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

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 Natl Cooperative Refinery Assoc. Candado #20A 0-3-26N-7W
Operator Lease and Well No. Unit, S-T-R

and my recommendations are as follows:

Approve with an allocation of 57% gas to the MV and 43% gas to the Chacra.

Yours truly,

Ernie Busch

# National Cooperative Refinery Association

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


*Crude Oil Division Office*

July 29, 1987



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

RE: Commingling Application
Candado No. 20A
Unit O, Sec 3, 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. 20A 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 76 percent of the Mesaverde bottom hole pressure based on a 5 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.

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 ~~59~~ 59 percent gas production to the Mesaverde.

2. Allocate ~~40~~ 41 percent gas production to the Chacra.

3. Allocate 100 percent condensate production to the Mesaverde.

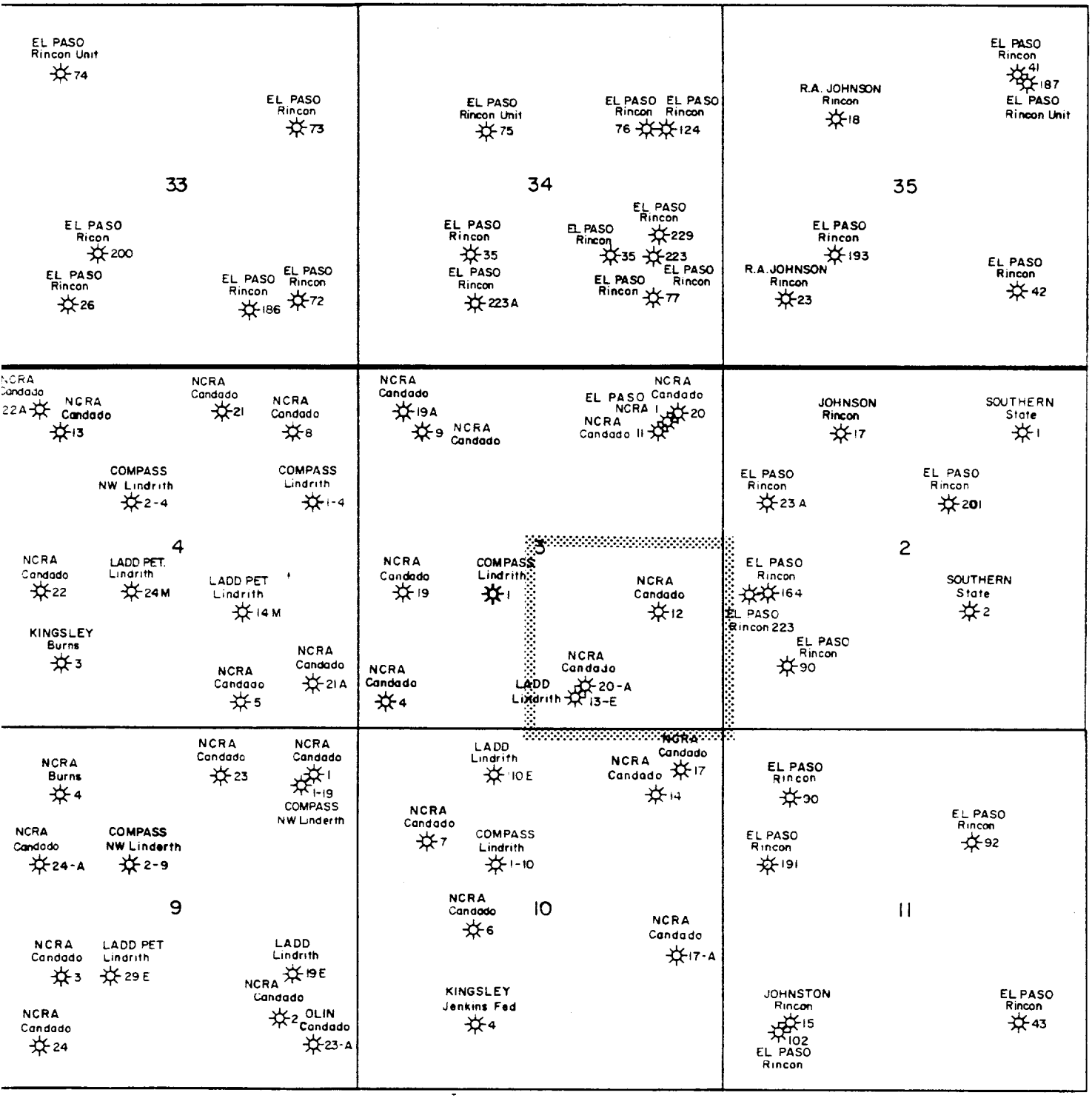
Questions concerning this commingling application should be directed to the undersigned at (303) 861-4883.

Sincerely,

A.M. O'Hare
Joint Operations Supervisor

MJB/bvl
enc

# R 7 W

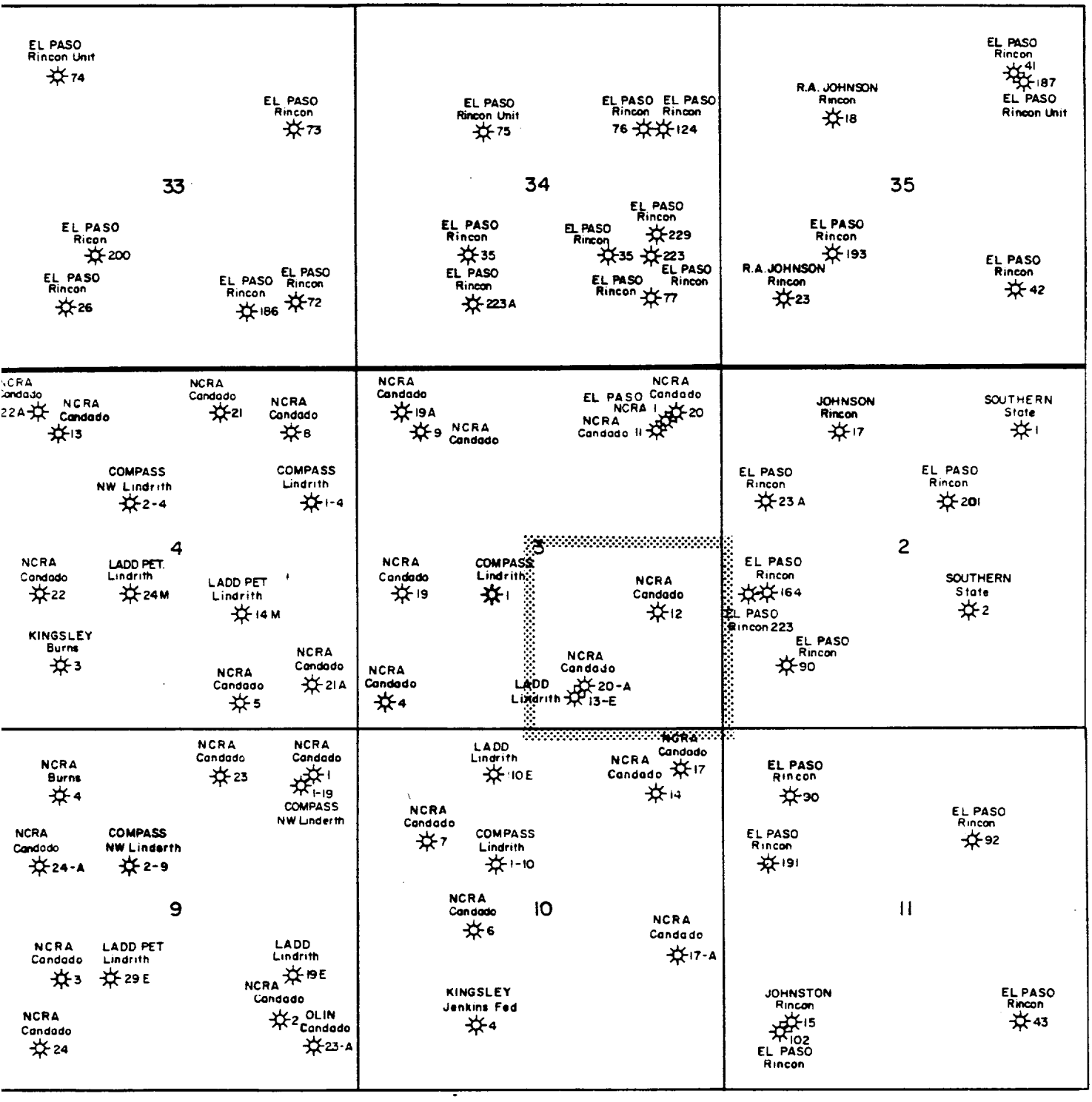



# N.C.R.A.

## Acerage Dedication Plat Showing Offset Ownership

## Candado No. 20A

## Rio Arriba County, New Mexico




# N.C.R.A.

## Acerage Dedication Plat Showing Offset Ownership

## Candado No. 20A

## Rio Arriba County, New Mexico

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

SANTA FE, NEW MEXICO 87501

Form C-116
Revised 10-1-78

# GAS-OIL RATIO TESTS

Operator: National Cooperative Refinery Asso.
Pool: Blanco Mesaverde/Otero Chacra
County: Rio Arriba
Address: 1775 Sherman, Suite 3000 Denver, CO 80203
TYPE OF TEST - (X): Scheduled [ ] Completion [ ] Special [X]

| LEASE NAME | WELL NO. | LOCATION U | S | T | R | DATE OF TEST | STATUS | CHOKE SIZE | TBG. PRESS. | DAILY ALLOWABLE | LENGTH OF TEST HOURS | PROD. DURING TEST WATER BBLS. | GRAV. OIL | OIL BBLS. | GAS M.C.F. | GAS - OIL RATIO CU.FT/BBL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Candado No. 20A Mesaverde | 20A | 0 | 3 | 26N | 7W | 7/14/87 | | | 352 | | 24 | 0 | | 0.7 | 145 | 207,142 |
| Candado No. 20A Chacra | 20A | 0 | 3 | 26N | 7W | 7/22/87 | | | 328 | | 24 | 0 | | 0 | 72 | |

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 allowables 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.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Division in accordance with Rule 301 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 (Signature)

Joint Operations Supervisor (Title)

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

SANTA FE, NEW MEXICO 87501

Form C-116
Revised 10-1-78

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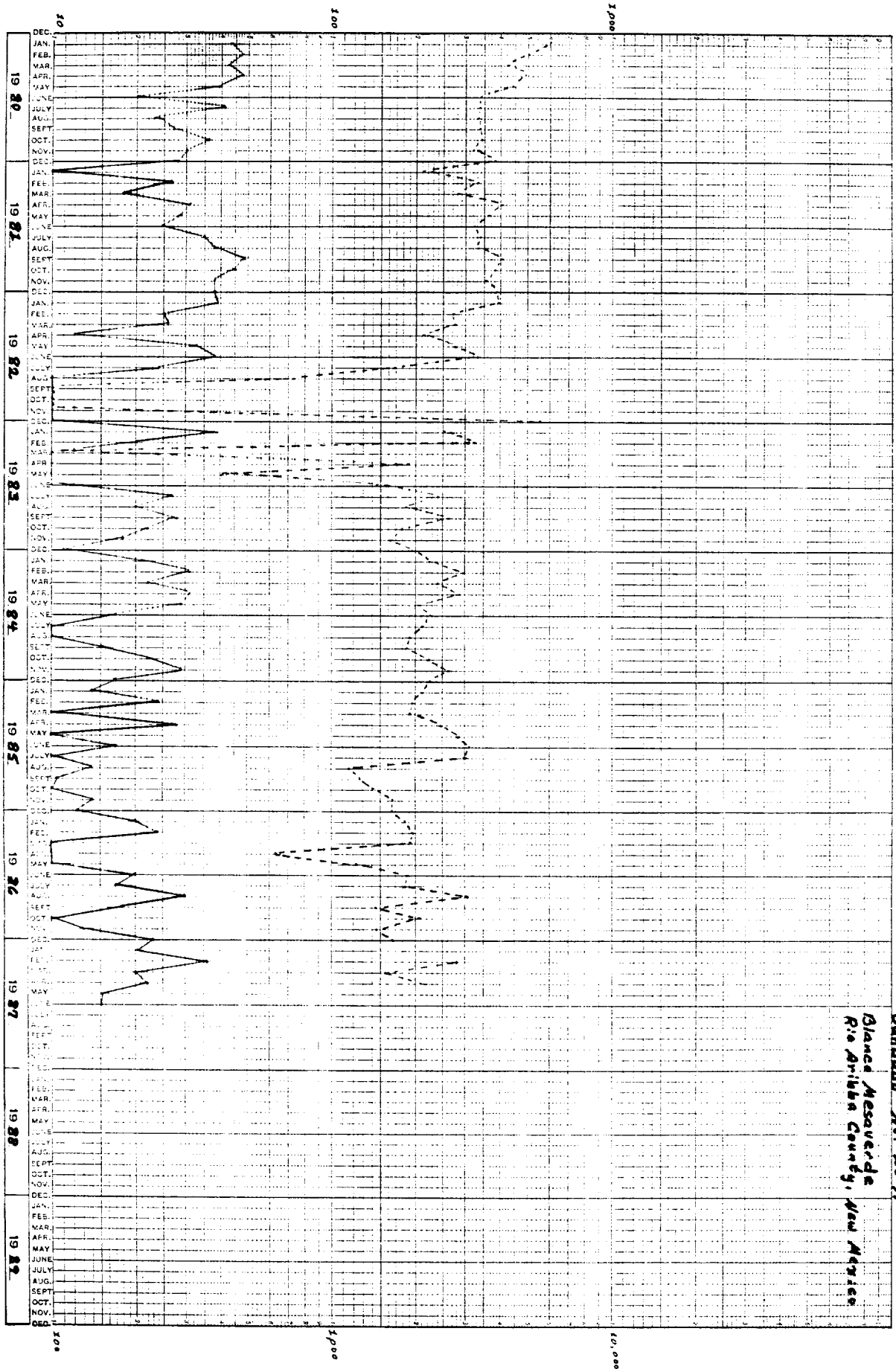
A.M. O'Hare (Signature)

Joint Operations Supervisor (Title)

Condensate per Month




Candado No. 20-A
Blanco Mesaverde
Rio Arriba County, New Mexico

MCF per Month

Condensate per Month

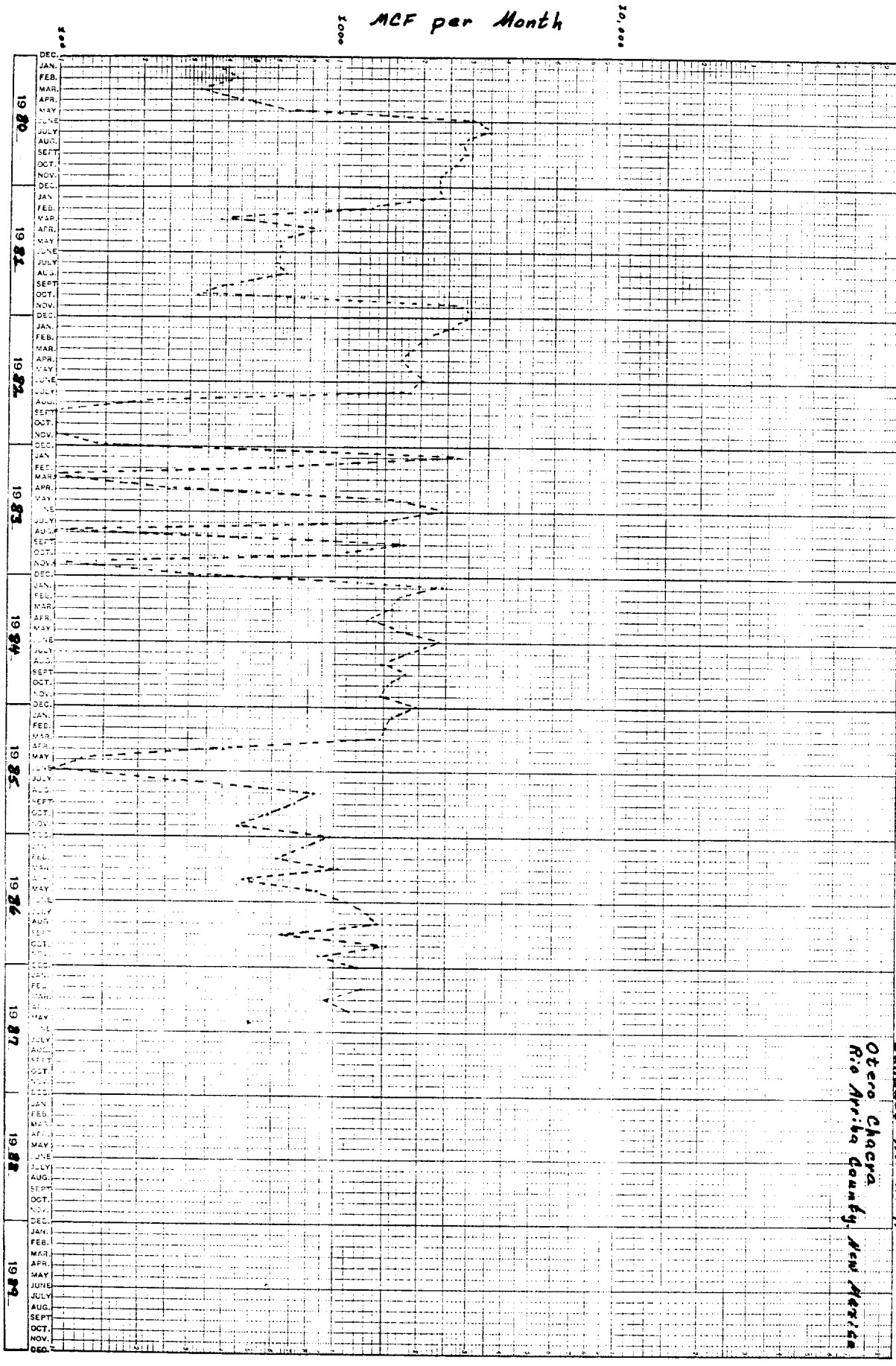
10 100 1,000

19 20 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 21 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 22 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 23 DEC. JAN. FEB. MAR. APR MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 24 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 25 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 26 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 27 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 28 DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.
19 29 DEC. JAN. FEB. MAR. APR MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

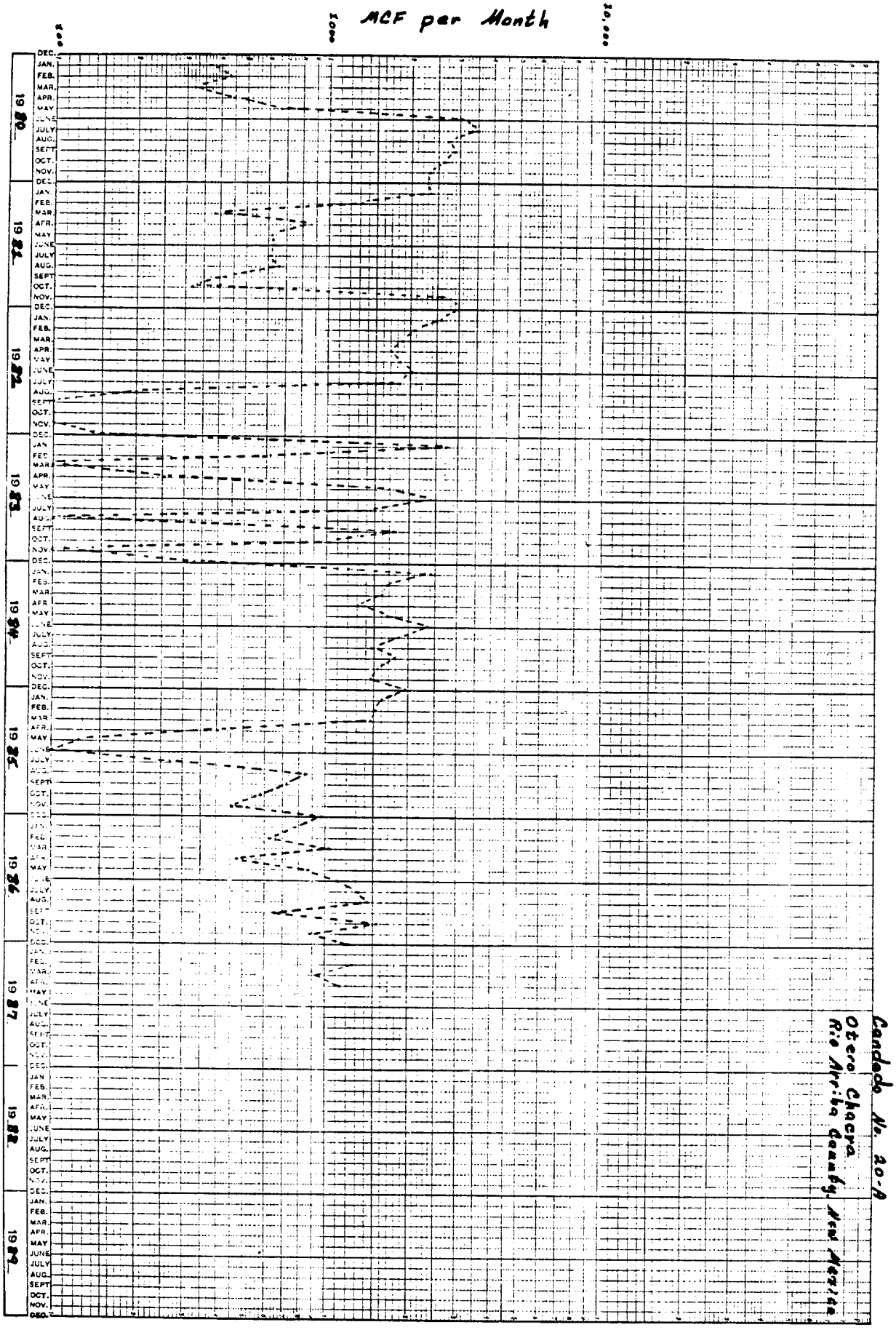
100 1,000 10,000

MCF per Month

Candado No. 20-A
Blanco Mesaverde
Rio Arriba County, New Mexico




Candado No. 20-A
Otero Chacra
Rio Arriba County, New Mexico




Candado No. 20-A
Otero Chacra
Rio Arriba County, New Mexico

# B & R SERVICE, INC.

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

| | | |
|---|---|---|
| Company N.C.R.A. | Lease CANADO | Well 20-A |
| County RIO ARRIBA | State NEW MEXICO | Date 6-25-87 |
| Shut-In | Zero Point G.L. | Tbg. Pressure 591 |
| Casing Pressure | Tbg. Depth | Casing Perf. |
| Max. Temp. | Fluid Level | |

| DEPTH | PSIG | GRADIENT |
|---|---|---|
| 0 | 591 | ---- |
| 3650 | 666 | .021 |
| 4900 | 693 | .022 |
| 5000 | 695 | .020 |

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Farmington, New Mexico 87499
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# CANDADO No. 20A

## CHACRA BOTTOM HOLE PRESSURE CALCULATION

Measured Surface Pressure, Ps = 482 psig = 496 psia

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

Estimated Bottom Hole Temperature, BHT - 110°F = 570°R
Surface Temperature, Ts = 60°F - 520°R

$$\overline{T} = \frac{BHT + Ts}{2} = \frac{570°R + 520°R}{2} = 545°R$$

Assume BHP = 541 psia, $P = \frac{Ps + BHP}{2} = 518.5$ psia

$$\rho = \frac{\overline{P}}{\overline{T}} \frac{M_A}{R} = \frac{518.5 \text{ psia} \cdot 20 \frac{lbm}{lb \text{ mol}}}{545°R - 10.73 \frac{psia \cdot ft^3}{lb \cdot mol \cdot °R}} = 1.773 \frac{lb}{ft^3}$$

$$BHP = Ps = Depth\ (\rho) = 496 \text{ psia} = 3650 \text{ ft } (1.773 \frac{lb}{ft^3}) \frac{1 ft^2}{144 in^2} =$$

BHP = 540.9 ≈ 541 psia

BHP = 541 psia = 527 psig

## CANDADO No. 20A

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Surface Temperature, Ts = 60°F - 520°R

$$\overline{T} = \frac{BHT + Ts}{2} = \frac{570°R + 520°R}{2} = 545°R$$

Assume BHP = 541 psia, $P = \frac{Ps + BHP}{2} = 518.5$ psia

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BHP = 540.9 ≈ 541 psia

BHP = 541 psia = 527 psig

| | | | |
|---|---|---|---|
| | | Report No: | 1 |
| | | Date: | 3-28-87 |
| Company: | N.D.R.P. | County: | [illegible] |
| Address: | | Field: | [illegible] |
| | | Formation: | MESA VERDE |
| Attention: | MIKE BARNES | Lease: | [illegible] |
| Date Sampled: | 3-25-87 | Well: | 33A |

## WATER ANALYSIS

| | | | |
|---|---|---|---|
| Specific Grav: | 1.000 | pH: | 8.50 |
| Chlorides: | 1,300 mg/l | Calcium: | 61 mg/l |
| Bicarbonate: | 51 mg/l | Magnesium: | 48 mg/l |
| Sulfate: | 0. | Total Iron: | 1. |
| Sulfide: | 0. | Sodium: | 1,268 mg/l |
| Total Hardness (as CaCO3): | 340 mg/l | Total Dissolved Solids: | 3,133 mg/l |
| Resistivity: | 4.18 | Dia Meters @: | 80 F |
| Potassium: | 0. | Carbonate: | 0 |

Sample Source:

Remarks:

Analyst: M. COFFEY
Smith Representative: M. COFFEY

| | | | |
|---|---|---|---|
| | | Report No: | 1 |
| | | Date: | 3-23-87 |
| Company: | N.C.R.A. | County: | SAN JUAN |
| Address: | | Field: | BLANCO |
| | | Formation: | MESA VERDE |
| Attention: | MIKE BARNES | Lease: | CANDADO |
| Date Sampled: | 3-22-87 | Well: | 30A |

## WATER ANALYSIS

| | | | |
|---|---|---|---|
| Specific Grav: | 1.000 | pH: | 6.50 |
| Chloride: | 1,900 mg/l | Calcium: | 56 mg/l |
| Bicarbonate: | 61 mg/l | Magnesium: | 43 mg/l |
| Sulfate: | 0. | Total Iron: | 0. |
| Sulfide: | 0. | Sodium: | 1,098 mg/l |
| Total Hardness (as CaCO3): | 340 mg/l | Total Dislvd Solids: | 3,163 mg/l |
| Resistivity: | 4.10 | Ohm Meters @: | 60 F |
| Potassium: | 0. | 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 #20A MV

METER STA 89988
OPER 6311

| TYPE CODE | SAMPLE DATE | EFF. DATE | USE MOS | H2S GRAINS | LOCATION |
|---|---|---|---|---|---|
| 00 *** | 04-15-87 | 04-28-87 | 06 | 0 | 4 F 13 |

| | NORMAL MOL% | GPM |
|---|---|---|
| CO2 | .64 | .000 |
| H2S | .00 | .000 |
| N2 | .92 | .000 |
| METHANE | 76.71 | .000 |
| ETHANE | 11.42 | 3.055 |
| PROPANE | 6.31 | 1.739 |
| ISO-BUTANE | 1.12 | .366 |
| NORM-BUTANE | 1.77 | .558 |
| ISO-PENTANE | .55 | .201 |
| NORM-PENTANE | .38 | .138 |
| HEXANE PLUS | .18 | .078 |
| | 100.00 | 6.135 |

| | |
|---|---|
| SPECIFIC GRAVITY | .748 |
| MIXTURE HEATING VALUE (BTU/CF @14.73 PSIA, 60 DEGREES,DRY) | 1284 |
| RATIO OF SPECIFIC HEATS | 1.275 |

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 #20A MV

METER STA 89988
OPER 6311

| TYPE CODE | SAMPLE DATE | EFF. DATE | USE MOS | H2S GRAINS | LOCATION |
|---|---|---|---|---|---|
| 00 *** | 04-15-87 | 04-28-87 | 06 | 0 | 4 F 13 |

| | NORMAL MOL% | GPM |
|---|---|---|
| CO2 | .64 | .000 |
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| N2 | .92 | .000 |
| METHANE | 76.71 | .000 |
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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 #20A CH

METER STA 89995
OPER 6311

| TYPE CODE | SAMPLE DATE | EFF. DATE | USE MOS | H2S GRAINS | LOCATION |
|---|---|---|---|---|---|
| 00 *** | 04-15-87 | 04-28-87 | 06 | 0 | 4 F 13 |

| | NORMAL MOL% | GPM |
|---|---|---|
| CO2 | .66 | .000 |
| H2S | .00 | .000 |
| N2 | .75 | .000 |
| METHANE | 83.95 | .000 |
| ETHANE | 7.92 | 2.119 |
| PROPANE | 3.88 | 1.069 |
| ISO-BUTANE | .73 | .239 |
| NORM-BUTANE | .97 | .306 |
| ISO-PENTANE | .38 | .139 |
| NORM-PENTANE | .27 | .098 |
| HEXANE PLUS | .49 | .213 |
| | 100.00 | 4.183 |

| | |
|---|---|
| SPECIFIC GRAVITY | .692 |
| MIXTURE HEATING VALUE (BTU/CF @14.73 PSIA, 60 DEGREES, DRY) | 1198 |
| RATIO OF SPECIFIC HEATS | 1.285 |

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 #20A CH

METER STA 89995
OPER 6311

| TYPE CODE | SAMPLE DATE | EFF. DATE | USE MOS | H2S GRAINS | LOCATION |
|---|---|---|---|---|---|
| 00 *** | 04-15-87 | 04-28-87 | 06 | 0 | 4 F 13 |

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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.

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

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

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

# 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 #20A
Section 3, T26N-R7W
Rio Arriba County, NM

Gentlemen:

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

Sincerely,

A.M. O'Hare

A.M. O'Hare
Joint Operations Supervisor

/bvl
enc

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

*Crude Oil Division Office*


July 29, 1987

Offset Operators

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/bvl
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. 20A and located in Unit O, Section 3, 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

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8/3/87

Form 3160-5
(November 1983)
(Formerly 9-331)

# UNITED STATES
# DEPARTMENT OF THE INTERIOR
## BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

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

5. LEASE DESIGNATION AND SERIAL NO.: SF-079161

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

## 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 ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: National Cooperative Refinery Association

8. FARM OR LEASE NAME: Candado

3. ADDRESS OF OPERATOR: 1775 Sherman Street, Suite 3000, Denver, CO 80203

9. WELL NO.: 20A

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1110' FSL x 1530' FEL

10. FIELD AND POOL, OR WILDCAT: Blanco Mesa Verde-Otero Chacra

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 3, T26N-R7W

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

12. COUNTY OR PARISH: Rio Arriba

13. STATE: NM

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

| NOTICE OF INTENTION TO: | | | | SUBSEQUENT REPORT OF: | | | |
|---|---|---|---|---|---|---|---|
| TEST WATER SHUT-OFF | ☐ | PULL OR ALTER CASING | ☐ | WATER SHUT-OFF | ☐ | REPAIRING WELL | ☐ |
| FRACTURE TREAT | ☐ | MULTIPLE COMPLETE | ☐ | FRACTURE TREATMENT | ☐ | ALTERING CASING | ☐ |
| SHOOT OR ACIDIZE | ☐ | ABANDON* | ☐ | SHOOTING OR ACIDIZING | ☐ | ABANDONMENT* | ☐ |
| REPAIR WELL | ☐ | CHANGE PLANS | ☐ | | | | |
| (Other) Comingle Well | | | X | (Other) | | | |

(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 A. M. O'Hare TITLE Jt. Operations Supervisor DATE 8-8-87

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Form 3160-5
(November 1983)
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# UNITED STATES
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1. OIL WELL ☐ GAS WELL ☒ OTHER

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|---|---|---|---|---|---|---|---|
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| FRACTURE TREAT | ☐ | MULTIPLE COMPLETE | ☐ | FRACTURE TREATMENT | ☐ | ALTERING CASING | ☐ |
| SHOOT OR ACIDIZE | ☐ | ABANDON* | ☐ | SHOOTING OR ACIDIZING | ☐ | ABANDONMENT* | ☐ |
| REPAIR WELL | ☐ | CHANGE PLANS | ☐ | | | | |
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