



The Oil and Natural Gas
Conservation Board

Room 309
Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

(204) 945-3130

August 28, 1990

Mr. Dan Barchyn
Exploration Manager
Tundra Oil and Gas Ltd.
1313 Richardson Building
One Lombard Place
Winnipeg, Manitoba
R3B 0X3

Dear Mr. Barchyn:

Re: Retirement of Over-Production
Tundra Daly 5-13-10-29 (WPM)

On July 3, 1990 the Board advised Tundra Oil and Gas Ltd. that its application for an increase in the maximum permissible production rate for the subject well was denied.

As of June 30, 1990 the subject well had accumulated over-production of 440.8 m³. Tundra is hereby requested to commence retiring over-production at a minimum rate of 50 m³/month starting in September, 1990.

Yours respectfully,

ORIGINAL SIGNED BY
H. CLARE MOSTER

H. Clare Moster
Deputy Chairman



Memorandum

Date August 23, 1990

To The Oil and Natural Gas
Conservation Board
Ian Haugh, Chairman
H. Clare Moster, Deputy Chairman
WM. McDonald, Member

From John N. Fox
Chief Petroleum Engineer
Petroleum Branch

Telephone

Subject

Re: Retirement of Over-Production
Tundra Daly 5-13-10-29 (WPM)

On July 3, 1990 the Board notified Tundra Oil and Gas Ltd. that its application for an MPR increase for the subject well was denied. As of June 30, 1990 the 5-13-10-29 (WPM) well had accumulated over-production of 440.8 m³. It is recommended that the Board request Tundra to begin retiring over-production at the rate of 50 m³/month starting in September, 1990. A copy of the proposed Board letter is attached.

John N. Fox

Approved by:

L.R. Dubreuil, Director

First | Fold



Memorandum

Date August 23, 1990

To The Oil and Natural Gas
Conservation Board
Ian Haugh, Chairman
H. Clare Moster, Deputy Chairman
WM. McDonald, Member

From John N. Fox
Chief Petroleum Engineer
Petroleum Branch

Telephone

Subject

Re: Retirement of Over-Production
Tundra Daly 5-13-10-29 (WPM)

On July 3, 1990 the Board notified Tundra Oil and Gas Ltd. that its application for an MPR increase for the subject well was denied. As of June 30, 1990 the 5-13-10-29 (WPM) well had accumulated over-production of 440.8 m³. It is recommended that the Board request Tundra to begin retiring over-production at the rate of 50 m³/month starting in September, 1990. A copy of the proposed Board letter is attached.

John N. Fox

Approved by:

L.R. Dubreuil, Director

First | Fold

July 12, 1990

Mr. J.D. Koop
23 Resources Ltd.
P.O. Box 101
Edmonton, Alberta
T6H 1A0

Dear Sir:

RE: Application for an Increase in the
Maximum Permissible Production Rate
Tundra Dely 5-13-10-29 (WPM)

Your objection to Tundra Oil and Gas Ltd.'s application for an increase in the maximum permissible production rate (MPR) for the subject well is hereby acknowledged.

The Board has reviewed Tundra's application and the concerns regarding conservation and equity that may result from an increase in MPR. At this stage of pool development, the Board does not feel there is enough technical evidence available to support the approval of the application. Consequently, Tundra's application has been denied.

Yours respectfully

*original signed
by Bill
McDonald*

Mr. McDonald
Director

bc: Ian Haugh
Wm. McDonald

July 3, 1990

Mr. Dan Barchyn, P. Eng.
Exploration Manager
Tundra Oil and Gas Ltd.
1313 Richardson Building
One Lombard Place
Winnipeg, Manitoba
R3B 0X3

Dear Mr. Barchyn:

RE: Application for an Increase in the
Maximum Permissible Production Rate
Tundra Daly 5-13-10-29 (WPM)

Your application for an increase in the maximum permissible production rate (MPR) for the subject well to 11 m³ OPD is hereby acknowledged.

Notice of the application was sent to the lessors and lessees in the W/2 of Section 13 and the E/2 of Section 14. A lessor objected to the application with the concern that an increase in the MPR could result in inequitable drainage.

The purpose of MPR's is to prevent waste that may occur as a result of over-production and to protect correlative rights. MPR's are an interim conservation measure that limits production from individual wells until the optimum depletion strategy for a pool can be determined.

Tundra's application does not adequately address conservation or equity concerns in respect of the requested MPR increase. The Board does not believe that at this stage of pool development any strong technical argument regarding the same can be made. Consequently, your application is denied.

The Board has recommended to the Department that the MPR provisions of the Petroleum Drilling and Production Regulation be reviewed with the intent of providing flexibility for new wells to produce in excess of the MPR restrictions for a period of time. This producing flexibility should allow operators to obtain additional reservoir information to support applications of this type.

Yours respectfully,

ORIGINAL SIGNED BY
H. CLARE MOSTER

H. Clare Moster
Deputy Chairman

July 3, 1990

The Oil and Natural Gas
Conservation Board
Ian Haugh, Chairman
H. Clare Moster, Deputy Chairman
Wm. McDonald, Member

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

APPLICATION FOR MPR INCREASE
TUNDRA DALY 5-13-10-29 (WPM)

Notice of Tundra Oil and Gas Ltd.'s application for an increase in the maximum permissible production rate (MPR) for the subject well was sent to the offsetting lessors and lessees. One objection to the application was received.

RECOMMENDATION

It is recommended that the application be denied. A copy of the proposed Board letter denying the application is attached. The letter contains a paragraph outlining the Branch's plan to review the MPR provisions of the regulations to allow some flexibility in producing new wells.

DISCUSSION

The lessor in the SW/4 of Section 14-10-29 (WPM) objected to Tundra's application. The lessor contends that increased production at 5-13-10-29 could adversely effect production at 8-14-10-29.

Tundra stated in its application that production from the 5-13 well has not had an impact on offsetting wells. A composite production plot (Figure 1) from the offsetting wells, 12-13-10-29, 8-14-10-29 and 9-14-10-29, indicates a production decline of 66.4% per year prior to 5-13 being placed on production and a production decline of 86.6% per year shortly after 5-13 commenced production. Though this is not conclusive evidence that production at 5-13 has effected the performance of the offsetting wells, it suggests that an increase in the MPR for 5-13 may result in inequitable drainage of offsetting lands.

Tundra in its application for a pilot waterflood in the Daly Bakken D Pool indicated the need for pressure maintenance to reverse the rapid decline in reservoir pressure (from a discovery pressure of 8600 kPa in February, 1987 to 5400 kPa in May, 1989). An increase in reservoir withdrawals at 5-13 will accelerate the pressure decline and possibly result in a loss of ultimate recovery.

Tundra has not adequately addressed conservation and equity concerns in its application and until there is some information available on the performance of the pilot waterflood which is scheduled to commence in July 1990, it is premature to grant an increase in the MPR for the 5-13 well.

Tundra's application is one of a number presently before the Board or expected to be filed in the near future requesting an MPR increase or exemption for wells with high initial productivity. The existing MPR restrictions limit an operator's ability to collect the necessary performance and reservoir data required to technically support an application for an MPR increase or exemption.

The Petroleum Branch is presently preparing a regulatory amendment to allow some MPR flexibility during the early life of a well. It is recommended that Tundra be informed by the Board of this initiative.

John N. Fox

Encl.

Original Signed By

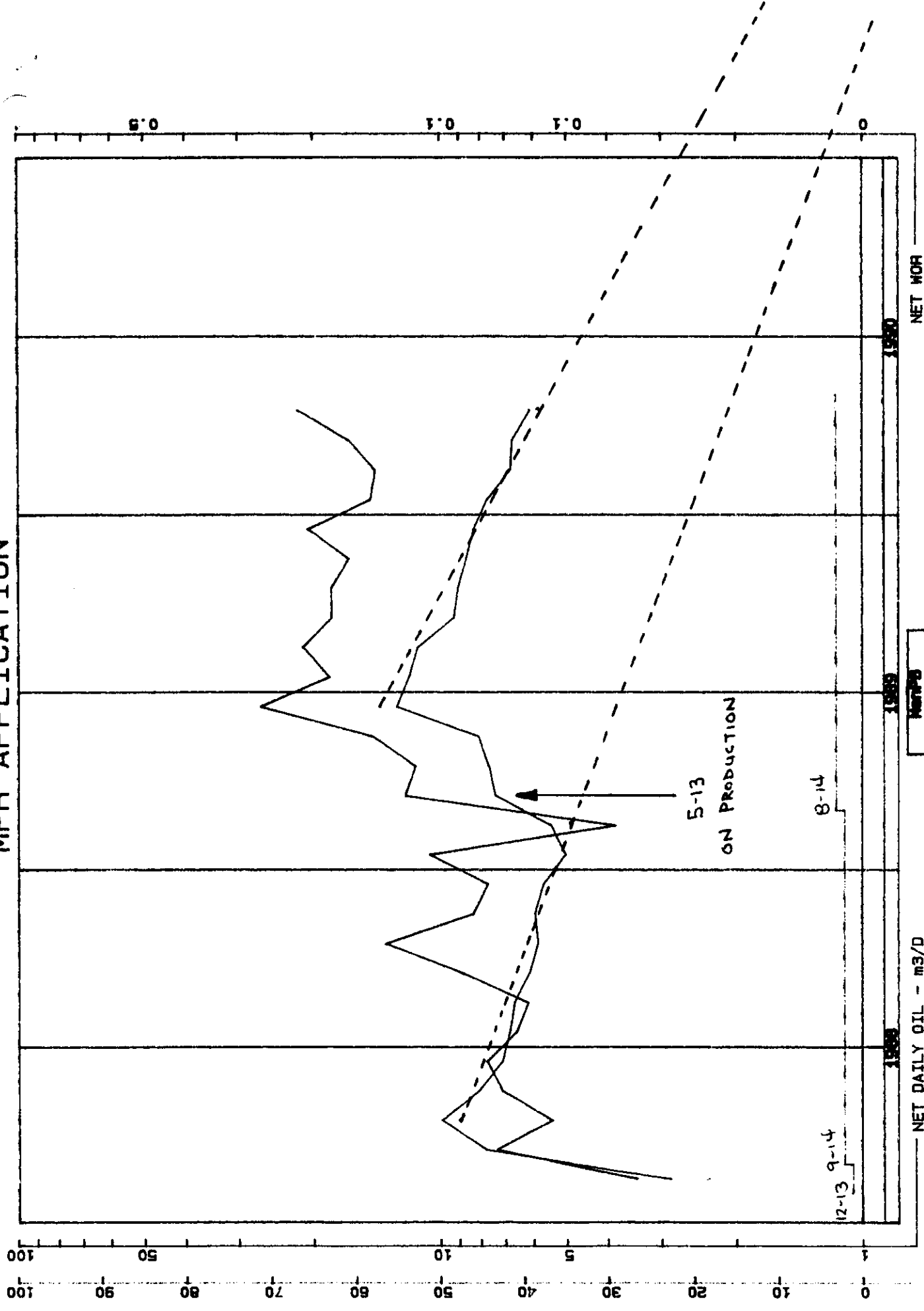
L. R. DUBREUIL

Approved by:

L.R. Dubreuil, Director

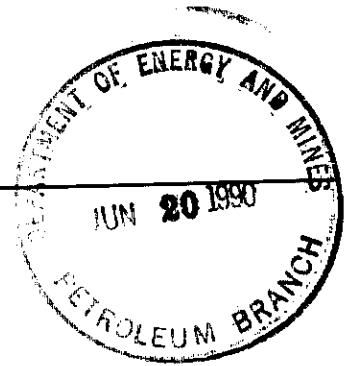
OFFSET PRODUCTION
 12-13
 8-14
 9-14

MPR APPLICATION



NET DAILY OIL - m3/D
 NET WOR
 90-06-25
 13:58:50

NET DAILY OIL - m3/D
 NET WOR
 90-06-25
 13:58:50



June 18, 1990

Department of Energy and Mines
Petroleum Branch
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4A5

Attention: Mr. John Fox

Dear John:

RE: MPR APPLICATION: TUNDRA DALY 5-13-10-29 WPM

In response to your letter of May 31, 1990 concerning the above, enclosed is a composite production plot for the offsetting wells.

The MPR requested for 5-13 represents the approximate rate which the well was produced during its first year of production. The absence of interference with the wells in the proposed unit during this period suggests that there will not be any detrimental impact on the efficacy of the proposed flood if the well is returned to this rate. Another important factor is that the 5-13 well is in a part of the pool with a much lower well density than that of the pilot flood.

A temporary increase in MPR would be acceptable and our intention would be to gather additional reservoir pressure data pending possible expansion of the flood if the pilot flood proves to be successful.

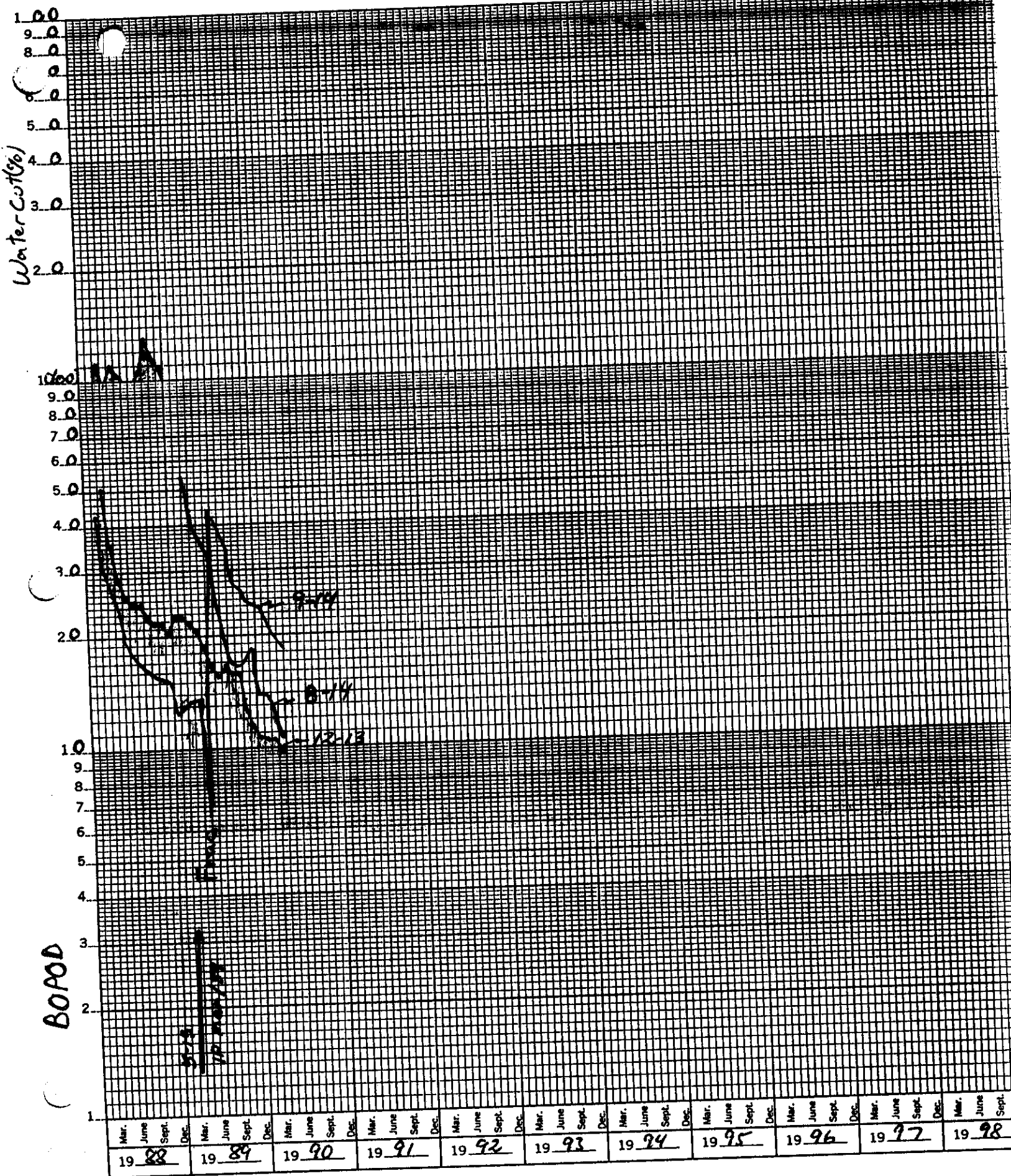
Sincerely,

A handwritten signature in cursive script, appearing to read "Dan Barchyn".

Dan Barchyn, P. Eng.
Exploration Manager

DB/ck

Enclosure

$$\underline{WT \div 100\%}$$


June 18/90 ^{7.7 B}

Dear Sirs,

I'm writing on behalf of Edith Bolam
(re: Tundra Oil & Gas Ltd.) Could any
information or mail in regards to
Edith, be mailed to her address not
Box: 754.

Thanks very much!

S Foster

(grand-daughter)

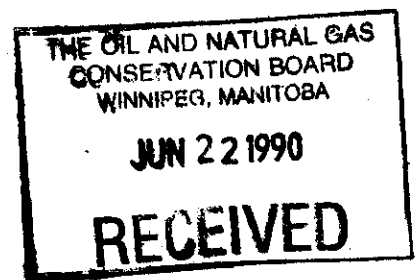
Address:

Edith H. Bolam

Box: 83

VIRDEN, MAN.

ROM2CO



To the Oil & Natural
Gas Conservation Board

Re: Application for an increase
in the Maximum Permissible
Production Rate under Daily
5-13-10-29 (20 PM)

This letter is to let you know
that I object for the increase
of this well
The reason: It could take
production from 8-14-10-29

Yours respectfully,

A. S. Resources Ltd
Atoka, Mon

per J.D. Kemp

June 1, 1990

The Oil and Natural Gas
Conservation Board
Ian Haugh, Chairman
H. Clare Moster, Deputy Chairman
Wm. McDonald, Member

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

RE: Application for an Increase in MPR
Tundra Daly 5-13-10-29 (WPM)

Tundra Oil and Gas Ltd. has applied pursuant to subsection 51(3) of The Petroleum Drilling and Production Regulation to increase the maximum permissible production rate (MPR) for the well, Tundra Daly 5-13-10-29 (WPM). The company has applied for an MPR of 11 m³ of clean oil per day and 290 m³ of clean oil per month.

Recommendation

It is recommended that the lessors and lessees in the W/2 of Section 13-10-29 (WPM) and the E/2 of Section 14-10-29 (WPM) be notified of the application directly by the Board. A copy of the proposed letter of notification is attached.

Discussion

The well, Tundra Daly 5-13-10-29 (WPM), was put on production in March 1989. A plot of the well's production history is shown in Figure 1. Tundra estimates the well to have the capability of producing 18 m³ OPD. The company has applied to increase the daily MPR to 11 m³ OPD and the monthly MPR to 290 m³ OPM.

The application is as a result of a notice from the Petroleum Branch (April 19, 1990) requesting Tundra to retire the well's over-production. Over-production as of March 1, 1990 was 362.6 m³.

Tundra's only technical argument is that the well is capable of high production rates and has not had an adverse effect on the offsetting wells. Tundra has been sent a letter by the Branch (attached) requesting more information to support the application.

Figure 2 shows the lessors and lessees in and within 0.5 km of the 5-13-10-29 (WPM) well. Prior to making a decision on the application, the lessors and lessees should be notified of the application and given 14 days to file an objection to or intervention in the application.

John N. Fox

Att'd.

Approved by:

L.R. Dubreuil, Director

June 1, 1990

Dear Sir/Madam:

RE: Application for an Increase in the
Maximum Permissible Production Rate
Tundra Daly 5-13-10-29 (WPM)

This letter is to notify you that Tundra Oil and Gas Ltd. has made application to increase the maximum permissible production rate (MPR) for the well, Tundra Daly 5-13-10-29 (WPM) from 9.5 m³ of clean oil per day and 240 m³ of clean oil per month, to 11 m³ of clean oil per day and 290 m³ of clean oil per month.

If no valid objection or intervention in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8, within 14 days of the date of this letter, the Board may approve the application.

Yours respectfully,

H. Clare Moster
Deputy Chairman

Albert D. Cohen
1370 Sony Place
Winnipeg, Manitoba
R3C 3C3

Harry B. Cohen
170 Sony Place
Winnipeg, Manitoba
R3C 3C3

John C. Cohen
1370 Sony Place
Winnipeg, Manitoba
R3C 3C3

Joseph H. Cohen
1370 Sony Place
Winnipeg, Manitoba
R3C 3C3

Morley M. Cohen
1370 Sony Place
Winnipeg, Manitoba
R3C 3C3

Leasam Holdings Limited
1370 Sony Place
Winnipeg, Manitoba
R3C 3C3

James D. MacDonald
c/o P.O. Box 278
Winnipeg, Manitoba
R3C 2G9

R. Barry Talbot
98 Shier Drive
Winnipeg, Manitoba
R3R 2H8

Louie Tolaini
486 Henderson Highway
Winnipeg, Manitoba
R2K 2H8

Rose Minnie Muir
273 Church Street
Comox, B.C.
V6G 2R8

Ogilvie Enterprises Ltd.
P.O. Box 66
Elkhorn, Manitoba
ROM ONO

Canada Trust
c/o Montreal Trust
411 - 8th Avenue S.W.
Calgary, Alberta
T2P 1E7

Attention: Oil Royalties
Edith Hannah Bolam
c/o P.O. Box 754
Virden, Manitoba
ROM 2C0
Doreen Perron
c/o P.O. Box 754
Virden, Manitoba
ROM 2C0
K8 Resources Ltd.
P.O. Box 101
Kola, Manitoba
ROM 1B0
Laura May Day

c/o P.O. Box 754
Virden, Manitoba
ROM 2C0
Mervin Roach
P.O. Box 754
Virden, Manitoba
ROM 2C0



Energy and Mines

Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

May 31, 1990

Tundra Oil and Gas Ltd.
1313 One Lombard Place
WINNIPEG, Manitoba R3B 0X3

Attention: Mr. Dan Barchyn, P. Eng.
Exploration Manager

Dear Dan:

Re: MPR Application
Tundra Daly 5-13-10-29 (WPM)

In support of the subject application, please submit a composite plot of daily production versus time for the wells offsetting 5-13-10-29; 12-13-10-29, 8-14-10-29 and 9-14-10-29. Please indicate on the plot the date 5-13-10-29 went on production.

Will increasing production at 5-13-10-29 have any detrimental impact on the efficacy of the proposed pilot waterflood in the Daly Bakken D Pool? Would Tundra be prepared to accept a temporary (6) month increase in the MPR on the condition that additional reservoir pressure data be gathered?

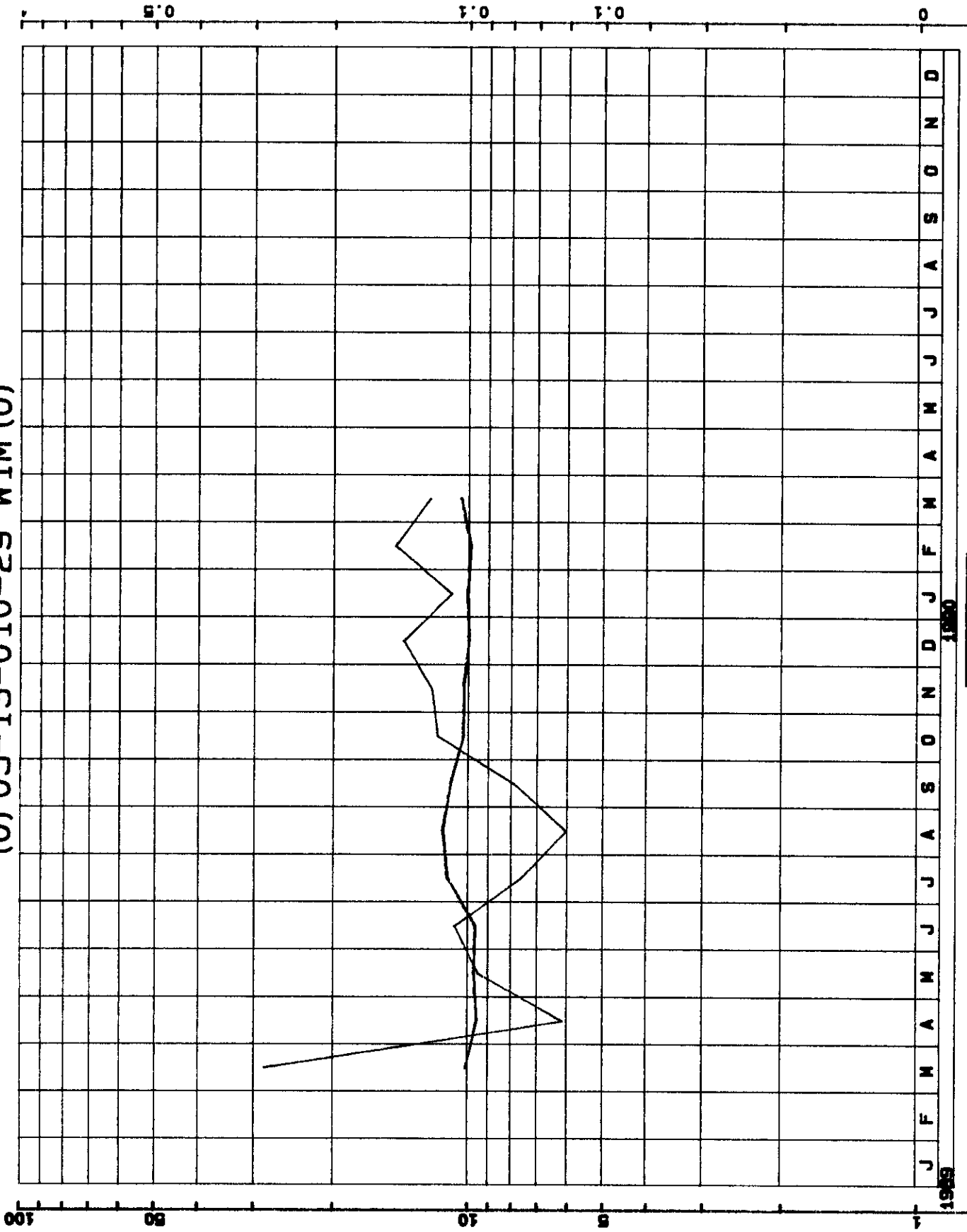
Yours truly,

A handwritten signature in dark ink, appearing to read 'John N. Fox'.

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

JNF:dah

(0) 05-13-010-29 W1M (0)



DAILY OIL - m3/d

Name:
 90-08-01
 08:37:05

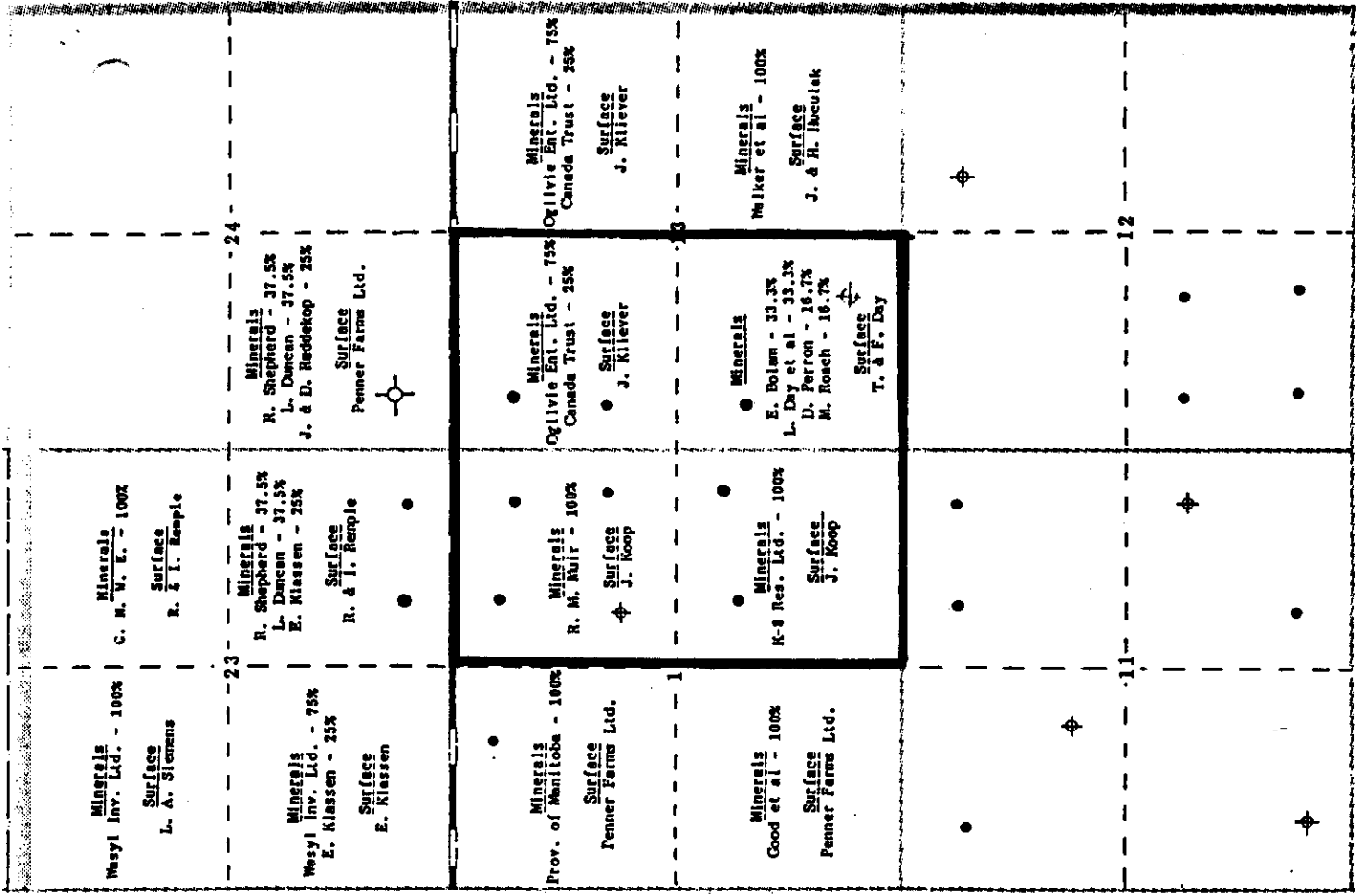
NOR

FIGURE 1

Figure 2:

LESSEES

LANDS		LESSEES	
Tract No. 1	Tundra	100.000000	
Tract No. 2	A. D. Cohen	2.083334	
	H. B. Cohen	2.083333	
	J. C. Cohen	2.083333	
	J. H. Cohen	2.083333	
	M. M. Cohen	2.083333	
	Leasam	2.083334	
	MacDonald	4.166667	
	Talbot	4.166667	
	Tolaini	4.166666	
	Tundra	75.000000	
Tract No. 3	Tundra	100.000000	
Tract No. 4	Tundra	100.000000	
Tract No. 5	Tundra	100.000000	
Tract No. 6	Tundra	100.000000	
Tract No. 7	A. D. Cohen	2.083334	
	H. B. Cohen	2.083333	
	J. C. Cohen	2.083333	
	J. H. Cohen	2.083333	
	M. M. Cohen	2.083333	
	Leasam	2.083334	
	MacDonald	4.166667	
	Talbot	4.166667	
	Tolaini	4.166666	
	Tundra	75.000000	
NE½ 13	Tundra	25.000000	
	Open	75.000000	
	Open	100.000000	
	Tundra	100.000000	
	Tundra	100.000000	
NE½ 13 - LSD's 11 & 14	Tundra	100.000000	
	Tundra	100.000000	
	Tundra	100.000000	
	Tundra	100.000000	
	Tundra	100.000000	
NE½ 14	Tundra	75.000000	
	Open	25.000000	
	Tundra	100.000000	
	Open	100.000000	
	Open	100.000000	
NE½ 23	Open	100.000000	
	Tundra	100.000000	
	Tundra	25.000000	
	Open	75.000000	
	Open	100.000000	
NE½ 23 - LSD's 7 & 8	Open	100.000000	
	Tundra	100.000000	
	Tundra	25.000000	
	Open	75.000000	
	Open	100.000000	
NE½ 24	Tundra	100.000000	
	Tundra	100.000000	
	Open	100.000000	
	Open	100.000000	
	Open	100.000000	





Energy and Mines

Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

May 31, 1990

Tundra Oil and Gas Ltd.
1313 One Lombard Place
WINNIPEG, Manitoba R3B 0X3

Attention: Mr. Dan Barchyn, P. Eng.
Exploration Manager

Dear Dan:

Re: MPR Application
Tundra Daly 5-13-10-29 (WPM)

In support of the subject application, please submit a composite plot of daily production versus time for the wells offsetting 5-13-10-29; 12-13-10-29, 8-14-10-29 and 9-14-10-29. Please indicate on the plot the date 5-13-10-29 went on production.

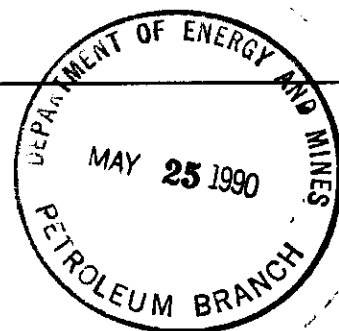
Will increasing production at 5-13-10-29 have any detrimental impact on the efficacy of the proposed pilot waterflood in the Daly Bakken D Pool? Would Tundra be prepared to accept a temporary (6) month increase in the MPR on the condition that additional reservoir pressure data be gathered?

Yours truly,

A handwritten signature in black ink, appearing to read 'J. N. Fox'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

JNF:dah



May 23, 1990

Chairman
The Oil and Natural Gas Conservation Board
c/o Petroleum Branch
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4A5

Dear Sir:

RE: TUNDRA DALY 5-13-10-29 WPM (LIC. #4105)
MAXIMUM PERMISSIBLE RATE

Tundra Oil and Gas Ltd. hereby makes application pursuant to Section 51 (3) of the Regulations to increase the MPR for the above well to 11.0 m³/day and 290 m³/month.

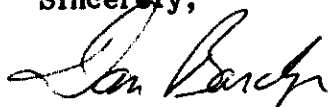
In support of this application is a plat showing the mineral owners and lessees within a one half kilometre of the well and a plot of the production history of the well.

The 5-13 well was placed on production in March of 1989 and has produced at a rate of 9 to 11 m³/day since then, with no apparent decline. These rates have been achieved with the well pumping part-time on a schedule of one hour off for every two hours on production. A recent 3-day, full-time production test showed a rate averaging approximately 16 m³/day. Using the observed fluid level and assuming a current reservoir pressure of 5000 KPa, we calculate the maximum potential of this well to be approximately 18 m³/day.

We feel that producing this well at a rate of 11 m³/day or 61% of its potential will in no way have a deleterious effect on the ultimate recovery of the pool, the producing characteristics of this well or the correlative rights of mineral owners and lessees. This view is supported by the absence of any significant interference effects on offsetting producers during the past 12 months of production.

If you have any questions or require further information pending approval of this application, please contact the undersigned.

Sincerely,



Dan Barchyn, P. Eng.
Exploration Manager

DB/ck

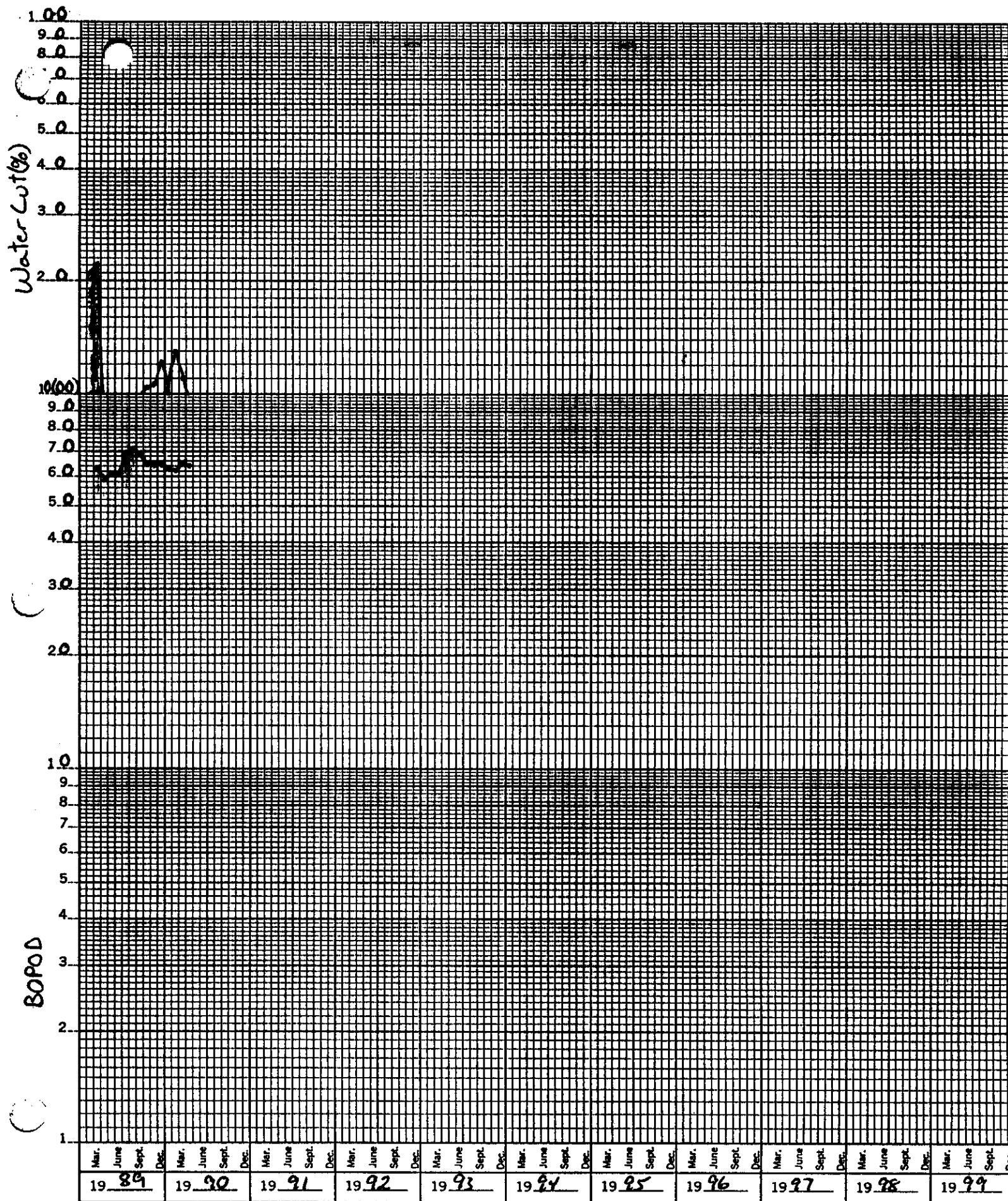
$WI \div 75\%$ 

Figure 2:

NORTH EBOR UNIT NO. 1

LESSSES

LANDS

Tract No. 1

Tract No. 2

Tract No. 3

Tract No. 4

Tract No. 5

Tract No. 6

Tract No. 7

NE 1/4 13

SE 1/4 13

SW 1/4 13

NW 1/4 13 - LSD's 11 & 14

NE 1/4 14 - LSD 10

SE 1/4 14

SW 1/4 14

NW 1/4 14

NE 1/4 23

SE 1/4 23 - LSD's 7 & 8

SW 1/4 23

NW 1/4 23

NE 1/4 24

SE 1/4 24

SW 1/4 24

NW 1/4 24

LESSEES

Tundra 100.000000

A. D. Cohen 2.083334

H. B. Cohen 2.083333

J. C. Cohen 2.083333

J. H. Cohen 2.083333

H. M. Cohen 2.083333

Lessan 2.083334

MacDonald 4.166667

Talbot 4.166667

Tolaini 4.166666

Tundra 75.000000

Tundra 100.000000

Tundra 100.000000

Tundra 100.000000

Tundra 100.000000

Tundra 100.000000

A. D. Cohen 2.083334

H. B. Cohen 2.083333

J. C. Cohen 2.083333

J. H. Cohen 2.083333

H. M. Cohen 2.083333

Lessan 2.083334

MacDonald 4.166667

Talbot 4.166667

Tolaini 4.166666

Tundra 75.000000

Tundra 25.000000

Open 75.000000

Open 100.000000

Tundra 100.000000

Tundra 100.000000

Tundra 100.000000

Tundra 100.000000

Open 75.000000

Open 100.000000

Open 100.000000

Tundra 100.000000

Tundra 100.000000

Open 25.000000

Open 75.000000

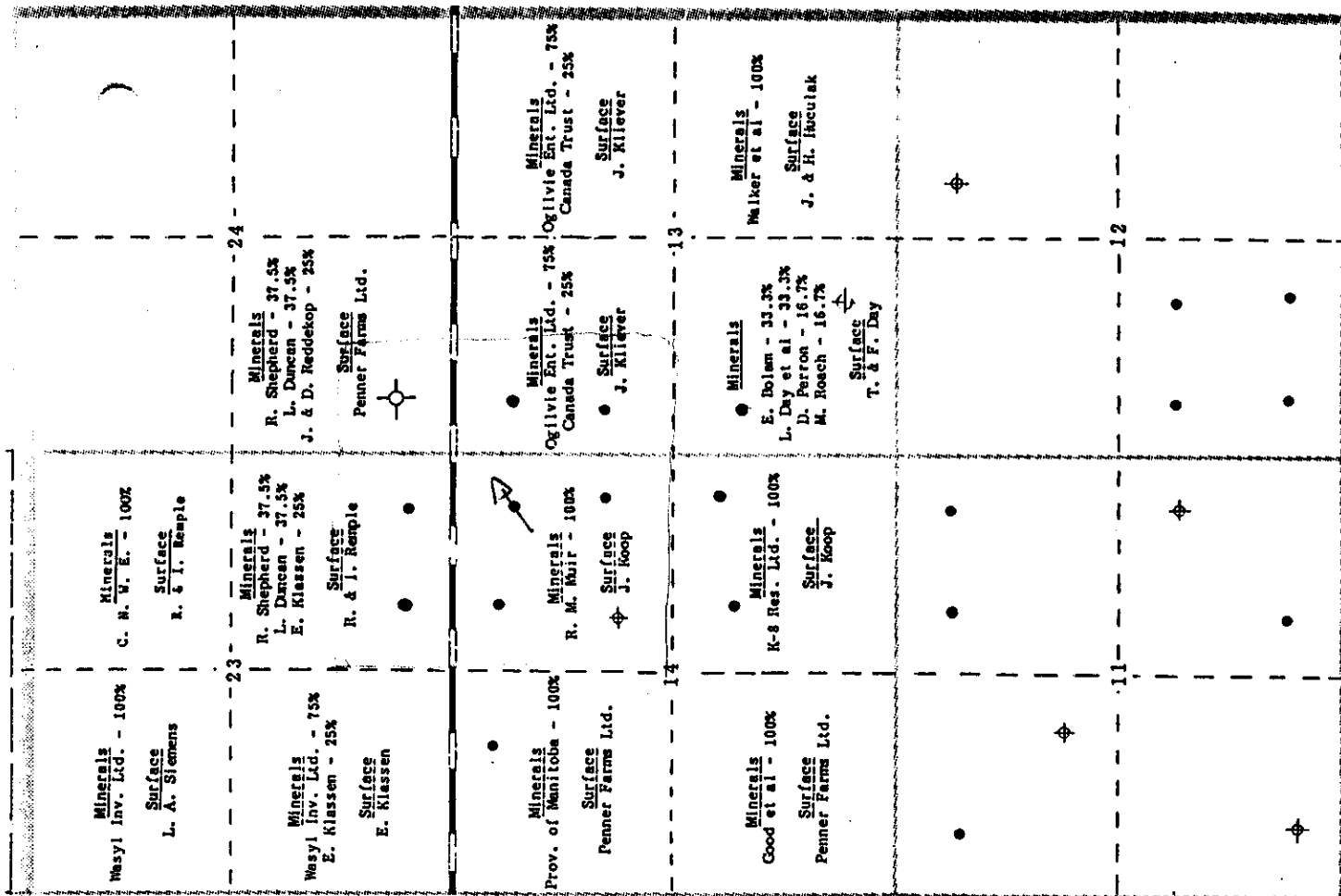
Open 100.000000

Tundra 100.000000

Tundra 100.000000

Open 100.000000

Open 100.000000





Energy and Mines

Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

May 31, 1990

Tundra Oil and Gas Ltd.
1313 One Lombard Place
WINNIPEG, Manitoba R3B 0X3

Attention: Mr. Dan Barchyn, P. Eng.
Exploration Manager

Dear Dan:

Re: MPR Application
Tundra Daly 5-13-10-29 (WPM)

In support of the subject application, please submit a composite plot of daily production versus time for the wells offsetting 5-13-10-29; 12-13-10-29, 8-14-10-29 and 9-14-10-29. Please indicate on the plot the date 5-13-10-29 went on production.

Will increasing production at 5-13-10-29 have any detrimental impact on the efficacy of the proposed pilot waterflood in the Daly Bakken D Pool? Would Tundra be prepared to accept a temporary (6) month increase in the MPR on the condition that additional reservoir pressure data be gathered?

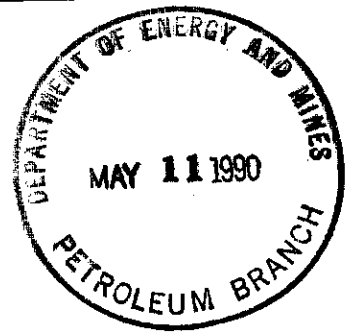
Yours truly,

A handwritten signature in dark ink, appearing to read 'J. N. Fox'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

JNF:dah

May 8, 1990



Department of Energy and Mines
Petroleum Branch
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4A5

Attention: Mr. John Fox
Chief Petroleum Engineer

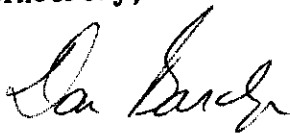
Dear John:

RE: TUNDRA DALY 5-13-10-29 WPM: OVERPRODUCTION

The above well has been and is currently producing only part-time and has had capability of producing significantly in excess of what has been produced during the past twelve months. In view of this, it is our intention to apply for an increase in the MPR, subject to section 51(3) of the Regulations. We are currently gathering the information necessary, including a full-time production test of the 5-13 well. An application will be submitted once the information is available.

In the meantime, I have instructed our operators to ensure that the monthly production for this well does not exceed 240 m³ in order to avoid any further accumulation of overproduction pending consideration of our application.

Sincerely,



Dan Barchyn, P. Eng.
Exploration Manager

DB/ck



Energy and Mines

Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

April 19, 1990

Tundra Oil and Gas Ltd.
1313 One Lombard Place
WINNIPEG, Manitoba R3B 0X3

Attention: Mr. Dan Barchyn

Dear Dan:

Re: Over-Production Tundra Daly 5-13-10-29 (WPM)

The maximum permissible production rate per well for the Daly Bakken D Pool is 240 m³ of clean oil per month. This letter is to advise you that the well Tundra Daly 5-13-10-29 has accumulated over-production of 362.6 m³ as of March 1, 1990.

Please submit to the Petroleum Branch by ~~May~~ 8, 1990 your plans to retire the over-production.

Yours truly,

A handwritten signature in black ink, appearing to be 'J. N. Fox', followed by a long horizontal line extending to the right.

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

PAGE NO. 1

*** STORE ***

ManPB

DALY5

90-06-01

WELL (0)05-13-010-29 WIN(0)

08:36:27

FIELD 1

PROVINCE MAN.

LAND#1 6

POOL 60

WORKING INTEREST 0.000002

LAND#2 0

BLOCK 4

DN PRDN 1989-03-15

LANB#3 4105

ACCTG 0

DN INJN NDT DN YET

MONTH	HOURS	OIL m3/M	WATER m3/M	OIL m3/d	WOR	CUM.OIL m3	CUM.WAT m3	
1989-03	288	121.0	34.3	10.1	0.28	121.0	34.3	
1989-04	264	104.6	6.4	9.5	0.06	225.6	40.7	
1989-05	720	290.6	27.5	9.7	0.09	516.2	68.2	
1989-06	552	220.6	23.6	9.6	0.11	736.8	91.8	
1989-07	600	277.7	21.1	11.1	0.08	1014.5	112.9	31
1989-08	696	329.7	19.8	11.4	0.06	1344.2	132.7	31
1989-09	672	305.3	24.1	10.9	0.08	1649.5	156.8	30
1989-10	720	306.4	35.8	10.2	0.12	1955.9	192.6	31
1989-11	672	286.0	34.5	10.2	0.12	2241.9	227.1	30
1989-12	720	298.3	41.6	9.9	0.14	2540.2	268.7	31
1990-01	720	301.1	32.7	10.0	0.11	2841.3	301.4	31
1990-02	576	236.4	34.4	9.9	0.15	3077.7	335.8	28
1990-03	744	322.3	39.2	10.4	0.12	3400.0	375.0	31

COMPOSITION PRODUCTION DECKWINE ANALYSIS

12-13-10-29

8-10-10-29

9-14-10-29

TIME LN(m3/d)

Apr/88 - Feb/89

0.083	2.293
0.167	2.092
0.25	1.96
0.333	1.917
0.417	1.887
0.5	1.808
0.583	1.758
0.667	1.775
0.75	1.723
0.833	1.609
0.917	1.686

Regression Output:

Constant	2.196532
Std Err of Y Est	0.074701
R Squared	0.870378
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s) -0.66433 ✓
 Std Err of Coef. 0.085457

exp. dec. rate

Jun/89 - Apr/90

0.083	2.542
0.167	2.468
0.25	2.425
0.333	2.219
0.417	2.197
0.5	2.152
0.583	2.116
0.667	2.041
0.75	1.902
0.833	1.902
0.917	1.808

Regression Output:

Constant	2.594113
Std Err of Y Est	0.042076
R Squared	0.972949
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s) -0.86604 ✓
 Std Err of Coef. 0.048134

exp. dec. rate

E NO. 1

T . . . STORE . . .

ManPB

DALY4

90-06-26

MPR APPLICATION

11:54:37

MONTH	PRDN	WELL COUNT INJN	P/IN	S/AB	HOURS	OIL #3/M	OIL #3/D	WOR
8-02	1	0	0	0	288	82.3	2.8	0.03
8-03	2	0	0	0	1008	240.3	7.8	0.07
8-04	2	0	0.083	0	1440	297.0	9.9	0.05
8-05	2	0	0.167	0	1464	249.9	8.1	0.07
8-06	2	0	0.25	0	1416	212.3	7.1	0.08
8-07	2	0	0.333	0	1464	210.6	6.8	0.07
8-08	2	0	0.417	0	1488	205.3	6.6	0.06
8-09	2	0	0.5	0	1416	183.0	6.1	0.09
8-10	2	0	0.583	0	1440	180.3	5.8	0.13
8-11	2	0	0.667	0	1440	178.1	5.9	0.08
8-12	2	0	0.75	0	1488	175.0	5.6	0.08
9-01	2	0	0.833	0	1368	155.0	5.0	0.11
9-02	2	0	0.917	0	1296	152.2	5.4	0.04
9-03	3	0	1.0	0	1632	227.9	7.4	0.12
9-04	3	0	0	0	1560	229.0	7.6	0.11
9-05	3	0	0	0	1416	250.7	8.1	0.14
9-06	3	0	0.083	0	1848	380.1	12.7	0.27
9-07	3	0	0.167	0	2064	366.3	11.8	0.18
9-08	3	0	0.25	0	2100	349.0	11.3	0.21
9-09	3	0	0.333	0	2088	276.7	9.2	0.18
9-10	3	0	0.417	0	2160	279.9	9.0	0.18
9-11	3	0	0.5	0	2064	258.6	8.6	0.16
9-12	3	0.583	0.667	0	2160	256.5	8.3	0.21
10-01	3	0.667	0.75	0	2232	237.8	7.7	0.15
10-02	3	0.75	0.833	0	1848	188.8	6.7	0.14
10-03	3	0.833	0.917	0	2184	207.1	6.7	0.17
10-04	3	0.917	1.0	0	2136	182.0	6.1	0.22

.917

 $\ln(m^3/d)$

LINEAR REGRESSION

X TIME - 1 mil = .08333 yrs.

Y $\ln(m^3/d)$ @ LN()

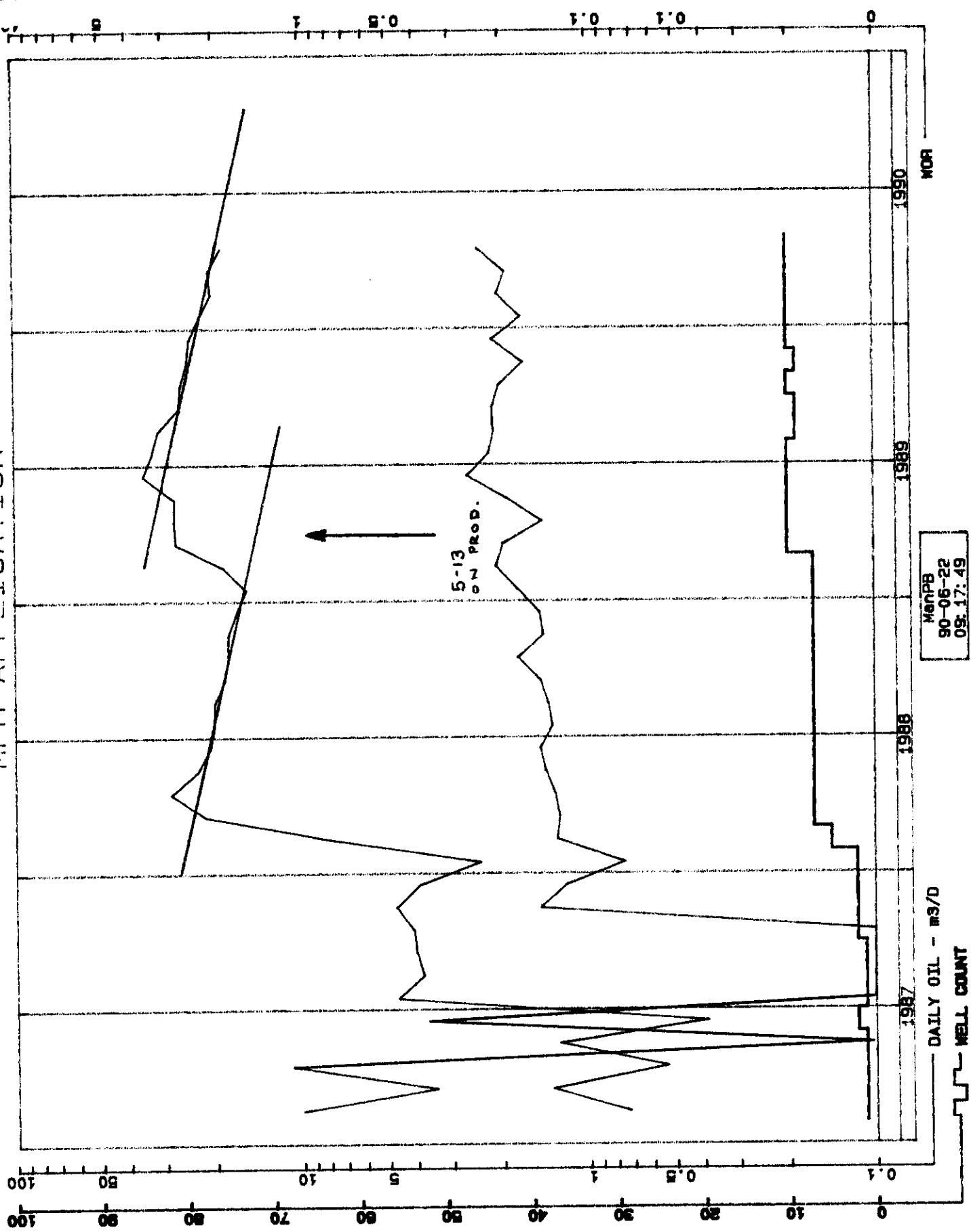
$\left\{ \begin{array}{l} \text{X = cumulative prod.} \\ \text{to density of } \end{array} \right.$

← 9-14 on prod.

2.542
 2.468
 2.425
 2.219
 2.197
 2.152
 2.116
 2.041
 1.902
 1.902
 1.8808

OFFSET PRODUCTION
 12-13 7-14 15-14
 13-13 8-14 16-14
 9-14

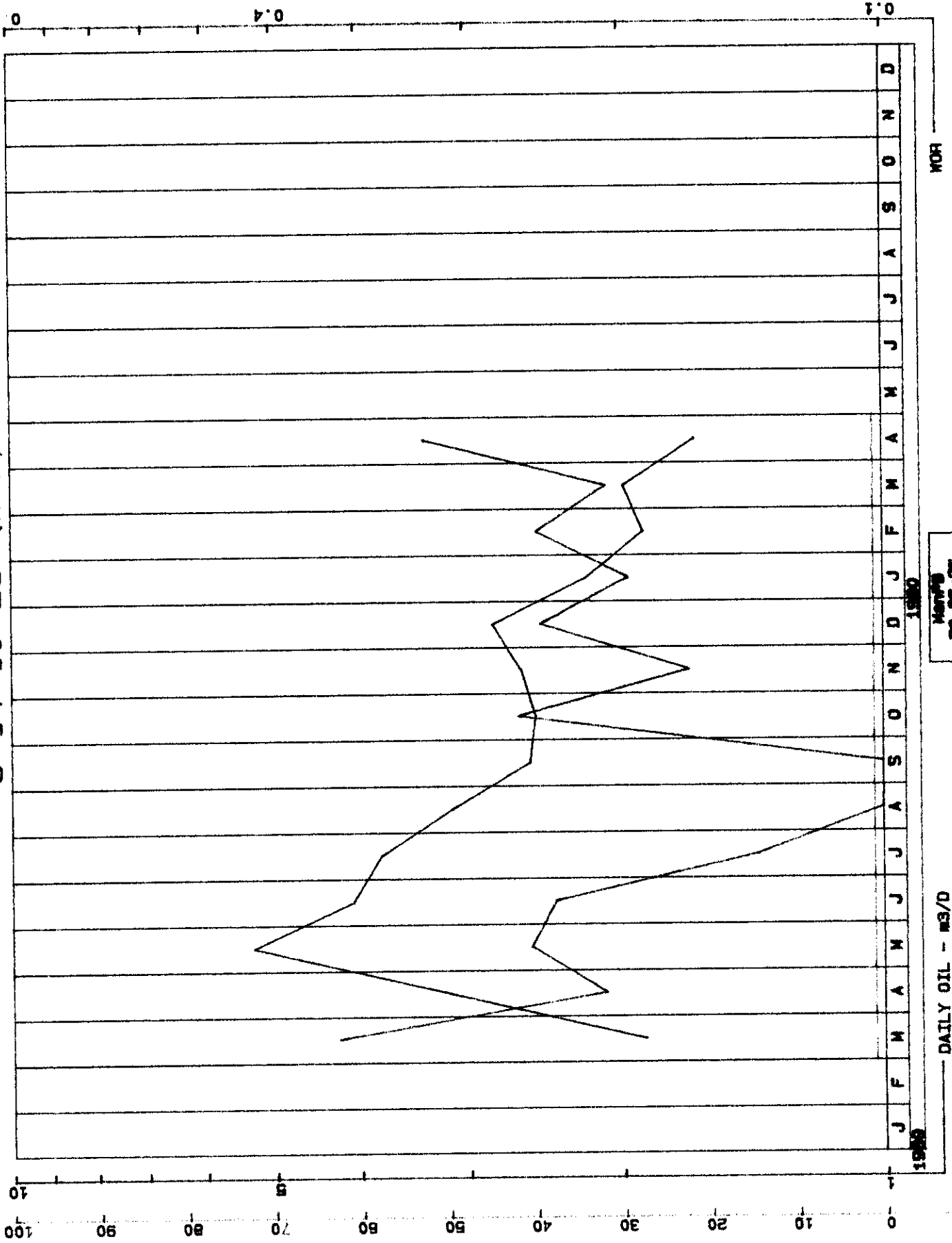
MPR APPLICATION



ManPB
 90-06-22
 09:17:49

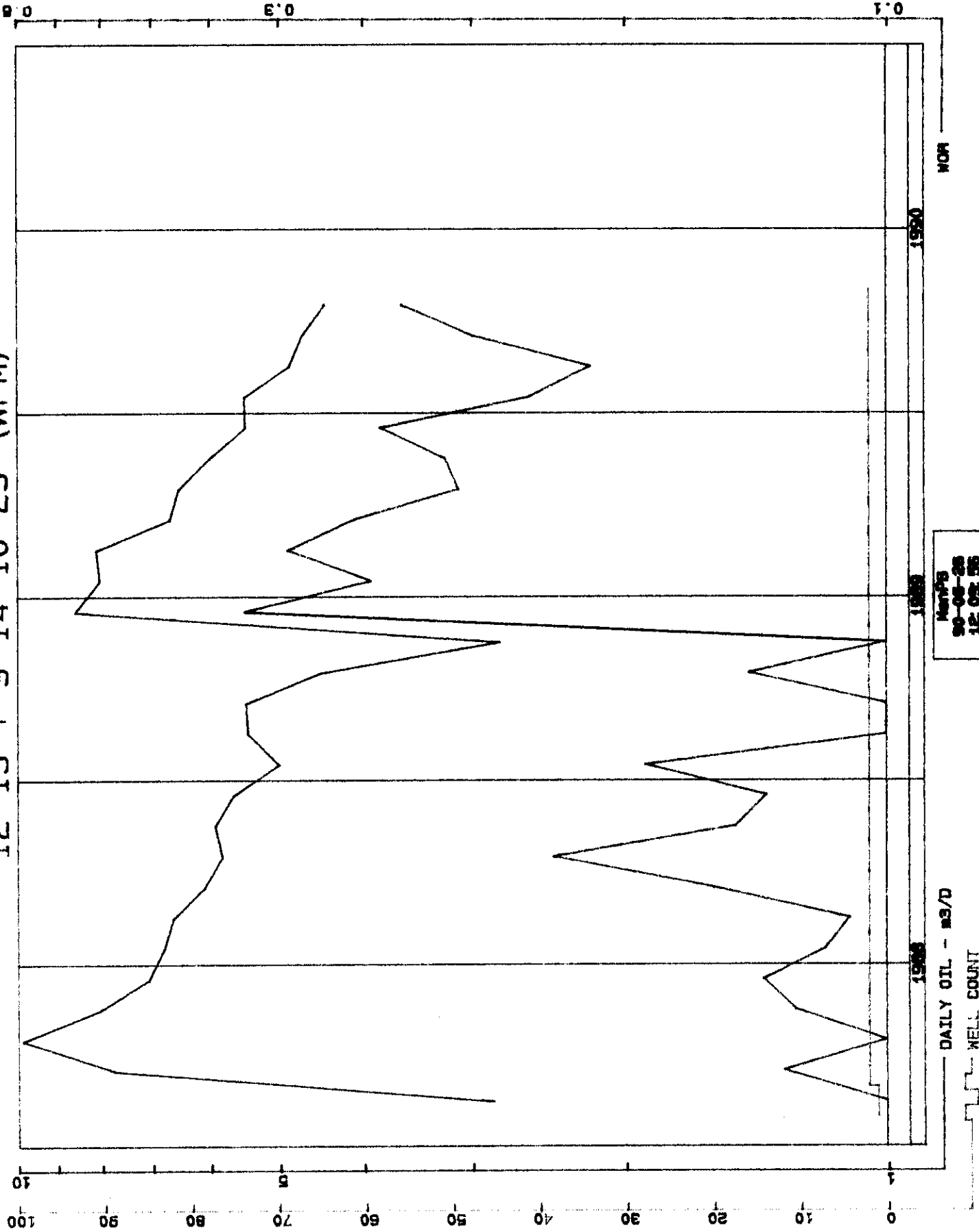
NOR

8-14-10-29 (WPM)



WELL COUNT
DAILY OIL - M3/D
8-14-10-29
90-08-26
11:43:23

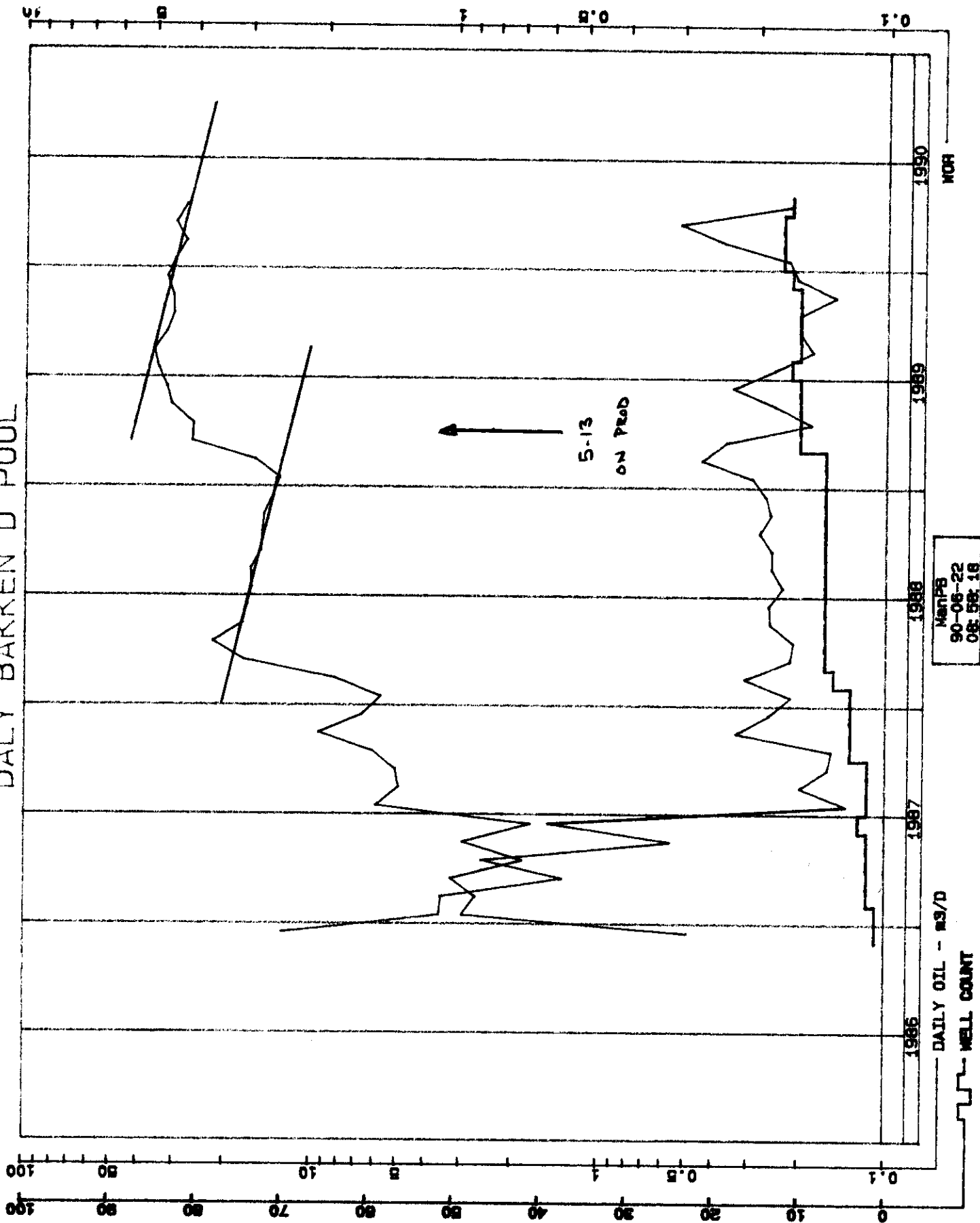
12-13 + 9-14-10-29 (WPM)



DAILY OIL - m3/D
WELL COUNT

12-13 + 9-14-10-29 (WPM)

DALY BAKKEN D POOL



NPR INCREASE S-13-10-29

1/ REVIEW POOL PRESSURE DECLINE (HISTORY S-13)

$$\bar{P}_R = 8600$$

$$P^* = 5400 \text{ KPa.}$$

$$\text{DST S-13 (Feb/89)} \quad p^* = 7426 \text{ KPa}$$

$$\text{discovery well 7-14 DST Feb/87} \quad \bar{P}_R = 8591 \text{ KPa}$$

2/ EFFECT OF INCREASE PRODUCTION \rightarrow S-13 ON WATERFLOOD PERFORMANCE - pilot WF appl^d - evaluate after 3 mos.
90-03-15

3/ REVIEW 8-14 PERFORMANCE

4/ OOIP S-13 $\text{OOIP/m}^3 \text{ area} = .12 * 16 * 10000 =$
Cum PROD (90-04) 3694 m³
- aver. primary recovery 27.5%

(5) S-13 AVER. PROD 89-07 to 90-03 - 9.7 m³/cal. d

(6) NPR EXCEPTION FOR N. EBOR UNIT No. 1 on DAILY BACKEN D POOL

(7) PRELIMINARY CONSIDERING CONCERNS PRESSURE DEPLETION & PENDING IMPLEMENTATION OF PILOT WATERFLOOD IN BACKEN D POOL + APPLICATION NOT TECHNICALLY SUPPORTED - INDICATIONS OFFSET PRODUCTION EXPERIENCED SLIGHT INCREASE IN DECLINE