MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED

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August 7, 1992

New Mexico Oil Conservation Division
Attn: Mr. Bill LeMay
P.O. Box 2088
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

**Subject:** Reid #7
Unit H, Section 19, T28N, R09W
San Juan County, New Mexico
Downhole Commingling Request

Dear Mr. LeMay:

Meridian Oil Inc. is applying for an administrative downhole commingling order for the referenced well in the Aztec Pictured Cliffs and the Basin Fruitland Coal fields. The ownership of the zones to be commingled is common. The offset operators to this well are Amoco Production Company and Conoco, Inc. The Bureau of Land Management and the above mentioned operators will receive notification of this downhole commingling.

The subject well was completed in the Aztec Pictured Cliffs interval in July 1956 and gas sales commenced in July 1956. The well currently produces about 58 MCFD and has a cumulative production of 1105 MMCF. This zone is still economic at the current rate and the well is not a candidate for plugging back the Pictured Cliffs and opening the Fruitland Coal.

The Fruitland Coal is proven to be productive in this area by Meridian and other operators producing wells. Based on offset production in this area, new well drilling is not economically justified. The only economical way to recover the Fruitland Coal reserves in this area is to commingle the production with an existing well.

It is proposed to set a bridge plug above the Pictured Cliffs, perforate and stimulate the Fruitland Coal, then remove the bridge plug and produce both zones through a single string of tubing. The reservoir characteristics of each of the subject zones are such that underground waste will not be caused by the proposed commingling. Neither producing interval makes oil or water in the offset wells. The shut-in pressure for the Pictured Cliffs and Fruitland Coal is 250 and 250 psi, respectively.

The allocation of the commingled production will be calculated using the attached allocation formula. This formula is based on the Pictured Cliffs production history for the last 19 years and uses accepted Reservoir Engineering methods to allocate the remaining Pictured Cliffs reserves. All additional reserves will be attributed to the Fruitland Coal reservoir. This addresses the Fruitland Coal producing characteristics of early life inclining production rates. The formula also addresses the possible situation of pipeline curtailment.

Approval of this commingling application will allow for the prevention of wasted resources and protection of correlative rights. Included with this letter are plats showing ownership of offsetting leases for both the Pictured Cliffs and Fruitland Coal, a copy of letters to the BLM and offset operators, wellbore diagrams, production history curves, pertinent data sheet, and an allocation formula.

Sincerely,

Thomas B. Nusz
Regional Production Engineer

KAS:tg
attachments

cc: Frank Chavez - NMOCD/Aztec

**Pertinent Data Sheet - Reid #7**

**Location:** NE/4, section 19, T28N, R09W, San Juan County, New Mexico

**Field:** Aztec Pictured Cliffs

**Elevation:** 5836'GL
5846'KB

**TD:** 2101'
**PBTD:** 2091'

**Completed:** 7/17/56

**Initial Potential:** 4202 MCFD(PITO

**Casing Record:**

| Hole Size | Csg. Size | Wt. & Grade | Depth Set | Top/Cement |
|---|---|---|---|---|
| 12-1/4" | 8-5/8" | 24.0# J-55 8rd | 198'KB | 110 sxs (surface)* |
| 7-7/8" | 5-1/2" | 14.0# J-55 8rd | 2101'KB | 150 sxs (1350')* |

* Cement tops calculated (75% coverage)

**Tubing Record:** 2060'KB (93 joints) 1" 1.7# J-55 10rd

**Formation Tops:**

| | |
|---|---|
| Ojo Alamo | 890' |
| Kirtland | 1090' |
| Fruitland | 1760' |
| Pic. Cliffs | 2025' |

**Logging Record:** Electrical, Gamma

**Stimulation:** Perfed Pictured Cliffs 2026-70' w/4spf. Fracture stimulated with 40,00 #'s sand and 43,570 gal. water.

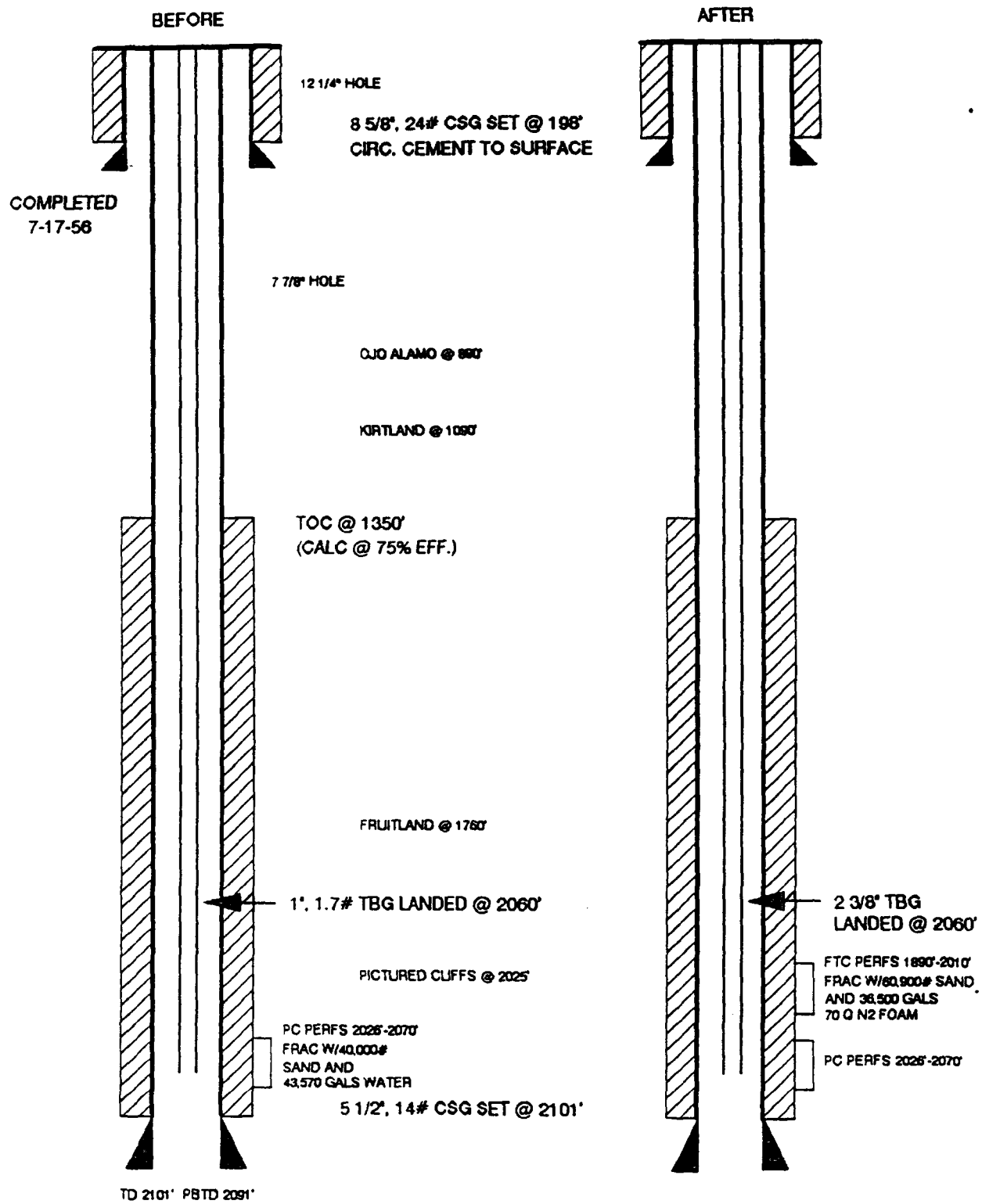
**Workover History:** None

**Production History:** Initial Deliverability - 461 MCFGD (1956)
Latest Deliverability - 65 MCFGD (1991)
Cumulative Production - 1105 MMCFG (1991)

**Transporter:** GCNM

# *REID #7*

AZTEC PICTURED CLIFFS
NE/4 SECTION 19, T28N-R09W




LMG/7-1-92

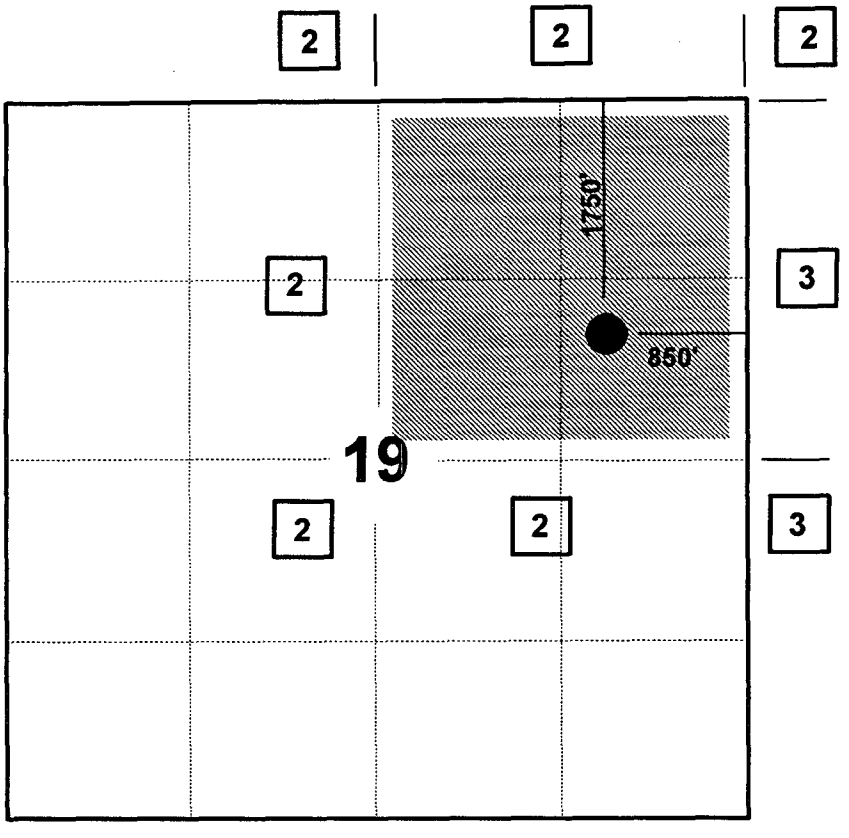
# MERIDIAN OIL INC

## OFFSET OPERATOR \ OWNER PLAT

## REID #7

## Fruitland Coal \ Pictured Cliffs Commingle

**Township 28 North, Range 09 West**




1) Meridian Oil Inc

2) Southland Royalty Company

3) Amoco Production Company — PO Box 800, Denver, CO 80201

Conoco, Inc. — PO Box 951062, Dallas, TX 75395-1062

PICTURED CLIFFS FORMATION

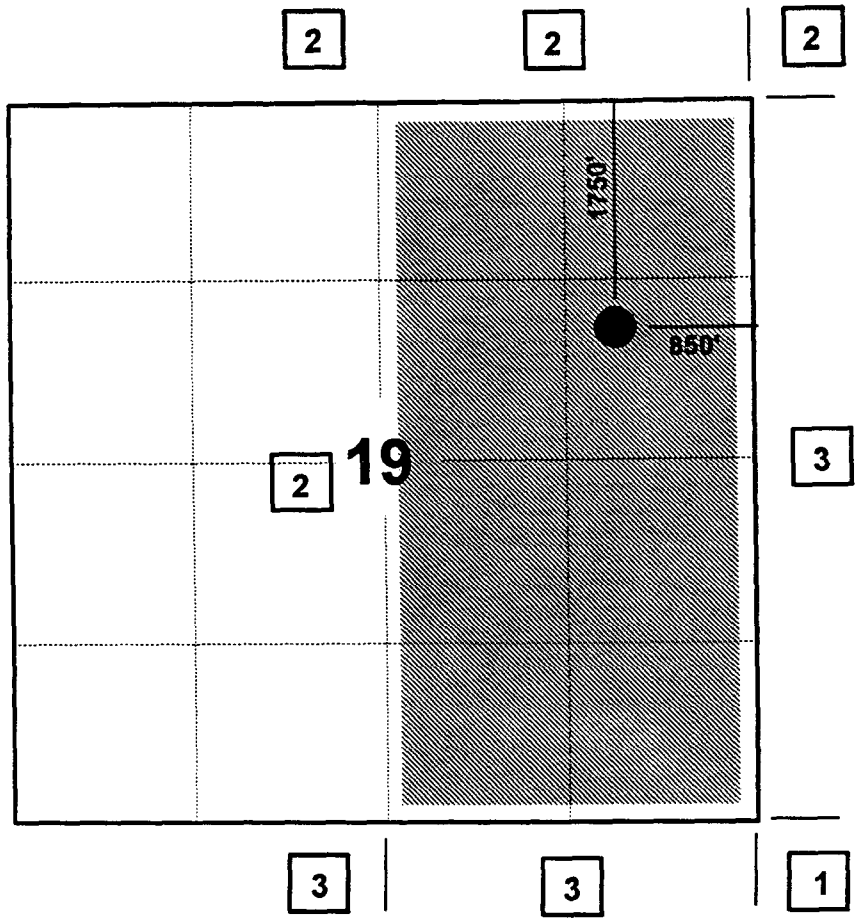
# MERIDIAN OIL INC

## OFFSET OPERATOR \ OWNER PLAT

## REID #7

## Fruitland Coal \ Pictured Cliffs Commingle

**Township 28 North, Range 09 West**

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Conoco, Inc. — PO Box 951062, Dallas, TX 75395-1062

**Fruitland Coal Formation**

Figure 1

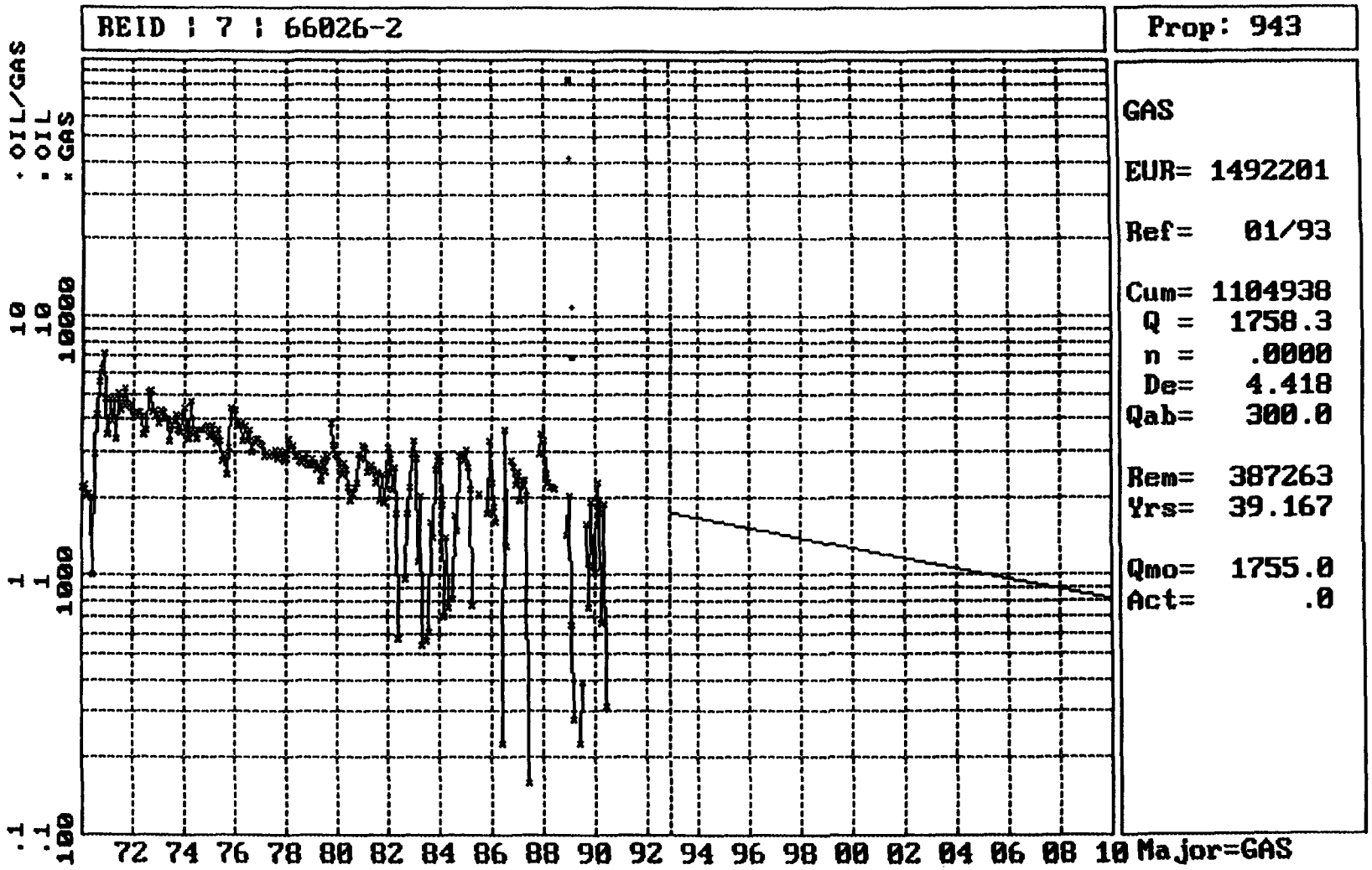
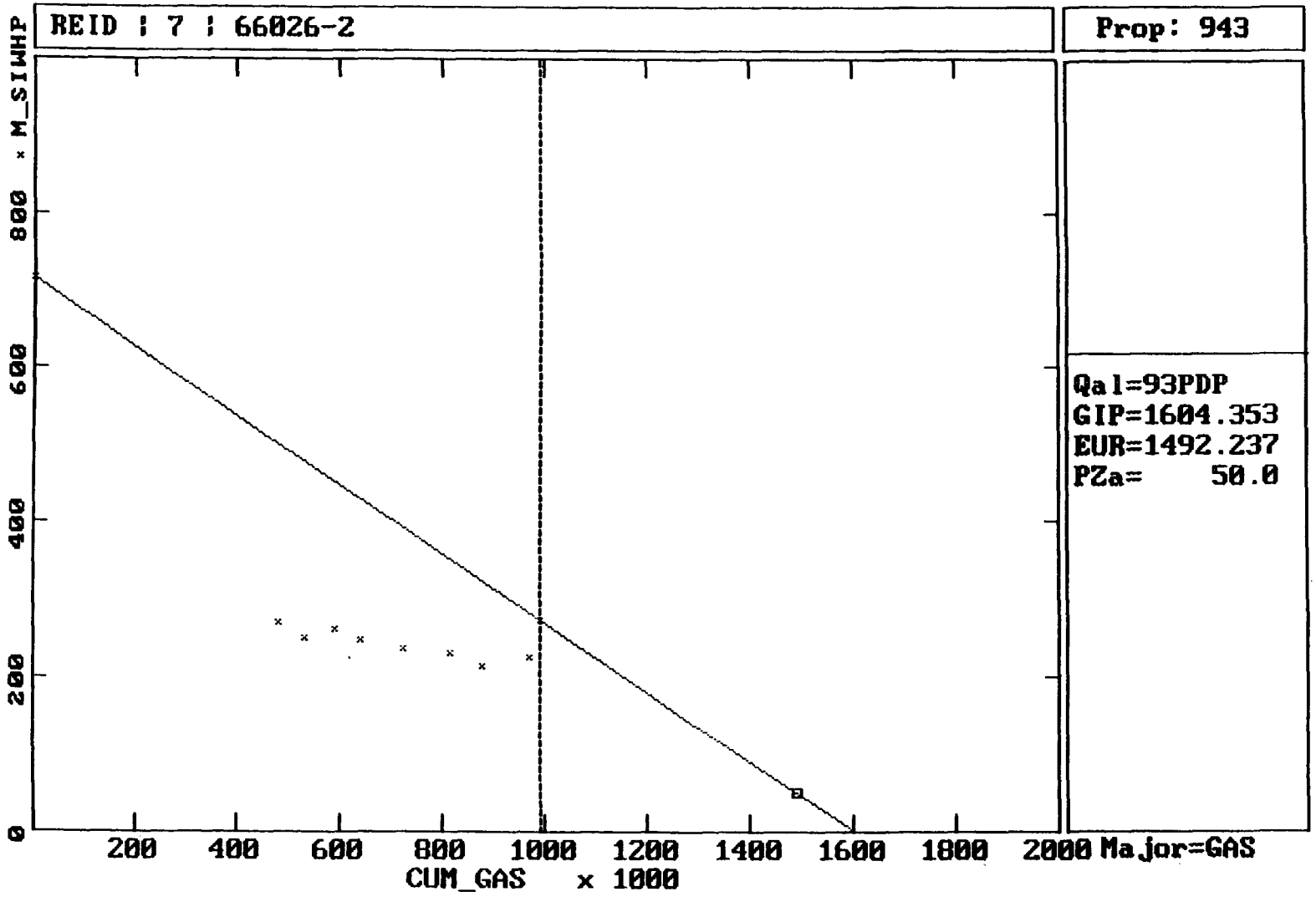

REID ¦ 7 ¦ 66026-2
Prop: 943
GAS
EUR= 1492201
Ref= 01/93
Cum= 1104938
Q = 1758.3
n = .0000
De= 4.418
Qab= 300.0
Rem= 387263
Yrs= 39.167
Qmo= 1755.0
Act= .0
Major=GAS
· OIL/GAS
· OIL
× GAS
10
10
10000
1
1
1000
.1
.1
100
72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10

Figure 2


REID : 7 : 66026-2
Prop: 943
M_SIWHP x 800
600
400
200
0
200
400
600
800
1000
1200
1400
1600
1800
2000
CUM_GAS x 1000
Qal=93PDP
GIP=1604.353
EUR=1492.237
PZa= 50.0
Major=GAS

# Reid #7 Allocation Formula

## Equation Derivation

Given the exponential decline cure analysis formula*:

$$De = 1-(Q_2/Q_1)^{(1/yr)}$$

Where: De = Effective Decline in %/yr
$Q_2$ = Rate two (at some future date) MCFD
$Q_3$ = Rate one (current rate) MCFD

Rearranging the equation to solve for Q2:

$$Q_2 = Q_1(1-De)^{yr} \text{ MCFD}$$

## Reid #7 Formula

Using Production plot (fig 1):

Last production rate = Q1 = 1970 MCFM ≅ 65 MCFD
De = 4.418% from plot

$$Q_{2PC} = 65\ (1 - 0.04418)^{yr} \text{ MCFD}$$

$$Q_{2PC} = 65\ (0.95582)^{yr} \text{ MCFD}$$ **FORMULA FOR FUTURE PC RATES**

Any production rate over what is calculated using the above PC formula on a specific date is Fruitland Coal.

## Curtailment Situations

If any curtailment occurs, both streams will be affected the same and go to 0 MCFD.

When production resumes, the rates will equate to those when the well was shut in:

$$Q_{2PC} = 65\ (0.95582)^{(yr - \text{curtailment time})}$$

$$Q_{FTC} = Q_{TOT} - Q_{PC}$$

$$Q_{TOT} = Q_{FTC} + Q_{PC}$$

The total amount of PC gas produced will be the EUR calculated through decline curve and P-Sum analysis (see figs 1 & 2).

*Reference: pg. 5-46 Oil Property Evaluation
by R. S. Thompson & J. D. Wright

## Reid #7 Allocation Formula, page 2

Example: Date Now = 1/1/93

Assuming the well produces steadily in 1993. On 1/1/94, the well produces 400 MCFD.

$Q_1$ = 65 MCFD De = 4.418%

$Q_{PC} = 65\ (0.95582)^{(yr\ -\ curtailment\ time)}$

$Q_{PC} = 65\ (0.95582)^{(1\ -\ 0)} = 62$ MCFD

$Q_{TOT} = 400$ MCFD $= Q_{FTC} + Q_{PC}$

$Q_{FTC} = 400 - 62 = 338$ MCFD

Then on 1/2/94, the well gets shut in for 1 month:

On 2/2/94, assume that the PC stream will come back on line at the same rate it left off. Or:

1 month curtailment = 1/12 = 0.0833

Tot. Time = 1 yr + 1 month = 1 + 1/12 = 1.0833

$Q_{PC} = 65\ (0.95582)^{(1.0833\ -\ 0.0833)} = 62$ MCFD.

$Q_{TOT} = 400$ MCFD

$Q_{FTC} = 338$ MCFD

MERIDIAN OIL

August 7, 1992

Bureau of Land Management
1235 La Plata Highway
Farmington, New Mexico 87401

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San Juan County, New Mexico
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Gentlemen:

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The purpose of this letter is to notify you of such action. If you have no objections to the proposed commingling order, we would appreciate your signing this letter and returning it to this office.

Your prompt attention to this matter would be appreciated.

Yours truly,

Keith A. Swainson
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

_____

Date: _____

MERIDIAN OIL

August 7, 1992

Amoco Production Company
Mr. J. W. Hawkins
P.O. Box 800
Denver, Colorado 80201

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San Juan County, New Mexico
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Production Engineer

KAS:tg

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Date: _____

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August 7, 1992

Conoco, Inc.
P.O. Box 951062
Dallas, Texas 75395-1062

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Production Engineer

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_____

Date: _____

STATE OF NEW MEXICO
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

OIL CONSERVATION DIVISION
RECEIVED
'92 AUG 27 AM 11 08

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

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

Date: 8/25/92

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

RE: Proposed MC_____ Proposed DHC X
Proposed NSL_____ Proposed SWD_____
Proposed WFX_____ Proposed PMX_____
Proposed NSP_____ Proposed DD_____

Gentlemen:

I have examined the application received on 8/11/92
for the Meridian Reid #7
OPERATOR LEASE & WELL NO.
14-19-28N-9W and my recommendations are as follows:
UL-S-T-R

Approve

Yours truly,