gross S
Used Mtl. & Eq - Whse.	3	0008	XXXXXXX			
Pur. Mtl. & Eq - Cash/Whse.	3	0009	XXXXXXX			
Total Material			XXXXXXX			
Fuel, Water, Lubs., Elec.	3	0103		3	0403	30,400
Loc. Dmgs., Roads, Bridges	3	0107		3	0407	
Salv. & Dismantling Costs	3	0108		3	0408	
Drig. Contract - Footage	3	0111		3	0411	
Drig. Contract - Daywork	3	0112		3	0412	146,200
Drilling Bits & Reamers			XXXXXXX	3	0413	
Fishing Tool Expense			XXXXXXX	3	0414	
Directional Drig. Costs			XXXXXXX	3	0415	
Mud Mtls., Chem. & Svcs.			XXXXXXX	3	0416	
Cement & Cementing Svcs.			XXXXXXX	3	0417	15,500
Noncontrollable Mtls.	3	0118		3	0418	
Tender Costs & Rentals			XXXXXXX	3	0419	
Boatel Service	3	0120		3	0420	
Sp. Drig. Tool Rentals			XXXXXXX	3	0421	83,600
Coring Costs	3	0125		3	0425	
Drill Stem Tests			XXXXXXX	3	0426	
Perforating			XXXXXXX	3	0427	40,200
Acid., Fractg., Shooting			XXXXXXX	3	0428	120,100
Well Surv., Elec - Mud Log			XXXXXXX	3	0429	10,400
Transportation	3	0131		3	0431	
Marine Vesi. Costs & Rentals	3	0132		3	0432	
Aircraft Costs & Rentals	3	0133		3	0433	
Overhead - Partner Oper.	3	0136		3	0436	
Division Expense			XXXXXXX	3	0437	4,700
Co. Labor & Supv.	3	0138		3	0438	15,600
Contract Labor	3	0139		3	0439	7,500
Platform - Fab & Install	3	0141		3	0441	
Platform Maintenance			XXXXXXX	3	0442	
Keyways - Well Structures			XXXXXXX	3	0443	
Sales Tax (Depr. Inv.)			XXXXXXX	3	0444	
Miscellaneous Costs	3	0145		3	0445	37,600
Subtotal - Intangibles						511,800
Dry - Bim. Hole Contrb. Rec.			XXXXXXX	3	0448	
Total Intangibles						511,800
Total Cash & Whse. Outlay						511,800
On Hand Mtl. & Eq.	3	0001				XXXXXXX
Grand Total						511,800
Grand Total - Mtl. & Depr. Intangibles & Exp. Intangibles						511,800

Accounting Use Only	
Card	Ex - Oil
Approval Date	Depr. Acct. Exp. Acct.
4	
In - Oil	Con - Ltd.
Depr. Acct. Exp. Acct.	Depr. Acct. Exp. Acct.
5	

Budget	
Project	
OC No.	
5	

Cash and Warehouse Outlay	
Gross	Conoco Net
511,800	196,700
Project Total	
Gross	Conoco Net
511,800	196,700

Approvals \_\_\_\_\_ Date \_\_\_\_\_

INFORMATIONAL COPY ONLY

Michael L. Korman 6/9/88

(Final Approval)

Distribution:

OLR: HES: DLN: SDW: AKB: FILE (2)

AFE contains S None Conoco net for Pollution abatement.

AFE Identification 40-61-5319

(3)

SOUTH EUNICE UNIT  
WATERFLOOD IMPROVEMENT PROJECT  
AFE JUSTIFICATION

In December of 1987, the project to enhance the performance of the Conoco operated South Eunice Unit (SEU) Waterflood began. This project is designed to modify injection profiles to reduce out of zone water losses and to open and stimulate all productive pay in the producers for maximum flood response. To date, 22 individual maintenance procedures have been approved for a total of \$721,000 gross (12 procedures have been completed for approximately \$380,000). This AFE is intended to provide funds for the remaining 1988 maintenance expenditures of \$511,800 and replace the need for approval of funds for 18 individual procedures.

Results of the SEU project work completed so far are very encouraging. Two wells (SEU Nos. 9 and 32) have been converted to injection and are each injecting 400+ BWPd at 0 psi surface pressure. This indicates that the areas surrounding these wells had previously received little to no injection support in the past and may result in greater secondary recoveries than previously expected. Response to the SEU No. 9 conversion was seen within 2 months as production from SEU No. 22, the southern offset producing well, has risen from 15 BOPD and 8 BWPd to 40 BOPD and 35 BWPd. In addition, three other injection wells (SEU Nos. 5, 6, and 43) have been worked on with post-repair injection surveys showing definite improvements in their injection profiles. Concurrently, the offset producers to the repaired injectors are being stimulated to prepare them for maximum response to the improved waterflood. Successful completion of this project is expected to add 1.1 MMBOE of gross reserves (359 MBOE Conoco net) to the South Eunice Unit over a 14 year life.

The remaining work schedule for 1988 to be covered by this AFE includes stimulation of 8 producing wells and profile modification of 10 injection wells. The attached project schedule shows the individual wells to be worked on in 1988.

AFE NO. 40-61-5319



SOUTH EUNICE UNIT - WATERFLOOD IMPROVEMENT PROJECT

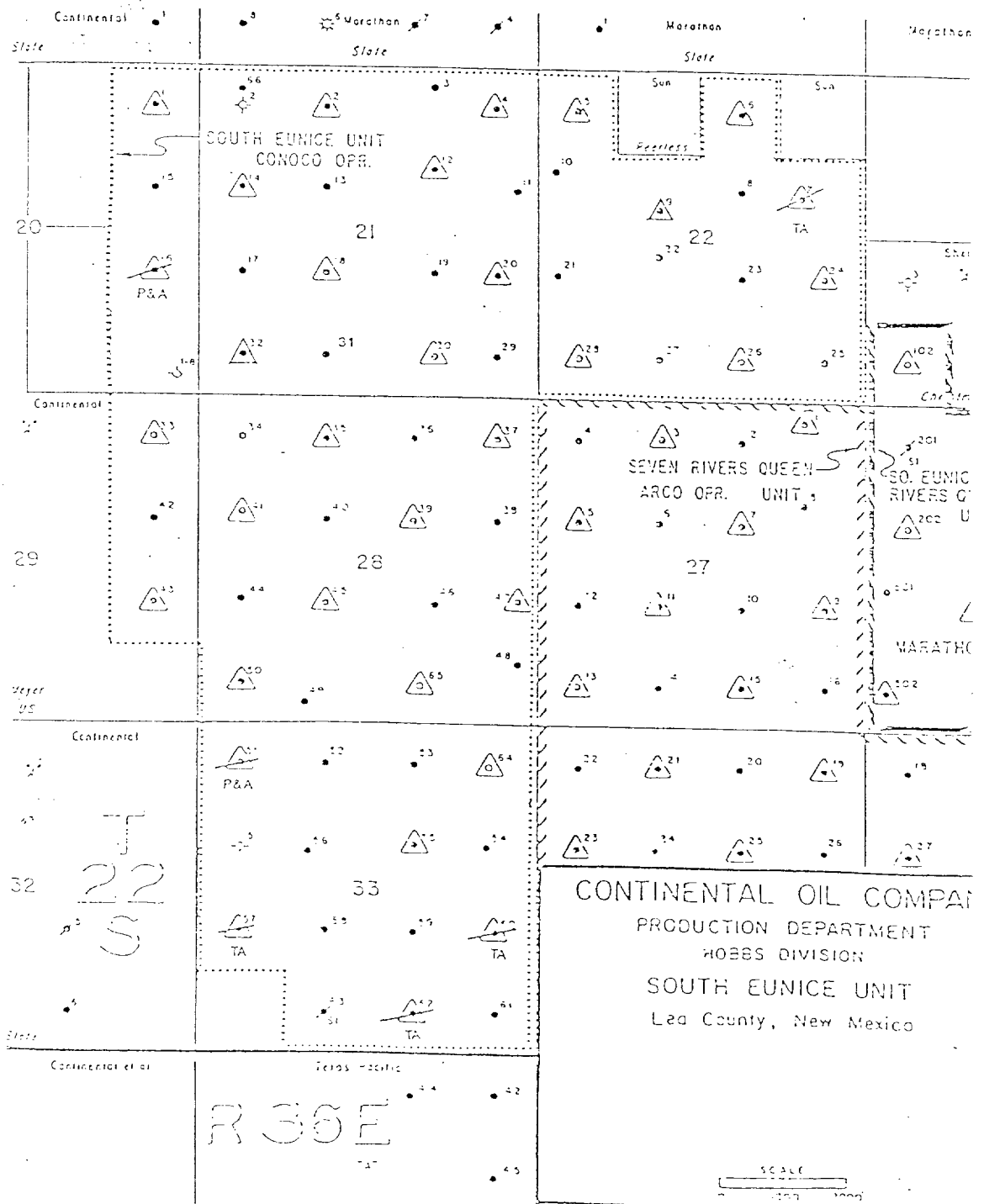
1988 WORK SCHEDULE

Injection wells completed or approved - SEU Nos. 5, 6, 7, 9, 14, 24, 26, 28, 32, 43

Remaining 1988 injection procedures - SEU Nos. 12, 18, 20, 30, 33, 35, 37, 39, 55, 64

Producing wells completed or approved - SEU Nos. 8, 10, 13, 15, 17, 21, 22, 23, 25, 27, 31

Remaining 1988 producer procedures - SEU Nos. 11, 19, 29, 34, 36, 53, 54, 59



MRR# 88040  
DIST. \_\_\_\_\_

# MAINTENANCE & REMEDIAL REQUEST

LEASE NAME SEMU Permian WELL NO. N/A CONOCO W.I. 2500000  
OBJECTIVE OF WORK Retrofit Stock Tank for Water Filtration  
LOCATION SW/4, Section 20, T20S, R38E COUNTY Lea STATE NM  
DIVISION Hobbs FIELD Skaggs Grayburg DATE 6/09/88

WELL CLASSIFICATION		WELL STATUS		TD		MEASURING POINT	
( ) OIL	( ) INJECT.	( ) ACTIVE		PBTD		FT. ABOVE	
( ) GAS	( ) SERVICE	( ) SHUT-IN		TOC		( ) GL	( ) LF
SURFACE & PRODUCTION CASING				LINER		TUBING	
SZ	GR	WT	SET @	SX	CMT	CEM. ( ) YES ( ) NO	SZ SET @
						TOP BTM SIZE WT.	TYPE SET @
FORMATION				PERF/OH	TOP	BTM	NEP
MISC. DATA (COLLAPSED CASING, BRIDGE PLUG, ETC.)				PROBLEM		RECURRING	
				( ) RES. BEHAVIOR		( ) YES	
				( ) MECHANICAL		( ) NO	
ALLOWABLE		PRESENT PROD.		EXPECTED INCREASE		ESTIMATED PAYOUT	
DATE		BOPD		BOPD		PERIOD :	
BOPD		MCFD		MCFD		OIL PRICE:	
MCFD		BWPD		BWPD		GAS PRICE:	

## JUSTIFICATION

The SEMU Permian Waterflood has suffered from injector problems since inception. Most of these problems are attributed to an insufficient water supply and poor water quality. A major renovation of the water supply system is currently underway, and, once complete, the subject Waterflood will have an adequate supply of water.

In addition, funds are hereby requested to retrofit an existing stock tank with some internal mechanisms that will aid it in functioning as a combination skim/solids removal vessel. Due to the proposed position of this tank in the new supply system, the cleaner processed water will benefit both the Permian Waterflood and Warren Unit No. 24 SWD well systems.

CE Natco has provided a quote of \$6,797 for the retrofit versus \$10,483 for a new tank.

INFORMATIONAL COPY ONLY

JUN 14 1988

ESTIMATED GROSS COST: \$7,500

APPROVED: \_\_\_\_\_

ESTIMATED NET COST: \$1,875

DATE: \_\_\_\_\_

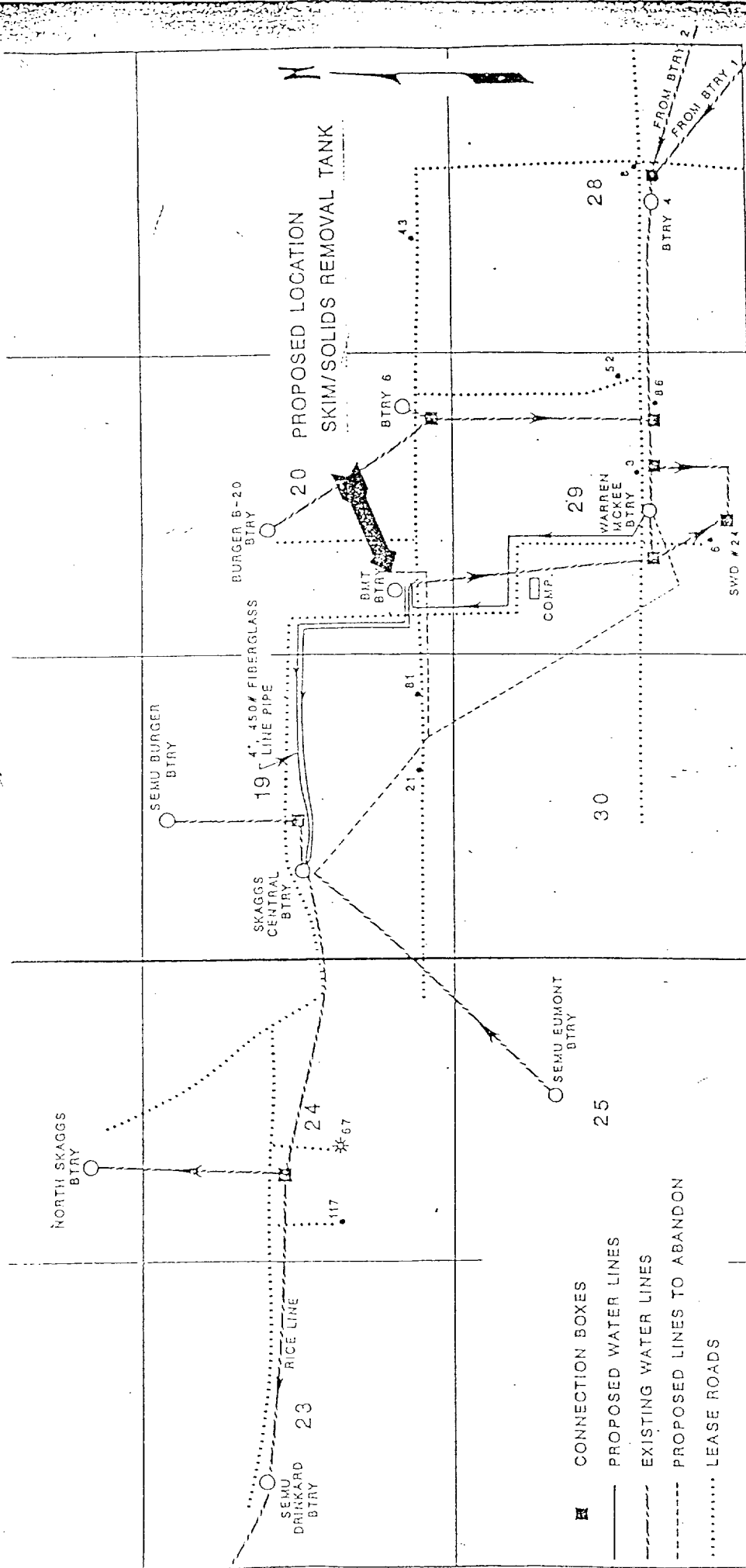
PREPARED BY: LGA

CHARGE: INV-NEW WK

DIST: \_\_\_\_\_

MRR: 88040

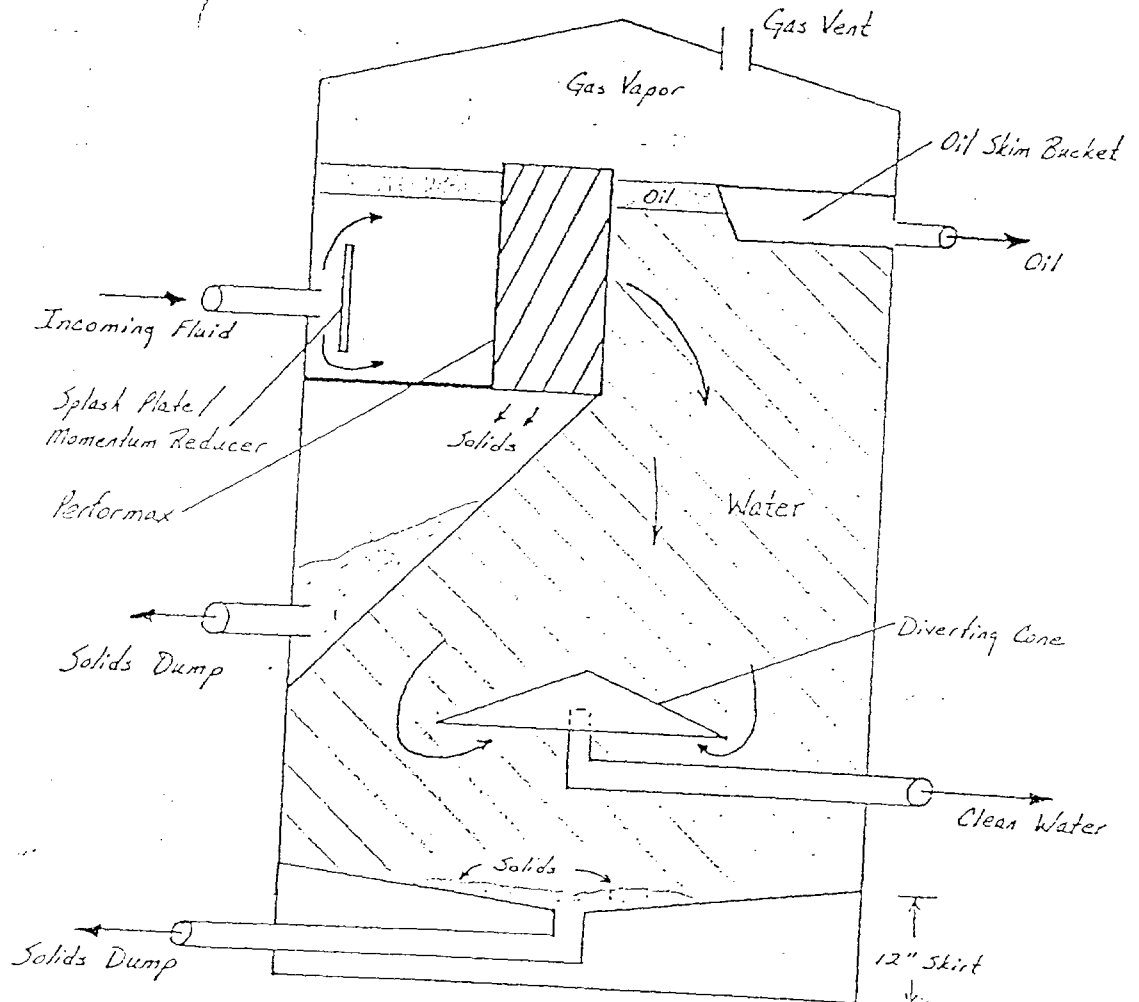
cc BLW, new



AREA 5  
PROPOSED PRODUCED WATER DISPOSAL SYSTEM

# SEMU Permian Waterflood

- Retrofit Existing Tank for Skimming & Solids Removal -



Existing Tank Data:

BS&B: 12' x 20' Tank  
Holds 380 Bbl.  
Welded, 1/4" Throughout  
Ser. No. 42-20225

Drawn By: Greg Ashdown

Checked By:

Date: June 3, 1988

Page: 1 of 1

Title: Skim/Solids Removal Tank

SEMU Permian Waterflood

\* from CE Natco Diagram

Company: SEMCO

Calculation Sheet

Field:

State:



SEU legal

David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 397-5800

July 26, 1988

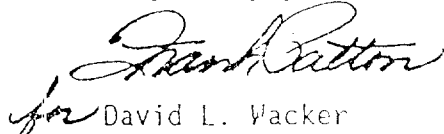
Doyle Hartman  
P.O. Box 10426  
500 N. Main  
Midland, TX 79702

Gentlemen:

Attached is the second quarterly report detailing the most recent remedial work completed in the South Eunice Unit Waterflood Project. Included in this report is a summary table of all work done and corresponding results to date.

If at any time you have any questions regarding the South Eunice Unit, please feel free to contact Jay Vashler at (505) 397-5866. We appreciate your concern and support for this project.

Very truly yours,

  
for David L. Wacker

Attachment

JDV/cln

cc: File

cc: DH  
B Rodge  
J Allard  
L. [unclear]  
BW

AUG 5 1988

SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

| Quarterly Report |  
| April - June 1988 |

The following is a summary of all waterflood improvement work done this past quarter in the South Eunice Unit. Also attached is a summary of wells repaired with before and after tests. If there are any questions concerning the South Eunice Unit Project, please call Jay Vashler at (505) 397-5866.

April 1988

SEU No. 32

The producing equipment was removed from this well and it was cleaned out to TD. A shallow casing leak was discovered upon pressure testing the casing and was repaired. The flood interval was then acidized with 120 bbls of 15% HCl. An injection packer and plastic coated tubing were run back into the well to convert it to an injector. A stabilized injection rate of 400 BWPd at 0 psi surface pressure has been attained, and the follow-up injection tracer survey shows 100% injection in the flood interval.

SEU No. 43

In December of 1987, a 3-1/2" fiberglass liner was installed in this well to divert injection to the lower pay zones. The follow-up injection survey revealed 60% of the injected fluid was still entering this upper zone. The liner has since been requeezed with cement. The well has stabilized at 100 BWPd and 540 psi surface pressure, and the results of the latest injection survey reveal the liner shoe is now holding with 100% injection into the desired flood zone.

May 1988

SEU No. 31

This producer was cleaned out and acidized with 90 bbls of 15% HCl. Ten feet of additional pay were also opened to production and fraced with 19,750 lbs of sand. All fill was again cleaned out of the well before returning it to production.

SEU No. 17

This well was discovered to have a packer left in the wellbore obstructing the lower three fourths of perforations. The packer was milled out, and all junk was cleaned out to TD. The entire pay interval was acidized with 120 bbls of 15% HCl before returning the well to production.

June 1988

SEU No. 14

This well was cleaned out and logged across the flood zone. A 5-1/2" steel liner was then run into the well and set across the upper thief zone in the flood interval. The productive flood interval was then acidized with 120 bbls of 15% HCl and returned to injection. An injection profile survey will be run as soon as a stabilized injection rate and pressure are obtained.

SEU No. 24

This injector was cleaned out to TD and all productive pay was reperforated. A liner is currently being installed to divert water to the lower pay intervals surrounding this well.

Note

In May, an attempt to properly plug and abandon SEU No. 51 according to NMOCD rules and regulations failed due to collapsed and parted casing. As a result, SEU Nos. 52 and 58 cannot be converted to injection at this time. Flood response on the eastern half of Section 33 will be monitored before any further plans are developed for the western half of this section.

SEU Total Production

	<u>BOPD</u>	<u>BWPD</u>	<u>MCF/D</u>
December 1987	259	790	300
March 1988	257	730	300
June 1988	267	930	378



# TYPICAL LOG SEU NO. 38

SECTION 28 - 22 - 36

TOP  
UNITIZED  
INTERVAL

232'

GAMMA RAY

NEUTRON

3400

3500

3600

3700

3800

TOP QUEEN

5-1/2"

TOP SEVEN RIVERS

ZONE 1

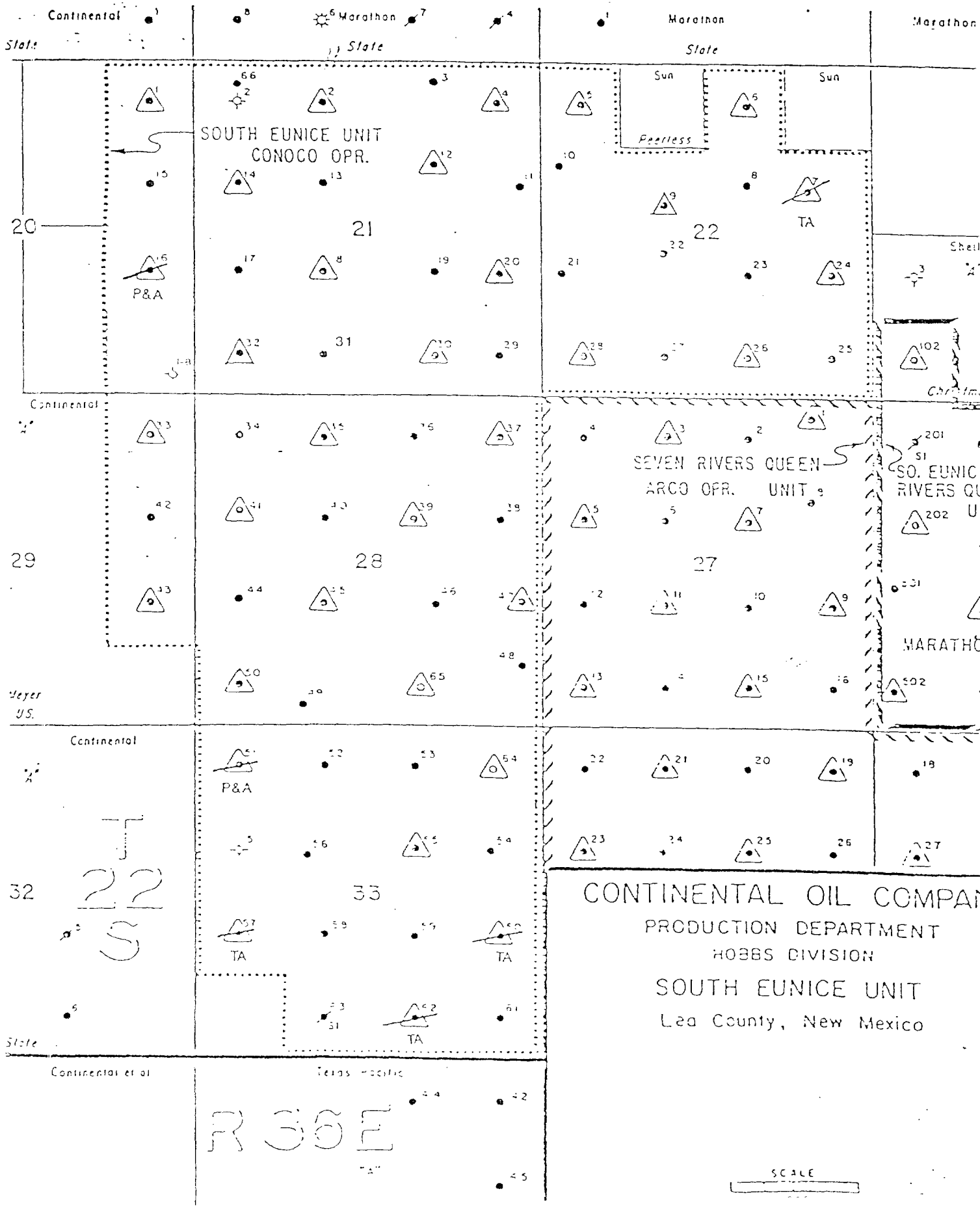
ZONE 2

ZONE 3

ZONE 4

FOOT LOG

55#



# SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	Test Before Remedial		Test After Remedial		3 Month Average		6 Month Average		9 Month Average		12 Month Average	
	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD	BOPD	BWPD
SEU No. 13 (1/88)	3	45	8	75	4	60						
SEU No. 22 (2/88)	16	8	18	34	35	35						
SEU No. 8 (2/88)	10	25	10	18	9	20						
SEU No. 10 (2/88)	5	110	5	80	6	75						
SEU No. 31 (5/88)	13	5	22	30								
SEU No. 17 (5/88)	3	25	5	80								

# SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	Test Before Remedial			Test After Remedial			3 Month Average			6 Month Average			9 Month Average		
	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss
SEU No. 43 (12-87)	230	700	100%	375	520	60% <sup>a</sup>	100	480							
SEU No. 9 (1-88)	---	---	---	430	0	0% <sup>b</sup>	400	0							
SEU No. 5 (2-88)	600	650	75% <sup>c</sup>	430	360	0% <sup>d</sup>	450	440							
SEU No. 6 (3-88)	285	680	0%	415	400	N/A	450	480							
SEU No. 7 (3-88)	265	660	100% <sup>e</sup>	0	0	0% <sup>f</sup>	0	0							
SEU No. 32 (4-88)	---	---	---	410	0	0%									
SEU No. 43 (4-88)	375	520	60%	100	540	0%									
SEU No. 14 (6-88)	800	400	100%	430	0	N/A									
SEU No. 24 (6-88)	45	720	95%	N/A	N/A	N/A									

a: pending squeeze procedure

b: 80% to Zone 4

c: to Zone 1

d: 50% Zone 1; 50% Zone 2

e: between Zones 1 & 2

f: TA due to bad casing



File

David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
726 East Michigan  
P.O. Box 460  
Hobbs, NM 88241  
(505) 397-5800

April 14, 1989

Doyle Hartman  
P. O. Box 10426  
Midland, TX 79702

Gentlemen:

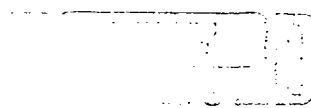
Attached is the most recent quarterly update detailing all work done in the South Eunice Unit during the first quarter of 1989. Included in this report is a summary table of all work completed in the SEU Waterflood Improvement Project with corresponding results to date.

If at any time you have any questions regarding the South Eunice Unit, please feel free to contact Jay Vashler at (505) 397-5866. We appreciate your concern and support for this project.

Very truly yours,

David L. Wacker  
Division Manager

JDV/mjm  
1/OWNERS  
Attachment  
cc: File



✓cc: DH  
BNbdc  
SP

APR 20 1989

SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

Quarterly Report  
January - March, 1989

The following is a summary of all waterflood improvement work done this past quarter in the South Eunice Unit. Also attached is a summary of all wells repaired with before and after tests. If there are any questions concerning the South Eunice Unit Project, please call Jay Vashler at (505)397-5866.

January, 1989

SEU No. 27

This producer had 17 feet of additional pay opened in zones 2 and 4. Zones 1-3 were then acidized with 60 bbls of 15% HCl and sand fraced with 41,000 lbs. of sand. The well was cleaned out to TD and returned to production.

SEU No. 28

This injection well had 103 feet of fill and corroded casing removed. An additional 32 feet of additional pay were opened in zones 1 and 4. The well was then plugged back to the top of the flood zone with sand, and a fiberglass liner was set across from the upper thief zone found in this well to shut off undesirable water loss. The thief zone was squeezed with a total of 200 sacks of cement. The liner shoe was successfully tested to 1000 psi before cleaning the well out to TD. The well was returned to injection, and an injection profile survey will be run as soon as a stabilized injection rate and pressure are obtained.

February, 1989

SEU No. 29

Zones 3-4 were acidized with 80 bbls 15% HCl acid. An additional 20 feet of additional pay were then opened in Zone 2. The entire flood interval was then sand fraced with 49,000 lbs. of sand in two equal stages. The well was cleaned out to TD and returned to production.

March, 1989

SEU No. 8

This producing well had 14 feet of additional pay opened in Zone 4. The well was then plugged back to the top of Zone 2 and Zone 1 was acidized with 40 bbls 15% HCl acid and fraced with 29,500 lbs. of 20/40 sand. The well was cleaned out to TD and returned to production.

Note

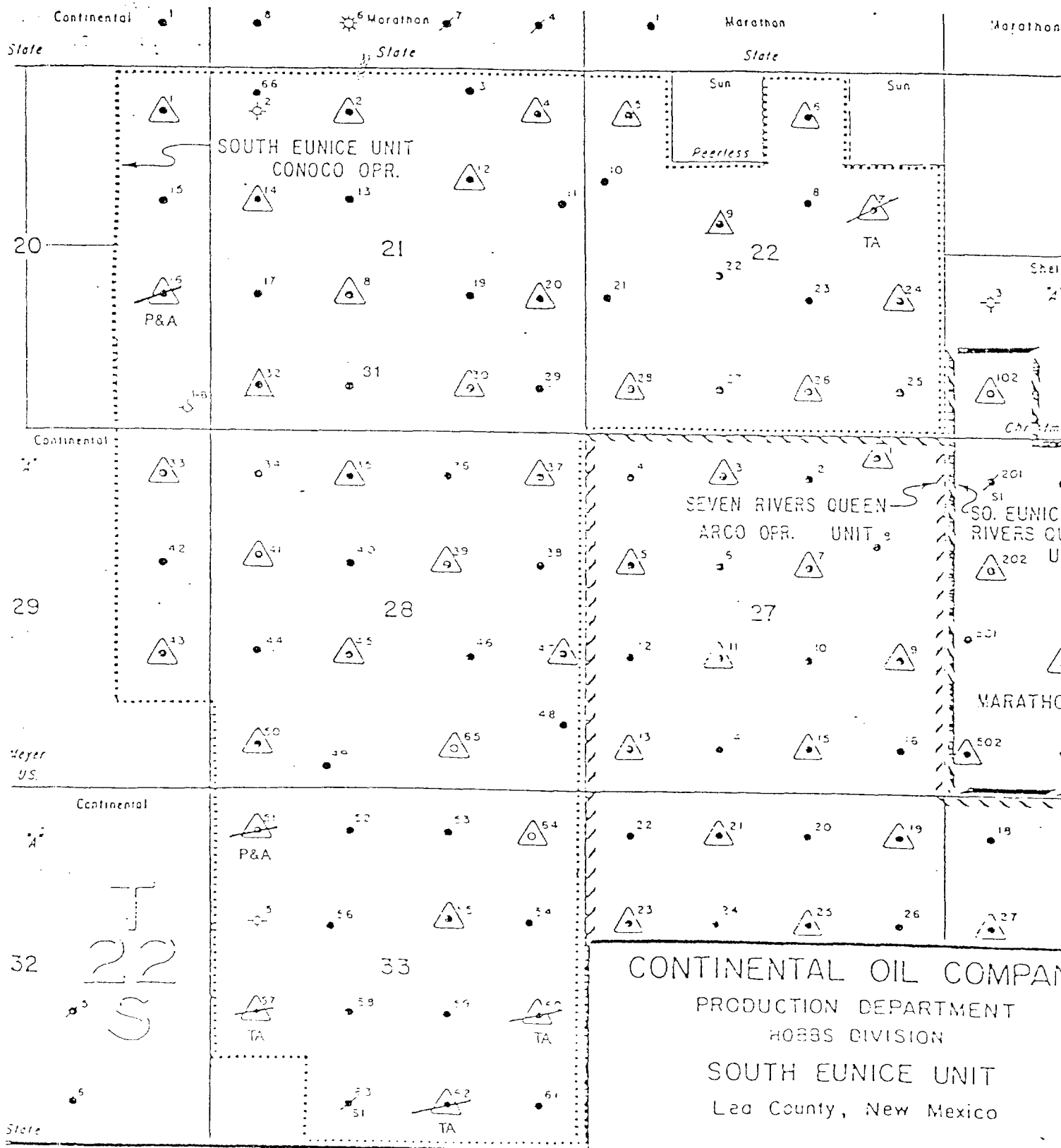
Injection profile tracer surveys on SEU Nos. 5, 6, 9, 18, 26 and 28 will be run in April, 1989 with the results being published in the second quarter, 1989 SEU Report.

SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

///

SEU TOTAL PRODUCTION

	<u>BOPD</u>	<u>BWPD</u>	<u>MCF/D</u>
December, 1987	259	1125	300
March, 1988	257	960	300
June, 1988	267	900	378
September, 1988	270	1225	412
December, 1988	263	1180	349
March, 1989	300	1380	429



CONTINENTAL OIL COMPANY  
PRODUCTION DEPARTMENT  
HOBBS DIVISION  
SOUTH EUNICE UNIT  
Lea County, New Mexico

R 30 E

"A"

SCALE  
0 1000 2000



# TYPICAL LOG SEU NO. 38

SECTION 28 - 22 - 36

TOP SEVEN RIVERS

TOP  
UNITIZED  
INTERVAL

232'

GAMMA RAY

NEUTRON

ZONE

ZONE 2

ZONE

TOP QUEEN

FLOAT COLLAR ZONE 4

5-1/2"

#55

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	Test Before Remedial		Test After Remedial		3 Month Average		6 Month Average		9 Month Average		12 Month Average	
	BOPD	BMPD	BOPD	BMPD	BOPD	BMPD	BOPD	BMPD	BOPD	BMPD	BOPD	BMPD
SEU No. 13 (1/88)	3	45	8	75	4	60	4	60	7	60	7	50
SEU No. 22 (2/88)	16	8	18	34	35	35	38	35	36	40	34	40
SEU No. 8 (2/88)	10	25	10	18	9	20	7	9	6	13	6	11
SEU No. 10 (2/88)	5	110	5	80	6	75	6	75	4	75	5	78
SEU No. 31 (5/88)	13	5	22	30	25	12	22	10	21	9		
SEU No. 17 (5/88)	3	25	5	80	6	80	5	40	4	38		
SEU No. 15 (7/88)	4	8	16	35	9	40	10	30				
SEU No. 25 (7/88)	12	3	4	5	10	2	10	4				
SEU No. 23 (8/88)	2	4	10	100	12	95	16	88				
SEU No. 21 (8/88)	6	70	6	80	6	75	5	74				
SEU No. 27 (1/89)	17	45	58	65								
SEU No. 29 (2/89)	18	21	37	270								
SEU No. 8 (3/89)	6	11	N/A	N/A								

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	15 Month		18 Month		21 Month		24 Month		27 Month		30 Month	
	Average	BOPD	Average	BOPD	Average	BOPD	Average	BOPD	Average	BOPD	Average	BOPD

SEU No. 13 (1/88)

6

55

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	Test Before Remedial			Test After Remedial			3 Month Average			6 Month Average			9 Month Average		
	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss
SEU No. 43 (12-87) (4-88)	230	700	100%	375	520	60% <sup>a</sup>	100	480 <sup>g</sup>	0	105	500	0	110	540	0
SEU No. 9 (1-88)	---	---	---	430	0	0% <sup>b</sup>	400	0	0% <sup>b</sup>	260	280	0	500	400	0
SEU No. 5 (2-88)	600	650	75% <sup>c</sup>	430	360	0% <sup>d</sup>	450	440	0% <sup>d</sup>	450	480	0	495	550	0
SEU No. 6 (3-88)	285	680	0%	415	400	0% <sup>e</sup>	450	480	0% <sup>f</sup>	455	490	0	500	540	0
SEU No. 7 (3-88)	265	660	100% <sup>e</sup>	0	0	0% <sup>f</sup>	0	0	0% <sup>f</sup>	0	0	0	0	0	0
SEU No. 32 (4-88)	---	---	---	410	0	0% <sup>g</sup>	430	0	0% <sup>g</sup>	500	0	0	710	130	0
SEU No. 14 (6-88)	800	400	100%	430	0	0% <sup>g</sup>	450	0	0% <sup>g</sup>	500	0	0	525	0	0
SEU No. 24 (6-88)	45	720	95% <sup>h</sup>	45	780	N/A	50	750	N/A	10	790	N/A	25	700	N/A
SEU No. 26 (8-88)	255 <sup>i</sup>	620	80%	370	530	N/A	375	600	N/A	325	580	N/A	465	240 <sup>h</sup>	N/A
SEU No. 18 (9-88)	0	0	75%	310	0	N/A	500	170	N/A						
SEU No. 28 (1-89)	130	700	13%	190	580	N/A									

a: pending squeeze procedure

b: 80% to Zone 4

c: to Zone 1

d: 50% Zone 1; 50% Zone 2

e: between Zones 1 & 2

f: TA due to bad casing

g: Squeeze procedure successful; 0% loss out of zone

h: to Zone 1 only

i: SI w/tbg leak

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	12 Month Average		15 Month Average		18 Month Average		21 Month Average		24 Month Average		27 Month Average	
	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI
SEU No. 43 (12-87) (4-88)	90	710										
SEU No. 9 (1-88)	495	370										
SEU No. 5 (2-88)	455	560										
SEU No. 6 (3-88)	510	560										
SEU No. 7 (3-88)	0	0										



David L. Wacker  
Division Manager  
Production Department  
Hobbs Division  
North American Production

Conoco Inc.  
P.O. Box 460  
726 East Michigan  
Hobbs, NM 88240  
(505) 397-5800

July 21, 1989

Doyle Hartman  
P. O. Box 10426  
Midland, TX 79702

Gentlemen:

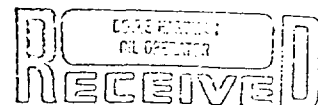
Attached is the second quarterly update of 1989 summarizing all work done in the South Eunice Unit. Due to general expenditure cutbacks, no new remedial work has been performed during this past quarter. The following summary table updates all work completed to date in the SEU Waterflood Improvement Project with corresponding results.

If at any time you have any questions regarding the South Eunice Unit, please feel free to contact Jay Vashler at (505) 397-5866. We appreciate your concern and support for this project.

Very truly yours,

David L. Wacker  
Division Manager

JDV/mjm  
1/OWNERS  
Attachment  
cc: File



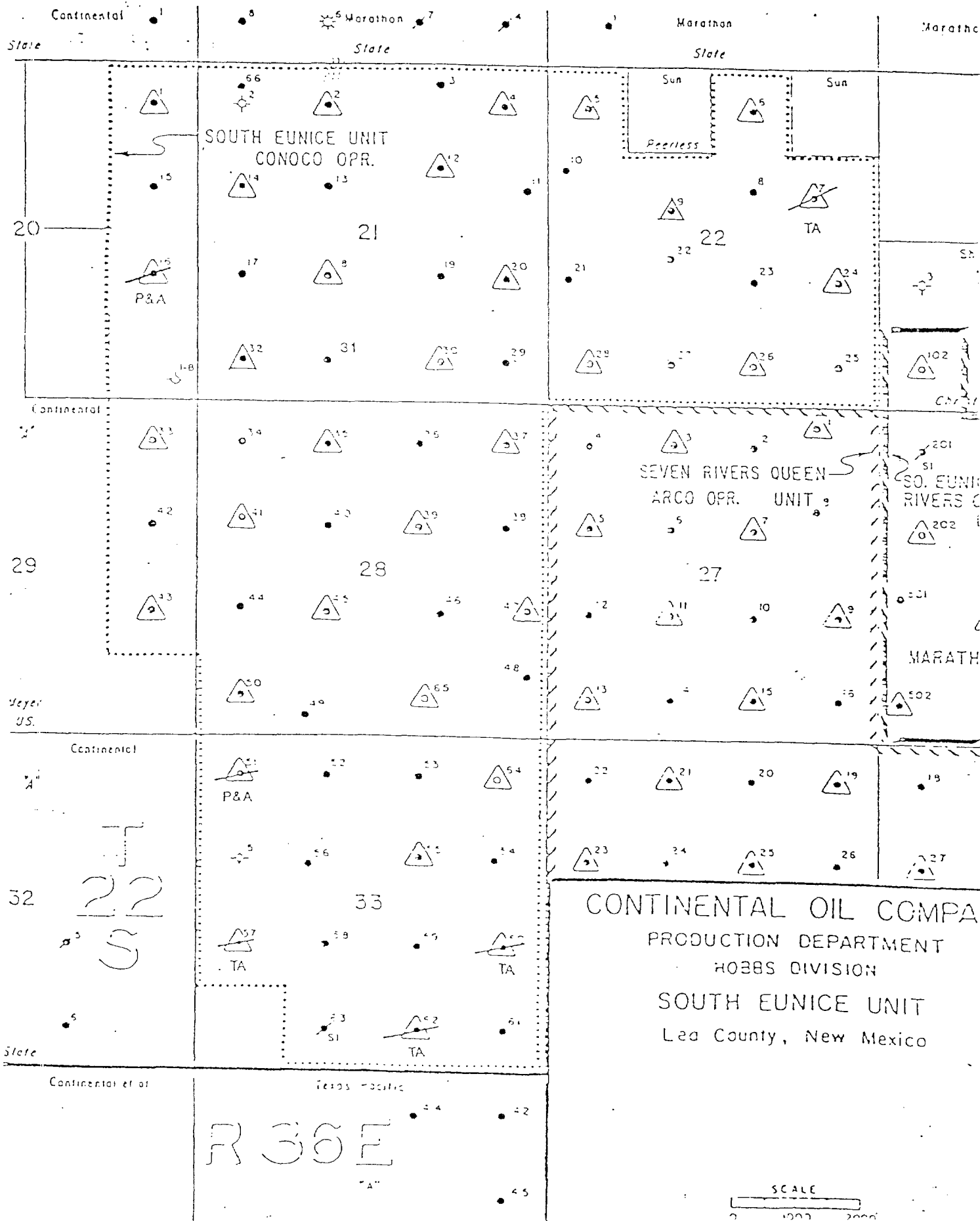
cc: DH  
MS  
BH

AUG 3 1989

SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

SEU TOTAL PRODUCTION

	<u>BOPD</u>	<u>BWPD</u>	<u>MCF/D</u>
December, 1987	259	1125	300
March, 1988	257	960	300
June, 1988	267	900	378
September, 1988	270	1225	412
December, 1988	263	1180	349
March, 1989	300	1380	429
June, 1989	306	1611	428





# TYPICAL LOG

## SEU NO. 38

SECTION 28 - 22 - 36

TOP  
UNITIZED  
INTERVAL

232'

GAMMA RAY

NEUTRON

3400

3500

3600

3700

3800

TOP QUEEN

5-1/2"

TOP SEVEN RIVERS

ZONE

ZONE

ZONE

FLOAT COLLAR ZONE

# SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

	18 Month	21 Month	24 Month	27 Month	30 Month
	Average	Average	Average	Average	Average
	BOPD	BOPD	BOPD	BOPD	BOPD
Producing Wells	BUPD	BUPD	BUPD	BUPD	BUPD
SEU No. 13 (1/88)	6	55	52		
SEU No. 22 (2/88)	21	45			
SEU No. 10 (2/88)	4	81			

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	Test Before Remedial			Test After Remedial			3 Month Average			6 Month Average			9 Month Average		
	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI	% Loss	BWPD	Pres. PSI		BWPD	Pres. PSI		BWPD	Pres. PSI	
SEU No. 43 (12-87) (4-88)	230	700	100%	375	520	60% <sup>a</sup>	100	490 <sup>b</sup>		105	500		110	540	
SEU No. 9 (1-88)	---	---	---	430	0	0% <sup>b</sup>	400	0		260	280		500	400	
SEU No. 5 (2-88)	600	650	75% <sup>c</sup>	430	360	0% <sup>d</sup>	450	440		450	480		495	550	
SEU No. 6 (3-88)	285	680	0%	415	400	0%	450	480		455	490		500	540	
SEU No. 7 (3-88)	265	660	100% <sup>e</sup>	0	0	0% <sup>f</sup>	0	0		0	0		0	0	
SEU No. 32 (4-88)	---	---	---	410	0	0%	410	0		500	0		710	130	
SEU No. 14 (6-88)	800	400	100%	430	0	0%	450	0		500	0		525	0	
SEU No. 24 (6-88)	45	720	95% <sup>h</sup>	45	780	N/A	50	750		10	790		25	700	
SEU No. 26 (8-88)	255	620	80% <sup>h</sup>	370	530	50%	375	600		325	580		300	660	
SEU No. 18 (9-88)	0 <sup>f</sup>	0	75%	310	0	49%	500	170		465	240		475	320	
SEU No. 28 (1-89)	130	700	13%	190	580	0%	150	700							

a: pending squeeze procedure

b: 80% to Zone 4

c: to Zone 1

d: 50% Zone 1; 50% Zone 2

e: between Zones 1 & 2

f: TA due to bad casing

g: Squeeze procedure successful: 0% loss out of zone

h: to Zone 1 only

i: SI w/thg leak

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	12 Month Average			15 Month Average			18 Month Average			21 Month Average			24 Month Average			27 Month Average		
	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI	BUPD	Pres. PSI
SEU No. 43 (12-87) (4-88)	90	710	115	780														
SEU No. 9 (1-88)	495	370	330	440														
SEU No. 5 (2-88)	455	560	520	600														
SEU No. 6 (3-88)	510	560	450	700														
SEU No. 7 (3-88)	0	0	0	0														
SEU No. 32 (4-88)	655	260																
SEU No. 14 (6-88)	560	0																
SEU No. 24 (6-88)	0	720																



MS ✓  
DH ✓  
file ←

David L. Wacker  
Division Manager  
Hobbs Division  
Exploration and Production, North America

Conoco Inc.  
726 East Michigan  
P.O. Box 460  
Hobbs, NM 88241  
(505) 397-5800

October 31, 1989


Doyle Hartman  
P. O. Box 10426  
Midland, TX 79702

Gentlemen:

Attached is the third quarterly update of 1989 summarizing all work done in the South Eunice Unit during the past three months. Also included is a summary table of all work completed in the SEU Waterflood Improvement Project with corresponding results to date.

If you have any questions regarding the South Eunice Unit, please contact Jay Vashler at (505) 397-5866. We appreciate your concern and support for this project.

Very truly yours,

  
David L. Wacker  
Division Manager

JDV/mjm  
OWNERS  
Attachment  
cc:  
File

RECEIVED

NOV 9 1989

SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

Quarterly Report  
July - September, 1989

The following is a summary of all waterflood improvement work done this past quarter in the South Eunice Unit. Also attached is a summary of all wells worked on with before and after tests. If there are any questions concerning the SEU Project, please call Jay Vashler at (505)397-5866.

July, 1989

SEU No. 30

This injection well had 14 feet of additional pay opened. The well was then acidized with 120 barrels of 15% HCl acid. Communication occurred above the intended flood interval through previously squeezed perforations, and it became necessary to resqueeze this thief zone. A 3-1/2" fiberglass liner was run in the well across from the upper thief zone and cemented in place. An old casing leak located well above the liner once again broke down and was also resqueezed with 170 sacks of cement. The well was then cleaned out and all casing successfully pressure tested to 500 psi. SEU No. 30 was returned to injection and allowed to reach a stabilized injection rate and pressure. The post remedial injection survey showed no leak around the liner shoe, and all productive zones are now taking water.

August, 1989

SEU No. 19

This producer had 24 feet of additional pay opened in Zones 2 and 4. All the pay was then acidized with 90 barrels of 15% HCl acid, and the well was returned to production.

SEU No. 11

This producer had 17 feet of additional pay in Zone 2 opened. The well was then acidized with 120 barrels of 15% HCl acid and returned to production.

SEU No. 36

This producer had 5 feet of additional pay perforated. It was then acidized with 150 barrels of 15% HCl acid and returned to production.

September, 1989

SEU No. 35

This injection well had scale bridges and fill cleaned out from 3659' to 3800'. Eleven feet of pay were perforated in Zone 2 and the entire flood interval was acidized with 50 barrels of 15% HCl acid. The well was returned to injection, and an injection profile survey will be run after a stabilized injection rate and pressure are obtained.

SEU No. 37

This injection well had 14 feet of unopened pay in the top of Zone 4 perforated. Several attempts were then made to plug the well back to the base of the flood interval with a dump bailer; however, the cement vanished out the bottom of the well after each run. A cement retainer was then set above the entire flood interval, due to the poor integrity of the casing below, and the flood zone and thief zone were squeezed with 400 sacks of cement. The well was then cleaned out to the base of the flood interval, and 42 feet of pay in Zones 2 through 4 were reopened. The well was then stimulated with 75 barrels of 15% HCl acid. The injection equipment was run back into the well, but after several attempts to set the packer and pressure test the casing failed, it was again pulled. A casing inspection log was run and revealed two holes and otherwise very poor casing integrity above the flood interval where the injection packer must be set. The well was then temporarily abandoned pending installation of a liner across the thief zone.

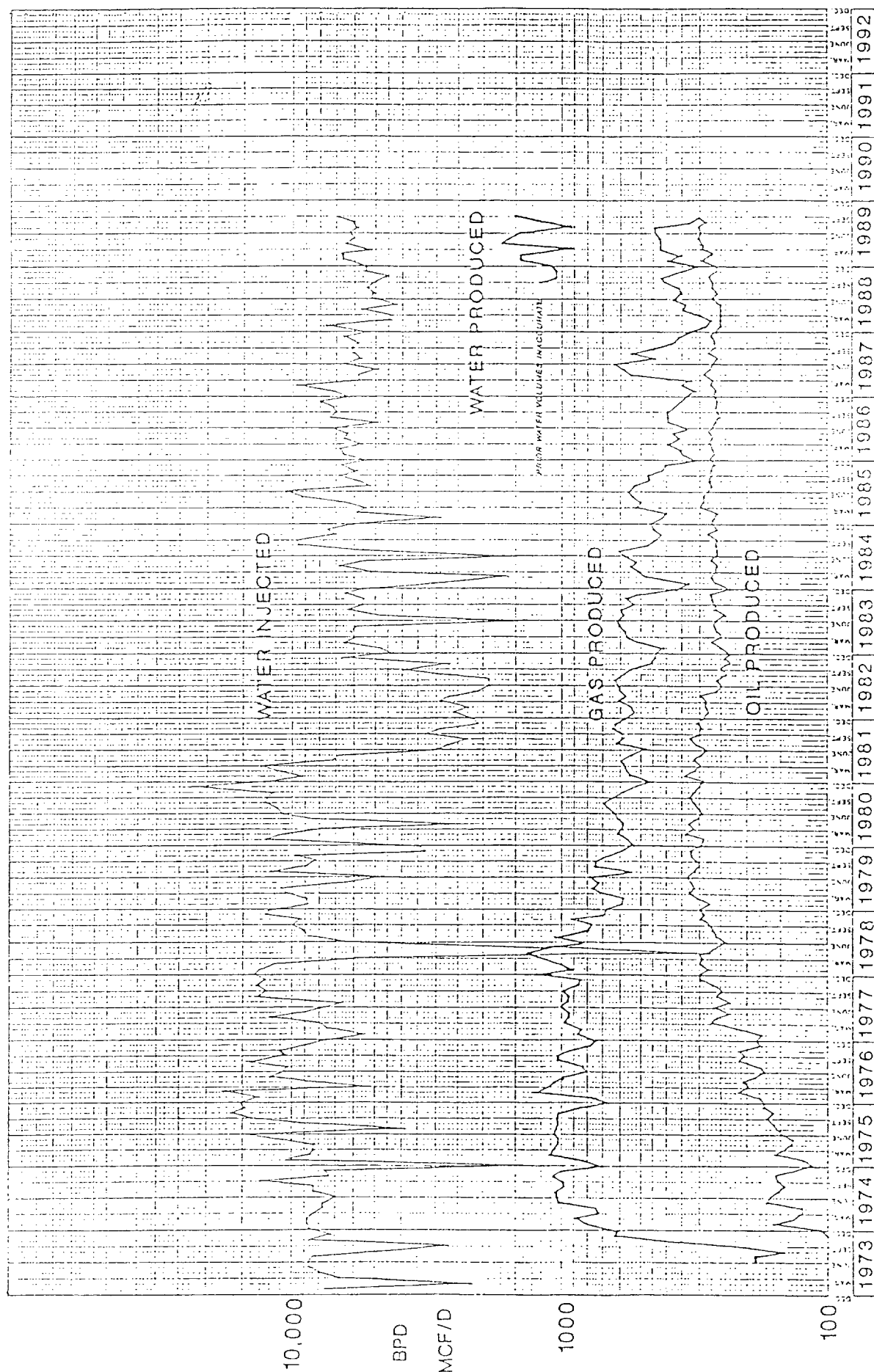
SOUTH EUNICE UNIT  
IMPROVED WATERFLOOD PROJECT

SEU TOTAL PRODUCTION

	<u>BOPD</u>	<u>BWPD</u>	<u>MCF/D</u>
December, 1987	259	1125	300
March, 1988	257	960	300
June, 1988	267	900	378
September, 1988	270	1225	412
December, 1988	263	1180	349
March, 1989	300	1380	429
June, 1989	306	1611	428
September, 1989	304	1510	300



# SOUTH EUNICE UNIT



# TYPICAL LOG

## SEU NO. 38

SECTION 28 - 22 - 36

TOP  
UNITIZED  
INTERVAL

232'

GAMMA RAY

NEUTRON

TOP SEVEN RIVERS

TOP QUEEN

5-1/2"

ZONE

ZONE 2

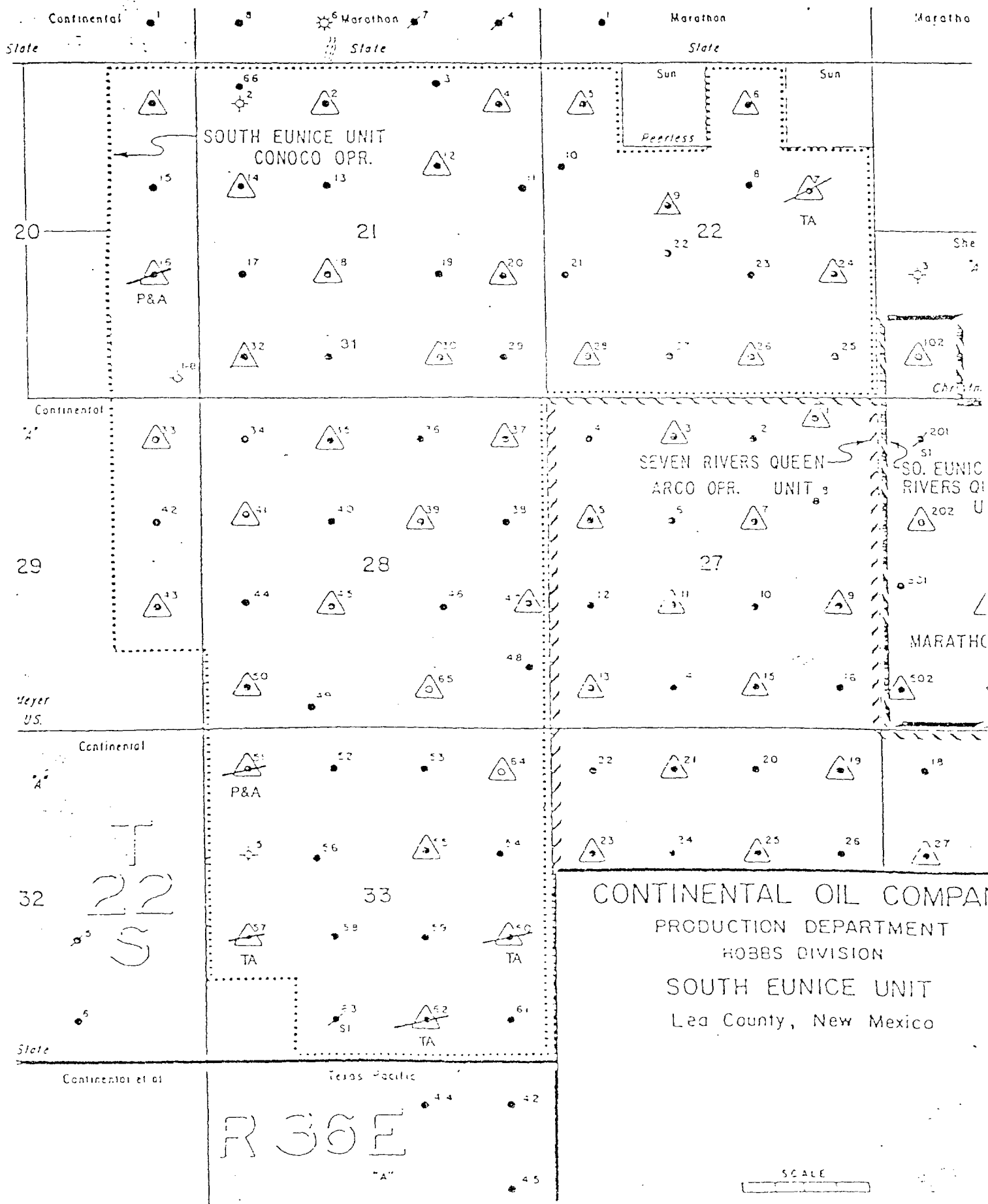
ZONE

ZONE 4

FOOT-DO-LAR

#39

RD-3810



SOUTH FURIE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	Test Before Remedial		Test After Remedial		3 Month Average		6 Month Average		9 Month Average		12 Month Average	
	BOPD	EWPD	BOPD	EWPD	BOPD	EWPD	BOPD	EWPD	BOPD	EWPD	BOPD	EWPD
SEU No. 13 (1/88)	3	45	8	75	4	60	4	60	7	60	7	50
SEU No. 22 (2/88)	16	8	18	34	35	35	38	35	36	40	34	40
SEU No. 8 (2/88)	10	25	10	18	9	20	7	9	6	13	6	11
SEU No. 10 (2/88)	5	110	5	80	6	75	6	75	4	75	5	78
SEU No. 31 (5/88)	13	5	22	30	25	12	22	10	21	9	23	8
SEU No. 17 (5/88)	3	25	5	80	6	80	5	40	4	38	4	36
SEU No. 15 (7/88)	4	8	16	35	9	40	10	30	5	8	4	7
SEU No. 25 (7/88)	12	3	4	5	10	2	10	4	8	3	9	3
SEU No. 23 (8/88)	2	4	10	100	12	95	16	88	9	76	9	80
SEU No. 21 (8/88)	6	70	6	80	6	75	5	74	6	70	4	70
SEU No. 27 (1/89)	17	45	58	65	39	103	38	106				
SEU No. 29 (2/89)	18	21	37	270	39	215	23	160				
SEU No. 8 (3/89)	6	11	6	23	6	13	5	16				
SEU No. 19 (8/89)	11	13	12	21								
SEU No. 11 (8/89)	8	17	17	44								
SEU No. 36 (8/89)	6	28	7	42								

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Injection Wells	Test Before Remedial		Test After Remedial		Current Test		Most Recent Survey		Remarks (Zones)	Floodable Zones
	WPD Pres.	PSI & Loss	WPD Pres.	PSI & Loss	WPD Pres.	PSI	Date	& Loss		
SEU No. 43 (12-87) (4-88)	230	700	100%	520	145	900	(9-89)	0%	38% (2), 31% (3), 31% (4)	2-4
SEU No. 9 (1-88)	---	---	---	0	525	700	(4-89)	0%	16% (1), 10% (3), 74% (4)	1-4
SEU No. 5 (2-88)	600	650	0% <sup>c</sup>	360	555	680	(4-89)	0%	50% (1), 50% (2-3)	1-4
SEU No. 6 (3-88)	285	680	0%	400	580	820	(4-89)	0%	87% (1), 13% (2)	1-4
SEU No. 7 (3-88)	265	660	100% <sup>e</sup>	0	0	0	NA	TA with bad casing		1-3
SEU No. 32 (4-88)	---	---	---	0	645	260	(9-89)	0%	58% (3), 42% (4)	3-4
SEU No. 14 (6-88)	800	400	100%	0	535	40	(9-89)	69%	31% (4), 69% below	4
SEU No. 24 (6-88)	45	720	95% <sup>h</sup>	780	50	880	NA	Injection rate too low to survey		1-3
SEU No. 26 (8-88)	255	620	80% <sup>h</sup>	530	300	700	(4-89)	50%	50% above, 50% (1)	1-4
SEU No. 18 (9-88)	0	0	75%	0	545	400	(4-89)	49%	49% (2), 28% (3), 23% (4)	3-4
SEU No. 28 (1-89)	130	700	13%	580	0	0	(4-89)	0%	15% (1), 14% (2), 25% (3), 46% (4)	1-4
SEU No. 30 (8-89)	230	760	0%	400	500	560	(9-89)	0%	87% (2), 3% (3), 10% (4)	2-4
SEU No. 35 (9-89)	600	540	0%	480	330	480	Pending post remedial survey			2-4
SEU No. 37 (9-89)	350	820	81%	TA	---	---	TA pending liner installation			2-4

- a: pending squeeze procedure  
b: 84% to Zone 4, 16% to Zone 1  
c: 75% to Zone 1  
d: 50% Zone 1; 50% Zones 2-4  
e: between Zones 1 & 2  
f: TA due to bad casing  
g: Squeeze procedure successful: 0% loss out of zone  
h: to Zone 1 only  
i: SI w/tbg leak  
j: Water leaving below flood interval  
k: SI pending replacement of injection line

SOUTH EUNICE UNIT - IMPROVED WATERFLOOD PROJECT SUMMARY

Producing Wells	Test Before Remedial		Test After Remedial		3 Month Average		6 Month Average		9 Month Average		12 Month Average	
	BOPD	RMPD	BOPD	RMPD	BOPD	RMPD	BOPD	RMPD	BOPD	RMPD	BOPD	RMPD
SEU No. 13 (1/88)	3	45	8	75	4	60	4	60	7	60	7	50
SEU No. 22 (2/88)	16	8	18	34	35	35	38	35	36	40	34	40
SEU No. 8 (2/88)	10	25	10	18	9	20	7	9	6	13	6	11
SEU No. 10 (2/88)	5	110	5	80	6	75	6	75	4	75	5	78
SEU No. 31 (5/88)	13	5	22	30	25	12	22	10	21	9	23	8
SEU No. 17 (5/88)	3	25	5	80	6	80	5	40	4	38	4	36
SEU No. 15 (7/88)	4	8	16	35	9	40	10	30	5	8		
SEU No. 25 (7/88)	12	3	4	5	10	2	10	4	8	3		
SEU No. 23 (8/88)	2	4	10	100	12	95	16	88	9	76		
SEU No. 21 (8/88)	6	70	6	80	6	75	5	74	6	70		
SEU No. 27 (1/89)	17	45	58	65	39	103						
SEU No. 29 (2/89)	18	21	37	270	39	215						
SEU No. 6 (3/89)	6	11	N/A	N/A	6	13						