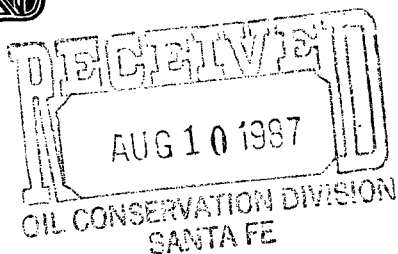




# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883



July 29, 1987

*Crude Oil  
Division  
Office*

New Mexico Oil Conservation Division  
Post Office Box 2088  
Sante Fe, New Mexico 87504

RE: Commingling Application  
Candado No. 17  
Unit A, Sec 10, T26N-R7W  
Rio Arriba County, New Mexico

Gentlemen:

National Cooperative Refinery Association requests administrative approval to downhole commingle production from the Blanco Mesaverde and the Otero Chacra in the subject well. The downhole commingling will be achieved by pulling both tubing strings and the packer. A single tubing string will be run to the Mesaverde and both the Chacra and the Mesaverde will produce through tubing.

The downhole commingling of the Candado No. 17 is necessary to improve the producing efficiency, and thereby prevent waste of the Mesaverde gas resources. Currently, the Mesaverde logs off every other day due to liquid loading and must be blown to the atmosphere to re-establish production. By commingling production downhole, the Chacra will provide additional gas production and aid the Mesaverde in unloading liquids from the wellbore. Subsurface and surface equipment installations can also be used to prevent waste if the well continues to log off. Such equipment cannot be used effectively with the current wellbore configuration.

The proposed commingling will not adversely effect either zone for the following reasons:

1. The bottom hole pressure of the Chacra is 89 percent of the Mesaverde bottom hole pressure based on a 7 day shut-in period.
2. Neither zone has a history of sensitivity to condensate or water and should not be damaged by the small amount produced.
3. Both zones produce gas with a similiar BTU content and commingling will not diminish the value of the commingled gas.

Commingling Application  
July 29, 1987  
Page 2

4. Both zones have common ownership.

In compliance with New Mexico Oil Conservation Division rule 303C, please find two copies of each of the following attachments:

1. Well location map showing acreage dedicated to well and ownership of offsetting leases.
2. Division Form C-116, 24-hour productivity test.
3. Production curve for the Mesaverde.
4. Production curve for the Chacra.
5. Bottom hole pressure for the Mesaverde.
6. Calculated bottom hole pressure for the Chacra.
7. Water analysis for the Mesaverde.\*
8. Gas analysis for the Mesaverde.
9. Gas analysis for the Chacra.
10. Formula for the allocation of production for each commingled zone.
11. A copy of the letter sent to all offset operators notifying them of our intent to commingle.

\* The Chacra formation does not produce any liquids in this well.

To allocate production to the individual Mesaverde and Chacra formations we recommend the following:

1. Allocate 77.6 percent gas production to the Mesaverde.
2. Allocate 22.4 percent gas production to the Chacra.

Commingling Application  
July 29, 1987  
Page 3

3. Allocate 100 percent condensate production to the Mesaverde.

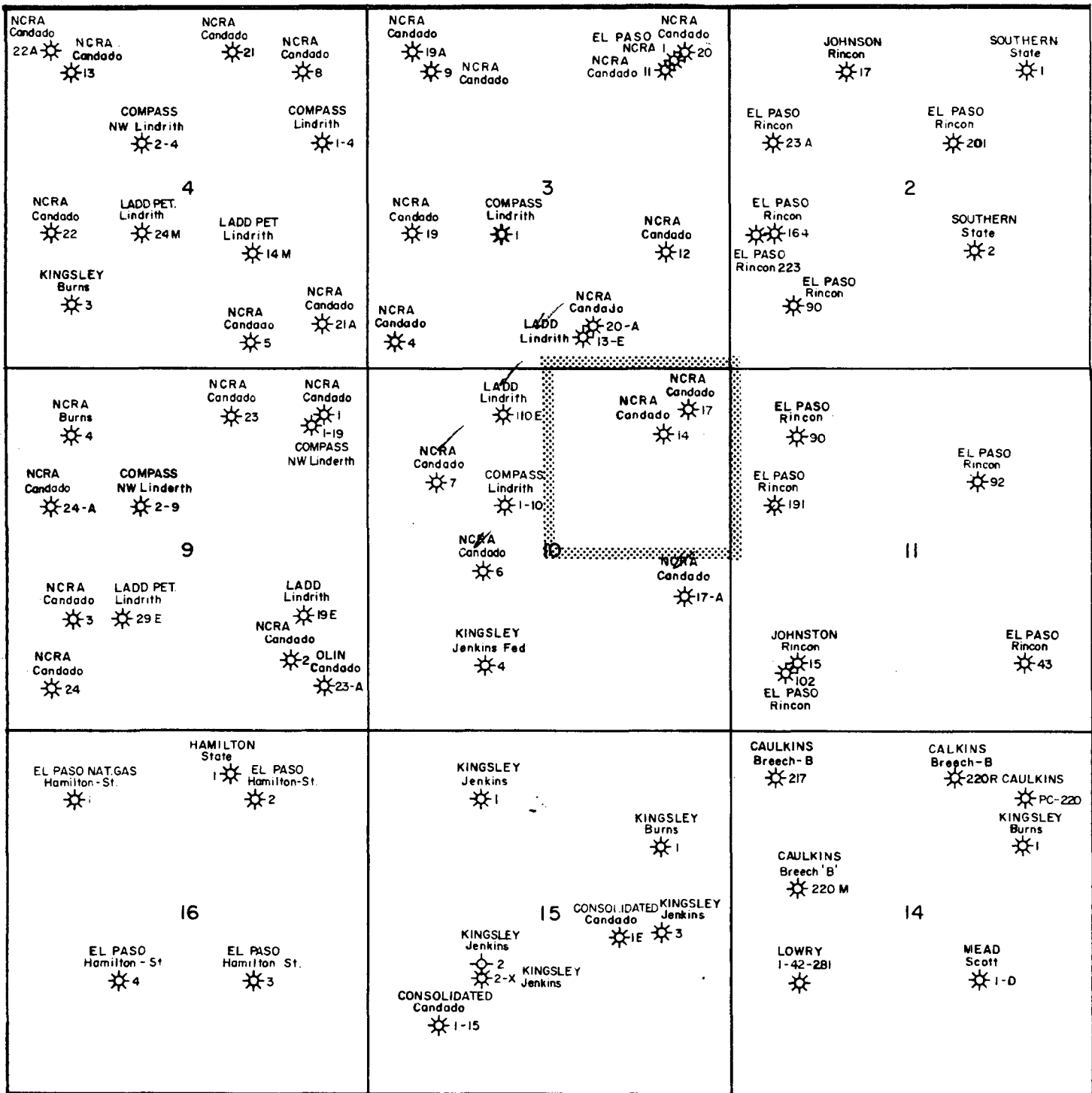
Questions concerning this commingling application should be directed to the undersigned at (303) 861-4883.

Sincerely,

A handwritten signature in cursive script, appearing to read "A.M. O'Hare".

A.M. O'Hare  
Joint Operations Supervisor

MJB/bv1  
enc



STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088  
SANTA FE, NEW MEXICO 87501

Form C-116  
Revised 10-1-78

GAS-OIL RATIO TESTS

Operator		Pool		County											
National Cooperative Refinery Assd.		Blanco Mesaverde/Otero Chacra		Rio Arriba											
Address		Type of Test - (X)		Completion		Special									
1775 Sherman, Suite 3000 Denver, CO 80203		<input type="checkbox"/> Scheduled <input type="checkbox"/> Special <input checked="" type="checkbox"/>		<input type="checkbox"/>		<input checked="" type="checkbox"/>									
LEASE NAME	WELL NO.	LOCATION				DATE OF TEST	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	TEST HOURS	PROD. DURING TEST				GAS - OIL RATIO CU.FT/BSL
		U	S	T	R						WATER BSLs.	GRAV. OIL BSLs.	GAS M.C.F.		
Candado No. 17 Mesaverde	17	A	10	26N	7W	7/15/87		130		24	0	0.1	350	3,500,000	
Candado No. 17 Chacra	17	A	10	26N	7W	7/22/87		93		24	0	0	150		

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowable when authorized by the Division.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

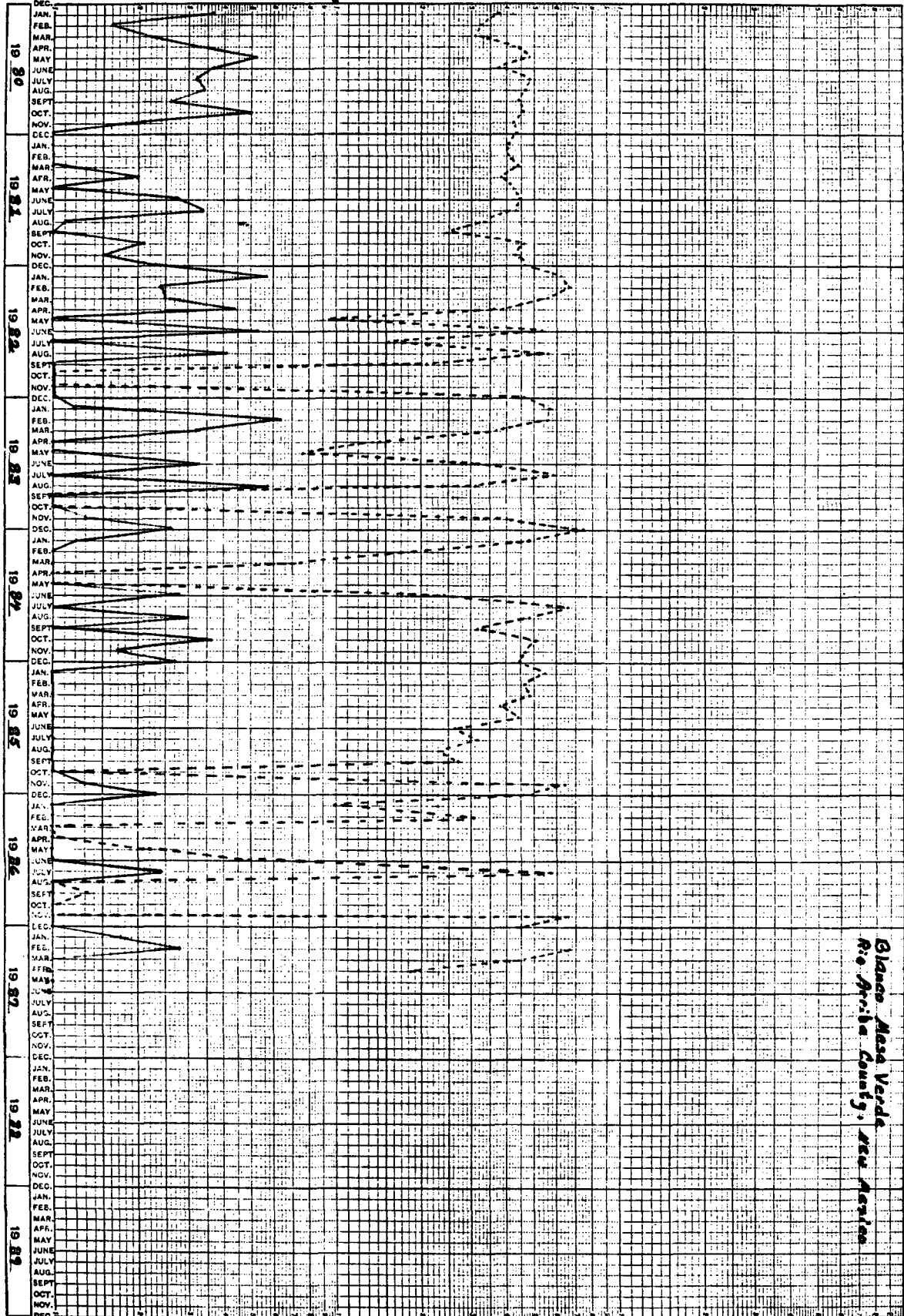
Report casing pressure in lieu of tubing pressure for any well producing through casing.

Well original and one copy of this report to the district office of the New Mexico Oil Conservation Division in accordance with Rule 101 and appropriate pool rules.

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

*A.M. O'Hare*  
A.M. O'Hare (Signature)  
Joint Operations Supervisor  
(Title)

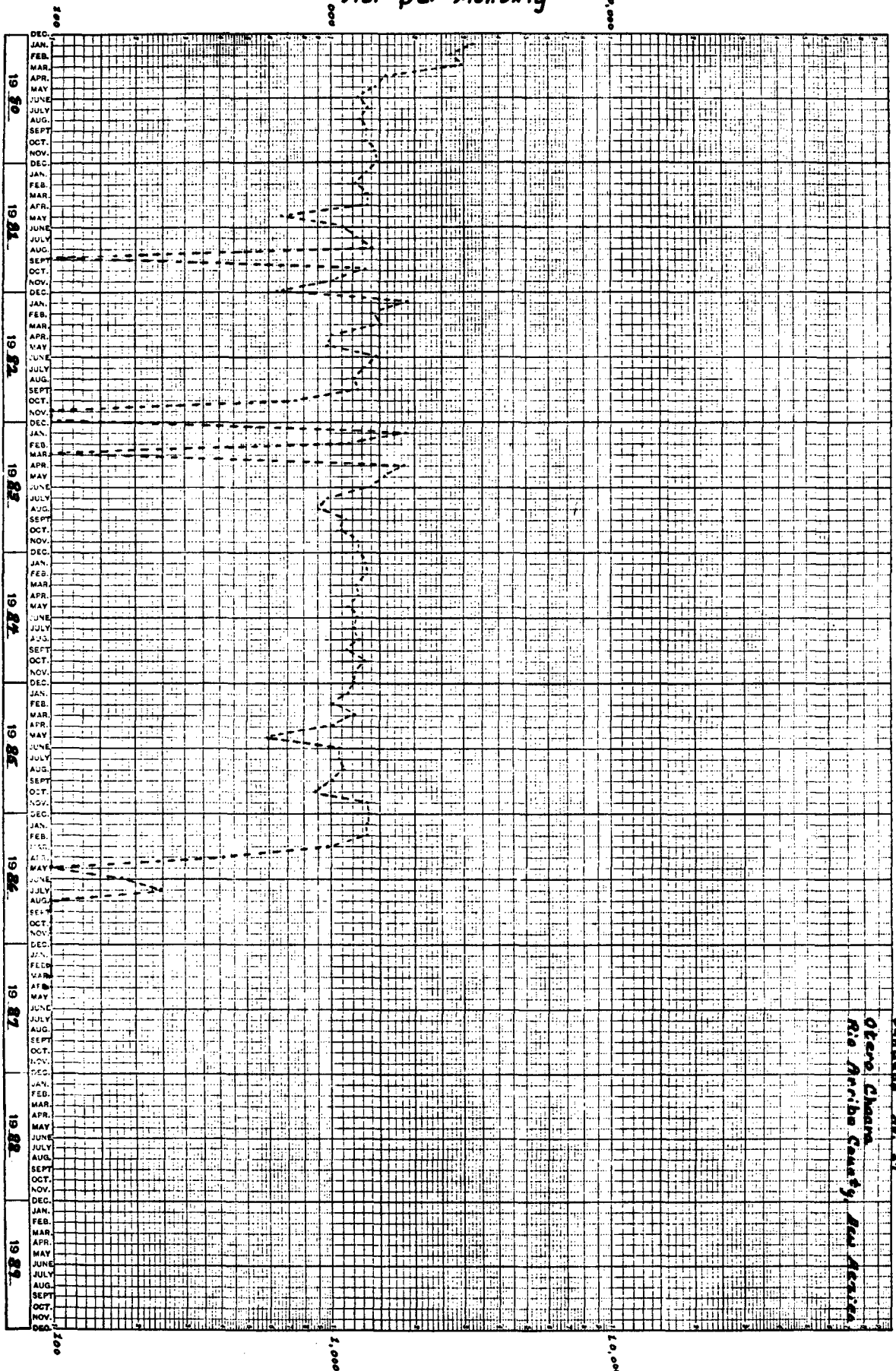
Condensate per Month - 1000



MCF per Month - - - -

Canada No. 17  
Blanco Mesa Verde  
Rio Arriba County, New Mexico

MCF per Monthly



Candelo, No. 17  
Otero, Chama  
Rio Arriba County, New Mexico

# B & R SERVICE, INC.

P. O. Box 1048  
Farmington, New Mexico 87499  
(505) 325-2393

Company	<u>N.C.R.A.</u>	Lease	<u>CANADO</u>	Well	<u>#17</u>
County	<u>RIO ARRIBA</u>	State	<u>NEW MEXICO</u>	Date	<u>6-25-87</u>
Shut-In	<u>6/21/87</u>	Zero Point	<u>G.L.</u>	Tbg. Pressure	<u>510</u>
Casing Pressure	_____	Tbg. Depth	_____	Casing Perf.	_____
Max. Temp.	_____	Fluid Level	_____		

<u>DEPTH</u>	<u>PSIG</u>	<u>GRADIENT</u>
0	510	----
3761	583	.019
5040	604	.016
5138	612	.081



CANDADO NO. 17

CHACRA BOTTOM HOLE PRESSURE CALCULATION

From Gas Analysis, Apparent Molecular Weight,  $MA = 20 \frac{\text{lbm}}{\text{lb} \cdot \text{mol}}$

Measured Surface Pressure,  $P_s = 495 \text{ psig} = 509 \text{ psia}$

Estimated BHT @ 3761 ft =  $110^\circ\text{F} = 570^\circ\text{R}$

Surface Temperature =  $60^\circ\text{F} = 520^\circ\text{R}$

$$\bar{T} = \frac{T_{BH} + T_s}{2} = \frac{570^\circ\text{R} + 520^\circ\text{R}}{2} = 545^\circ\text{R}$$

Assume BHP = 557 psia,  $P = \frac{509 + 557}{2} = 533 \text{ psia}$

$$\rho = \frac{\bar{P}}{\bar{T}} \frac{M_A}{R} = 533 \text{ psia} \times \frac{20 \frac{\text{lbm}}{\text{lb} \cdot \text{mol}}}{545^\circ\text{R} \times 10.73 \frac{\text{psia} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot ^\circ\text{R}}} = 1.823 \frac{\text{lb}}{\text{ft}^3}$$

$$\text{BHP} = P_s + 3761 \text{ ft} \left( 1.823 \frac{\text{lbm}}{\text{ft}^3} \cdot \frac{1 \text{ ft}^2}{144 \text{ in}^2} \right) = 509 + 47.6 \text{ psia} =$$

$$\text{BHP} = 556.6 \approx 557$$

$$\text{BHP} = 557 \text{ psia} = 543 \text{ psig}$$

Company: N. R. C. A.  
 Address:  
 Attention: MIKE BARNES  
 Date Sampled: 3-22-87

Report No: 1  
 Date: 3-23-87  
 County: SAN JUAN  
 Field: BLANCO  
 Formation: MESA VERDE  
 Lease: CANDADO  
 Well: 17

# WATER ANALYSIS

Specific Grav: 1.000  
 Chloride: 1,000 mg/l  
 Bicarbonate: 31 mg/l  
 Sulfate: 0.  
 Sulfide: 0.  
 Total Hardness  
 (as CaCO3): 400 mg/l  
 Resistivity: 10.00  
 Potassium: 0.

pH: 6.50  
 Calcium: 160 mg/l  
 Magnesium: N D  
 Total Iron: 0.  
 Sodium: 476 mg/l  
 Total Disslvd  
 Solids: 1,666 mg/l  
 Ohm Meters @: 60 F  
 Carbonate: N D

Sample Source:

Remarks:

Analyst: M. CONREY  
 Smith Representative: M. CONREY

06-05-87

EL PASO NATURAL GAS COMPANY  
MEASUREMENT DEPARTMENT  
POST OFFICE BOX 1492  
EL PASO, TEXAS 79978

MAILEE  
04920

CHROMATOGRAPHIC GAS ANALYSIS REPORT

NATIONAL CO-OP REFINERY ASSN  
1775 SHERMAN ST. SUITE 3000  
DENVER, CO 80203

ANAL DATE 00-00-00

METER STATION NAME  
CANDADO #17 MV

METER STA 89642  
OPER 6311

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS	H2S GRAINS	LOCATION
00 ***	04-13-87	04-28-87	06	0	4 F 13

	NORMAL MOL%	GPM
CO2	.55	.000
H2S	.00	.000
N2	.94	.000
METHANE	75.22	.000
ETHANE	11.84	3.167
PROPANE	6.45	1.778
ISO-BUTANE	1.11	.363
NORM-BUTANE	1.85	.583
ISO-PENTANE	.67	.245
NORM-PENTANE	.53	.192
HEXANE PLUS	.84	.365
	100.00	6.693

SPECIFIC GRAVITY .774

MIXTURE HEATING VALUE  
(BTU/CF @14.73 PSIA, 60 DEGREES, DRY) 1327

RATIO OF SPECIFIC HEATS 1.272

NO TEST SECURED FOR H2S CONTENT

\*\*\* TYPE CODE EXPLANATION SINGLE METER ANALYSIS

GXC

06-05-87

EL PASO NATURAL GAS COMPANY  
MEASUREMENT DEPARTMENT  
POST OFFICE BOX 1492  
EL PASO, TEXAS 79978

MAILEE  
04920

CHROMATOGRAPHIC GAS ANALYSIS REPORT

NATIONAL CO-OP REFINERY ASSN  
1775 SHERMAN ST. SUITE 3000  
DENVER, CO 80203

ANAL DATE 00-00-00

METER STATION NAME  
CANDADO #17 CH

METER STA 89643  
OPER 6311

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS	H2S GRAINS	LOCATION
40 ***	04-17-86	04-28-87	06	0	4 F 13

	NORMAL MOL%	GPM
CO2	.41	.000
H2S	.00	.000
N2	.91	.000
METHANE	84.10	.000
ETHANE	6.86	1.835
PROPANE	3.63	1.000
ISO-BUTANE	.65	.213
NORM-BUTANE	1.01	.318
ISO-PENTANE	.41	.150
NORM-PENTANE	.32	.116
HEXANE PLUS	1.70	.739
	100.00	4.371

SPECIFIC GRAVITY .716

MIXTURE HEATING VALUE  
(BTU/CF @14.73 PSIA, 60 DEGREES, DRY) 1240

RATIO OF SPECIFIC HEATS 1.284

NO TEST SECURED FOR H2S CONTENT

\*\*\* TYPE CODE EXPLANATION SINGLE METER ANALYSIS

GXC

### ALLOCATION FORMULA

The recommended allocation of production back to the Chacra and Mesaverde formations is based on the percentage of gas historically produced from each formation to the total amount of gas produced from the wellbore.

The established production declines were extrapolated to mid-year 1987. The monthly values from that point were individually divided by the sum of the values and multiplied by 100 to get the percentage production for each formation. This procedure is outlined arithmetically below.

$$\text{Chacra Allocation} = \frac{\text{Chacra Production}}{\text{Chacra} + \text{Mesaverde Prod. combined}} \times 100$$

$$\text{Mesaverde Allocation} = \frac{\text{Mesaverde Production}}{\text{Chacara} + \text{Mesaverde Prod. combined}} \times 100$$



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

*Crude Oil  
Division  
Office*

July 29, 1987

Offset Operators

RE: Candado #17  
Section 10, T26N-R7W  
Rio Arriba County, NM

Gentlemen:

National Cooperative Refinery Association is applying to the New Mexico Oil Conservation Division pursuant to NMOCD Rule 303C for administrative approval to commingle production from the Mesaverde and Chacra zones in the subject well. If you have no objections to this application we ask that you sign and return one copy of the enclosed Waiver of Objection to the NMOCD in the envelope provided.

Please contact the undersigned at (303)861-4883 if you have any questions pertaining to this application.

Sincerely,

A.M. O'Hare  
Joint Operations Supervisor

/bv1  
enc



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

*Crude Oil  
Division  
Office*

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

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

Name(print): \_\_\_\_\_

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

Firm: \_\_\_\_\_

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

8/3/87

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPPLICATE\*  
(Other instructions on re-  
verse side)

Form approved.  
Budget Bureau No. 1004-0135  
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER		5. LEASE DESIGNATION AND SERIAL NO. SF-079161
2. NAME OF OPERATOR National Cooperative Refinery Association		6. IF INDIAN, ALLOTTEE OR TRIBE NAME
3. ADDRESS OF OPERATOR 1775 Sherman Street, Suite 3000, Denver, CO 80203		7. UNIT AGREEMENT NAME
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface  790' FEL x 885' FNL		8. FARM OR LEASE NAME Candado
14. PERMIT NO.		9. WELL NO. 17
15. ELEVATIONS (Show whether DF, RT, GR, etc.)		10. FIELD AND POOL, OR WILDCAT Blanco Mesa Verde- Otero Chacra
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 10, T26N-R7W
		12. COUNTY OR PARISH Rio Arriba
		13. STATE NM

13.

Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>
(Other) <input type="checkbox"/>	Comingle Well <input checked="" type="checkbox"/>

SUBSEQUENT REPORT OF:

WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
(Other) <input type="checkbox"/>	

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

It is our intention to seek administration approval for downhole comingling of the Mesa Verde and Chacra Zones in this well from New Mexico Oil Conservation Division.

18. I hereby certify that the foregoing is true and correct

SIGNED J. M. O'Hare

TITLE Jt. Operations Supervisor DATE 8-8-87

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

TITLE \_\_\_\_\_ DATE \_\_\_\_\_

\*See Instructions on Reverse Side





# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: Clyde E. Phillips

Name(print): Clyde E. Phillips

Title: District Superintendent

Firm: Ladd Petroleum Corporation

Date: 8-17-87

8/3/87



LINCOLN TOWER BUILDING  
1860 LINCOLN STREET  
DENVER, COLORADO 80295  
(303) 861-5252

*Columbus Energy Corp.*

SEP 18 1987

September 14, 1987

Oil Conservation Division  
Box 2088  
Santa Fe, N.M. 87501-2088

Re: NCRA  
Candado #17  
Section 10-T26N-R7W  
Rio Arriba County, New Mexico

Gentlemen:

Attached please find Columbus Energy Corp.'s waiver  
to the proposed commingling of the Mesaverde and Chacra  
zones in the above referenced well.

Yours very truly

COLUMBUS ENERGY CORP.

*J. D. Stewart, Jr.* /BL

J. D. Stewart, Jr.  
Operations Manager

JDS:bl  
Encl.



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: J D Stewart  
Name(print): J D Stewart  
Title: Opns Mgr  
Firm: Columbus Energy Corp  
Date: 9/11/87

8/3/87



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

RECEIVED

AUG 20 1987

PRODUCTION

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

Name(print): \_\_\_\_\_

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

Firm: \_\_\_\_\_

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

Gentlemen:

According to our records, Hamilton Brothers Oil Company is not an offset operator to the Candado No. 17 well. We therefore are unaffected by the proposed commingling.

8/3/87

David P. Oberbrockling  
Sr. Production Engr.



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

RECEIVED

AUG 21 1987

PRODUCTION DEPT.

WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: M. D. Rogers

Name(print): M. D. Rogers

Title: V. P.

Firm: Adobe Resources Corporation

Date: 8-18-87

RECEIVED

AUG 21 1987

PRODUCTION DEPT.  
8/3/87

TO NADCD 8/21



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: R. Craig Nielsen

Name(print): R. Craig Nielsen

Title: Attorney-in-Fact

Firm: SOUTHERN UNION EXPLORATION COMPANY

Date: 8-21-87

8/3/87



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: S. F. Reiger  
Name(print): G. F. REIGER  
Title: Mgr. Outside Opns.  
Firm: DEPCO, INC  
Date: 8-20-87

8/3/87



# National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil  
Division  
Office

## WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 17 and located in Unit A, Section 10, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: Jon H. Pardee  
Name(print): Jon H. PARDEE  
Title: Casper District Oper. Manager  
Firm: UNION OIL CO. OF CALIFORNIA  
Date: 9-1-87

8/3/87





STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

OIL CONSERVATION DIVISION  
BOX 2088  
SANTA FE, NEW MEXICO 87501

RECEIVED  
SEP 25 1987

DATE 9-18-87

RE: Proposed MC \_\_\_\_\_  
Proposed DHC X \_\_\_\_\_  
Proposed NSL \_\_\_\_\_  
Proposed SWD \_\_\_\_\_  
Proposed WFX \_\_\_\_\_  
Proposed PMX \_\_\_\_\_

Gentlemen:

I have examined the application dated 9-15-87  
for the Nat'l Cooperative Refinery Assoc. Candidate #17 A-10-260-7u  
Operator Lease and Well No. Unit, S-T-R

and my recommendations are as follows:

Approve with an allocation of 28% gas to the  
NRV & 52% gas to the Chacra.

Yours truly,

E. Basil