

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT

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LAND OFFICE	
TRANSPORTER	<input type="checkbox"/> OIL
	<input type="checkbox"/> GAS
OPERATOR	
PROBATION OFFICE	

OIL CONSERVATION DIVISION  
P. O. BOX 2088  
SANTA FE, NEW MEXICO 87501

Form C-104  
Revised 10-01-78  
Format 08-01-83  
Page 1

REQUEST FOR ALLOWABLE  
AND  
AUTHORIZATION TO TRANSPORT OIL AND NATURAL GAS

I. Operator  
Southland Royalty Company

Address  
PO Box 4289, Farmington, NM 87499

Reason(s) for filing (Check proper box)

<input type="checkbox"/> New Well	Change in Transporter of:
<input type="checkbox"/> Recompletion	<input type="checkbox"/> Oil
<input type="checkbox"/> Change in Ownership	<input type="checkbox"/> Casingshead Gas
	<input checked="" type="checkbox"/> Dry Gas
	<input type="checkbox"/> Condensate

Other (Please explain)

If change of ownership give name  
and address of previous owner

II. DESCRIPTION OF WELL AND LEASE

Lease Name Reid	Well No. 8	Pool Name, including Formation Aztec Pictured Cliffs	Kind of Lease State, Federal or Fee	Lease No. NM 01772 A
Location				
Unit Letter <u>I</u> <u>1640</u> Feet From The <u>South</u> Line and <u>1120</u> Feet From The <u>West</u>				
Line of Section <u>19</u> Township <u>28N</u> Range <u>9W</u> NMPM. San Juan County				

III. DESIGNATION OF TRANSPORTER OF OIL AND NATURAL GAS

Name of Authorized Transporter of Oil <input type="checkbox"/> or Condensate <input checked="" type="checkbox"/>	Address (Give address to which approved copy of this form is to be sent)
Meridian Oil Inc.	PO Box 4289, Farmington, NM 87499
Name of Authorized Transporter of Casingshead Gas <input type="checkbox"/> or Dry Gas <input type="checkbox"/>	Address (Give address to which approved copy of this form is to be sent)
Sunterra Gas Gathering Co.	P.O. Box 1899, Bloomfield, NM 87413
If well produces oil or liquids, give location of tanks.	Is gas actually connected? When
Unit <u>19</u> Sec. <u>28N</u> Range <u>9W</u>	

If this production is commingled with that from any other lease or pool, give commingling order number:

NOTE: Complete Parts IV and V on reverse side if necessary.

VI. CERTIFICATE OF COMPLIANCE

I hereby certify that the rules and regulations of the Oil Conservation Division have been complied with and that the information given is true and complete to the best of my knowledge and belief.

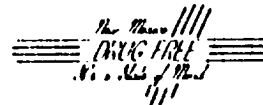
1994 Dook  
(Signature)  
Drilling Clerk  
May 15, 1987  
(Date)

OIL CONSERVATION DIVISION

JUN 22 1987

APPROVED \_\_\_\_\_ 19  
BY Supervisor  
SUPERVISION DISTRICT # 3  
TITLE \_\_\_\_\_

This form is to be filed in compliance with RULE 1104.  
If this is a request for allowable for a newly drilled or deepened well, this form must be accompanied by a tabulation of the deviated tests taken on the well in accordance with RULE 111.  
All sections of this form must be filled out completely for allowable on new and recompleted wells.  
Fill out only Sections I, II, III, and VI for changes of owner well name or number, or transporter, or other such change of condition.  
Separate Forms C-104 must be filed for each pool in multip. completed wells.



STATE OF NEW MEXICO

ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

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 NSL \_\_\_\_\_  
Proposed WFX \_\_\_\_\_  
Proposed NSP \_\_\_\_\_

Proposed DHC X \_\_\_\_\_  
Proposed SWD \_\_\_\_\_  
Proposed PMX \_\_\_\_\_  
Proposed DD \_\_\_\_\_

Gentlemen:

I have examined the application received on 8/11/92  
for the McKinnin Lease # 8  
OPERATOR LEASE & WELL NO.

L-19-28N-9W and my recommendations are as follows:  
UL-S-T-R

Ignore  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yours truly,

318

# MERIDIAN OIL

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

**RECEIVED**  
AUG 11 1992  
OIL CON. DIV.  
DIST. 3

Subject: Reid #8  
Unit L, 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 June 1956 and gas sales commenced in June 1956. The well currently produces about 48 MCFD and has a cumulative production of 1096 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.

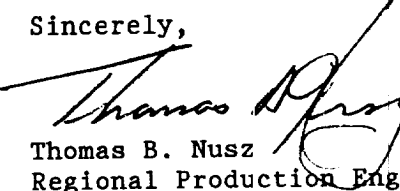
It is proposed to set a bridge plug above the Pictured Cliffs, perforate and stimulate the Fruitland Coal, then remove the bridge plug and produce both zones through a single string of tubing. The reservoir characteristics of each of the subject zones are such that underground waste will not be caused 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 200 and 250 psi, respectively.

New Mexico Oil Conservation Division  
Mr. Bill LeMay  
Reid #8  
Downhole Commingling Request  
Page Two

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,

A handwritten signature in black ink, appearing to read "Thomas B. Nusz", is written over the typed name and title.

Thomas B. Nusz  
Regional Production Engineer

KAS:tg  
attachments

cc: Frank Chavez - NMOCD/Aztec

Pertinent Data Sheet - Reid #8

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

Field: Aztec Pictured Cliffs

Elevation: 5926' GL  
5936' KB

TD: 2145'  
PBTD: 2135'

Completed: 7/7/56

Initial Potential: 3709 MCFD(PIT)

Casing Record:

<u>Hole Size</u>	<u>Csq. Size</u>	<u>Wt. &amp; Grade</u>	<u>Depth Set</u>	<u>Top/Cement</u>
12-1/4"	8-5/8"	24.0# J-55 8rd	198' KB	100 sxs (surface)*
7-7/8"	5-1/2"	14.0# J-55 8rd	2145' KB	150 sxs (1404')*

\* Cement tops calculated (75% coverage)

Tubing Record: 2004' KB (approx 92 joints) 1" 1.7# J-55 10rd

Formation Tops:

Ojo Alamo	952'
Kirtland	1140'
Fruitland	1815'
Pic. Cliffs	2075'

Logging Record: Electrical, Gamma

Stimulation: Perfed Pictured Cliffs 2076-2130' w/4spf. Fracture stimulated with 40,000 #'s sand and 42,000 gal. water.

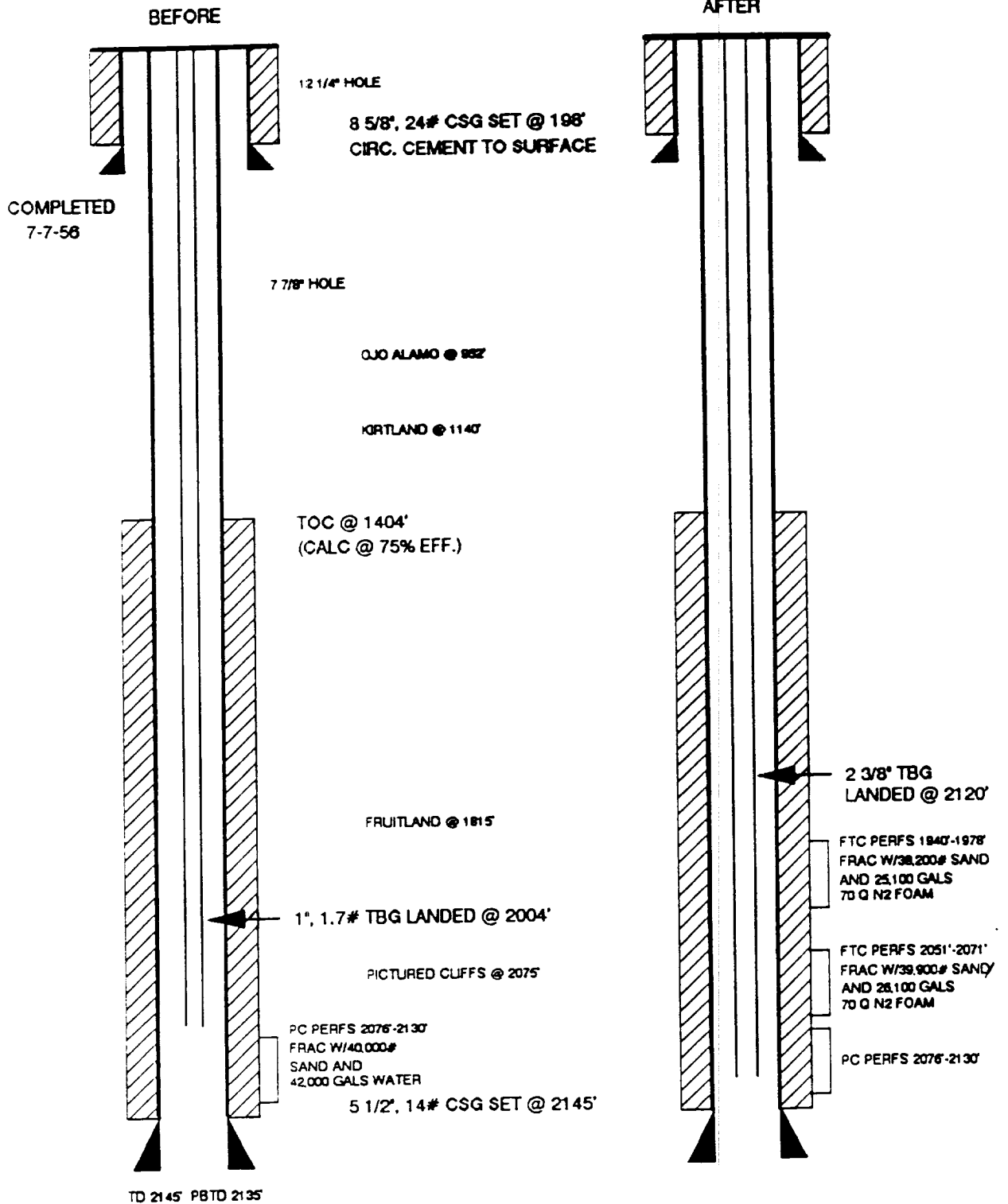
Workover History: None

Production History: Initial Deliverability - 862 MCFGD (1956)  
Latest Deliverability - 48 MCFGD (1991)  
Cumulative Production - 1096 MMCFG (1991)

Transporter: GCNM

# REID #8

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



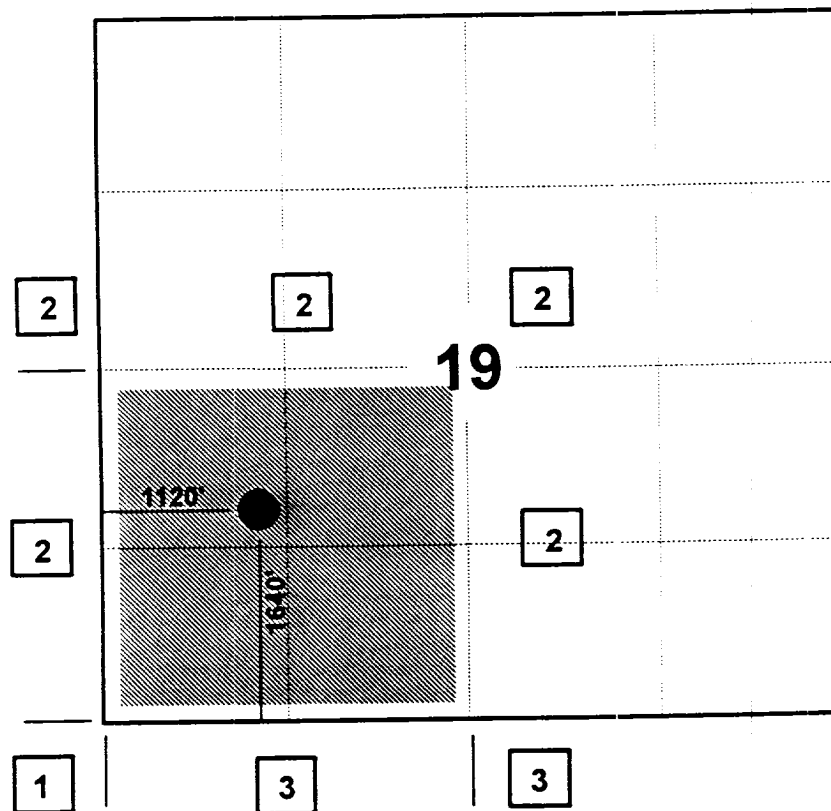
# MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

REID #8

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

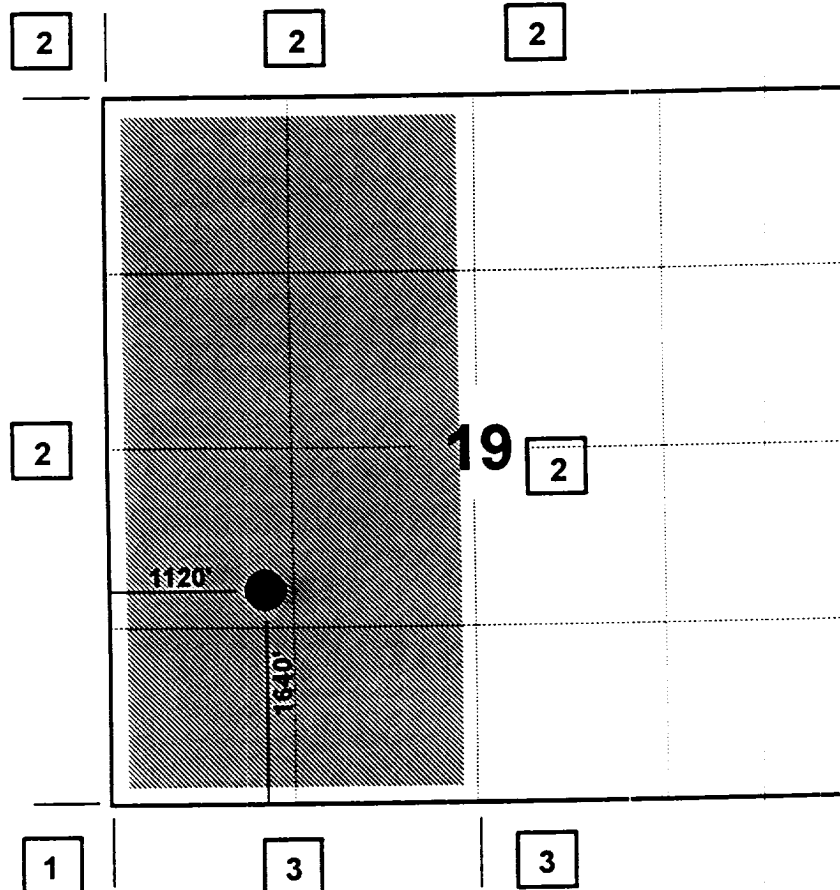
# MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

REID #8

Fruitland Coal \ Pictured Cliffs Commingle

Township 28 North, Range 09 West



1) Meridian Oil Inc

2) Southland Royalty Company

3) Amoco Production Company

Conoco, Inc.

PO Box 800, Denver, CO 80201

PO Box 951062, Dallas, TX 75395-1062

Fruitland Coal Formation



Figure 1

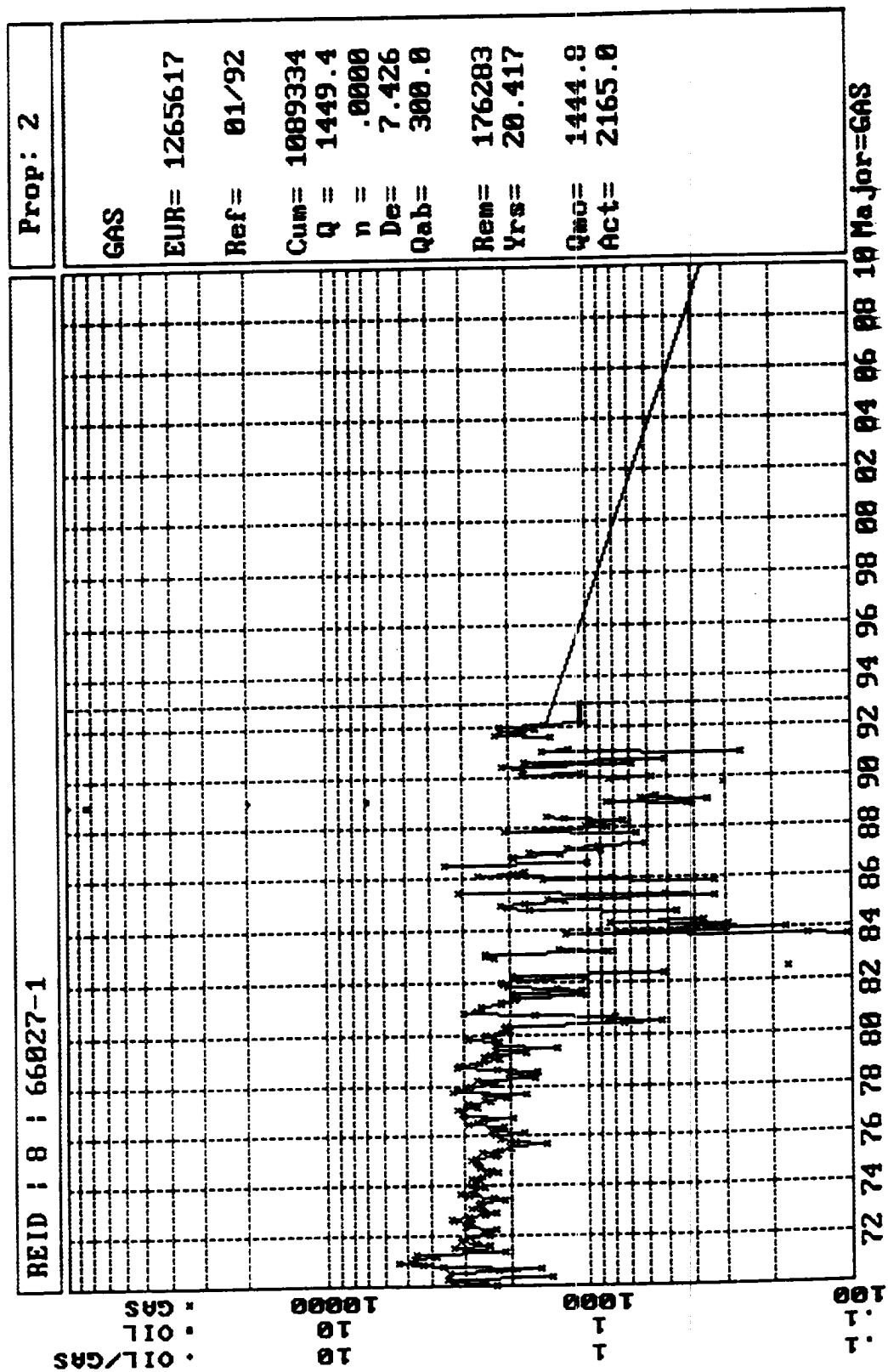
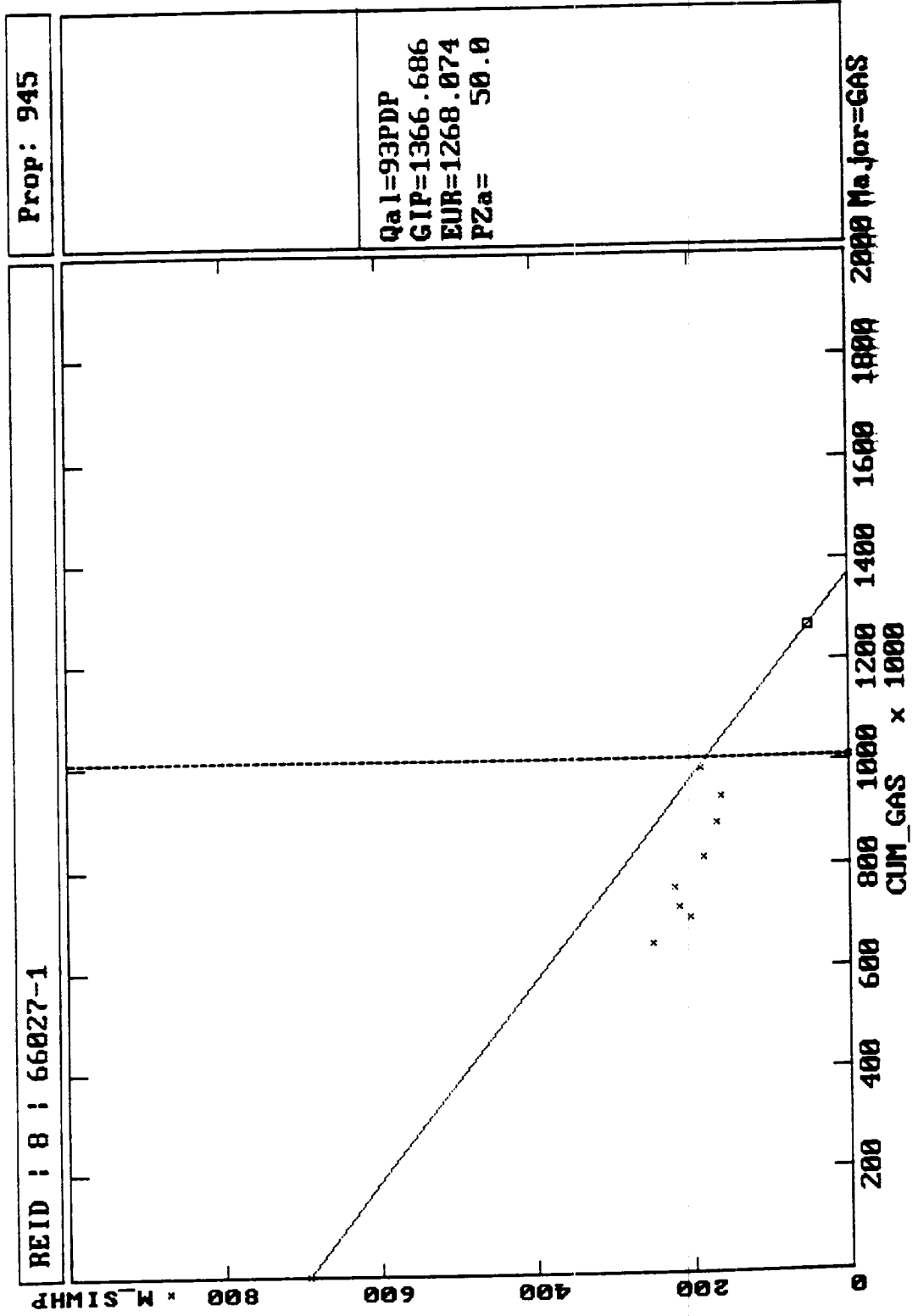


Figure 2



## Reid #8 Allocation Formula

### Equation Derivation

Given the exponential decline curve analysis formula\*:

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

Where: De = Effective Decline in %/yr

Q<sub>2</sub> = Rate two (at some future date) MCFD

Q<sub>3</sub> = Rate one (current rate) MCFD

Rearranging the equation to solve for Q<sub>2</sub>:

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

### Reid #8 Formula

Using Production plot (fig 1):

Last production rate = Q<sub>1</sub> = 1449 MCFM  $\equiv$  48 MCFD  
De = 7.426% from plot

$$Q_{2PC} = 48 (1 - 0.07426)^{Yr} \text{ MCFD}$$

$$Q_{2PC} = 48 (0.92574)^{Yr} \text{ MCFD} \quad \text{FORMULA FOR FUTURE PC RATES}$$

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:

$$Q_{2PC} = 48 (0.92574)^{(Yr - \text{curtailment time})}$$

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

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

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 #8 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.

$$Q_1 = 48 \text{ MCFD} \qquad \qquad \qquad De = 7.426\%$$

$$Q_{PC} = 48 (0.92574) (\text{yr} - \text{curtailment time})$$

$$Q_{PC} = 48 (0.92574) (1 - 0) = 44 \text{ MCFD}$$

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

$$Q_{FTC} = 400 - 44 = 356 \text{ MCFD}$$

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:

$$1 \text{ month curtailment} = 1/12 = 0.0833$$

$$\text{Tot. Time} = 1 \text{ yr} + 1 \text{ month} = 1 + 1/12 = 1.0833$$

$$Q_{PC} = 48 (0.92574) (1.0833 - 0.0833) = 44 \text{ MCFD.}$$

$$Q_{TOT} = 400 \text{ MCFD}$$

$$Q_{FTC} = 356 \text{ MCFD}$$

# MERIDIAN OIL

August 7, 1992

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

Subject: Reid #8  
Unit L, Section 19, T28N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request


Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for the Reid #8 well located in Unit L, Section 19, T28N, R09W, N.M.P.M., San Juan County, New Mexico, in the Aztec Pictured Cliffs and Basin Fruitland Coal fields.

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

Subject: Reid #8  
Unit L, Section 19, T28N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for the Reid #8 well located in Unit L, Section 19, T28N, R09W, N.M.P.M., San Juan County, New Mexico, in the Aztec Pictured Cliffs and Basin Fruitland Coal fields.

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Keith A. Swainson  
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

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

# MERIDIAN OIL

August 7, 1992

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

Subject: Reid #8  
Unit L, Section 19, T28N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request


Gentlemen:

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Production Engineer

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