STATE OF NEW MEXICO

ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

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

Date: June 23, 1992

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 June 11, 1992

for the Meridian (OPERATOR) Navajo #23 (LEASE & WELL NO.)

D-7-27N-9W (UL-S-T-R) and my recommendations are as follows:

Approve

Yours truly,

B. J. [illegible]

MERIDIAN OIL

June 10, 1992

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

RE: Hanks #23
Unit D, Section 7, T27N, 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 Fulcher Kutz 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, Conoco, Inc., Dugan Production and McKenzie Methane. The Bureau of Land Management and the above mentioned operators will receive notification of this downhole commingling.

The subject well was completed in the Fulcher Kutz Pictured Cliffs interval in July 1969. Gas sales commenced in August 1969 with a cumulative to date production of 299 MMCF. This well has been inactive for five years and is currently blind plated.

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 270 and 350 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,

Richard E. Fraley
Engineering Manager

KAS:tg
attachments

cc: Frank Chavez - NMOCD/Aztec

Pertinent Data Sheet - Hanks #23 FTC/PC

Location: 800' FNL, 1120' FWL, Section 7, T27N R9W, San Juan County, N.M.

Field: Basin Fruitland Coal
Futcher Kutz Pictured Cliffs

Elevation: 6554' GL

TD: 2632'
PBTD: 2604

GWI: 25.000%
NRI: 21.125%

Completed: 7-25-69

DP Number: 27197 PC
27197B FTC

Initial Potential:
PC: 1,622 MCF/D - Pitot

Casing Record:

Hole Size	Csg Size	Wt. & Grade	Depth Set	Cement	Top/Cmt.
12-1/4"	8-5/8"	24 # NA	111'	60 sxs	SURF (CIRC)
6-3/4"	4-1/2"	9.5 # NA	2604'	250 sxs	1500' (CBL)

Tubing Record:

	1"	NA	2520'

Formation Tops:

Ojo Alamo:	1547'
Kirtland:	1674'
Fruitland:	2299'
Pictured Cliffs:	2498'

Logging Record: ES-INDUCTION, CBL.

Stimulation: Perferated from 2510-18', 2523-28' and 2532-38' with 4 SPF. Fraced with 25,000 lbs sand. Injection rate 43 BPM. Max treating pressure 1900 psi.

Workover History: None.

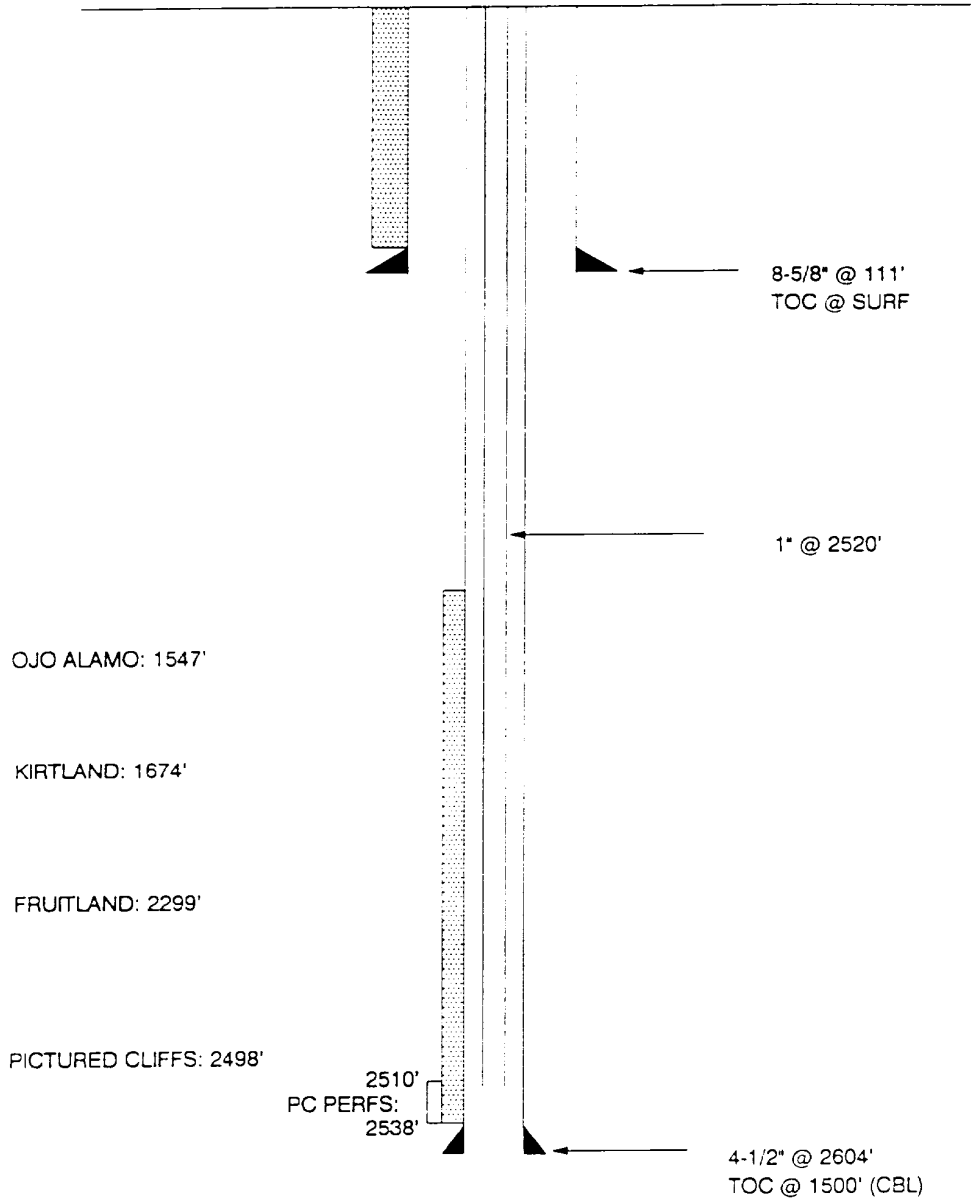
Production History: PC cum = 299 MMCF since 1st delivery in August of 1969. Well has been inactive since 1987 and is currently SIBP.

CURRENT

HANKS #23

UNIT D SECTION 7 T27N R9W

SAN JUAN COUNTY, NEW MEXICO

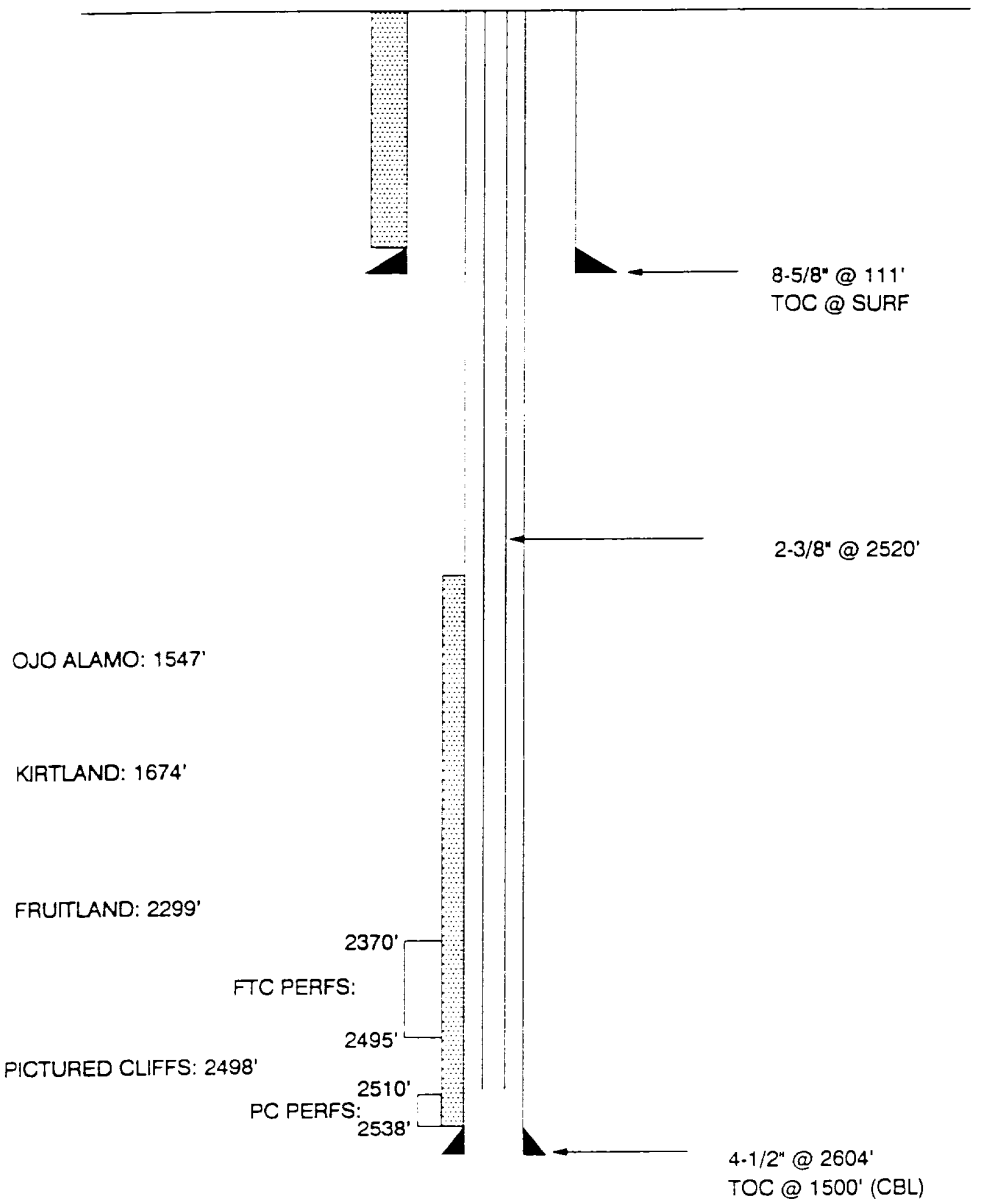


PROPOSED

HANKS #23

UNIT D SECTION 7 T27N R9W

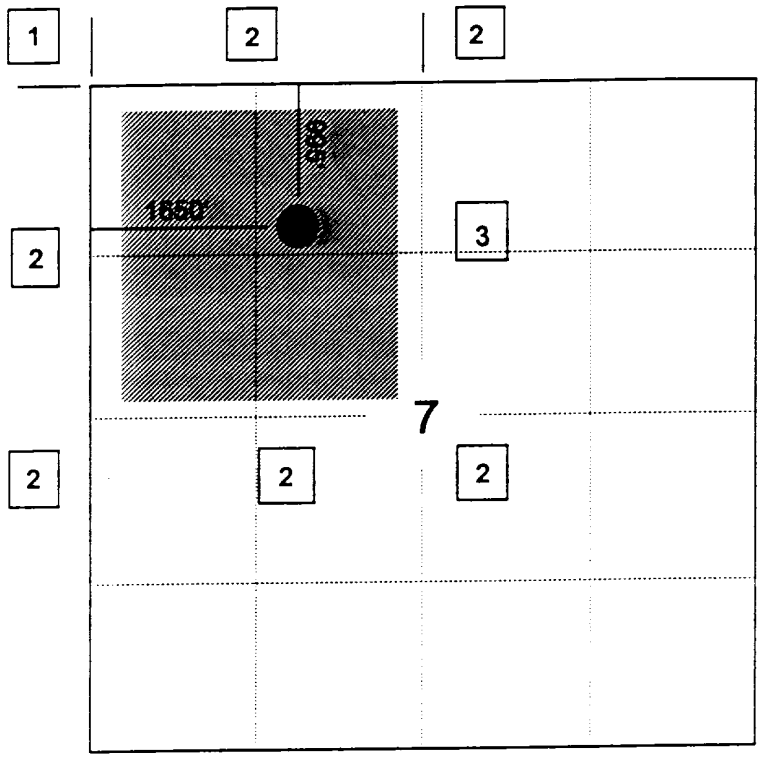
SAN JUAN COUNTY, NEW MEXICO



MERIDIAN OIL INC
OFFSET OPERATOR PLAT
HANKS #23

Fruitland Coal \ Pictured Cliffs Comingle

Township 27 North, Range 09 West



1) Meridian Oil Inc

2) Southland Royalty Company

3) Southland Royalty Company

Dugan Production Corp., PO Box 208, Farmington, NM 87499

Pictured Cliffs Formation

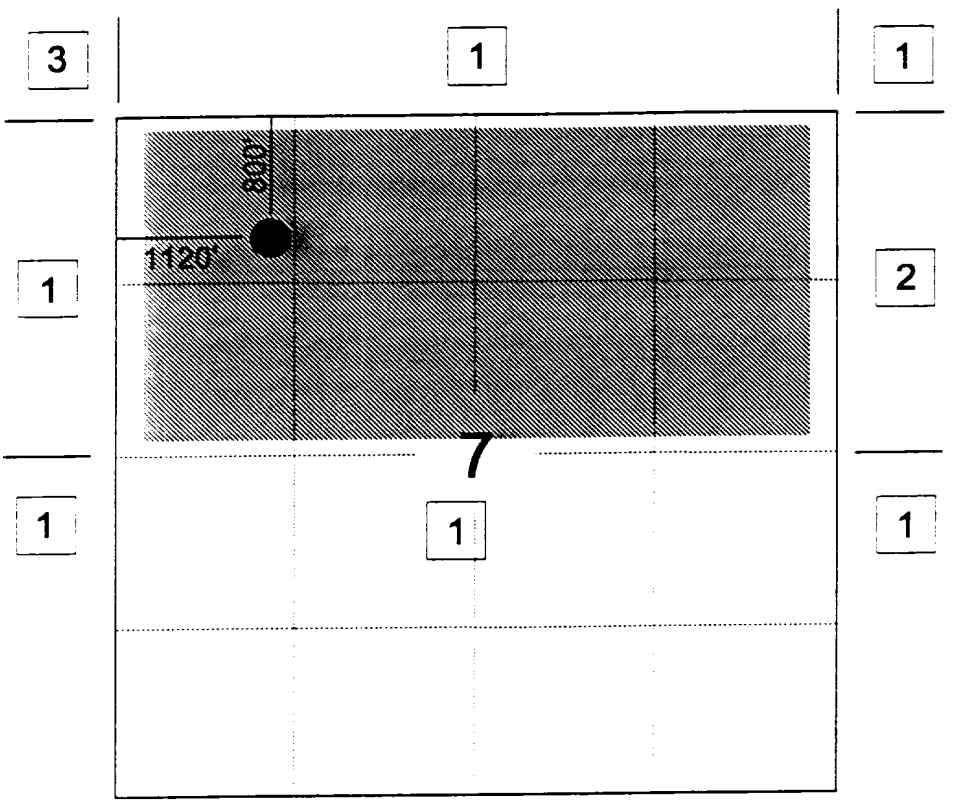
MERIDIAN OIL INC

OFFSET OPERATOR \ OWNER PLAT

HANKS #23

Fruitland Coal \ Pictured Cliffs Commingle

Township 27 North, Range 09 West



1) Soluthland Royalty Company

2) Southland Royalty Company

Dugan Production Corp., PO Box 208, Farmington, NM 87499

3) McKenzie Methane, 7880 San Felipe, Houston, TX 77063

Amoco Production Company, PO Box 800, Denver CO 80202

Conoco, Inc., PO Box 951063, Houston, TX 75395-1063

Fruitland Coal Formation

FIGURE 1

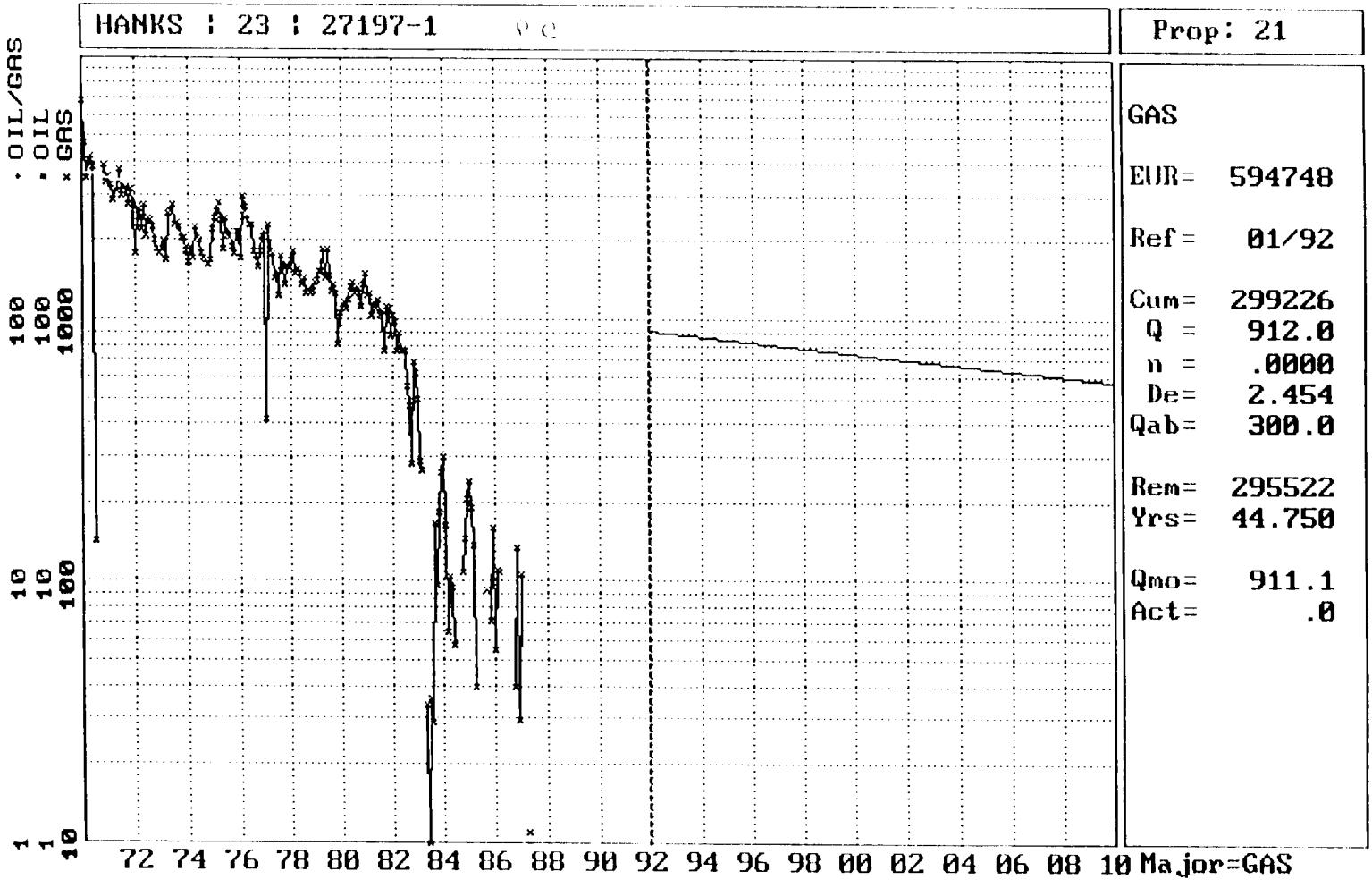
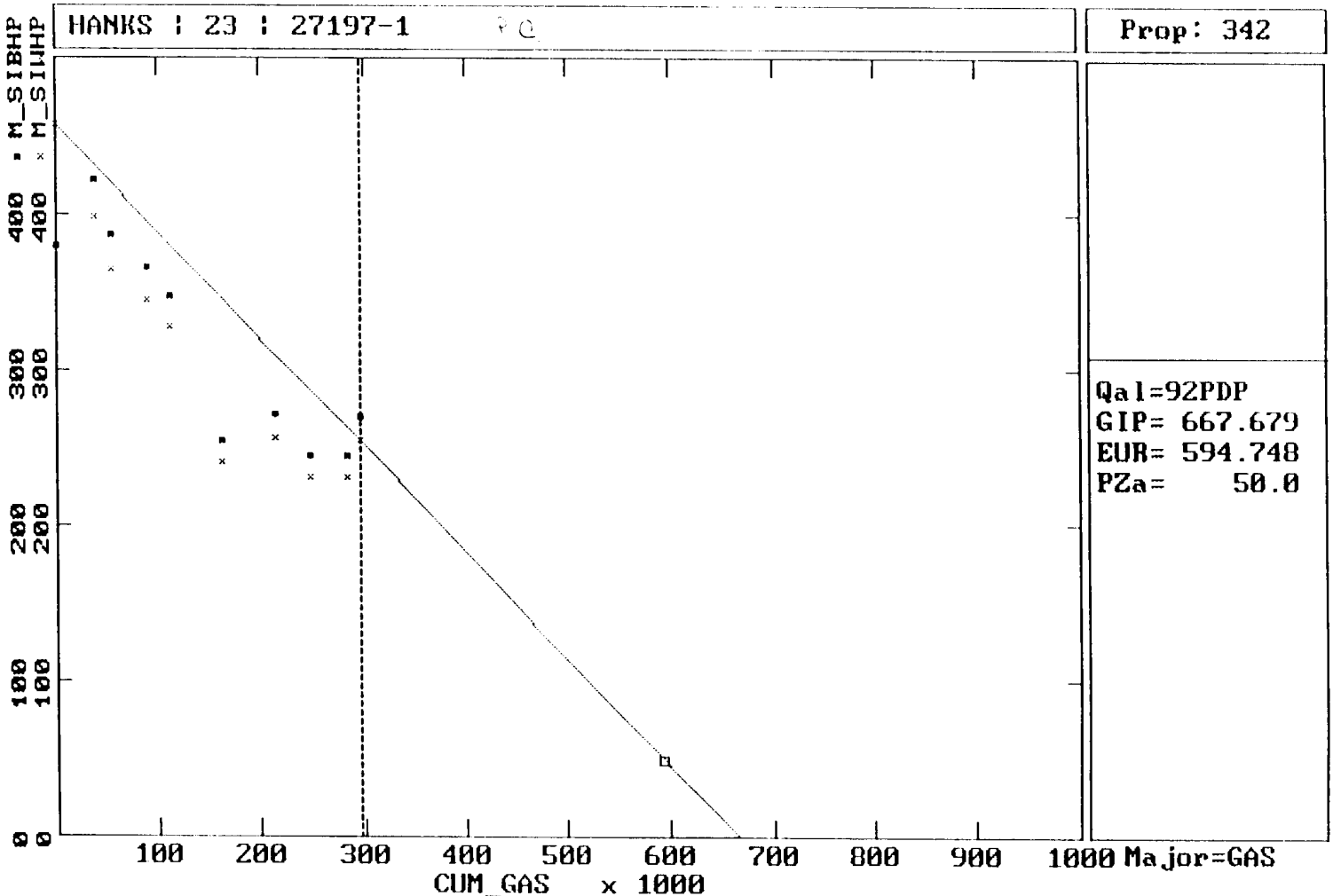

HANKS : 23 : 27197-1
Prop: 21
. OIL/GAS
. OIL
x GAS
100
100
1000
10
10
100
1
1
10
72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10
Major=GAS
GAS
EUR= 594748
Ref= 01/92
Cum= 299226
Q = 912.0
n = .0000
De= 2.454
Qab= 300.0
Rem= 295522
Yrs= 44.750
Qmo= 911.1
Act= .0

FIGURE 2


HANKS : 23 : 27197-1
Prop: 342
M_SIBHP
M_SIWHP
400
300
200
100
0
100
200
300
400
500
600
700
800
900
1000
CUM_GAS x 1000
Qal=92PDP
GIP= 667.679
EUR= 594.748
PZa= 50.0
Major=GAS

Hanks #23 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:

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

Hanks #23 Formula

Using Production plot (Fig 1):

Last production rate = Q1 = 912 MCFM ≅ 30 MCFD
De = 2.454% from plot

$$Q_{2PC} = 30\ (1 - 0.02454)^{yr} \text{ MCFD}$$

$$Q_{2PC} = 30\ (0.97546)^{yr} \text{ MCFD}$$ **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:

$$Q_{2PC} = 30\ (0.97546)^{(yr - \text{curtailment time})}$$

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

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

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

Hanks #23 Allocation Formula, page 2

Example: Date Now = 1/1/93

Assuming the well produces steadily in 1993. On 1/1/94, the well produces 300 MCFD.

Q_1 = 30 MCFD De = 2.454%

$Q_{PC} = 30\ (0.97546)^{(yr\ -\ curtailment\ time)}$

$Q_{PC} = 30\ (0.97546)^{(1\ -\ 0)} = 29$ MCFD

$Q_{TOT} = 300$ MCFD $= Q_{FTC} + Q_{PC}$

$Q_{FTC} = 300 - 29 = 271$ 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

$Q_{PC} = 30\ (0.97546)^{(1.0833\ -\ 0.0833)} = 29$ MCFD.

$Q_{TOT} = 300$ MCFD

$Q_{FTC} = 271$ MCFD

MERIDIAN OIL

June 10, 1992

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

RE: Hanks #23
Unit D, Section 7, T27N, 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 Hanks #23 well located in Unit D, Section 7, T27N, R09W, N.M.P.M., San Juan County, New Mexico, in the Fulcher Kutz 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 the attached copy of 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 Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700

MERIDIAN OIL

June 10, 1992

Dugan Production Company
P.O. Box 208
Farmington, New Mexico 87499

RE: Hanks #23
Unit D, Section 7, T27N, R09W
San Juan County, New Mexico
Downhole Commingling Request

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MERIDIAN OIL

June 10, 1992

McKenzie Methane
7880 San Felipe
Houston, Texas 77063

RE: Hanks #23
Unit D, Section 7, T27N, R09W
San Juan County, New Mexico
Downhole Commingling Request

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Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700

MERIDIAN OIL

June 10, 1992

Amoco Production Company
P.O. Box 800
Denver, Colorado 80202

RE: Hanks #23
Unit D, Section 7, T27N, R09W
San Juan County, New Mexico
Downhole Commingling Request

Gentlemen:

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Production Engineer

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Date: _____

Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700

MERIDIAN OIL

June 10, 1992

Conoco, Inc.
P.O. Box 951063
Houston, Texas 75395-1063

RE: Hanks #23
Unit D, Section 7, T27N, R09W
San Juan County, New Mexico
Downhole Commingling Request

Gentlemen:

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