

**Home Oil Company Limited**

Home 32  
be Savings



26 August 1991

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3

Attention: John N. Fox

Dear Sir:

RE: Home Oil - Petroleum Branch Meeting

Home Oil would like to discuss the following items at our meeting scheduled for August 28, 1991 (10:30 a.m.) in your offices:

1. 1991 South Pierson drilling results
2. Update on progress of South Pierson simulation
3. Future incentive programs
4. Other business

The following five Home Oil staff will be attending:

Dave Bertram  
Gary Harrison  
Allan Willms  
John Brook  
Don Cairns

Yours truly,

HOME OIL COMPANY LIMITED

A.R. Willms, P. Eng.  
Reservoir Engineering

ARW/jlc

cc: D.A. Bertram  
G.B. Harrison  
J.R. Brook  
D.A. Cairns  
Day File

MEETING - HONE OIL - PIERSON AREA

AUG 28/91

ATTENDEES

HONE OIL

DAVE BOSTROM  
GARY HARRISON  
DON CHANG  
AL WILLIS  
JOHN BROOK

PETROLEUM

JOHN FOX  
BOB SUBRENT  
Bred  
Cand

- probably end of Sep/91 for submission of depletion study

10-19 ON PROD. AUG/91

- 8-9 RECOMPLETED LAR

- 1990 DOWNSIZED FRACS, AVERAGE WATER-CUT LOWER  
7-10 TONNES

- SEC 1 FRAC INTO MISSISSIPPIAN

- JUNE/91 SASK/MB LANDS APPROACHED TUNBER, GIRON,  
ANTWERP RVR FOR FARM-OUT - NO INTEREST

- NO GAS CONSERVATION, USE FULL GAS.

200 NCFD

PRODUCERS

WANTS GUARANTEED PRODUCTION VOL.  $150 \text{ m}^3$

NOT MUCH TRANSPORTATION SAVING OVER TRUCKING

- TIE-IN AT GAINSBOROUGH, ONE OPTION  
FEDERATED BUILD LINE

- REPLACED 2-6 WITH 14-11 AS CROWN OFFSET

- PROPOSED 20 WBLs FOR 1992 BUDGET (INCLUDES  
3 COMMITMENT WBLs) - 20% OF PROPOSED  
DEVELOPMENT BUDGET

- PERSON ECONOMICS FAVOURABLE BUT NEED  
INCENTIVES

SIMULATION STUDY 10-8, 12-9, 14-9, 2-16, 4-16, 6-16  
+ 8-17

- difficulty history match

- relative k curve indicate when bubble pt.  
reached, rapid increase in gas prod.  $\rightarrow$  rapid  
pressure depletion

- used oil-based core @ 12-19 for relative  
permeability study (2-4 w/ plugs used)

\* - check if P.B. has <sup>special core</sup> study

- conclusion - not dealing with volumetric reservoir,  
hydrocarbon migration obvious, 1-10 w/ in-situ  
permeability to air

① Has individual well performance decline

(NO)

- increase production - declined

- higher work

- pressure data (GOR's) 52.5 - 85.5 - 2 1988.9,

②	<del>Spring 1990</del> Drill & Com	\$ 180 M	→	<u>1991</u> \$ 140 M
	Complete	\$ 75 M		\$ 65 M
	Artificial Lift	\$ 30 M		\$ 30 - 35 M
	Tie-in	\$ 35 M		\$ 7 - 10 M
		<u>\$ 320 M</u>		<u>\$ 250 M</u>

③ Board Order No. 546 Oct 31/91

- application to continue 32 La due Aug 31/91

to include economic review (16 La) +

determination of recovery - 16 La spacing

④ WATERSTUDY FEASIBILITY STUDY - Aug 31/91 (Pinson - LA (2nd))  
- which wells in communication with MC. 8-8 & 14-10

⑤ MPR Approval Board Order No. 80A OCT 31/91

14 m<sup>3</sup>/d & 360 L<sup>3</sup>/L-TH

APPLN Aug 31/91

- oil/water chemistry between LAR & MC undifferentiated

- original sourcing microfracturing <sup>MISS.</sup> & vertical fracture (leaked) evident in MISS.

- almost continuous staining between MISS. & LAR.

- trend of this underlying dolomitic / anhydritic MISS. caprock follows pool productive limits.

o/w contact - SSS & SS.

- structural nose focus oil migration into area

-  $\bar{P} = 8000$  kPa.

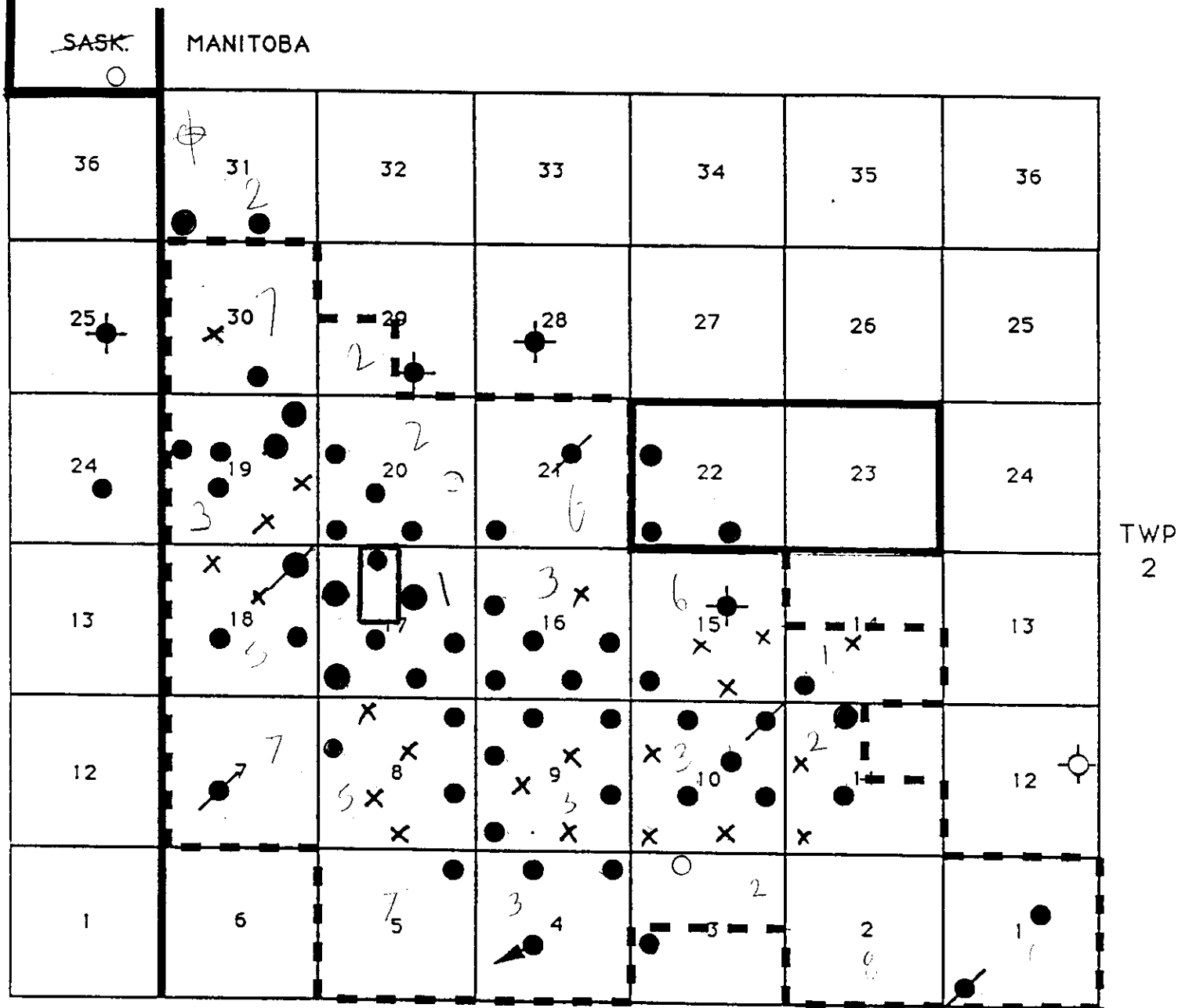
- low priority as horizontal well candidate  $\rightarrow$  must be frac'd, possible damage

- 10-19 unusual well, water leg, upper  $\phi$  stringer, not perforated

Aug /91

FIGURE 1

# SOUTH PIERSON AREA



R.30

R. 29 W1M

———— 32 ha SPACING AREA NOT INCLUDED IN APPLICATION

----- APPLICATION AREA FOR INCREASE IN  
MAXIMUM PERMISSABLE PRODUCTION RATE

○ LICENCED LOCATIONS

X 1991 LOCATIONS

PIERSON FIELD

OIL WATER	Cum.Prod. Dec.31/90 m <sup>3</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	JUNE Daily m <sup>3</sup>	1991 Y.T.D. m <sup>3</sup>	Cum. Total m <sup>3</sup>
LAm A POOL 07 29A																
NON-UNIT PREVIOUS	42.0															42.0
PRODUCERS	112.5															112.5
LAm A	42.0		-		-		-									42.0
POOL :	112.5		-		-		-									112.5
TOTAL OIL		-		-		-									-	
TOTAL WATER		-		-		-									-	

LAm B POOL  
07 29B

LYLETON CORPORATION

09 -24-02-29	7051.2	40.4	50.2	49.8	50.1	47.4	42.0							1.40	279.9	7331.1
	44 717.5	415.0	355.5	415.9	388.0	414.2	393.2								2 381.8	47 099.3

T.D.L. PETROLEUMS INC.

03 -24-02-29	67.5	-	-	-	-	-	-								-	67.5
	60.5	-	-	-	-	-	-								-	60.5

TUNDRA OIL AND GAS LTD.

04 -19-02-28	567.3	45.0	37.9	38.8	34.0	36.3	34.2							1.14	226.2	793.5
	173.7	8.1	15.7	5.0	16.4	17.7	14.0								76.9	250.6
12 -19-02-28	113.5	1.1	0.9	1.0	0.7	0.7	0.8							0.03	5.2	118.7
	2.5	-	-	-	-	-	-								-	2.5
08 -24-02-29	1 611.1	47.9	43.0	34.6	44.7	43.6	41.6							1.39	255.4	1 866.5
Prov.	233.5	8.6	7.6	6.3	2.1	4.8	5.2								34.6	268.1
	2 291.9		81.8		79.4		76.6									2 778.7
	409.7		23.3		18.5		19.2									521.2
TOTAL OIL		94.0		74.4		80.6									486.8	
TOTAL WATER		16.7		11.3		22.5									111.5	

NON-UNIT PREVIOUS	1 744.5															1 744.5
PRODUCERS	4 100.3															4 100.3
LAm B	11 155.1		132.0		129.5		118.6									11 921.8
POOL :	49 288.0		378.8		406.5		412.4									51 781.3
TOTAL OIL		134.4		124.2		128.0									766.7	
TOTAL WATER		431.7		427.2		436.7									2 493.3	

PIERSON FIELD

OIL WATER	Cum.Prod. Dec. 31/90 m <sup>3</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	JUNE Daily m <sup>3</sup>	1991 Y.T.D. m <sup>3</sup>	Cum. Total m <sup>3</sup>
Lam C POOL 07 29C																
HOME OIL COMPANY LIMITED																
14 -04-02-29	4 202.5	98.3	105.8	103.5	97.4	91.8	93.5							3.12	590.3	4 792.8
Prov.	1 508.6	18.1	19.1	22.6	18.5	17.6	20.5								116.4	1 625.0
16 -04-02-29	953.5	73.6	64.4	85.3	62.6	63.3	55.8							1.86	405.0	1 358.5
Prov.	472.2	22.7	10.7	11.6	5.4	12.1	19.8								82.3	554.5
16 -05-02-29	7 971.6	53.2	35.8	47.7	61.9	74.7	79.1							2.64	352.4	8 324.0
	8 045.1	78.7	67.8	84.0	90.8	94.8	114.0								530.1	8 575.2
08 -08-02-29	6 670.5	195.0	217.1	244.4	246.3	227.4	212.1							7.07	1 342.3	8 012.8
Prov.	12 473.2	350.7	386.1	439.3	422.0	358.7	401.6								2 358.4	14 831.5
12 -08-02-29 (06/13)	—	—	—	—	—	—	115.2							12.80	115.2	115.2
	—	—	—	—	—	—	—								—	—
16 -08-02-29	7 250.6	73.2	76.8	74.8	84.5	82.4	81.3							2.71	473.0	7 723.6
	1 429.0	2.1	3.1	1.6	2.5	1.3	1.5								12.1	1 441.1
04 -09-02-29	3 620.3	117.1	93.9	101.7	97.6	89.3	88.5							2.95	588.1	4 208.4
	11 601.5	278.7	233.7	256.9	237.1	193.8	256.0								1 456.2	13 057.7
08 -09-02-29 (06/19)	—	—	—	—	—	—	1.9							0.95	1.9	1.9
	—	—	—	—	—	—	17.3								17.3	17.3
12 -09-02-29	6 707.9	164.2	130.9	151.1	155.7	151.0	140.9							4.70	893.8	7 601.7
	1 389.6	28.3	24.7	21.6	9.0	9.6	10.9								104.1	1 493.7
14 -09-02-29	5 051.8	122.7	125.6	149.6	143.0	105.5	90.1							3.00	736.5	5 788.3
	42 122.6	1551.6	1343.9	1494.7	1349.7	1136.5	1429.6								8 306.0	50 428.6
16 -09-02-29	8 911.3	252.7	233.5	333.8	310.0	294.4	278.7							9.29	1 703.1	10 614.4
	1 096.3	23.4	19.1	25.3	28.9	25.3	33.2								155.2	1 251.5
06 -10-02-29	3 675.6	106.8	92.2	97.7	121.5	124.8	124.9							4.16	667.9	4 343.5
	18 291.4	741.8	658.9	763.3	661.6	590.6	724.2								4 140.4	22 431.8
08 -10-02-29	2 900.6	65.8	87.2	107.1	85.8	87.3	68.9							2.30	502.1	3 402.7
	29 648.5	763.1	784.7	899.8	823.7	655.6	835.4								4 762.3	34 410.8
10 -10-02-29	401.2	—	56.4	49.9	50.5	46.6	48.9							1.63	252.3	653.5
Prov.	1 495.8	—	548.6	524.6	487.9	340.8	352.6								2 254.5	3 750.3
14 -10-02-29	1 728.1	250.4	196.6	209.0	114.5	108.3	135.9							4.53	1 014.7	2 742.8
	3 158.0	395.6	311.4	358.6	324.1	230.6	289.8								1 910.1	5 068.1
16 -10-02-29	—	—	—	—	—	—	—								—	—
Prov.	251.1	—	—	—	—	—	—								—	251.1
06 -11-02-29	461.4	52.3	50.2	62.2	47.1	38.8	50.0							2.17	300.6	762.0
Prov.	208.7	21.8	12.4	14.6	17.3	9.5	12.7								88.3	297.0
04 -14-02-29	1 288.9	183.7	198.9	207.6	190.9	191.7	186.7							6.22	1 159.5	2 448.4
Prov.	294.3	9.6	4.0	6.8	10.9	7.4	5.4								44.1	338.4
04 -15-02-29	9 367.1	173.5	158.4	154.7	152.5	147.6	134.0							4.47	920.7	10 287.8
	819.0	14.1	7.0	2.9	2.6	9.2	13.2								49.0	868.0
02 -16-02-29	1 010.3	145.1	140.8	147.1	127.5	114.8	77.8							3.89	753.1	1 763.4
Prov.	82.9	7.2	1.3	1.1	0.6	0.8	0.7								11.7	94.6
04 -16-02-29	2 111.5	191.5	164.6	171.5	157.3	150.0	142.3							4.74	977.2	3 088.7
Prov.	102.2	1.6	2.4	1.5	0.9	3.2	1.6								11.2	113.4
06 -16-02-29	1 725.4	77.6	57.6	250.1	165.6	139.5	126.5							4.22	816.9	2 542.3
Prov.	256.3	1.2	3.0	10.3	7.0	5.3	6.4								33.2	289.5
08 -16-02-29	558.0	46.5	39.2	45.4	48.2	42.8	49.8							1.66	271.9	829.9
Prov.	144.0	1.6	1.3	1.4	0.9	0.5	0.2								5.9	149.9
12 -16-02-29	415.2	89.6	73.7	78.1	74.6	74.0	67.3							2.24	457.3	872.5
Prov.	12.2	0.3	0.1	0.3	0.2	0.3	0.3								1.5	13.7



**LAm C POOL  
07 29C**

**PIERSON FIELD**

OIL WATER	Cum.Prod. Dec. 31/90 m <sup>3</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	JUNE Daily m <sup>3</sup>	1991 Y.T.D. m <sup>3</sup>	Cum. Total m <sup>3</sup>
<b>HOME OIL COMPANY LIMITED (Cont.)</b>																
02 -17-02-29	1 113.1	154.2	129.3	133.8	126.2	122.4	115.5									
	21.8	4.2	2.3	0.8	2.6	3.7	2.6							3.85	781.4	1 894.5
04 -17-02-29 (02/21)	—	—	17.2	140.4	75.2	70.1	75.2							2.51	378.1	578.1
	—	—	13.3	64.2	52.9	42.4	14.1								186.9	186.9
06 -17-02-29	1 262.2	25.6	35.3	27.3	23.4	21.4	15.8							0.53	148.8	1 411.0
	7 210.7	179.8	170.1	186.1	167.3	143.0	182.1								1 028.4	8 239.1
08 -17-02-29	461.7	67.1	65.8	64.4	59.1	56.4	14.1							1.76	326.9	788.0
	42.7	0.8	0.6	1.0	0.6	0.3	0.1								3.4	49.1
10 -17-02-29 (02/21)	—	—	2.8	151.4	83.8	53.5	57.6							1.99	349.1	349.1
	—	—	—	17.4	29.2	13.7	11.6								71.9	71.9
12 -17-02-29 (02/02)	—	—	65.7	72.7	62.6	49.4	59.3							1.98	309.7	309.7
	—	—	98.4	38.4	17.9	15.9	12.9								183.5	183.5
06 -18-02-29	343.9	29.1	21.7	24.3	21.8	16.3	15.8							0.54	129.0	472.8
	353.9	24.8	20.1	22.3	19.5	13.4	16.7								116.8	470.7
08 -18-02-29 Prov.	607.7	93.3	70.4	78.9	69.7	59.5	61.2							2.11	433.0	1 040.7
	117.3	15.6	12.8	9.5	9.5	8.1	2.9								58.4	175.7
16 -18-02-29 (02/09)	—	—	6.8	—	—	—	—								6.8	6.8
	—	—	6.6	24.2	—	—	—								30.8	36.4
16 -19-02-29 (02/10)	—	—	36.4	144.6	198.1	158.7	190.5							6.57	728.3	728.3
	—	—	98.9	384.7	400.5	293.6	341.4								1 519.1	1 519.1
02 -20-02-29	87.3	3.3	10.4	7.7	4.7	4.3	2.1							0.07	32.5	119.8
	108.5	6.2	19.5	15.9	11.5	10.6	14.1								77.8	186.3
04 -20-02-29 Prov.	446.6	59.5	42.3	50.8	47.6	41.5	40.1							1.34	281.8	728.4
	145.7	11.4	9.8	9.3	4.1	0.7	6.5								41.8	187.5
06 -20-02-29 Prov.	100.6	16.8	11.0	13.2	17.1	20.4	18.0							0.60	96.5	197.1
	74.4	10.0	9.9	10.0	6.6	4.5	3.9								44.9	119.3
12 -20-02-29 Prov.	753.6	78.1	77.9	85.0	101.3	83.9	61.5							2.20	487.7	1 241.3
	152.7	14.0	21.0	13.6	18.6	12.2	5.8								85.2	237.9
04 -21-02-29	280.2	18.1	5.2	20.2	11.7	9.6	—								64.8	345.0
	7 239.5	1144.3	1420.9	1820.4	995.4	725.4	—								6 106.4	13 345.9
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	82 440.2		2 997.8		3 497.3		3 176.8									102 290.4
	150 369.7		6 347.5		6 237.8		5 161.6									186 391.5
TOTAL OIL		3 077.9		3 887.0		3 213.4									19 850.2	
TOTAL WATER		5 723.3		7 560.6		4 991.0									36 021.8	
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<b>TUNDRA OIL AND GAS LTD.</b>																
02 -22-02-29	—	—	—	65.5	81.0	56.4	48.8									
Prov.(03/17)	—	—	—	32.6	56.0	42.6	30.3							1.63	251.7	251.7
															161.5	161.5
04 -22-02-29	624.4	34.6	—	52.9	36.6	40.5	41.2							1.37	205.8	830.2
Prov.	187.9	19.3	—	9.8	11.9	24.1	11.4								76.5	264.4
12 -22-02-29	—	—	—	48.8	32.5	13.1	26.5							0.88	120.9	120.9
Prov.(03/13)	—	—	—	46.1	37.8	41.6	16.8								142.3	142.3
	624.4		—		150.1		116.5									1 202.8
	187.9		—		105.7		58.5									568.2
TOTAL OIL		34.6		167.2		110.0									578.4	
TOTAL WATER		19.3		88.5		108.3									380.3	

**LAm C POOL  
07 29C**

**PIERSON FIELD**

OIL WATER	Cum.Prod. Dec. 31/90 m <sup>3</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	JUNE Daily m <sup>3</sup>	1991 Y.T.D. m <sup>3</sup>	Cum. Total m <sup>3</sup>
NON-UNIT PREVIOUS PRODUCERS	115.0 827.8															115.0 827.8
LAm C POOL :	83 179.6 151 385.4		2 997.8 6 347.5		3 647.4 6 343.5		3 293.3 5 220.1									103 608.2 187 787.5
TOTAL OIL		3 112.5		4 054.2		3 323.4									20 428.6	
TOTAL WATER		5 742.6		7 649.1		5 099.3									36 402.1	

**LAm D POOL  
07 29D**

**HOME OIL COMPANY LIMITED**

06 -19-02-29	5 598.2	142.4	136.2	113.5	135.1	131.7	101.9							3.51	760.8	6 359.0
	278.8	11.9	10.7	4.7	4.1	2.5	2.1								36.0	314.8
11 -19-02-29	3 184.4	177.0	142.0	173.7	149.1	132.3	119.9							4.00	894.0	4 078.4
	269.1	10.9	3.8	6.0	3.2	2.8	3.3								30.0	299.1
12 -19-02-29	37.3	41.8	47.2	37.8	28.9	25.8	20.2							0.78	201.7	239.0
	440.2	376.5	299.5	339.5	355.7	294.4	322.6								1 988.2	2 428.4
	8 819.9		325.4		313.1		242.0									10 676.4
	988.1		314.0		363.0		328.0									3 042.3
TOTAL OIL		361.2		325.0		289.8									1 856.5	
TOTAL WATER		399.3		350.2		299.7									2 054.2	

NON-UNIT PREVIOUS PRODUCERS	—															—
LAm D POOL :	8 819.9 988.1		325.4 314.0		313.1 363.0		242.0 328.0									10 676.4 3 042.3
TOTAL OIL		361.2		325.0		289.8									1 856.5	
TOTAL WATER		399.3		350.2		299.7									2 054.2	

**LAm E POOL  
07 29E**

**HOME OIL COMPANY LIMITED**

04 -01-02-29	84.8	—	—	—	—	—	—	—	—	—	—	—	—	—	84.8
	1 363.4	—	—	—	—	—	—	—	—	—	—	—	—	—	1 363.4
10 -01-02-29	22.0	—	—	—	—	—	—	—	—	—	—	—	—	—	22.0
	373.0	—	—	—	—	—	—	—	—	—	—	—	—	—	373.0
<hr/>															
	106.8	—	—	—	—	—	—	—	—	—	—	—	—	—	106.8
	1 736.4	—	—	—	—	—	—	—	—	—	—	—	—	—	1 736.4
TOTAL OIL		—	—	—	—	—	—	—	—	—	—	—	—	—	
TOTAL WATER		—	—	—	—	—	—	—	—	—	—	—	—	—	
<hr/>															
LAm E	106.8	—	—	—	—	—	—	—	—	—	—	—	—	—	106.8
POOL :	1 736.4	—	—	—	—	—	—	—	—	—	—	—	—	—	1 736.4
TOTAL OIL		—	—	—	—	—	—	—	—	—	—	—	—	—	
TOTAL WATER		—	—	—	—	—	—	—	—	—	—	—	—	—	

PIERSON FIELD

OIL WATER	Cum.Prod. Dec. 31/90 m <sup>3</sup>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	JUNE Daily m <sup>3</sup>	1991 Y.T.D. m <sup>3</sup>	Cum. Total m <sup>3</sup>
--------------	-------------------------------------------	------	------	------	------	-----	------	------	------	------	------	------	------	---------------------------------	----------------------------------	---------------------------------

LAm F POOL  
07 29F

HOME OIL COMPANY LIMITED

06 -07-02-29	41.6 699.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.6 699.8
NON-UNIT PREVIOUS PRODUCERS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAm F POOL :	41.6 699.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.6 699.8
TOTAL OIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL WATER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

LAm G POOL  
07 29G

HOME OIL COMPANY LIMITED

02 -30-02-29	1 012.1 81.9	37.1 19.8	72.3 3.8	172.8 11.5	146.3 8.3	147.6 4.0	154.8 1.9	-	-	-	-	-	-	5.16 730.9 49.3	730.9 49.3	1 743.0 131.2
LAm G POOL :	1 012.1 81.9	-	72.3 3.8	-	146.3 8.3	-	154.8 1.9	-	-	-	-	-	-	-	-	1 743.0 131.2
TOTAL OIL	-	37.1	-	172.8	-	147.6	-	-	-	-	-	-	-	-	730.9	-
TOTAL WATER	-	19.8	-	11.5	-	4.0	-	-	-	-	-	-	-	-	49.3	-

MISSION CANYON 3b B POOL  
07 42B

TUNDRA OIL AND GAS LTD.

06 -07-03-28	1 938.4 4 342.4	41.0 227.9	40.0 220.4	44.2 230.9	42.7 221.5	45.1 215.6	44.4 266.5	-	-	-	-	-	-	1.48 1 382.8	257.4 5 725.2	2 195.8 5 725.2
10 -07-03-28	3 025.7 5 262.2	24.7 82.2	24.0 81.5	27.1 84.3	26.1 72.7	27.1 70.9	29.5 72.7	-	-	-	-	-	-	0.98 464.3	158.5 5 726.5	3 184.2 5 726.5
11 -07-03-28	9 718.7 10 190.7	65.8 153.0	64.0 147.9	70.7 155.0	68.5 145.3	72.2 138.8	76.1 137.7	-	-	-	-	-	-	2.62 877.7	417.3 10 136.0 11 068.4	10 136.0 11 068.4
12 -07-03-28	3 734.9 12 602.8	52.0 352.8	50.7 341.2	56.0 357.4	23.5 201.2	12.0 159.5	13.1 163.7	-	-	-	-	-	-	0.44 1 575.8	207.3 14 178.6	3 942.2 14 178.6
14 -07-03-28	2 955.6 2 674.3	22.6 3.2	21.3 3.0	23.6 3.2	22.8 3.0	29.0 3.8	29.5 21.2	-	-	-	-	-	-	0.98 37.4	148.8 2 711.7	3 104.4 2 711.7
15 -07-03-28	11 726.4 26 053.5	33.9 287.1	32.0 268.7	35.3 281.5	35.3 279.3	36.1 262.9	39.4 269.8	-	-	-	-	-	-	1.31 1 649.3	212.0 11 938.4 27 702.8	11 938.4 27 702.8
03 -18-03-28	6 054.6 11 282.6	84.6 0.8	88.0 3.0	74.5 2.4	97.1 3.1	99.3 2.9	83.0 2.3	-	-	-	-	-	-	3.61 14.5	526.5 11 297.1	6 581.1 11 297.1
13 -01-03-29	3 630.1 8 297.8	49.5 182.1	38.4 144.7	43.0 158.3	43.8 145.5	35.2 163.7	39.6 145.8	-	-	-	-	-	-	1.32 940.1	249.5 9 237.9	3 879.6 9 237.9



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

JUL 31 1990

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

Dear Mr. Barchyn:

RE: South Pierson Area  
Special 32 ha Drilling Spacing Units

The Board has jointly reviewed Tundra's and Home's applications for special 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area.

The Board has extended the interim approval of 32 ha spacing in the South Pierson area to include the additional lands requested in the applications. A copy of Board Order No. SU 6 establishing 32 ha spacing units for the Lower Amaranth Formation is attached. Board Order No. SU 6 replaces Board Order No. SU 5 and includes the lands covered by that Board Order.

As a result of concerns expressed by the Petroleum Branch and freehold mineral owners, who objected to these and previous applications, regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation and the limited amount of geological, reservoir, production and pressure data available, the Board has chosen to limit the term of the approval of 32 ha spacing to October 31, 1991.

If you wish to have the special drilling spacing units established by Board Order No. SU 6 extended past the expiry date, you are directed to submit, prior to August 31, 1991, an appropriate application under Section 20 of the Petroleum Drilling and Production Regulation. The application should include a review of the economics of developing the Lower Amaranth Formation on 16 ha spacing, paying particular attention to determination of the level of incremental recovery associated with reduced spacing.

HOME OIL - AL WILMS (403) 232-7362

• HOME TO APPLY FOR CONTINUATION ON ONLY  
LANDS OWN TO COMPANY - HOC TO  
SUPPLY LIST OF ADJACENT OWNERS W10/120

• TUNDRA (91-09-24) ASKED TO  
WALK AROUND FOR CONTINUATION, ETC.

• BOARD NOTICE TO REFER TO APPL'S  
AND PREVIOUS ORDER AROUND

Tundra is requested to conduct an annual pressure survey on at least one well in Section 22-2-29 (WPM) commencing this year to determine the static reservoir pressure. Tundra shall submit to the Petroleum Branch a list of the well(s) to be surveyed, the measurement technique to be used and the intended shut-in time for the well(s) and approval shall be obtained from the Director of Petroleum before the survey is carried out.

If you have any questions in respect of this matter, please contact L.R. Dubreuil, Director of Petroleum, or John Fox, Chief Petroleum Engineer, at 945-6573 and 945-6574 respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
IAN HAUGH

Ian Haugh  
Chairman

Encl.

Date typed: July 16, 1990

JNF/cvs



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

*Jul 31 1991*

Mr. K.R. Brown, P. Eng.  
Manager, Reservoir Engineering  
Home Oil Company Limited  
1700 Home Oil Tower  
324 - 8 Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Dear Mr. Brown:

RE: South Pierson Area  
Special 32 ha Drilling Spacing Units

The Board has jointly reviewed Home's and Tundra's applications for special 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area.

The Board has extended the interim approval of 32 ha spacing to include the additional lands requested in the applications. A copy of Board Order No. SU 6 establishing 32 ha spacing units for the Lower Amaranth Formation is attached. Board Order No. SU 6 replaces Board Order No. SU 5 and includes the lands covered by that Board Order.

As with the previous approval, the Board has chosen to limit the term of the approval to October 31, 1991. The requirements for continuation of 32 ha spacing beyond that date remain unchanged from our letter dated October 5, 1989.

Home is also reminded of the continued applicability of the other requirements set out in that letter regarding submission of a waterflood feasibility study by August 31, 1991 and an annual pressure survey of the South Pierson Lower Amaranth B Pool. The Board requests that the annual pressure survey be extended to include the South Pierson Lower Amaranth C Pool and a number of other wells presently outside existing pool boundaries.

If you have any questions in respect of this matter, please contact L.R. Dubreuil, Director of Petroleum, or John Fox, Chief Petroleum Engineer, at (204) 945-6573 and 945-6574 respectively.

Yours respectfully,

ORIGINAL SIGNED BY:  
IAN HAUGH

Ian Haugh  
Chairman

Encl.

Date typed: July 16, 1990

JF/cvs

JUL 31 1990

South West Oil Limited  
P.O. Box 855  
Melita, Manitoba  
ROM 1L0

Dear Sir:

RE: South Pierson Area  
Application for 32 ha Drilling Spacing Units

Your objection to Home Oil Company Limited's and Tundra Oil and Gas Ltd.'s applications for 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area is hereby acknowledged.

After careful consideration of the technical and economic information filed by Home Oil and Tundra in support of their applications and the concerns expressed in your objection, the Board has approved the applications for an interim period.

Attached for your information is a copy of Board Order No. SU 6 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area.

In recognition of concerns regarding the appropriateness of 32 ha spacing and the limited amount of technical information presently available, the Board has limited the term of the approval to October 31, 1991. Any application for continuation of 32 ha spacing past this date will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.

If you have any questions in respect of this matter, please contact L.R. Dubreuil, Director of Petroleum, or John Fox, Chief Petroleum Engineer, at 945-6573 or 945-6574 respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
IAN HAUGH

Ian Haugh  
Chairman

Encl.

Date typed: July 18, 1990

JF/ibj





Date: July 5, 1990

## Memorandum

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

From: John Fox  
Chief Petroleum Engineer  
Petroleum Branch

Telephone

Subject: APPLICATION FOR 32 SPACING - SOUTH PIERSON AREA

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made separate applications for special 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area. The applications were jointly advertised. One objection was filed.

### RECOMMENDATIONS

It is recommended that the Board approve the enlargement of 32 ha spacing for the Lower Amaranth Formation in the South Pierson area for an interim period ending October 31, 1991. A copy of the proposed Board Order No. SU 6 is attached. Board Order No. SU 6 includes the lands covered by Board Order No. SU 5 and rescinds that Order.

### DISCUSSION

Board Order No. SU 5 (October 4, 1989) established temporary 32 ha spacing for the Lower Amaranth Formation in the South Pierson area (Figure 1). Home and Tundra have applied to extend 32 ha spacing to include an additional 8 3/4 sections containing the South Pierson Lower Amaranth C, D and E Pools and other lands adjoining the area covered by Board Order No. SU 5 (Figure 1).

The South Pierson area has been the target of renewed activity. During 1990 a total of 21 wells have been licenced of which 13 have been drilled to date (Figure 1). Eleven wells are within the area of application while the other 10 are within the area covered by Board Order No. SU 5.

### Production Performance and Reserves Estimates

Home and Tundra have provided very different estimates of well performance and recoverable reserves in their respective applications. Table 1 lists the individual well production and reserves estimates provided by the two companies.

Home's estimate of recoverable reserves is 10 976 m<sup>3</sup>/well or 12% of the OOIP on 32 ha spacing, unchanged from its previous application (January 4, 1989). Home continues to maintain that reduced 16 ha spacing will not result in any incremental recovery.

Home's estimate is based on decline curve analysis for 6 wells in the field. A composite production plot of the 6 wells is shown in Figure 2. The Petroleum Branch's estimate of recoverable reserves for the 6 wells is 78,759 m<sup>3</sup> or 12.4% of the OOIP on 32 ha spacing which matches closely with Home's estimate of 80,270 m<sup>3</sup>.

Tundra estimates recoverable reserves of 3 846 m<sup>3</sup>/well or 7.8% of OOIP on 32 ha spacing and 2 472 m<sup>3</sup>/well or 10% of OOIP on 16 ha spacing. Tundra's lower estimates appears to reflect the performance of the well 4-22-2-29 which may be in a less permeable portion of the reservoir near the updip edge of the pool.

#### Economics

The basis of both Home's and Tundra's applications is that the South Pierson area is uneconomic to develop on 16 ha spacing. A comparison of the companies' economics of developing the pool on 16 ha and 32 ha spacing is shown in Table 2.

Home has reduced its capital costs from \$444 000 in its previous application to \$320 000. Home's price forecast is also very optimistic at \$130.42/m<sup>3</sup> in 1990 (average Manitoba oil price May 1990 - \$116/m<sup>3</sup>) and increasing approximately 6%/yr. Development on 32 ha is quite attractive with a net present value of \$176 600, a 33% rate of return and a 2.7 year pay-out. However, development on 16 ha spacing assuming no incremental recovery remains uneconomic.

Tundra's capital costs are only 65% of Home's, however the recoverable reserves used by Tundra are 65% and 55% less than Home's for 32 ha and 16 ha spacing, respectively. Development on 32 ha is attractive with a net present value of \$30 000, a 34% rate of return and a 1.9 year pay-out. However, development on 16 ha spacing which Tundra assumes will result in an incremental recovery of 500 m<sup>3</sup>/well or 2.2% of the OOIP is uneconomic.

For both companies the critical issue surrounding the economics of development on 16 ha spacing is the level of incremental recoverable reserves that can be expected. It is difficult to accept both Home's position that 16 ha spacing will not result in some incremental recovery and Tundra's position that 16 ha spacing will only result on a 2.2% increase in recovery. However, without further geological, production and pressure data it is impossible to quantify the incremental recovery that could be expected on 16 ha spacing.

#### Notice of Applications

Notice of Home's and Tundra's applications were jointly published in the Manitoba Gazette (90-06-09) and the Melita New Era (90-06-05).

Unlike Home's previous application for 32 ha spacing which resulted in objections from 6 freehold mineral owners having concerns regarding the effect of 32 ha spacing on recovery, royalties and offset obligations, only one objection to the applications was filed.

The objection was filed by a freehold mineral owner with an interest in Section 19-2-29 (WPM) who made an unsupported request that spacing in Section 19 remain at 16 ha because 32 ha spacing will result in lower production and therefore less royalties in the short term..

#### Proposed Enlargement of 32 ha Spacing

The Board when it issued Board Order No. SU 5, recognized the concerns of the Petroleum Branch and mineral owners regarding the appropriateness of 32 ha spacing and the limited amount of technical information presently available. For the above reasons 32 ha spacing was approved for an interim period of two years ending October 31, 1991.

No new supporting technical or economic information was filed by either Home or Tundra with the current applications, nor has any additional information come to light that would call into question the appropriateness of approving 32 ha spacing for the additional lands under the same conditions as set out in Board Order No. SU 5.

Enlarging the 32 ha spacing approval to include the additional lands will ensure the following objectives continue to be met;

- 1) the pool is developed in an orderly manner,
- 2) the correlative rights of freehold mineral owners and the Crown are protected,
- 3) additional reservoir, production and pressure data can be collected and analyzed,
- 4) the drilling of potentially unnecessary wells on 16 ha spacing is avoided,
- 5) reduction of the concern that the pool will be rapidly depleted below the bubble point before an enhanced recovery scheme can be implemented,
- 6) there is no reduction in the ultimate recovery from the pool, (i.e. approval is not irreversible) and
- 7) any uncertainty regarding the economics of development on 16 ha spacing is reduced.

It is therefore recommended the Board Order No. SU 6 be issued approving 32 ha spacing for both the lands covered by Board Order No. SU 5 and the additional lands for an interim period ending October 31, 1991. Board Order No. SU 5 will be rescinded. The mineral owner that objected to the application should be notified of the Board's decision.

Home Oil has requested that the 11-19-2-29 (WPM) well which will be off-target under the proposed 32 ha spacing approval be deemed on target. This is a reasonable request and should be approved as long as the 11-19 well remains the only producing well in the spacing unit.

## Other Matters

In conjunction with Board Order No. SU 5, Home Oil was requested by the Board in its letter dated October 5, 1989 to conduct an annual pressure survey in the South Pierson Lower Amaranth B Pool and to review the feasibility of waterflooding the pool. The Board also indicated that an application to continue 32 ha spacing beyond October 31, 1991 would have to include a detailed evaluation of the incremental recovery that could be expected on 16 ha spacing.

It is proposed to reiterate these conditions in the Board letter of transmittal to the companies that will accompany the Board Order.

ORIGINAL SIGNED  
JOHN N. FOX

John N. Fox

Approved by:


  
L.R. Dubreuil, Director

TABLE 1  
RESERVE ESTIMATES

	<u>32 ha Spacing</u>		<u>16 ha Spacing</u>	
	Home	Tundra	Home	Tundra
Initial Productivity (m <sup>3</sup> OPD)	7.0	4.0	7.0	4.0
Decline Rate (%/yr)	21	25	43	40
Recoverable Reserves (m <sup>3</sup> )	10976	3846	5500	2472
Primary Recovery Factor (%)	12	7.8*	12	10*

\*Petroleum Branch estimate based on OOIP for 4-22-2-29.

TABLE 2  
DEVELOPMENT ECONOMICS

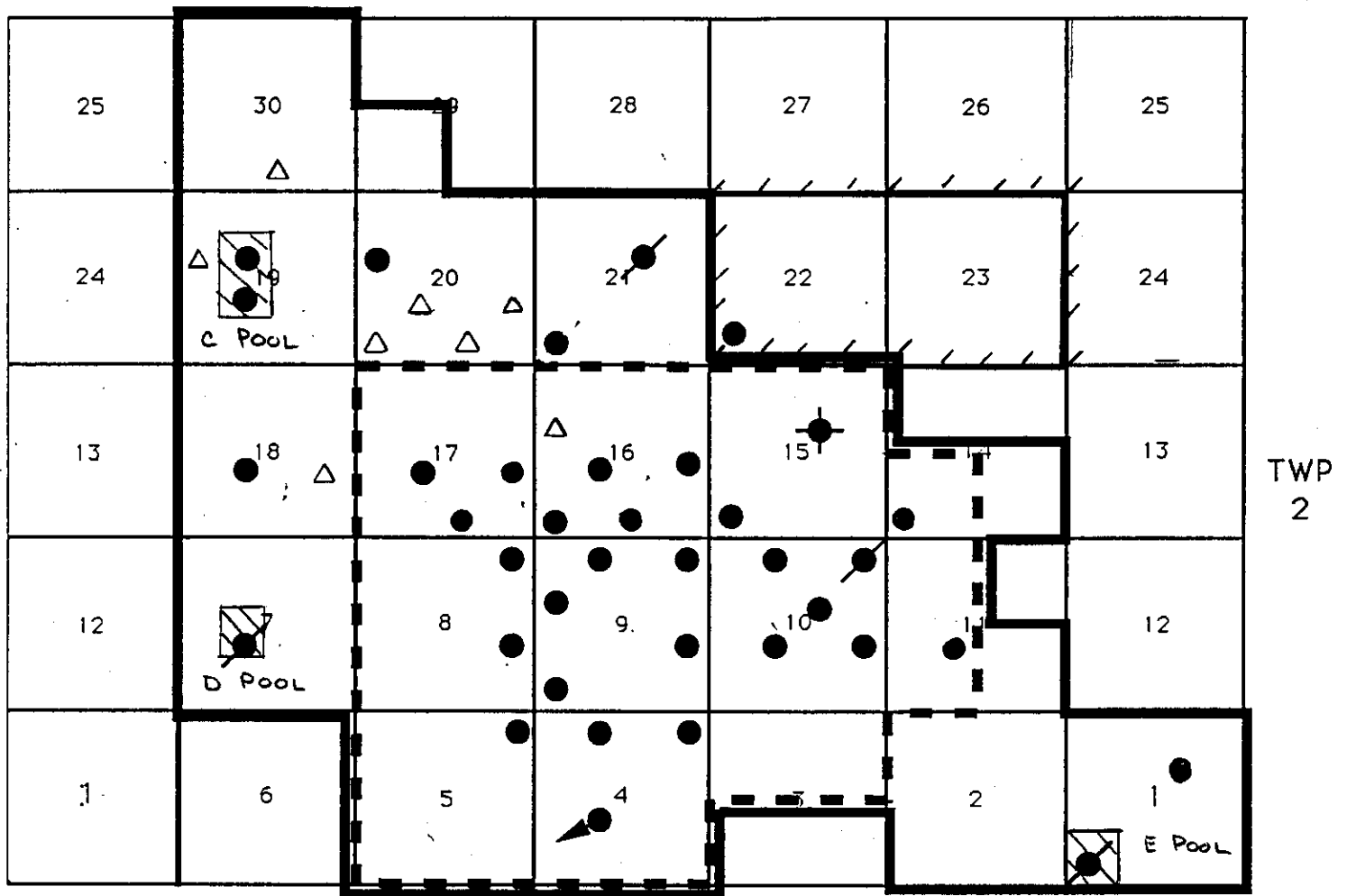
	<u>32 ha Spacing</u>		<u>16 ha Spacing</u>	
	Home	Tundra	Home	Tundra
Capital Costs(\$M)	320	210	320	210
Operating Costs				
Fixed (\$/well/mon)	1500	1000	1500	1000
Variable (\$/m <sup>3</sup> )	15.00	13.70	15.00	13.70
1990 Oil Price (\$/m <sup>3</sup> )	130.42	132.10	130.42	132.10
Oil Price Escalation (%/yr)	6.0	5.0*	6.0	5.0*
Recoverable Reserves (m <sup>3</sup> )	10,976	3,846	5,500	2,472
Net Present Value (AIT)(\$M)	176.6**	30.0 <sup>+</sup>	-6.3**	-18.0 <sup>+</sup>
Rate of Return (%)	33.1	34.1	10.7	9.4
Payout (yrs)	2.7	1.9	3.9	2.7

\* Tundra's oil prices is constant at \$132.10/m<sup>3</sup> for 1990 & 1991

\*\* Home's discount factor = 12%

+ Tundra's discount factor = 20%

# SOUTH PIERSON AREA



R.30

R. 29 W1M

AREA OF 32 HA SPACING:

--- CURRENT - BOARD ORDER NO. 54 5

— EXPANDED - HONE OIL

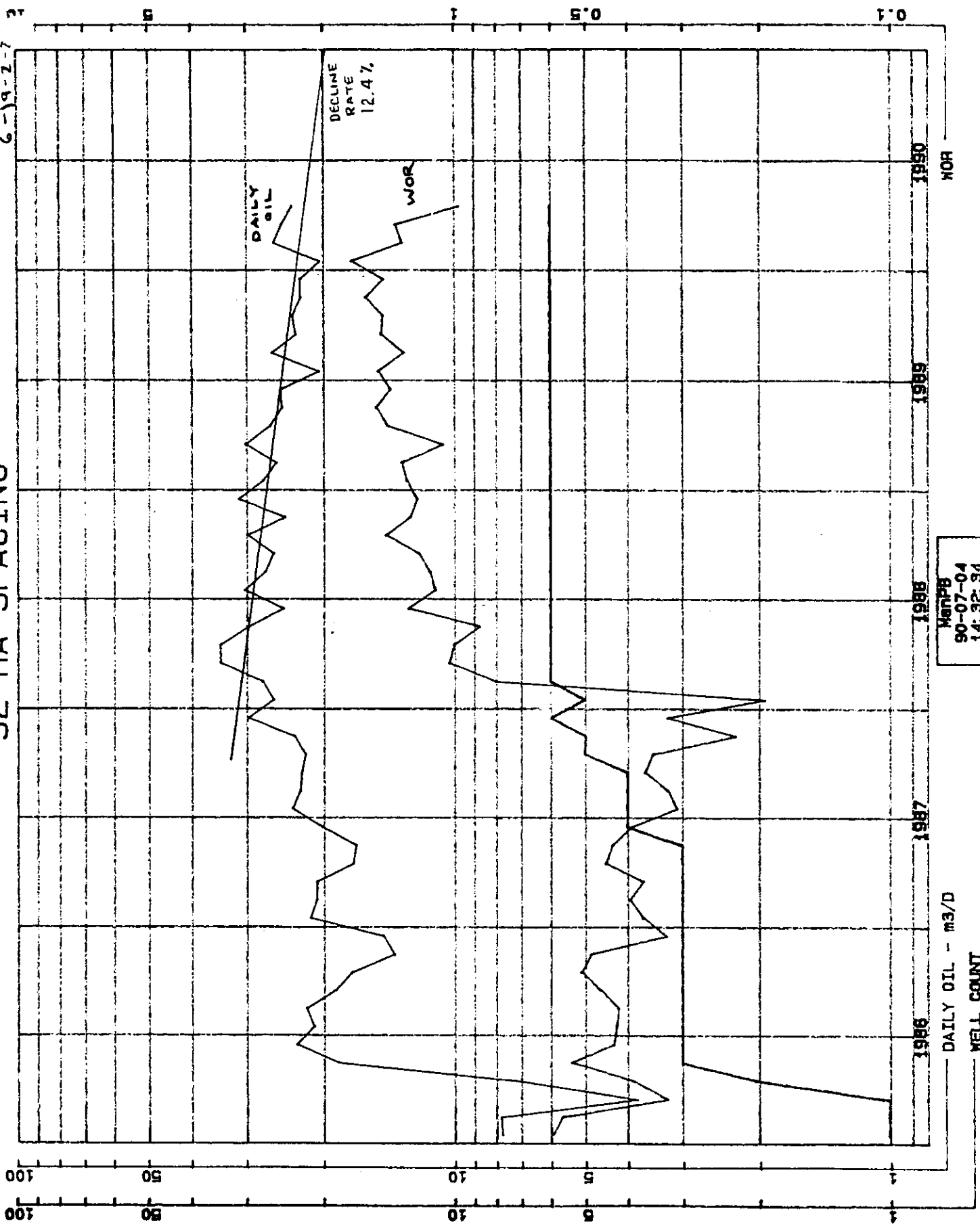
/// EXPANDED - TUNDRA

Δ LICENCED LOCATIONS

FIG. 1

16-5-2-29  
16-8-2-29  
16-9-2-29  
8-10-2-29  
4-15-2-29  
6-19-2-7 3

# 32 HA SPACING



ManPB  
90-07-04  
14:32:34

DAILY OIL - m3/D  
WELL COUNT

WOR

FIG 1





The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

## Order No. SU 6

### An Order Pertaining to Drilling Spacing Units South Pierson Area Lower Amaranth Formation

WHEREAS, subsection (9)(b) of section 62 of "The Mines Act", being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(b) respecting the designation of the area that shall be allocated to a well in connection with fixing allowable production;"

AND WHEREAS, clause (1)(f) of section 63 of "The Mines Act" being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides in part as follows:

"63(1) For the purpose of carrying out the provisions of this Part and Part III according to their intent, the Lieutenant Governor in Council may make such regulations and orders as are ancillary thereto, and are not inconsistent therewith; and every such regulation or order made under, and in accordance with the authority granted by, this section has the force of law; and, without restricting the generality of the foregoing, the Lieutenant Governor in Council may make regulations and orders,

(f) prescribing spacing units and the size and shape of spacing units;"

AND WHEREAS, subsection (1) of section 20 of Manitoba Regulation 430/87R under The Mines Act ("the Petroleum Drilling and Production Regulation") provides as follows:

"20(1) Notwithstanding section 19, the board may, after a public hearing or after publication of notice, prescribe by order special drilling spacing units which may differ from normal drilling spacing units in size, shape or target area."

AND WHEREAS, subsection (3) of section 21 of the Petroleum Drilling and Production Regulation provides as follows:

"21(3) Where a special drilling spacing unit is prescribed under section 20, the board may prescribe the target area within which a well shall be completed in order to qualify for a maximum permissible production rate based on the area of the special drilling spacing unit."

AND WHEREAS, the Board received an application dated April 3, 1990 from Tundra Oil and Gas Ltd. and an application dated May 17, 1990 Home Oil Company Limited for approval of special 32 ha drilling spacing units for the Lower Amaranth Formation in the South Pierson area ("the area of application").

AND WHEREAS, upon publication of notice of the application, the Board received an objection to the application.

AND WHEREAS, upon due consideration of the said applications and objection thereto, the Board considers temporary establishment of special 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application to be reasonable and desirable.

NOW THEREFORE, the Board orders that:

1. The spacing unit for each well drilled, or to be drilled, for the purpose of obtaining oil from the Jurassic Lower Amaranth Formation within the area outlined on Schedule A is two legal subdivisions comprising the east half or the west half of a quarter section.
2. The target area of each drilling spacing unit shall be a square area in the even-numbered legal subdivision having sides one hundred metres from the sides of the legal subdivision and parallel to them.
3. This order expires October 31, 1991 unless rescinded by the Board prior to this date.
4. Board Order No. SU 5 dated October 4, 1989 is hereby rescinded.

---

H. Clare Moster  
Deputy Chairman

---

Ian Haugh  
Chairman

OIL AND NATURAL GAS CONSERVATION  
BOARD ORDER NO. SU 6 APPROVED THIS  
DAY OF A.D., 1989  
AT THE CITY OF WINNIPEG.

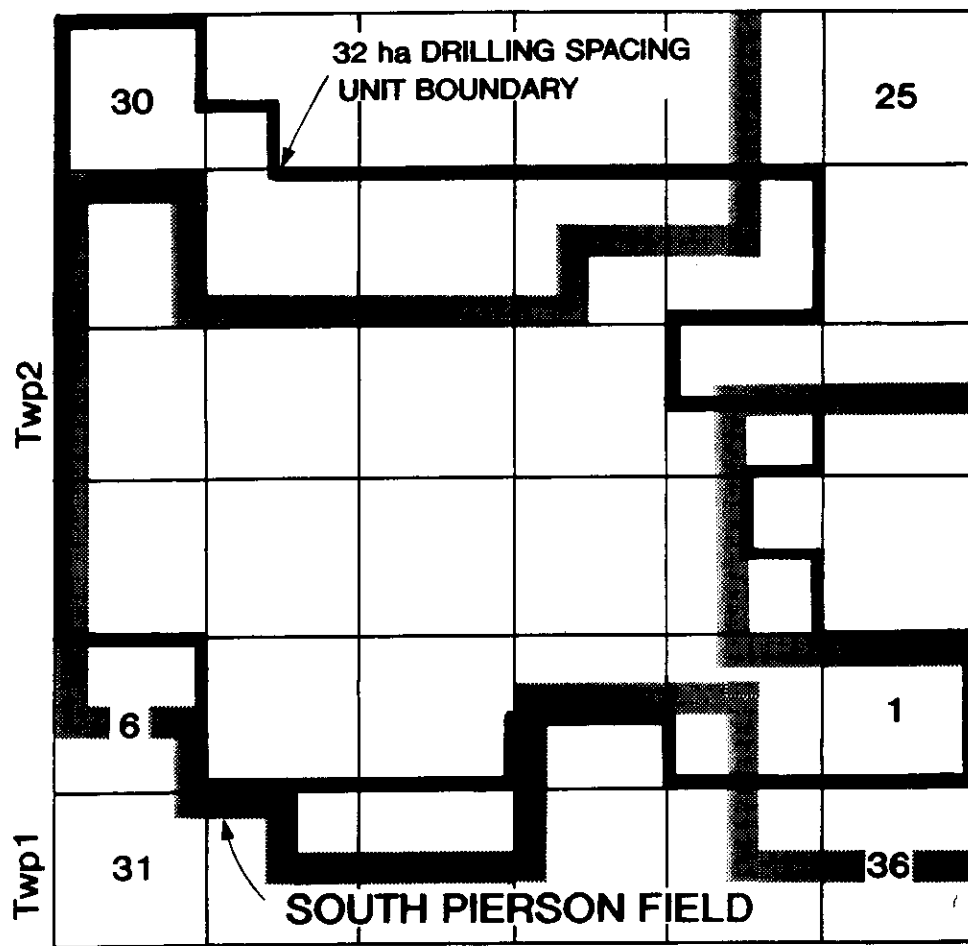
APPROVED:

---

Harold Neufeld  
Minister of Energy and Mines

**BOARD ORDER NO. SU 6  
SCHEDULE A**

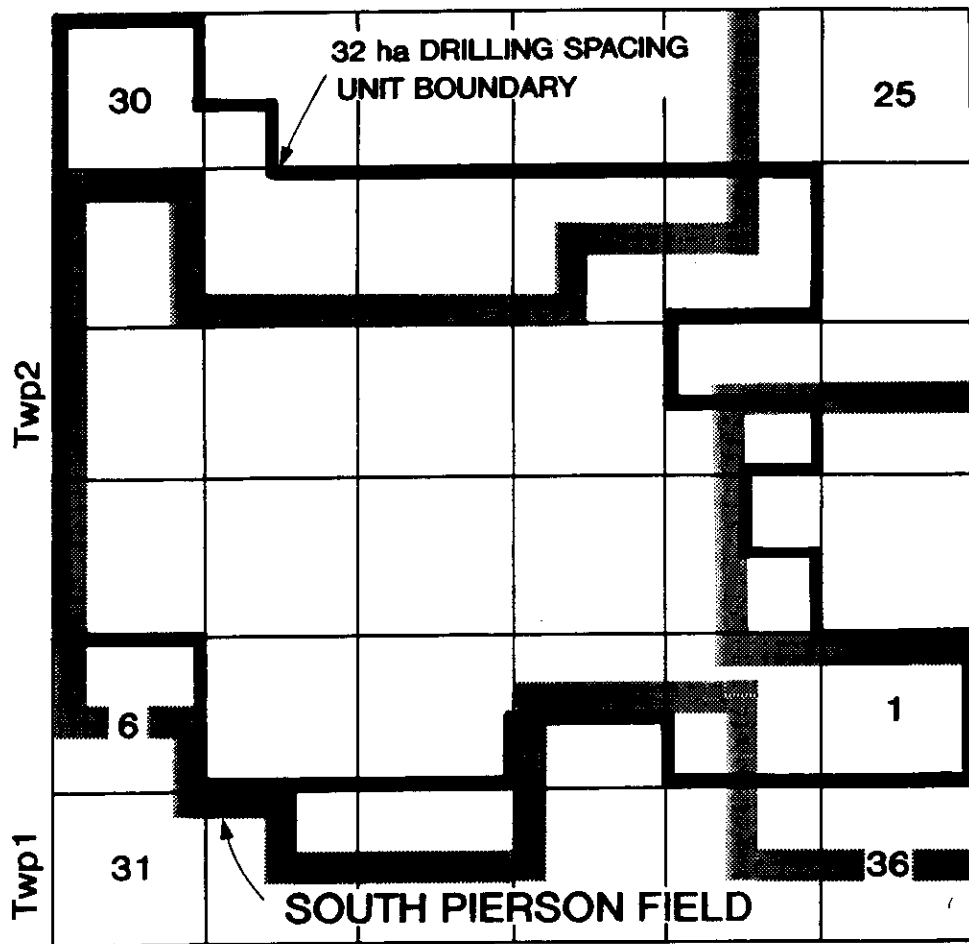
**SOUTH PIERSON AREA  
32 ha DRILLING SPACING UNITS  
LOWER AMARANTH FORMATION**



**Rge29(WPM)**

**BOARD ORDER NO. SU 6  
SCHEDULE A**

**SOUTH PIERSON AREA  
32 ha DRILLING SPACING UNITS  
LOWER AMARANTH FORMATION**



**Rge29(WPM)**

1. WINE. 02 MA EFADINE  
1. 0F 4E113

01 18 05 107-29 4.17(0) (0)16-02-002-29 WIM(0) (0)16-09-002-29 WIM(0)  
0.06 11-010 0.10 (0)04-15-002-29 WIM(0) (0)06-19-002-29 WIM(0)



05-06-03

\*\*\* SITE \*\*\*

Map2B

SOUTH

90-07-04

30 HA STAGING

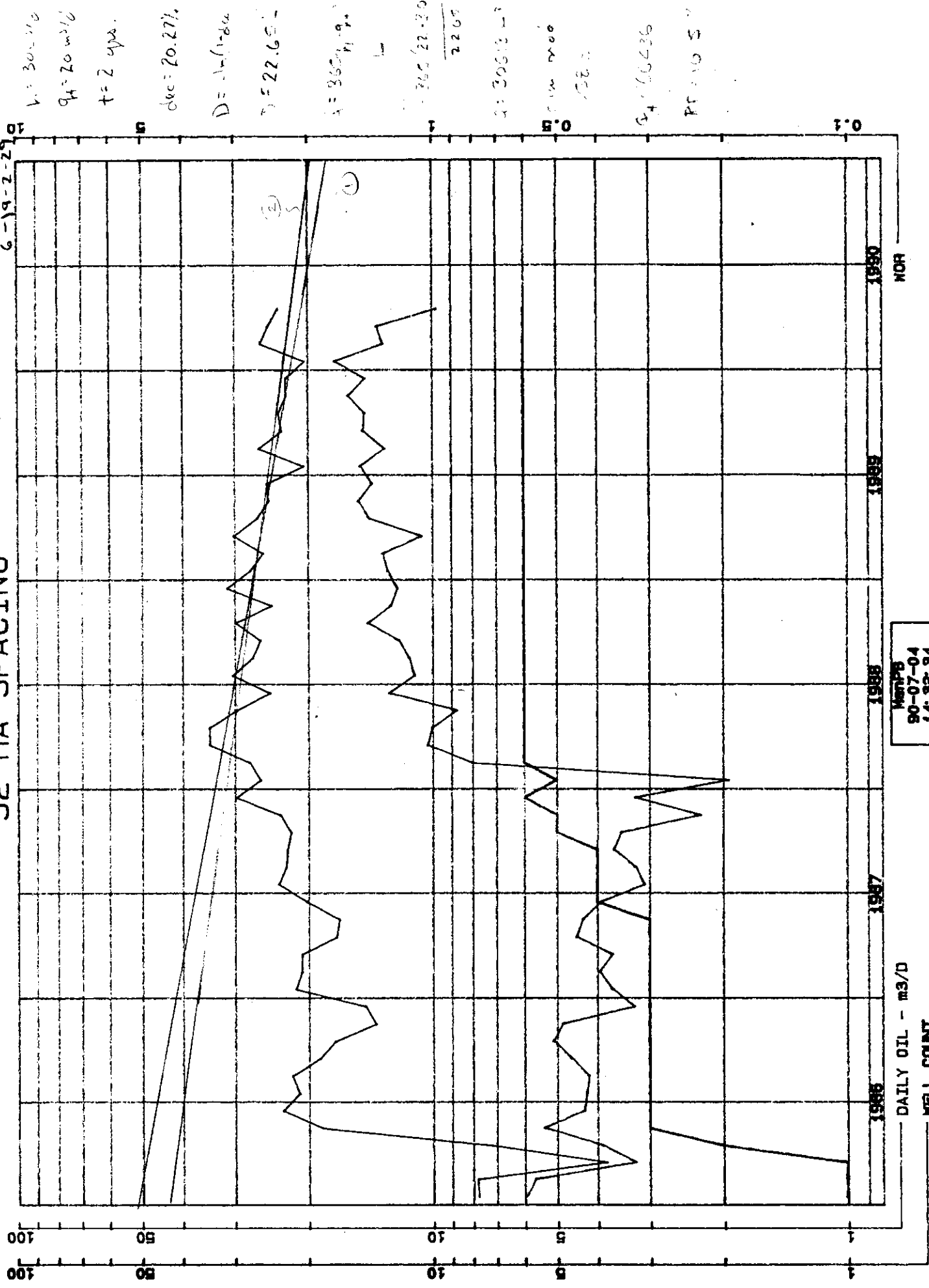
14:32:34

DATE	AREA	SEAL COUNT	INCH	PSI	W/AF	HOURS	OIL	WATER	OIL	WDR	CUM. OIL	WATER
							#3/M	#3/M	#3/D		#3	#3/M
07-10	0	0	0	0	0	3732	700.9	1020.0	22.0	1.46	12935.4	0.0
07-11	0	0	0	0	0	3408	671.0	1033.0	20.4	1.73	33618.4	0.0
07-12	0	0	0	0	0	3408	725.1	956.0	25.0	1.32	34343.5	0.0
07-13	0	0	0	0	0	3936	769.6	1051.0	24.0	1.37	35182.3	0.0
07-14	0	0	0	0	0	3100	705.8	889.0	23.5	0.90	35018.1	0.0



$\begin{array}{r} 7 \\ \times 40 \\ \hline 280 \end{array}$   
 6 = 365(23-3) = 42941  
 sum prod 37282 =  
 91 = 78759  
 RF =  $\frac{78.76}{721.1} = 12.4\%$   
 $\begin{array}{r} 16-5-2-29 \\ 16-8-2-29 \\ 16-9-2-29 \\ 16-10-2-29 \\ 16-5-2-29 \end{array}$   
 1+9 = 10

# 32 HA SPACING



Monte B  
90-07-04  
14:32:94

DAILY OIL - M3/D

WELL COUNT

# ECONOMICS

	TUNDRA		HOME	OIL
	32 ha	16 ha	32 L <sub>a</sub>	16 L <sub>a</sub>
CAPITAL COST (\$M)	210	210	320	320
OPERATING COST - fixed (\$/well/year)			1500	1500
variable (\$/m <sup>3</sup> )			15	15
INITIAL PRODUCTION (m <sup>3</sup> /d)	4.0	4.0	7	7.0
DECLINE RATE (%)	25	40	21	43
RECOVERABLE RESERVES (m <sup>3</sup> )	3846	2472	10976	5500
OIL PRICE 1990 - 1994 (\$/m <sup>3</sup> )	1990-94 132.10 - 152.91 1990-93 132.10 - 145.61*		1990-2004 130.42 - 339.74	1990-97 130.42 - 225**
NET PRESENT VALUE (NPV) (AT 12% DCF)	30***		176.6**	-6.3***
RATE OF RETURN (AT)	34.1	9.4	33.1	10.7
PAY OUT (YEARS)	1.9	2.7	2.7	3.05

NOTE: TUNDRA ANALYSIS - 24% increase in recoverable reserves on 16 L<sub>a</sub> vs 32 L<sub>a</sub> spacing - based on 4-22 reservoir parameters (OOIP = 0.155 m<sup>2</sup>)  
Tundras estimate for primary recovery is 7.8% for 32 L<sub>a</sub> spacing & 10% for 16 L<sub>a</sub> spacing

\* OIL PRICE 1990-1993

\*\* DISCOUNT FACTOR = 12%

\*\*\* DISCOUNT FACTOR = 20%

- to answer the following questions of  
the management: What is the value of the  
data?

- The data is required to be relevant to the  
business. Relevant means that  
it is good to an entity because with  
the information an additional decision  
can be made - general and specific production  
data, resource data

- The data expression of the  
entity will capture the  
right data to perform a function, if necessary

- AREA INCLUDES <sup>ALL OF</sup> THE S DIERSON LAKE B, C, D & E POOLS  
 & EXTENTS OUTSIDE THE BOUNDARIES OF THE S DIERSON  
 FIELD

- TUNDRA APPLICATION DESIGNATION OF SPECIAL DSM pursuant to  
 S. 20 of Regulation - Sec. 22 & 23

- Board Order No. 505 (89-10-4)

- HUC APPLICATION AS ABOVE + request the  
 11-19 be drawn on Target

- SU No 5 covers 9 1/4 sections

- additional lands 12, 7, SE 1/4 - 11, SE 1/4 - 14, 18  
 19, 20, 21, SW 1/4 - 29, 30 = 8 3/4 sections

- AREA OF B POOL AS MAPPED BY M. ARDER  
 3/2 - 20, 21, 3/2 - 22

STUDY	10-5, 10-8, 14-9, 4-15	dec <sup>aver</sup> rate 3 1/2%
dec rate	25      9      15      12	aver RF = 16%

# TIONES DECLINE ANALYSIS

Wells 16-5 16-9 6-19 } see composite plot  
 experiencing a constant decline 16-8 4-15 8-10

- individual well recovery failures age 3% - 15%  
 range of HOCs recoverable reserves 2 - 5%  
 given than Tunes

## OOIP Comparison

WELL	HOC OOIP	PB OOIP	HOC ROIP	PB
	1032.2	1032.2		
16-5	114.3	57.6		
16-8	103.9	105.9		
16-9	64.8	92.2		
4-15	117.4	115.3		
6-19	119.9	113.8		
8-10	148.6	99.7		
	<hr/> 668.9	<hr/> 634.6		

4-22-2-29

interval	VCLAY	$\phi_T$ Sonic	$S_w$	OOIP/m <sup>2</sup>
1011-1012.6	11	8	38	.065
1013-1013.7	10	7	41	.023
1015.3-1016.5	26	10.5	36	.067
				<hr/> 2.15

301D

16 ha

24800 m<sup>3</sup>

32 ha

49600 m<sup>3</sup>

HOC - 3 Pierson 32 Ha Spring Area

① EXPANDED AREA - Sec 1 2 7, SW/4 - 11, SW/4 14,  
TOP 2 20 21, SW/4 - 24 30

- Additional 1000 gallons of fuel oil on above lands

10-1

2-30

2 4 6 8 20 12-20

8 18 6-18

② LANDS THAT SHOULD BE CONSIDERED FOR INCLUSION IN  
32 Ha SPRING AREA

S/2 - 3	NE/4 - 11	N/2 - 14	SE/4 - 29
SW/4 + LSD 247 ANTLER EVR	LAST DITCH INV.	SCEPTRE RES	HOC ONLY OWNS SW/4 - 29

③ POOL PRODUCTION PLOT

④ HOC - NO INCREMENTAL RECOVERY ON 16 HA SPRING

⑤ ECONOMIC RETURN ON SPRING PREVIOUS APPLN 89-01-04

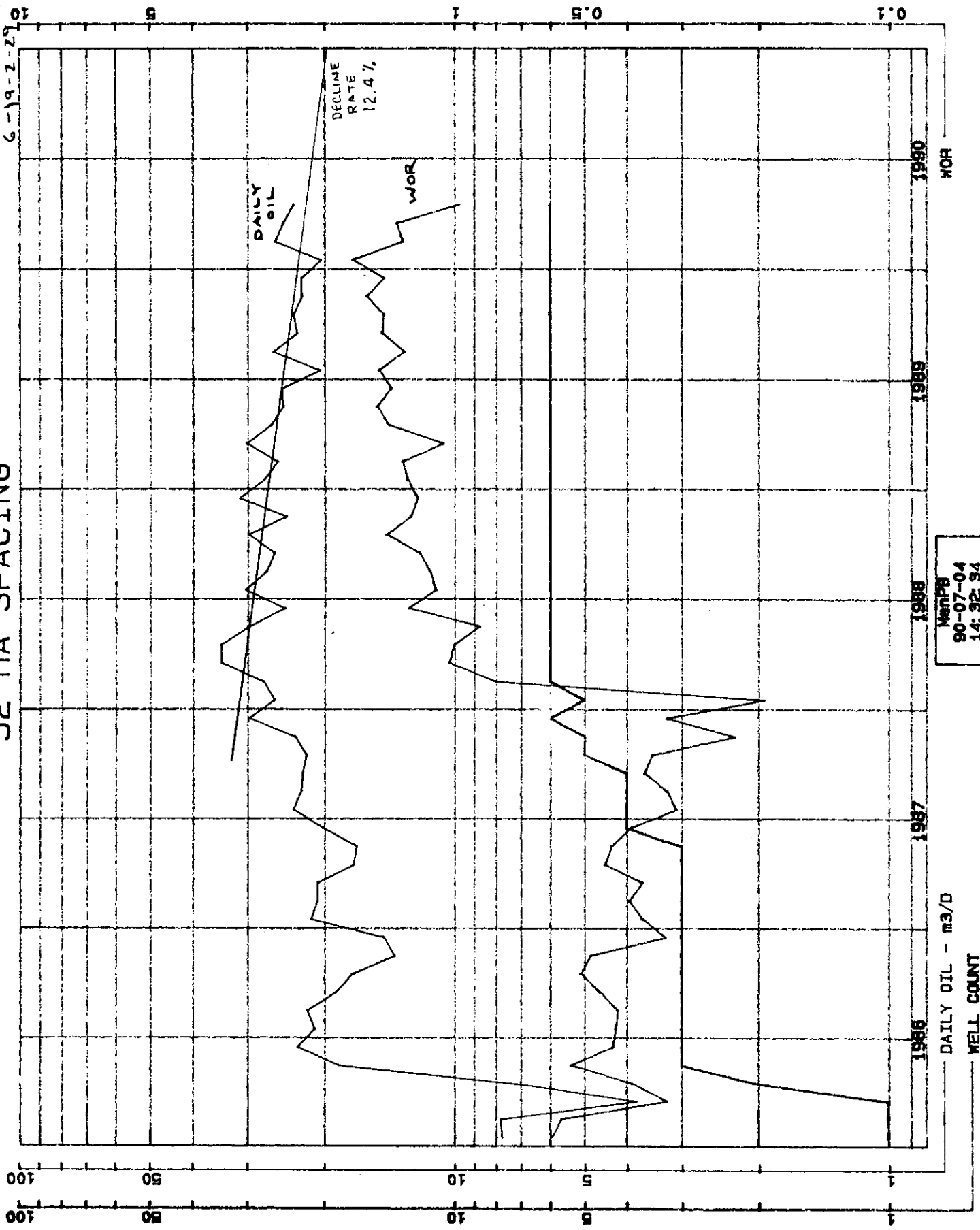
ADDITIONAL COSTS	\$ 320.00	\$ 444.00
OIL PRICES	\$ 130.43 / L <sup>3</sup>	\$ 107.63 / L <sup>3</sup> 1990
GAS COST	\$ 1500.00 / L <sup>3</sup>	(same)
DAY UNIT	1.40 GAS	5.6 GAS
POB	12.5%	18.5%
NAV	1.00	64.6

(6) LESSOR | LESSEES  
INFORMATION - IN EXPANDED AREA + 1/2 100  
surrounding expanded area

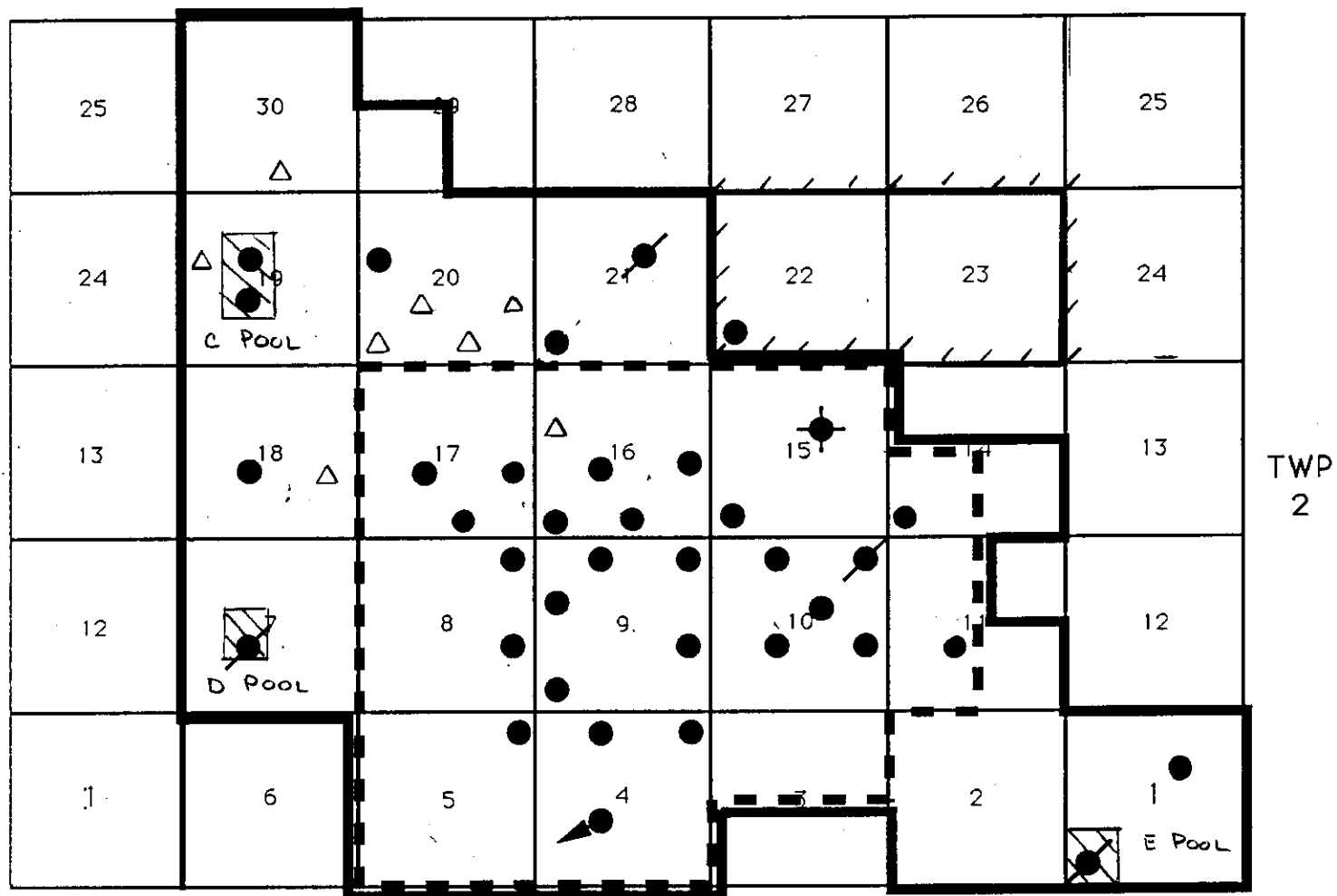


# 32 HA SPACING

16-5-2-29  
16-8-2-29  
16-9-2-29  
8-10-2-29  
4-15-2-29  
6-19-2-29



SOUTH PIERSON AREA



R.30

R. 29 W1M

AREA OF 32 HA SPACING:

■ ■ ■ ■ CURRENT - BOARD ORDER No. 54 5

EXPANDED - NONE OIL

       EXPANDED - TUNDRA

**Δ LICENCED LOCATIONS**

FIG. 1

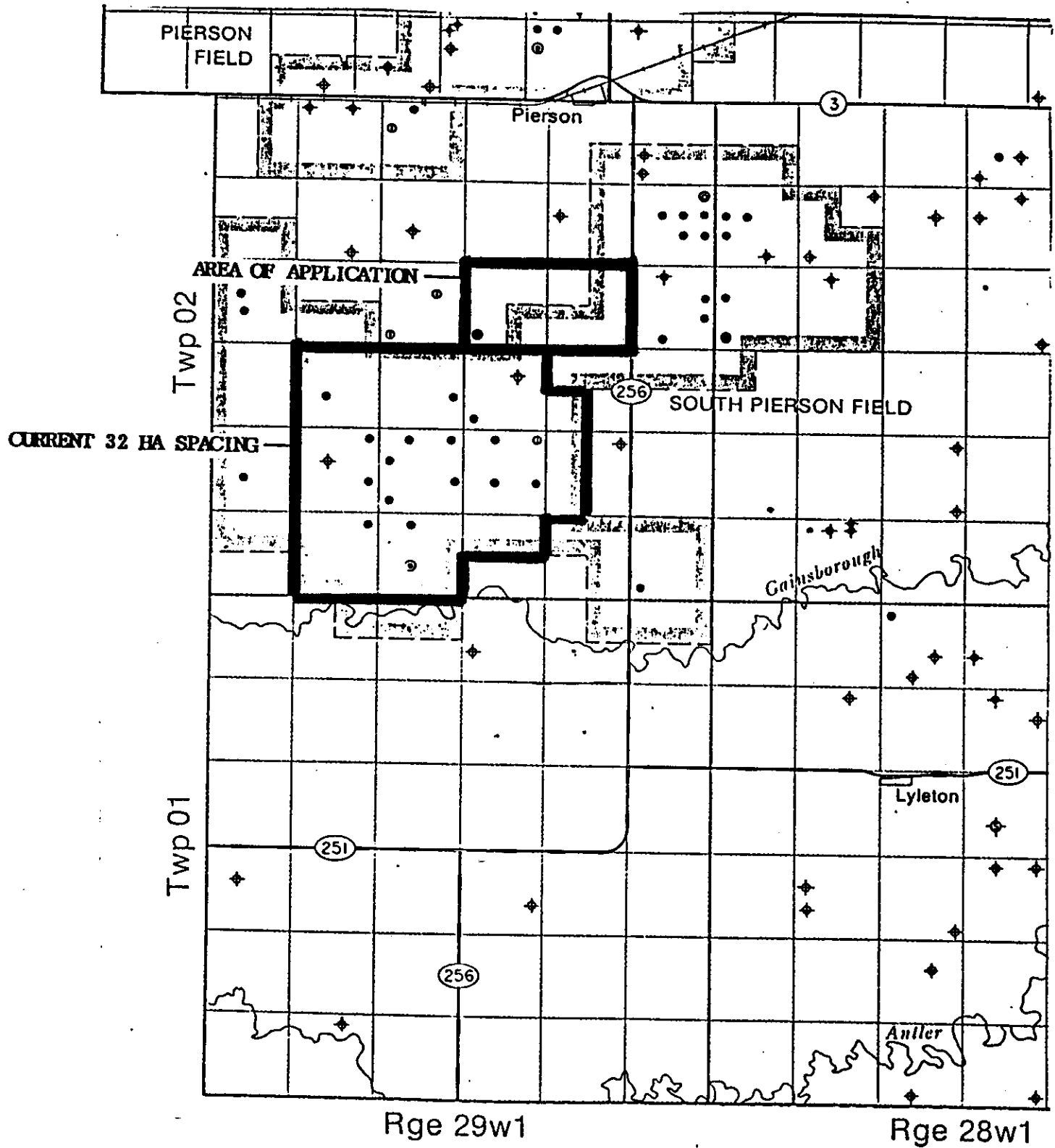


FIGURE 1

John


June 14, 1990

L.R. DUBREUIL

H. CLARE MOSTER

**RE: INCREASED SPACING - SOUTH PIERSON**

- Attached is copy of objection to application pertaining to Section 19-2-29 WPM from South West Oil Limited.
- Hold til after Notice deadline date and then we can meet to discuss and REPLY.

 \_\_\_\_\_  
H. Clare Moster

Attachment

1477T

*Leo Samoil - Leo  
Application*

# South West Oil Limited

(No Personal Liability)

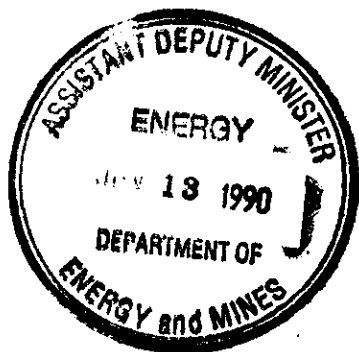
P.O. Box 855—Melita, Manitoba  
R0M 1L0

11  
'90  
- less wells drilled, lower production  
in immediate  
future - less  
royalties  
Lp 70-07-6  
D. Minnis Sec - Treasurer  
South West Oil Limited  
K.  
A.

Dear Sir:

Regarding your proposal to increase  
the drilling spacing from 40 acres to  
80 acres.

Our directors would like to have  
Section 19-2-29 remain 40 acres  
drilling spacing as this is the section  
South West Oil Limited has an interest  
in.



Yours truly  
D. Minnis Sec

522-8419 home

522-8254 bus.

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

**NOTICE**

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made application separately under subsection 20(1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field and surrounding area. The area of application is outlined below. The area of application adjoins the area covered by Board Order SU 5 (~~October 4, 1989~~) which established temporary special 32 hectare drilling spacing within the shaded area in the South Pierson Field.

30	29	28	27	26	25
			AREA OF APPLICATIONS		
19	20	21	22	23	24
18				14 Kae	13
7				12	
6			3	Wagoner Blvd	2
31	SOUTH PIERSON FIELD				36

14 Lee Daniels

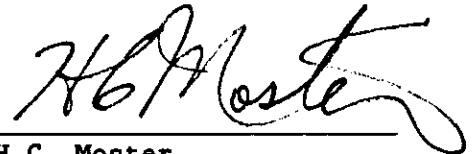
**Fig 29(WPM)**

It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from the Lower Amaranth Formation in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7, etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivisions and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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

Copies of the applications can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Avenue S.W., Calgary, Alberta, T2P 2Z5 [phone: (403) 232-7100] and Tundra Oil and Gas Ltd., 1313 - One Lombard Place, Winnipeg, Manitoba, R3B 0X3 [phone: (204) 949-1195], or can be viewed at the offices of the Petroleum Branch, 555-330 Graham Avenue, Winnipeg, Manitoba, R3C 4E3 [phone: (204) 945-1195].

Dated at Winnipeg, this 25<sup>th</sup> day of MAY, 1990.

A handwritten signature in dark ink, appearing to read 'H.C. Moster', with a long, sweeping underline that extends to the right.

H.C. Moster  
Deputy Chairman

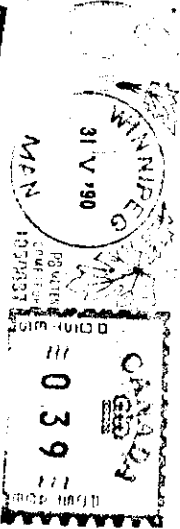
*As per Master*

*Unknown*

*Moved  
Address  
Unknown*

Paul Kielhorn and Harold  
Executors of Estate of  
29 Langley Street  
Regina, Saskatchewan  
S4S 3V5

Pearl MacLean  
Ste. 105,  
218 - 4th Street  
Brandon, Manitoba  
R7A 3G8



**RETURN TO SENDER**  
**REVOI A L'EXPEDITEUR**

☐ Unclaimed  
Non réclamé

☐ No such address  
Pas d'adresse connue

☐ Address incomplete  
Adresse incomplète

☐ Moved, Address unknown  
Déplacé, Adresse inconnue

☐ No such Post Office  
Pas de bureau auxiliaire

☐ Returned by addressee  
Retourné par le destinataire

☐ Deceased  
Décédé

☐ Unknown  
Inconnu

**RETURN TO SENDER**  
**REVOI A L'EXPEDITEUR**

☐ Non réclamé

☐ No such address  
Pas d'adresse connue

☐ Address incomplete  
Adresse incomplète

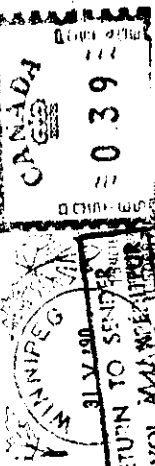
☐ Moved, Address unknown  
Déplacé, Adresse inconnue

☐ No such Post Office  
Pas de bureau auxiliaire

☐ Returned by addressee  
Retourné par le destinataire

☐ Deceased  
Décédé

☐ Unknown  
Inconnu





**Home Oil Company Limited**

1600 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta T2P 2Z5  
Telephone (403) 232-7100  
Fax (403) 232-7678



1990-06-06

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3

Attention: Mr. J.N. Fox  
Chief Petroleum Engineer, Petroleum Branch

Dear Mr. Fox:

Re: Application for Special Drilling Spacing Units  
South Pierson Field, Lower Amaranth B Pool

Pertaining to your telephone message, listed below are the Working Interest Owners (lessees) in the lands requested:

NW1/4-31-001-28 W1M	Home Oil Company Limited(HOCL)
NW1/4-06-002-28 W1M	Omega Hydrocarbons(50%), HOCL(50%)
SW1/4-07-002-28 W1M	Omega Hydrocarbons
S1/2-31-002-29 W1M	HOCL
SW1/4-32-002-29 W1M	HOCL(50%), Amoco(50%)
NE1/4-11-002-29 W1M	Lastditch Investments
S1/2-12-002-29 W1M	Unleased

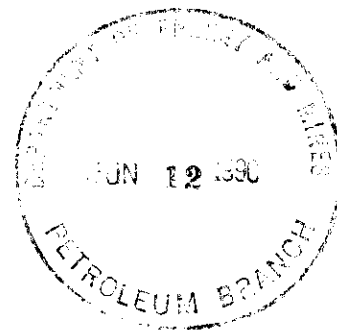
The above information is the latest according to Home Oil's records.

If you require further information, please contact Mr. Allan Willms at (403) 232-7362.

Yours truly,  
HOME OIL COMPANY LIMITED

*K.R. Brown*  
K.R. Brown, P.Eng.  
Manager, Reservoir Engineering

cc: A.R. Willms  
Day File



May 31, 1990

Department of Energy & Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3

Attention: Mr. John N. Fox  
Chief Petroleum Engineer

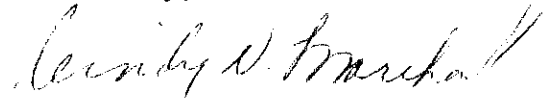
Dear Sirs:

Re: Application for 32 ha Spacing - South Pierson Field

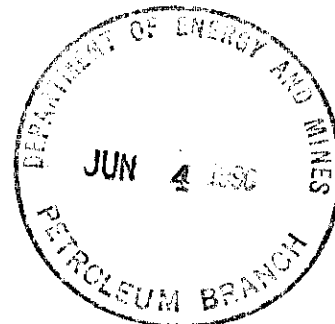
Further to your request dated May 29, 1990, directed to Dan Barchyn's attention, please find enclosed a list of lessors' and lessees' addresses.

I trust you will find the list satisfactory.

Yours truly,



Cindy V. Marchant  
Landman



LESSORS

1. Sceptre Resources Limited  
3100 - 150 - 6th Avenue S.W.  
Calgary, Alberta  
T2P 3Y7
2. T. R. Daniels and  
J. M. K. Daniels  
General Delivery  
Pierson, Manitoba  
R0M 1S0
3. K. Daniels and  
G. F. Douglas  
General Delivery  
Sub. P.O. 6  
Brandon, Manitoba  
R7B 0M0
4. Estate of Lowell Gough Stevens  
Royal Trust Corporation of Canada  
Box 748  
Winnipeg, Manitoba  
R3C 2M2
5. Paul Edward Kilhorn and  
Harold Edwin Freburg  
Execs. of Est. of Amanda Olivia Freburg  
27 Langley Street  
Regina, Saskatchewan  
S4S 3V5
6. Audrey Elaine Carr  
576 Johnson Avenue East  
Winnipeg, Manitoba  
R2L 1A8
7. Ryan James Carr  
Box 401  
Gillam, Manitoba  
R0B 0L0
8. Ardeen May Sokalski  
733 Charleswood Road  
Winnipeg, Manitoba  
R3R 1K7
9. Gladys Sarah Patmor  
General Delivery  
Pipestone, Manitoba  
R0M 1T0
10. David James Southam  
Pierson, Manitoba  
R0M 1S0
11. Stewart John Southam  
Pierson, Manitoba  
R0M 1S0
12. Crossman Petroleums Ltd.  
Box 212  
Pierson, Manitoba  
R0M 1S0
13. F. G. Crossman and  
G. H. Crossman  
General Delivery  
Pierson, Manitoba  
R0M 1S0
14. Robyn Henry Lore  
36 Hutton Crescent S.W.  
Calgary, Alberta  
T2V 3B7
15. Moral Re-Armament  
(The Oxford Group in Canada)  
387 Cote Sainte Catherine  
Montreal, Quebec  
H2V 2B5

LESSEES

- Shell Canada Limited  
400 - 4th Avenue S.W.  
Calgary, Alberta  
T2P 0J4
- Home Oil Company Limited  
1700 - 324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5
- Scurry-Rainbow Oil Limited  
1700 - 324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5
- Chevron Canada Resources  
500 - 5th Avenue S.W.  
Calgary, Alberta  
T2P 0L7
- Newscope Resources Limited  
1090 - 700 - 9th Avenue S.W.  
Calgary, Alberta  
T2P 3V4
- Melaar Resources Ltd.  
Box 420  
Duchess, Alberta  
T0J 0Z0
- Omega Hydrocarbons Ltd.  
1300, 112 - 4th Avenue S.W.  
Calgary, Alberta  
T2P 0H3
- Troy Oils Ltd.  
705 - 805 - 8th Street S.W.  
Calgary, Alberta  
T2P 1H7

## LESSORS

1. Sceptre Resources Limited  
3100 - 150 - 6th Avenue S.W.  
Calgary, Alberta  
T2P 3Y7
2. T. R. Daniels and  
J. M. K. Daniels  
General Delivery  
Pierson, Manitoba  
R0M 1S0
3. K. Daniels and  
G. F. Douglas  
General Delivery  
Sub. P.O. 6  
Brandon, Manitoba  
R7B 0M0
4. Estate of Lowell Gough Stevens  
Royal Trust Corporation of Canada  
Box 748  
Winnipeg, Manitoba  
R3C 2M2
5. Paul Edward Kilhorn and  
Harold Edwin Freburg  
Execs. of Est. of Amanda Olivia Freburg  
27 Langley Street  
Regina, Saskatchewan  
S4S 3V5
6. Audrey Elaine Carr  
576 Johnson Avenue East  
Winnipeg, Manitoba  
R2L 1A8
7. Ryan James Carr  
Box 401  
Gillam, Manitoba  
R0B 0L0
8. Ardeen May Sokalski  
733 Charleswood Road  
Winnipeg, Manitoba  
R3R 1K7
9. Gladys Sarah Patmore  
General Delivery  
Pipestone, Manitoba  
R0M 1T0
10. David James Southam  
Pierson, Manitoba  
R0M 1S0
11. Stewart John Southam  
Pierson, Manitoba  
R0M 1S0
12. Crossman Petroleums Ltd.  
Box 212  
Pierson, Manitoba  
R0M 1S0
13. F. G. Crossman and  
G. H. Crossman  
General Delivery  
Pierson, Manitoba  
R0M 1S0

## LESSEES

- Shell Canada Limited  
400 - 4th Avenue S.W.  
Calgary, Alberta  
T2P 0J4
- Home Oil Company Limited  
1700 - 324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5
- Scurry-Rainbow Oil Limited  
1700 - 324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5
- Newscope Resources Limited  
1090 - 700 - 9th Avenue S.W.  
Calgary, Alberta  
T2P 3V4
- Melaar Resources Ltd.  
Box 420  
Duchess, Alberta  
T0J 0Z0
- Omega Hydrocarbons Ltd.  
1300, 112 - 4th Avenue S.W.  
Calgary, Alberta  
T2P 0H3

<u>LEGAL DESCRIPTION</u>	<u>WORKING INTEREST OWNER</u>	<u>ROYALTY INTEREST OWNER</u>
N $\frac{1}{2}$ 14-2-29 WPM	Open	Sceptre Resources Limited
NE $\frac{1}{4}$ 15-2-29 WPM	Shell Canada	T. & J. Daniels
NW $\frac{1}{4}$ 15-2-29 WPM	Shell Canada	K. Daniels & G. Douglas - 50% L. G. Stevens - 50%
NE $\frac{1}{4}$ 16-2-29 WPM	Home Oil Company Limited Scurry - Rainbow Oil Limited	Crown
E $\frac{1}{2}$ 21-2-29 WPM	Shell Canada	A. O. Freiburg, Executrix
Sec. 22-2-29 WPM	Tundra Oil and Gas Ltd.	Crown
NE $\frac{1}{4}$ 23-2-29 WPM	Open	A. & R. Carr
SE $\frac{1}{4}$ 23-2-29 WPM	Tundra Oil and Gas Ltd.	A. Sokalski
W $\frac{1}{2}$ 23-2-29 WPM	Tundra Oil and Gas Ltd. Newscope Resources Limited - 50%	G. S. Patmore
SW $\frac{1}{4}$ 24-2-29 WPM	Melaar Resources Ltd.	Robyn Henry Lore
NW $\frac{1}{4}$ 24-2-29 WPM	Chevron Canada Resources	A. Sokalski
SW $\frac{1}{4}$ 25-2-29 WPM	Troy Oils	Moral Re-Armament (The Oxford Group)
SE $\frac{1}{4}$ 26-2-29 WPM	Open	D. J. Southam
SW $\frac{1}{4}$ 26-2-29 WPM	Melaar Resources Ltd.	S. J. Southam
SE $\frac{1}{4}$ 27-2-29 WPM	Melaar Resources Ltd.	S. J. Southam
SW $\frac{1}{4}$ 27-2-29 WPM	Home Oil Company Limited	Crossman Petroleums Ltd. - 50% F. & G. Crossman - 50%
SE $\frac{1}{4}$ 28-2-29 WPM	Omega Hydrocarbons Ltd.	Crown



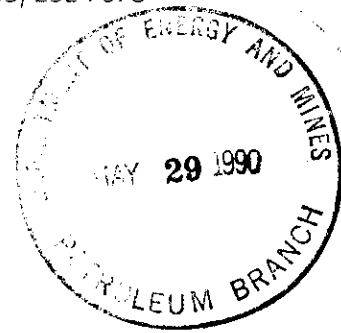
**Home Oil Company Limited**

1600 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta T2P 2Z5  
Telephone (403) 232-7100  
Fax (403) 232-7678



1990-05-24

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3



Attention: Mr. L.R. Dubreuil  
Director, Petroleum Branch

Dear Mr. Dubreuil:

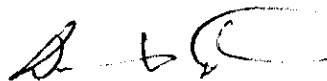
Re: Application for Special Drilling Spacing Units  
South Pierson Field, Lower Amaranth B Pool

Home Oil Company Limited submits a list of freehold mineral rights owners within a 0.8 km radius of the Special Drilling Spacing Units application area, as indicated it would in our original application dated 1990-05-17.

If you require any further information or have any questions, please contact Mr. Allan Willms at (403) 232-7362.

Yours truly,

HOME OIL COMPANY LIMITED

  
for K.R. Brown, P.Eng.  
Manager, Reservoir Engineering

Attachment

cc: G.B. Harrison  
A.R. Willms  
Day File  
File:13-PIER-0

# SOUTH PIERSON AREA

Location		Name of Interest		Address	City	Area	Cert. Number
Dir	Sec Twp Rge Mer					Pr Code	
NW	31	1	28 W1M Andrew Thomas Brown	Box 2157	Brandon	MB R7A 6X5	58638
NE	31	1	29 W1M Pearl MacLean	Ste. 105, 218 - 4 Street	Brandon	MB R7A 3G8	27029
			Theodore Joseph Artz and	P.O. Box 85	Lyleton	MB ROM 1G0	189153
			Rebecca Susanne Artz	P.O. Box 85	Lyleton	MB ROM 1G0	189153
NW	33	1	29 W1M PanCanadian Petroleum Limited	Box 2850	Calgary	AB T2P 2S5	
NE	33	1	29 W1M PanCanadian Petroleum Limited	Box 2850	Calgary	AB T2P 2S5	
NW	34	1	29 W1M South West Oil Limited	P.O. Box 855	Melita	MB ROM 1L0	24080
			Sarah Ruby Caney	Box 1013	Virden	MB ROM 2C0	41444
			Wayne Gordon Tingey	Box 95	Lyleton	MB ROM 1G0	170831
			Wayne Gordon Tingey	Box 95	Lyleton	MB ROM 1G0	170830A
			Wayne Gordon Tingey	Box 95	Lyleton	MB ROM 1G0	170830
			Trent Wayne Tingey	Box 95	Lyleton	MB ROM 1G0	170829
			Adele Celeste Tingey	Box 95	Lyleton	MB ROM 1G0	170829
NE	34	1	29 W1M Ramona Mae Murray and	Box 129	Melita	MB ROM 1L0	175912
			Edith Diana Marie Erixon	Box 39	Lyleton	MB ROM 1G0	175912
			Kenneth Kerfoot Foster	1820 Abbot Street	Kelowna	BC V1Y 1B5	18443
NW	35	1	29 W1M Cautantownit Holdings Ltd.	26 Mariner Crescent	Winnipeg	MB R2P 0V4	58400
NE	35	1	29 W1M Cautantownit Holdings Ltd.	26 Mariner Crescent	Winnipeg	MB R2P 0V4	58400
NW	36	1	29 W1M Earle Fletcher	Post Office	Coulter	MB ROM 0G0	35279
			Norman Glinz and Willis Glinz	Box 78, Route #2	Bottineau	ND 58318	186471
NE	36	1	29 W1M Earle Fletcher	P.O. Box 1	Gerald	SK S0A 1B0	12578
			Kathleen Louise Martinovsky	Post Office	Coulter	MB ROM 0G0	35279
			South West Oil Limited	P.O. Box 855	Melita	MB ROM 1L0	186476
SW	6	2	28 W1M Kathleen Louise Martinovsky	P.O. Box 1	Gerald	SK S0A 1B0	12578
			Theodore Joseph Artz and	P.O. Box 85	Lyleton	MB ROM 1G0	189153
			Rebecca Susanne Artz	P.O. Box 85	Lyleton	MB ROM 1G0	189153
			Pearl MacLean	Ste. 105, 218 - 4 Street	Brandon	MB R7A 3G8	27029
NW	6	2	28 W1M Theodore Joseph Artz and	P.O. Box 85	Lyleton	MB ROM 1G0	189153
			Rebecca Susanne Artz	P.O. Box 85	Lyleton	MB ROM 1G0	189153
			Ramona Mae Murray and	Box 129	Melita	MB ROM 1L0	175624
			Edith Diana Marie Erixon	Box 39	Lyleton	MB ROM 1G0	175624

# SOUTH PIERSON AREA

Location		Dir		Sec		Twp		Rge		Mer		Name of Interest		Address		City		Pr Code		Area		Cert. Number	
SW	7	2	28	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Don Harley Insurance Agencies Ltd.		Village of Lyleton		Pierston		MB				59210	
												Winnifred Anne Law						MB	ROM 150			55630	
												Muriel May Bird						MB				55630	
NW	1	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Ralph Raymond Law				Melita		MB				55630	
												Kathleen Louise Martinovsky ✓		P.O. Box 1		Gerald		SK	SOA 180			12578	
NE	1	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	South West Oil Limited ✓		P.O. Box 855		Melita		MB	ROM 110			25839	
												Kathleen Louise Martinovsky ✓		P.O. Box 1		Gerald		SK	SOA 180			12578	
SW	1	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Norman Glinz and Willis Glinz ✓		Box 78, Route #2		Bottineau		ND	58318			25916	
												Kathleen Louise Martinovsky ✓		P.O. Box 1		Gerald		SK	SOA 180			12578	
SE	1	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Gerald Ralph Dressler		1116 Rosser Avenue, Box 954		Coulter		MB	R7A 529			28674	
												Kevin Marcus Kearns		6215 North 31st Dr.		Phoenix		AZ	85017			28674	
												Kathleen Louise Martinovsky ✓		P.O. Box 1		Gerald		SK	SOA 180			12578	
												Joel Keith Morgan		59 Beaver Ridge		(Mepean) Ottawa		ON	K2E 6E2			58278	
NW	2	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Gerald Ralph Dressler ✓		1116 Rosser Avenue, Box 954		Coulter		MB	R7A 529			58278	
NE	2	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Crossman Petroleum Ltd.		Box 149		Pierston		MB	ROM 150			182396	
												Crossman Petroleum Ltd.		Box 149		Pierston		MB	ROM 150			182400	
												Crossman Petroleum Ltd.		Box 149		Pierston		MB	ROM 150			182396	
												Crossman Petroleum Ltd.		Box 149		Pierston		MB	ROM 150			182400	
SE	3	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	The Rural Municipality of Edmond		Box 100		Pierston		MB	ROM 150			8887	
NE	6	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Canada Trust Company c/o Montreal Trust		411 - 8 Ave. S.W.		Calgary		AB	T2P 1E7			28266	
												Canada Trust Company c/o Montreal Trust		411 - 8 Ave. S.W.		Calgary		AB	T2P 1E7			27629	
												George Douglas Hart		331 Mainwright Rd. S.E.		Calgary		AB	T2J 1H9			27552	
NW	7	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Charles Thomas Nicoll		Box 275		Treherne		MB	ROG 2V0			50647	
												William John Nicoll		See Charles Thomas Nicoll		Rossendale						50647	
NE	7	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Mary F. McLeod		See Charles Thomas Nicoll		Chatton		AB				50647	
												Charles Thomas Nicoll ✓		Box 275		Treherne		MB	ROG 2V0			50648	
												William John Nicoll		See Charles Thomas Nicoll		Rossendale						50648	
												Mary F. McLeod ✓		See Charles Thomas Nicoll		Chatton		AB				50648	
SW	7	2	29	W1M	W1M	W1M	W1M	W1M	W1M	W1M	W1M	Charles Thomas Nicoll ✓		Box 275		Treherne		MB	ROG 2V0			50647	
												William John Nicoll ✓		See Charles Thomas Nicoll		Rossendale						50647	
												Mary F. McLeod ✓		See Charles Thomas Nicoll		Chatton		AB				50647	



SOUTH PIERSON AREA

Location		Name of Interest		Address		City		Area		Cert. Number	
Dir	Sec Twp Rge Mer										
SE	7 2 29 W1M	Charles Thomas Nicoll ✓		Box 275		Treherne		MB ROG 2V0		50648	
		William John Nicoll ✓		See Charles Thomas Nicoll		Rosendale				50648	
		Mary F. McLeod ✓		See Charles Thomas Nicoll		Chatton		AB		50648	
SW	12 2 29 W1M	Robert William Daniels ✓		P.O. Box 26		Pierson		MB ROM 1S0		190465	
SE	12 2 29 W1M	Robert William Daniels ✓		P.O. Box 26		Pierson		MB ROM 1S0		190465	
NW	13 2 29 W1M	Harold Herbert Mayes and Loretta Mae Mayes		Both of the Postal District of Lyleton		Lyleton		MB		52067	
SW	13 2 29 W1M	Amoco Canada Petroleum Company Limited		Box 200, Station #M		Calgary		AB T2P 2H8		26291	
		John Murray		Box 3		Pierson		MB ROM 1S0		15790	
NW	14 2 29 W1M	Sceptre Resources Limited		3100, 150 - 6 Ave. S.W.		Calgary		AB T2P 3Y7		163076	
NE	14 2 29 W1M	Sceptre Resources Limited ✓		3100, 150 - 6 Ave. S.W.		Calgary		AB T2P 3Y7			
NE	18 2 29 W1M	Marie Eikanger		Box 252		Pierson		MB ROM 1S0		171168	
SW	18 2 29 W1M	Wang Oil Properties Ltd.		c/o Fred L. Wang, Gen. Del.		Pierson		MB ROM 1S0		172138	
N	19 2 29 W1M	Patricia Ann Flueher		R.R. 2, 152J		Buffalo Lake		NN		169767	
		Neil Robert Silker		2410 Red Leaf Court		Winnipeg		NN	56101	169767	
		Donald Keith Silker		Route 2, P.O. Box 245		Hector		NN	55342	169767	
		Donald Silker		Route 2, P.O. Box 245		Hector		NN	55342	178183	
SW	19 2 29 W1M	Amoco Canada Petroleum Company Limited ✓		Box 200, Station #M		Calgary		AB T2P 2H8			
SE	19 2 29 W1M	Amoco Canada Petroleum Company Limited ✓		Box 200, Station #M		Calgary		AB T2P 2H8			
N	21 2 29 W1M	Paul Kielhorn and Harold Freberg, Executors of Estate of Amanda Freberg ✓		Box 29 Langley Street		Regina		SK S4S 3V5		27114	
SW	21 2 29 W1M	Kenneth James Lee		Box 35		Pierson		MB ROM 1S0		38056	
SE	21 2 29 W1M	Paul Kielhorn and Harold Freberg, Executors of Estate of Amanda Freberg ✓		Box 29 Langley Street		Regina		SK S4S 3V5		27114	
SE	22 2 29 W1M	Her Majesty the Queen								170213	
SW	23 2 29 W1M	Gladys Sarah Patmore		Post Office of Pipestone		Pipestone		NN		45340	
SW	27 2 29 W1M	Crossman Petroleum Ltd. ✓		Box 149		Pierson		MB ROM 1S0		182702	
SW	29 2 29 W1M	Glen Howard Crossman		Box 149		Pierson		MB ROM 1S0		26849	
SE	29 2 29 W1M	Frank George Crossman		Box 212		Pierson		MB ROM 1S0		24448	
NW	30 2 29 W1M	Governing Council of the Salvation Army, Canada West								59038	
NE	30 2 29 W1M	c/o Pollock Co.								59038	
SW	30 2 29 W1M	Attn. Mr. Harvey Pollock								59038	
SE	30 2 29 W1M	1610 - 155 Carleton Street				Winnipeg		MG R3C 3W8		59038	
SE	31 2 29 W1M	Ronald La Verne Mayes		c/o G.D. Drier, Box 81		Pierson		MB ROM 1S0		56446	

# SOUTH PIERSON AREA

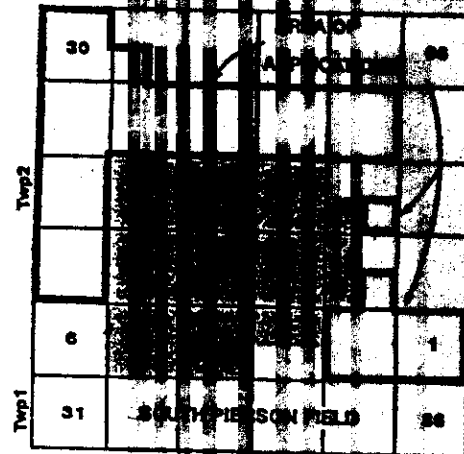
Location		Dir		Sec		Twp		Rge		Mer		Name of Interest		Address		City		Area		Pr		Code		Cert.		Number	
SW	31	2	29	W1M								Gerald Dordon Drier		c/o G.D. Drier, Box 81		Pierson		MB	ROM	1S0						56446	
												Ronald La Verne Mayes ✓		c/o G.D. Drier, Box 81		Pierson		MB	ROM	1S0						56446	
SW	32	2	29	W1M								Gerald Dordon Drier ✓		c/o G.D. Drier, Box 81		Pierson		MB	ROM	1S0						56446	
												William John Olson		Box 234		Pierson		MB	ROM	1S0						183207	
NE	1	2	30	W1M								Amoco Canada Petroleum Company Limited ✓		Box 200, Station "M"		Calgary		AB	T2P	2H8						26292	
NE	13	2	30	W1M								Thomas Dale Bonner		Box 206		Pierson		SK	S0A	3C0							
NE	24	2	30	W1M								Albert Edward Hoskin		357 George Street		Cobourg		ON	K9A	3V5							
												PanCanadian Petroleum Limited ✓		Box 2850		Calgary		AB	T2P	2S5							
												Caryle Energy Ltd.		700, 1122 - 4 St. S.W.		Calgary		AB	T2R	1M1							
												Pembina Resources Limited		P.O. Box 1948		Calgary		AB									
E	1/2	25	2	30	W1M							Robert J. Kleinman		1409 Willow Street		Minneapolis		MN			55403						

Alberta	AB
Sask	SK
Manitoba	MB
Ontario	ON
Quebec	QP
New Brunswick	NB
Nova Scotia	NS
Prince Edward Island	PE
Newfoundland	NF
Arizona	AZ
North Dakota	ND
Minnesota	MN

# NOTICE

## Under The Mines Southwestern Oil

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made application separately under subsection 20(1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field and surrounding area. The area of application is outlined below. The area of application adjoins the area covered by Board Order SU 5 (October 1, 1989) which established temporary special 32 hectare drilling spacing within the South Pierson Oil Field.



Winnipeg  
New Era  
Thursday May 25/90

It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from the Lower Anisotropy Formation in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7, etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivisions and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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

Copies of the applications can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Avenue S.W., Calgary, Alberta, T2P 2Z5 (phone: (403) 232-7100) and Tundra Oil and Gas Ltd., 1313-Due Leman Place, Winnipeg, Manitoba, R3B 0X3 (phone: (204) 949-1195), or can be viewed at the offices of the Petroleum Branch, 555-330 Graham Avenue, Winnipeg, Manitoba, R3C 0E5 (phone: (204) 945-1195).

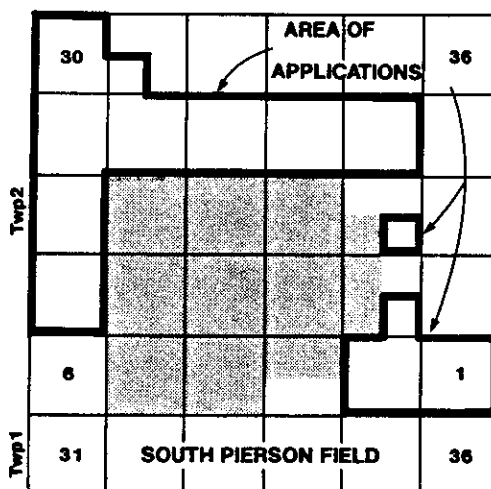
Dated at Winnipeg, this 25th day of May, 1990.

—H. C. Moster, Deputy Chairman

# NOTICE

## Under The Mines Act South Pierson Oil Field

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made application separately under subsection 20(1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field and surrounding area. The area of application is outlined below. The area of application adjoins the area covered by Board Order SU 5 (October 4, 1989) which established temporary special 32 hectare drilling spacing within the shaded area in the South Pierson Field.



Page 29 (WPM)

It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from the Lower Amaranth Formation in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7, etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivisions and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

1/011/096/AB/90 — Ben Metcalf

An application for a permit for an Access Driveway (Residential) onto P.T.H. No. 11, N.E. ¼, Section 33-15-11 East, R.M. of Lac du Bonnet.

2/059/097/A/90 — Leo Prefontaine

An application for a permit to Relocate an Existing Access Driveway (Residential) onto P.T.H. No. 59, S.E. ¼, Section 28-5-4 East, R.M. of DeSalaberry.

1/009/099/AB/90 — Manitoba Telephone System

An application for a permit for an M.T.S. Building and Access Driveway (other) onto Kencaron Crescent all adjacent to P.T.H. No. 9, Lot 3, Block 1, Plan 15884, N.W. ¼, Section 21-18-4 East, R.M. of Gimli (Sandy Hook).

The Highway Traffic Board will be prepared to consider all submissions written or oral on the above applications by contacting the Secretary prior to or at the hearing.

A. POLTARUK, MMM CD  
Secretary,  
The Highway Traffic Board.

465—23

UNDER THE MINES ACT

NOTICE  
SOUTH PIERSON OIL FIELD

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made application separately under subsection 20(1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field and surrounding area. The area of application is outlined below. The area of application adjoins the area covered by Board Order SU 5 (October 4, 1989) which established temporary special 32 hectare drilling spacing within the shaded area in the South Pierson Field.

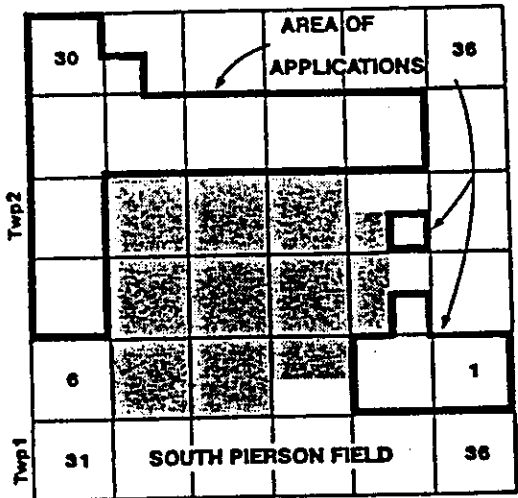


Fig 29(WPM)

It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from the Lower Amaranth Formation in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7, etc.). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivisions and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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Dated at Winnipeg, this 25th day of May, 1990.

8487—23

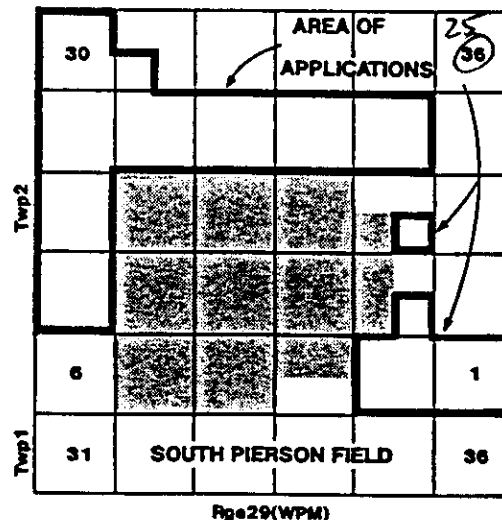
H. C. MOSTER,  
Deputy Chairman.



## NOTICE

### Under The Mines Act South Pierson Oil Field

Home Oil Company Limited and Tundra Oil and Gas Ltd. have made application separately under subsection 20(1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field and surrounding area. The area of application is outlined below. The area of application adjoins the area covered by Board Order SU 5 (October 4, 1989) which established temporary special 32 hectare drilling spacing within the shaded area in the South Pierson Field.



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Dated at Winnipeg, this 25<sup>th</sup> day of MAY, 1990.

A handwritten signature in dark ink, appearing to read 'H.C. Moster', with a long, sweeping flourish extending from the end of the name.

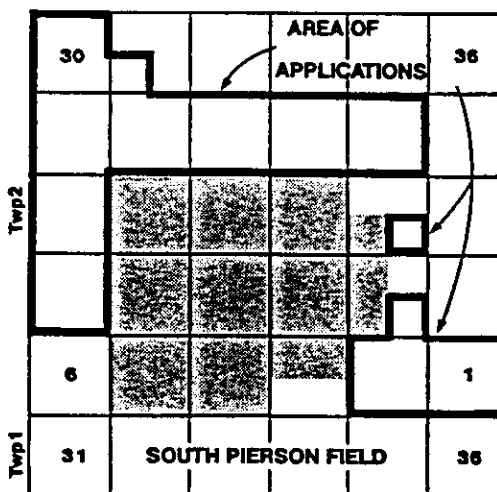
H.C. Moster  
Deputy Chairman



## NOTICE

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Page 29 (WPM)

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## NOTICE

### Under The Mines Act South Pierson Oil Field

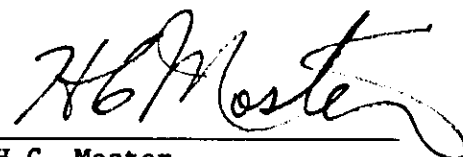
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It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from the Lower Amaranth Formation in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7, etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivisions and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

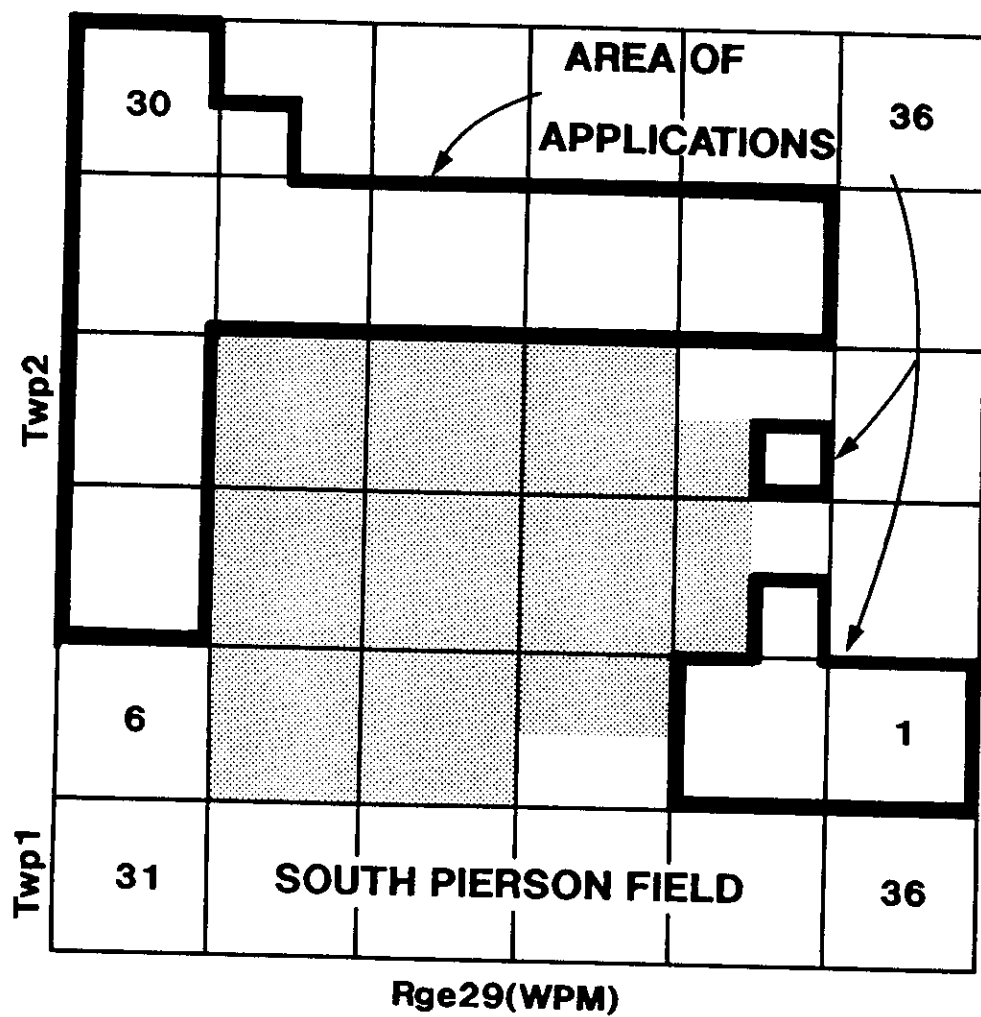
If no valid intervention or objection in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8 within 14 days of the publication of this notice, the Board may approve the application.

Copies of the applications can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Avenue S.W., Calgary, Alberta, T2P 2Z5 [phone: (403) 232-7100] and Tundra Oil and Gas Ltd., 1313 - One Lombard Place, Winnipeg, Manitoba, R3B 0X3 [phone: (204) 949-1195], or can be viewed at the offices of the Petroleum Branch, 555-330 Graham Avenue, Winnipeg, Manitoba, R3C 4E3 [phone: (204) 945-1195].

Dated at Winnipeg, this 25<sup>th</sup> day of MAY, 1990.

A handwritten signature in black ink, appearing to read 'H.C. Moster', with a long, sweeping underline that extends to the right.

H.C. Moster  
Deputy Chairman





Energy and Mines

Petroleum

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

(204) 945-6577

May 29, 1990

Tundra Oil and Gas Ltd.  
1313 Richardson Building  
One Lombard Place  
Winnipeg, Manitoba  
R3B 0X3

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

Dear Dan:

Re: Application for 32 ha Spacing - South Pierson Field

Tundra's application for 32 ha spacing in the South Pierson Field will be jointly advertised with Home Oil's application in the Melita New Era and the Manitoba Gazette (1990 - 06 - 09).

The Branch has a list of the lessors and lessees in and within 1 km of the area of application. In order to notify those parties directly a list of their addresses is required as soon as possible.

Yours sincerely,

*for H. Hinko*  
John N. Fox  
Chief Petroleum Engineer

JNF:cvs



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

May 24, 1990

Home Oil Company Limited  
1700 Home Oil Tower  
324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. K.R. Brown, P. Eng.  
Manager, Reservoir Engineering

Dear Sir:

RE: Application for Special Drilling  
Spacing Units - South Pierson

Your application for special 32 ha drilling spacing units within and adjacent to the South Pierson Field is hereby acknowledged.

The Board, as indicated in its letter dated April 18, 1990, intends to jointly advertise Home Oil's and Tundra Oil and Gas Ltd.'s spacing applications.

In order to complete the application, you are requested to supply the Board with a list of the names and addresses of the lessors and lessees in and within 0.5 km of the area of application. To avoid any delays in processing the application, this information is required as soon as possible.

Yours respectfully,

A handwritten signature in black ink, appearing to read "H. Clare Moster". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

H. Clare Moster  
Deputy Chairman

May 24, 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 32 ha Spacing Units - South Pierson Field

Home Oil Company Limited has applied under Section 20 of the Petroleum Drilling and Production Regulation for approval of special 32 ha drilling spacing units for the Lower Amaranth Formation in the area outlined in Figure 1 within and adjacent to the South Pierson Field. As discussed in our memo of April 20, 1990, Tundra Oil and Gas Ltd. has made a similar application (see Figure 1).

#### RECOMMENDATIONS

It is recommended that Home Oil's and Tundra's applications for 32 ha spacing units within and surrounding the South Pierson Field be advertised jointly in the Manitoba Gazette and the Melita New Era. Attached is a copy of the proposed advertisement.

Also attached is a copy of the proposed Board letter of acknowledgement to Home Oil which also requests the company supply the names and addresses of lessors and lessees in and within 0.5 kilometres of the area of application.

Upon receipt of the names and addresses, the lessors and lessees will be notified directly of the application.

*[Signature]*  
John N. Fox

*[Signature]* John N. Fox

Att'd.

*[Signature]*  
L.R. Dubreuil

Approved: \_\_\_\_\_  
L.R. Dubreuil, Director

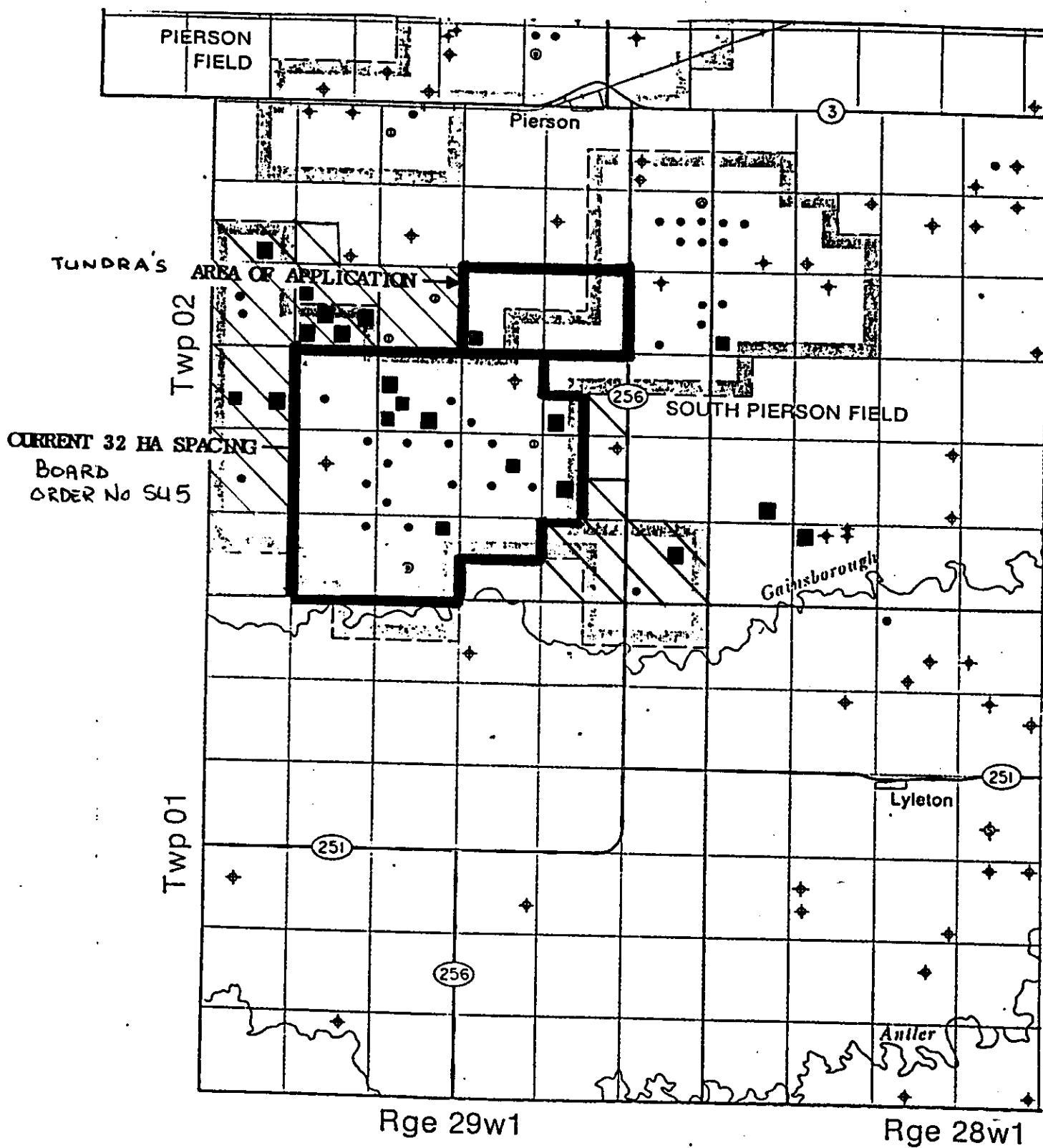


FIGURE 1

■ NEW WELLS

▨ HOME OIL'S AREA OF APPLICATION

April 20, 1990

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

John N. Fox  
Chief Petroleum Engineer  
Petroleum Branch

Application for 32 ha Spacing Units - South Pierson Field

Tundra Oil and Gas Ltd. has applied under Section 20 of the Petroleum Drilling and Production Regulation for approval of special 32 ha drilling spacing units for the Lower Amaranth Formation in Sections 22 and 23-2-29 (WPM) in the South Pierson Field. Home Oil Company Limited has also expressed an interest in expanding 32 ha spacing in the South Pierson Field.

Recommendations

It is recommended that Tundra and Home Oil be notified by the Board of the other's interest in expanding the area covered under Board Order No. SU 5 establishing 32 ha spacing for the Lower Amaranth Formation in a portion of the South Pierson Field. A copy of the proposed letters of notification are attached.

It is also recommended that all applications for approval of 32 ha spacing for the Lower Amaranth Formation in the South Pierson Field be dealt with by the Board simultaneously.

Discussion

Tundra has applied for special 32 ha drilling spacing units for the Lower Amaranth Formation in Sections 22 and 23-2-29(WPM) in the South Pierson Field (Figure 1).

The area of application adjoins the area that the Board by Board Order No. SU 5 dated October 4, 1989 established 32 ha spacing for the Lower Amaranth Formation (Figure 1).

The Lower Amaranth Formation in the South Pierson Field has been the target of renewed drilling activity. This year to date, eight new wells have been drilled by Tundra and Home Oil (Figure 1). In addition to Tundra's application, Home Oil has indicated that it intends to file an application for 32 ha spacing for Sections 6, 7, 18, 19, 20 and 21-2-29 (WPM) (Figure 1) within the next month.



It is proposed that the Board deal with the Tundra application and the Home Oil application simultaneously. To that end, it is recommended that both Tundra and Home Oil be contacted and informed of the Board's intent. If either company expresses a concern with this approach, the matter can be reviewed.


ORIGINAL SIGNED  
JOHN N. FOX

John N. Fox

Encl.

ORIGINAL SIGNED BY  
JOHN N. FOX

Approved by:

\_\_\_\_\_  
L.R. Dubreuil, Director



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 18, 1990.

Tundra Oil and Gas Ltd.  
1313 Richardson Building  
One Lombard Place  
Winnipeg, Manitoba  
R3B 0X3

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

Dear Sir:

RE: Application for Special Drilling Spacing Units - South Pierson Field

Your application for special 32 ha drilling spacing units for the Lower Amaranth Formation in Sections 22 and 23-2-29 (WPM) in the South Pierson Field in hereby acknowledged.

The Board has been advised that Home Oil Company Limited is also interested in extending the area covered by Board Order No. SU 5 which temporarily established special 32 ha drilling spacing units in the Lower Amaranth Formation in a portion of the South Pierson Field. It is the Board's intention to deal with the two applications simultaneously. To that end, Home Oil has been requested to formally file its application before May 21, 1990.

If you have any concerns with the proposed approach or questions in respect of the application, please contact the Board.

Yours respectfully,

H. Clare Moster  
Deputy Chairman

JF/ibj



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 18, 1990.

Home Oil Company Limited  
1700 Home Oil Tower  
324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. K.R. Brown, P. Eng.,  
Manager, Reservoir Engineering

Dear Sir:

RE: South Pierson Field - Expansion of 32 ha Spacing

This letter is to advise you that Tundra Oil and Gas Ltd. has made application for special 32 ha drilling spacing units for the Lower Amaranth Formation in Sections 22 and 23-2-29 (WPM) in the South Pierson Field.

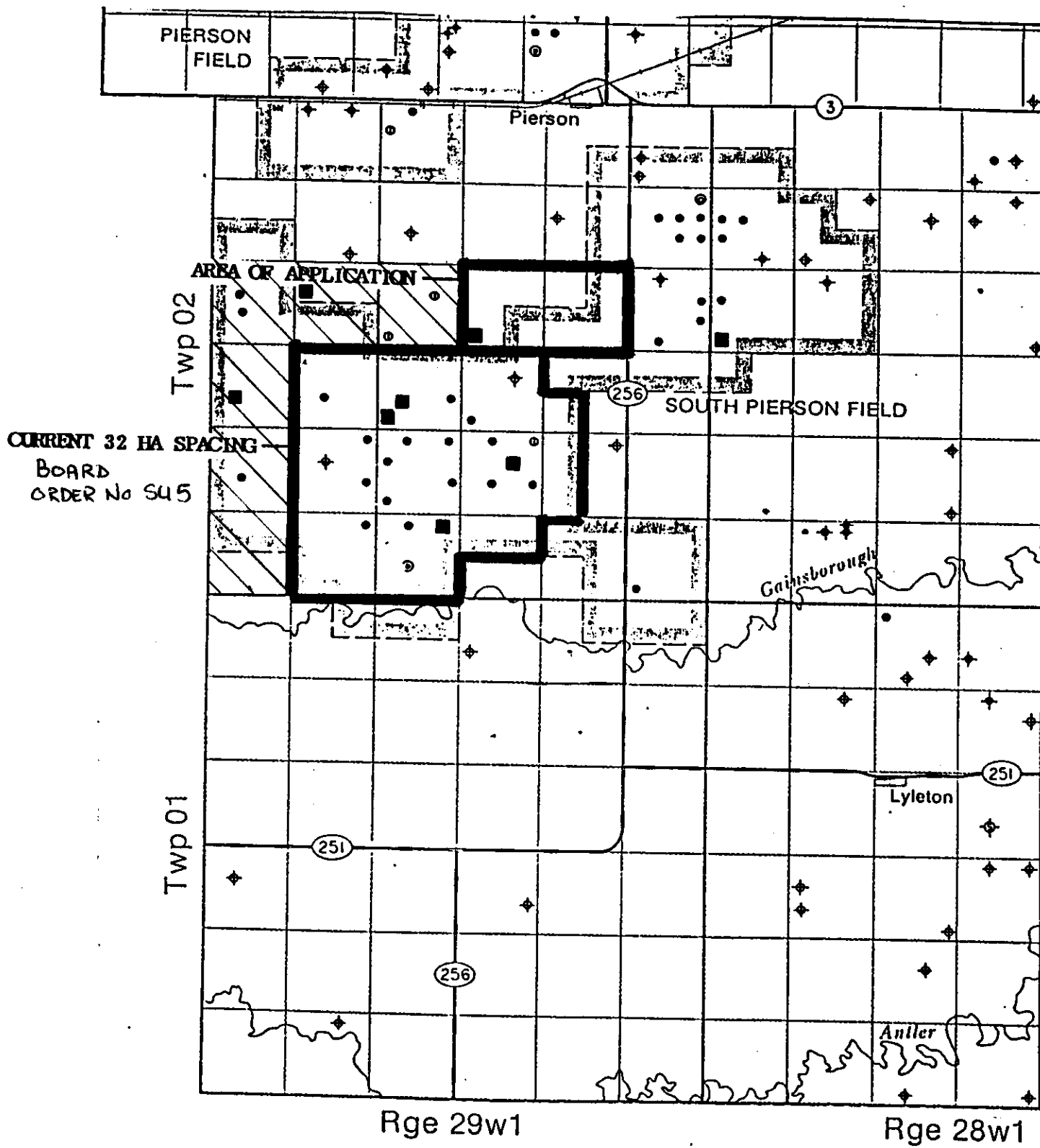
The Board has been advised that Home Oil is also interested in extending the area covered by Board Order No. SU 5 which temporarily established special 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. If Home Oil plans to make application for 32 ha spacing, the Board would prefer to deal with the two applications simultaneously. In order to expedite this matter, you are requested to file such an application before May 21, 1990.

If you have any concerns with the proposed approach or any questions in respect of the application, please contact the Board.

Yours respectfully,

H. Clare Moster  
Deputy Chairman

JF/ibj



■ NEW WELLS

▨ HOME OIL'S AREA OF INTEREST

FIGURE 1



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 20, 1990.

Tundra Oil and Gas Ltd.  
1313 Richardson Building  
One Lombard Place  
Winnipeg, Manitoba  
R3B 0X3

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

Dear Sir:

RE: Application for Special Drilling Spacing Units - South Pierson Field

Your application for special 32 ha drilling spacing units for the Lower Amaranth Formation in Sections 22 and 23-2-29 (WPM) in the South Pierson Field in hereby acknowledged.

The Board has been advised that Home Oil Company Limited is also interested in extending the area covered by Board Order No. SU 5 which temporarily established special 32 ha drilling spacing units in the Lower Amaranth Formation in a portion of the South Pierson Field. It is the Board's intention to deal with the two applications simultaneously. To that end, Home Oil has been requested to formally file its application before May 21, 1990.

If you have any concerns with the proposed approach or questions in respect of the application, please contact the Board.

Yours respectfully,

A handwritten signature in black ink, appearing to read "H. Clare Moster". The signature is fluid and cursive, with a long, sweeping underline.

H. Clare Moster  
Deputy Chairman

JF/1bj



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 20, 1990.

Home Oil Company Limited  
1700 Home Oil Tower  
324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. K.R. Brown, P. Eng.,  
Manager, Reservoir Engineering

Dear Sir:

RE: South Pierson Field - Expansion of 32 ha Spacing

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The Board has been advised that Home Oil is also interested in extending the area covered by Board Order No. SU 5 which temporarily established special 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. If Home Oil plans to make application for 32 ha spacing, the Board would prefer to deal with the two applications simultaneously. In order to expedite this matter, you are requested to file such an application before May 21, 1990.

If you have any concerns with the proposed approach or any questions in respect of the application, please contact the Board.

Yours respectfully,

H. Clare Moster  
Deputy Chairman

JF/ibj



The Oil and Natural Gas  
Conservation Board

Room 309  
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Winnipeg, Manitoba, CANADA  
R3C 0V8

(204) 945-3130

## NOTICE

### Under The Mines Act Daly Oil Field

Tundra Oil and Gas Ltd. has made application under The Mines Act to conduct a pilot waterflood project in the Bakken Formation in that portion of the Daly Field described as follows: Lsd's 12 and 13 of Section 13-10-29 (WPM), Lsd's 9, 15 and 16 of Section 14-10-29 (WPM) and Lsd's 1 and 2 of Section 23-10-29 (WPM).

It is proposed to convert the well, Tundra Daly 16-14-10-29 (WPM) to water injection.

If no valid objection or intervention in writing is received by The Oil and Natural Gas Conservation Board at 555-330 Graham Avenue, Winnipeg, Manitoba, R3C 4E3 within 14 days of the publication of this notice, the Board may approve the application.

Copies of the application may be obtained from Tundra Oil and Gas Ltd., 1313-One Lombard Place, Winnipeg, Manitoba, R3B 0X3.

Dated at Winnipeg this 20<sup>th</sup> day of April, 1990.

  
H. C. Moster  
Deputy Chairman.

**Home Oil Company Limited**

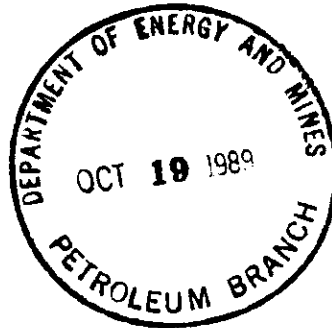
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta T2P 2Z5  
Telephone (403) 232-7100  
Fax (403) 232-7678

*Joan  
-File*



1989-10-16

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3



ATTENTION: Mr. L.R. Dubreuil, Director  
Petroleum Branch

Gentlemen:

RE: Minutes of Meeting  
Home Oil Operated South Pierson Property

The meeting was convened at 1:00 P.M., Tuesday, October 7, 1989. The following people were in attendance:

<u>Affiliation</u>	<u>Attendee</u>
Petroleum Branch	Mr. L.R. Dubreuil
Petroleum Branch	Mr. B. Thiessen
Petroleum Branch	Mr. J. Fox
Home Oil Company Limited	Mr. K.R. Brown
Home Oil Company Limited	Mr. G.B. Harrison
Home Oil Company Limited	Ms. R.A. Bennett

The agenda was as follows:

1. 32 ha Spacing Application Status,
2. Details of Home Oil's Plans,
3. Review of Offset Situation,
4. Other Business.

...2/



1. 32 ha Spacing

The application was approved in part for a period of approximately two years with certain conditions. A copy of the approval is attached.

Home inquired about the possibility of the Mississippian rights reverting to the Crown to be drilled on infill 16 ha spacing by a subsequent purchaser.

The Branch indicated the 16 ha spacing was intended to promote drilling the optimum locations for Mississippian production which may be on 16 ha spacing. Reversion of the rights would not be for several years and the Branch would not offer the Mississippian rights if production segregation could not be established.

2. Home Oil's Plans

Home discussed the reasons for delays in developing the area. Freehold lease validity has been questioned and must be resolved before further drilling can take place. The property may be offered for sale shortly, causing difficulty in long range planning.

Home indicated a multi-well drilling program will be presented for management approval once the lease situation has been resolved, even if the property sale is still pending.

3. Review of Offset Situation

As a result of the revised spacing, certain 16 ha offsets are no longer required and other 32 ha offsets are created. Three notice locations issued on 16 ha spacing remain in effect for the larger 32 ha DSUs. The target LSDs are changed however. These offset locations will begin paying compensatory royalties totaling \$M 17/mo beginning in November 1989. An additional three offset locations created on 32 ha spacing will begin paying additional compensatory royalties of \$M 14.7/mo in February 1990. Compensatory royalties are paid at the "old oil" royalty rate. A summary of compensatory royalties/locations is attached.

The Crown will waive compensatory royalties on one location for each Crown well drilled regardless whether it is the offset required, allowing Home to drill the preferred Crown locations rather than the notice locations. The Crown would reserve the right to re-issue the offset notices, however, if development does not proceed to their satisfaction.

It was made clear by the Manitoba Crown that development of Crown leases in the South Pierson area is a high Petroleum Branch priority as it contains some of the most productive wells in the province.

4. Other Business

Home requested clarification of requirements to hold Crown leases past the primary term as outlined in the regulations.

The Crown provided an information letter (attached) explaining that a written commitment to drill one in each four remaining DSUs in a lease is required plus payment of a fee for each additional year the lease is extended.

The meeting ended at approximately 2:30 P.M. If there are any errors or omissions please contact Mr. Gary Harrison at (403) 232-7107.

Yours truly,

HOME OIL COMPANY LIMITED



K.R. Brown, P. Eng.  
Manager, Reservoir Engineering

GBH/eja  
1696e

Attachments

c.c. Attendees  
W.B. Baker  
K.R. Evans  
G. Macleod  
G.O. Raham  
L.E. Snell  
W.C. Tersmette  
T. Williams  
File: 13-PIER-0  
Day File

# SOUTH PIERSON COMPENSATORY ROYALTY

## Compensatory Royalty Payable 1989-11

<u>Crown Offset Location</u>	<u>Producing Locations Offsetting</u>	<u>Production 1989-06 m<sup>3</sup>/mo</u>	<u>Royalty Payable m<sup>3</sup>/mo</u>	<u>\$/mo</u>
12-04-02-29W1	16-05-02-29W1	115.0		
	04-09-02-29W1	167.5	62.3	7 845
04-11-02-29W1	08-10-02-29W1	51.7	10.2	1 284
06-16-02-29W1	14-09-02-29W1	169.7	63.3	7 970
Compensatory Royalty Payable 1989-11			135.8	17 100


## Offsets Issued 1989-10-05

16-04-02-29W1	08-09-02-29W1	38.9	5.7	719
10-10-02-29W1	14-10-02-29W1	75.8	21.0	2 649
04-16-02-29W1	12-09-02-29W1	229.5	90.2	11 361

Additional Compensatory Royalty Payable 1990-02 116.9 14 729

Total Compensatory Royalty Payable 1990-02 is \$31,829/mo.

*G. B. HARRISON*

*cc Longman  
Ruth  
Bennett* 

# Manitoba

The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

October 5, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Ken Brown, P. Eng.  
Manager, Reservoir Engineering

Dear Mr. Brown:

Re: South Pierson Field  
Special Drilling Spacing Units

The Board has reviewed your application for special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field.

After careful consideration of the technical and economic information filed in support of the application, the Board hereby approves on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application. A copy of Board Order No. SU 5 establishing 32 ha spacing units for the Lower Amaranth Formation is attached.

Reservoir development in the Mission Canyon in the area of application is very localized and reservoir characteristics indicate it would be more appropriate to retain 16 ha spacing for the Mission Canyon Formation. Your application for special 32 ha drilling spacing units for the Mission Canyon Formation is therefore denied.

As a result of concerns expressed by the Petroleum Branch and freehold mineral owners who objected to the application regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation and the limited amount of geological, reservoir, production and pressure data available, the Board has chosen to limit the approval of 32 ha spacing to a term of two (2) years ending October 31, 1991.

Prior to August 31, 1991, Home Oil is requested to apply under Section 20 of the Petroleum Drilling and Production Regulation, either to continue 32 ha spacing units for the Lower Amaranth or to amend the spacing. The application should include a review of the economics of developing the Lower Amaranth Formation on 16 ha spacing paying particular attention to determination of the level of incremental recovery associated with reduced spacing.

Home Oil indicated in their May 19, 1989 response to the Board's deficiency letter, that special fluid and core studies will be commenced in 1989 to determine the feasibility of waterflooding the South Pierson Lower Amaranth B Pool. The Board directs Home Oil to submit a comprehensive report discussing the feasibility of implementing an enhanced recovery scheme on either 32 ha or 16 ha spacing in the South Pierson Lower Amaranth B Pool before August 31, 1991.

The Board is concerned that insufficient reservoir pressure data is available to determine the optimum timing for possible implementation of an enhanced recovery scheme. Therefore, Home Oil is also requested to conduct an annual pressure survey in the South Pierson Lower Amaranth B Pool commencing in 1989 to determine the static reservoir pressure in the pool. Home Oil shall submit to the Petroleum Branch, the details of the proposed pressure survey, including a list of the wells to be surveyed, the measurement technique to be used, and the intended shut-in period for each well, and approval shall be obtained from the Director of Petroleum before the survey is carried out.

If over the next two years pressure data indicates significant depletion of the pool, the schedule for review of enhanced recovery feasibility may be accelerated.

If you have any questions in respect of this matter, please contact L.R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at (204) 945-6573 or 945-6574, respectively.

Yours respectfully,



H. Clare Moster  
Deputy Chairman

Attachment

cc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil



## Order No. SU 5

### An Order Pertaining to Drilling Spacing Units South Pierson Field Lower Amaranth Formation

WHEREAS, subsection (9)(b) of section 62 of "The Mines Act", being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(b) respecting the designation of the area that shall be allocated to a well in connection with fixing allowable production;"

AND WHEREAS, subsection (1)(f) of section 63 of "The Mines Act" being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides in part as follows:

"63(1) For the purpose of carrying out the provisions of this Part and Part III according to their intent, the Lieutenant Governor in Council may make such regulations and orders as are ancillary thereto, and are not inconsistent therewith; and every such regulation or order made under, and in accordance with the authority granted by, this section has the force of law; and, without restricting the generality of the foregoing, the Lieutenant Governor in Council may make regulations and orders,

(f) prescribing spacing units and the size and shape of spacing units;"

AND WHEREAS, subsection (1) of section 20 of Manitoba Regulation 430/87R under The Mines Act ("the Petroleum Drilling and Production Regulation") provides as follows:

"20(1) Notwithstanding section 19, the board may, after a public hearing or after publication of notice, prescribe by order special drilling spacing units which may differ from normal drilling spacing units in size, shape or target area."

AND WHEREAS, subsection (3) of section 21 of the Petroleum Drilling and Production Regulation provides as follows:

"21(3) Where a special drilling spacing unit is prescribed under section 20, the board may prescribe the target area within which a well shall be completed in order to qualify for a maximum permissible production rate based on the area of the special drilling spacing unit."

AND WHEREAS, the Board received an application dated January 4, 1989 from Home Oil Company Limited for approval of special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field outlined in Schedule A ("the area of application").

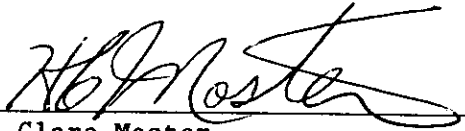
AND WHEREAS, upon publication of notice of the application, the Board received a number of objections to and interventions in the application.

AND WHEREAS, after Home Oil Company Limited supplied those persons who objected to and intervened in the application with additional information and discussed the application with them, all but one objection to the application, were withdrawn.

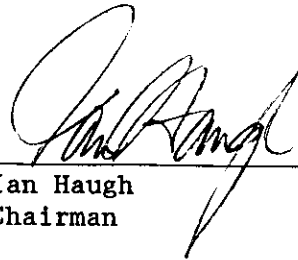
AND WHEREAS, upon due consideration of the said application and objection thereto, the Board considers temporary establishment of special 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application to be reasonable and desirable.

NOW THEREFORE, the Board orders that:

1. The spacing unit for each well drilled, or to be drilled, for the purpose of obtaining oil from the Jurassic Lower Amaranth Formation within the area of application outlined on Schedule A is two legal subdivisions comprising the east half or west half of a quarter section.
2. The target area of each drilling spacing unit shall be a square area in the even-numbered legal subdivision having sides one hundred metres from the sides of the legal subdivision and parallel to them.
3. This order expires October 31, 1991 unless rescinded by the Board prior to this date.



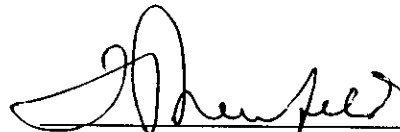
H. Clare Moster  
Deputy Chairman



Ian Haugh  
Chairman

OIL AND NATURAL GAS CONSERVATION  
BOARD ORDER NO. SU 5 APPROVED THIS  
4<sup>th</sup> DAY OF OCTOBER A.D., 1989  
AT THE CITY OF WINNIPEG.

APPROVED:

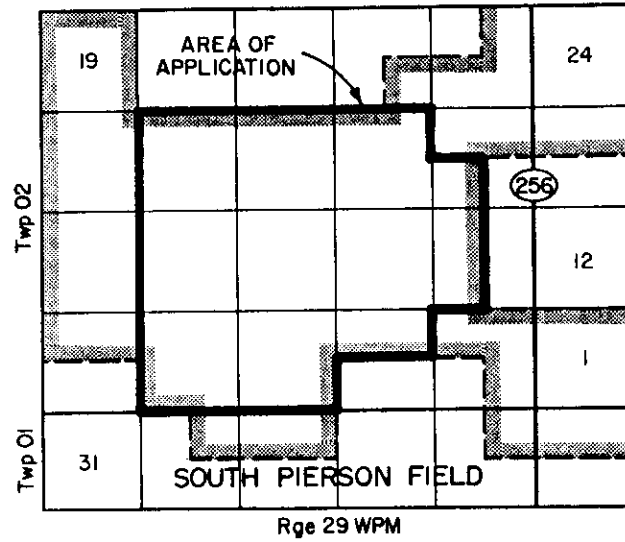


Harold Neufeld  
Minister of Energy and Mines



# SCHEDULE A

## SOUTH PIERSON FIELD 32 ha DRILLING SPACING UNITS LOWER AMARANTH FORMATION



*Copy - Gary Harrison* XC  
**Manitoba**

ORIG

GARY HARRISON  
DAVE BORTMAN  
KRB.

Energy and Mines

Petroleum

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

(204) 945-6577

October 4, 1989

"Hand Delivered"

Home Oil Company Limited  
1700 Home Oil Tower  
324 - 8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Ms R. A. Bennett  
Land Representative

Dear Madam:

Re: Crown Oil and Natural Gas Lease No. L861-693  
Crown Oil and Natural Gas Lease No. L851-528  
Crown Oil and Natural Gas Lease No. L851-529

Pursuant to Section 46 of the Petroleum Crown Leasing Regulation (MR 429/87) and Section 12 of the above noted Leases, this notice serves as a written request from the director to commence within 90 days of receipt of this notice, the drilling of three offset wells to be located in the following locations and to meet the stated requirements:

1. Lsd 16 of Section 4-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 065 metres.
2. Lsd 10 of Section 10-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 065 metres.
3. Lsd 4 of Section 16-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 060 metres.

The Regulation makes provision for the payment of compensatory royalty at the "old oil" rate, surrender of the location or deferment of drilling. You are advised to review the Regulation regarding these provisions. If drilling will not commence within 90 days of receipt of this notice, a written response must be submitted indicating and supporting your intentions.

Should you have any questions or wish to discuss this matter please contact Brad Thiessen at (204) 945-6571 or the undersigned at (204) 945-6573.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "L. R. Dubreuil".

L. R. Dubreuil  
Director of Petroleum

BT/jb

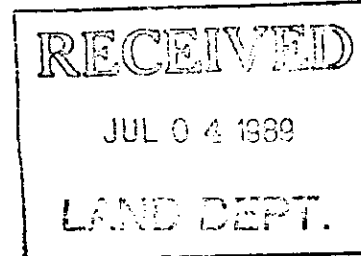
cc: H. Clare Moster



DOUBLE REGISTERED MAIL

June 28, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324-8th Avenue S.W.  
Calgary, Alberta  
T2P 2Z5



Attention: Mr. R.S. (Bob) Bachynski  
Senior Land Representative

Dear Sir:

Re. Crown Oil and Natural Gas Lease No. L861-693  
Crown Oil and Natural Gas Lease No. L861-696  
Crown Oil and Natural Gas Lease No. L851-528  
Crown Oil and Natural Gas Lease No. L862-771  
Crown Oil and Natural Gas Lease No. L851-529

Pursuant to Section 46 of the Petroleum Crown Leasing Regulation (MR 429/87) and Section 12 of the above noted Leases, this notice serves as a written request from the director to commence within 90 days of receipt of this notice, the drilling of six offset wells to be located in the following locations and to meet the stated requirements:

1. Lsd 13 of Section 4-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 077 metres.
2. Lsd 1 of Section 8-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 077 metres.
3. Lsd 9 of Section 10-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 067 metres.
4. Lsd 5 of Section 11-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 067 metres.
5. Lsd 1 of Section 16-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 065 metres.

6. Lsd 3 of Section 16-2-29 (WPM), to be drilled to adequately test the Mississippian Mission Canyon Formation to an approximate depth of 1 065 metres.

Because your application for 32 ha spacing is in process we are prepared to consider alternative locations to the offsets that are listed above.

The Regulation makes provision for the payment of compensatory royalty at the "old oil" rate, surrender of the location or deferment of drilling. You are advised to review the Regulation regarding these provisions. If drilling will not commence within 90 days of receipt of this notice, a written reponse must be submitted indicating and supporting your intentions.

Should you have any questions or wish to discuss this matter please contact Brad Thiessen at (204) 945-6571 or the undersigned at (204) 945-6573.

Yours sincerely,

A handwritten signature in cursive script, appearing to read 'L.R. Dubreuil', written in dark ink.

L.R. Dubreuil  
Director

BT/ps

cc: H. Clare Moster



Informational Notice 89-1

May 9, 1989

## NOTICE TO MANITOBA CROWN LEASE HOLDERS

Re: Extension of Crown Oil and Natural Gas Leases  
Section 43 - Petroleum Crown Leasing Regulation MR 429/87R

With reference to Section 43 of the Petroleum Crown Leasing Regulation regarding applications for extensions of Crown oil and natural gas leases, the interpretation of "to develop further" will be applied as follows:

1. Extension applications will only be considered when the application contains a written commitment to drill a well or wells on the lease which satisfies the following requirements:
  - (a) where the area covered by the lease is one quarter section or less in size and is not fully developed (i.e. - does not have production from, or allocated to, each drilling spacing unit in the lease), a commitment to drill at least one well during the one year lease term extension on a non-productive drilling spacing unit covered by the lease;
  - (b) where the area covered by the lease is more than one quarter section in size and is not fully developed, a commitment to drill during the one year extension period, at least one well on a non-productive drilling spacing unit for each four non-productive drilling spacing units covered by the lease.

Examples:	No. of Non-productive <u>Drilling Spacing Units</u>	Required <u>Drilling Commitment</u>
	1-4	1 well
	5-8	2 wells
	9-12	3 wells
	etc.	

2. Extension applications must apply only to one lease and relate to the whole area of the lease (i.e. - a portion of a lease cannot be extended).
3. Where an extension has been granted and the complete drilling commitment had NOT been satisfied, the effective date of any lease eligible for renewal will be the last anniversary date of the lease when all scheduled commitments had been satisfied.

A handwritten signature in cursive script, appearing to read "L. R. Dubreuil".

L. R. Dubreuil  
Director, Petroleum Branch



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

October 5, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Ken Brown, P. Eng.  
Manager, Reservoir Engineering

Dear Mr. Brown:

Re: South Pierson Field  
Special Drilling Spacing Units

The Board has reviewed your application for special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field.

After careful consideration of the technical and economic information filed in support of the application, the Board hereby approves on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application. A copy of Board Order No. SU 5 establishing 32 ha spacing units for the Lower Amaranth Formation is attached.

Reservoir development in the Mission Canyon in the area of application is very localized and reservoir characteristics indicate it would be more appropriate to retain 16 ha spacing for the Mission Canyon Formation. Your application for special 32 ha drilling spacing units for the Mission Canyon Formation is therefore denied.

As a result of concerns expressed by the Petroleum Branch and freehold mineral owners who objected to the application regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation and the limited amount of geological, reservoir, production and pressure data available, the Board has chosen to limit the approval of 32 ha spacing to a term of two (2) years ending October 31, 1991.



Prior to August 31, 1991, Home Oil is requested to apply under Section 20 of the Petroleum Drilling and Production Regulation, either to continue 32 ha spacing units for the Lower Amaranth or to amend the spacing. The application should include a review of the economics of developing the Lower Amaranth Formation on 16 ha spacing paying particular attention to determination of the level of incremental recovery associated with reduced spacing.

Home Oil indicated in their May 19, 1989 response to the Board's deficiency letter, that special fluid and core studies will be commenced in 1989 to determine the feasibility of waterflooding the South Pierson Lower Amaranth B Pool. The Board directs Home Oil to submit a comprehensive report discussing the feasibility of implementing an enhanced recovery scheme on either 32 ha or 16 ha spacing in the South Pierson Lower Amaranth B Pool before August 31, 1991.

The Board is concerned that insufficient reservoir pressure data is available to determine the optimum timing for possible implementation of an enhanced recovery scheme. Therefore, Home Oil is also requested to conduct an annual pressure survey in the South Pierson Lower Amaranth B Pool commencing in 1989 to determine the static reservoir pressure in the pool. Home Oil shall submit to the Petroleum Branch, the details of the proposed pressure survey, including a list of the wells to be surveyed, the measurement technique to be used, and the intended shut-in period for each well, and approval shall be obtained from the Director of Petroleum before the survey is carried out.

If over the next two years pressure data indicates significant depletion of the pool, the schedule for review of enhanced recovery feasibility may be accelerated.

If you have any questions in respect of this matter, please contact L.R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at (204) 945-6573 or 945-6574, respectively.

Yours respectfully,

H. Clare Moster  
Deputy Chairman

Attachment

cc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil

JNF/HCM/sml



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

## Order No. SU 5

### An Order Pertaining to Drilling Spacing Units South Pierson Field Lower Amaranth Formation

WHEREAS, subsection (9)(b) of section 62 of "The Mines Act", being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(b) respecting the designation of the area that shall be allocated to a well in connection with fixing allowable production;"

AND WHEREAS, subsection (1)(f) of section 63 of "The Mines Act" being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides in part as follows:

"63(1) For the purpose of carrying out the provisions of this Part and Part III according to their intent, the Lieutenant Governor in Council may make such regulations and orders as are ancillary thereto, and are not inconsistent therewith; and every such regulation or order made under, and in accordance with the authority granted by, this section has the force of law; and, without restricting the generality of the foregoing, the Lieutenant Governor in Council may make regulations and orders,

(f) prescribing spacing units and the size and shape of spacing units;"

AND WHEREAS, subsection (1) of section 20 of Manitoba Regulation 430/87R under The Mines Act ("the Petroleum Drilling and Production Regulation") provides as follows:

"20(1) Notwithstanding section 19, the board may, after a public hearing or after publication of notice, prescribe by order special drilling spacing units which may differ from normal drilling spacing units in size, shape or target area."

AND WHEREAS, subsection (3) of section 21 of the Petroleum Drilling and Production Regulation provides as follows:

"21(3) Where a special drilling spacing unit is prescribed under section 20, the board may prescribe the target area within which a well shall be completed in order to qualify for a maximum permissible production rate based on the area of the special drilling spacing unit."

AND WHEREAS, the Board received an application dated January 4, 1989 from Home Oil Company Limited for approval of special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field outlined in Schedule A ("the area of application").

AND WHEREAS, upon publication of notice of the application, the Board received a number of objections to and interventions in the application.

AND WHEREAS, after Home Oil Company Limited supplied those persons who objected to and intervened in the application with additional information and discussed the application with them, all but one objection to the application, were withdrawn.

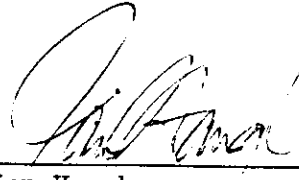
AND WHEREAS, upon due consideration of the said application and objection thereto, the Board considers temporary establishment of special 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application to be reasonable and desirable.

NOW THEREFORE, the Board orders that:

1. The spacing unit for each well drilled, or to be drilled, for the purpose of obtaining oil from the Jurassic Lower Amaranth Formation within the area of application outlined on Schedule A is two legal subdivisions comprising the east half or west half of a quarter section.
2. The target area of each drilling spacing unit shall be a square area in the even-numbered legal subdivision having sides one hundred metres from the sides of the legal subdivision and parallel to them.
3. This order expires October 31, 1991 unless rescinded by the Board prior to this date.



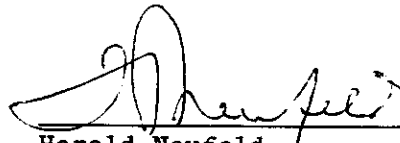
H. Clare Moster  
Deputy Chairman



Ian Haugh  
Chairman

OIL AND NATURAL GAS CONSERVATION  
BOARD ORDER NO. SU 5 APPROVED THIS  
4<sup>th</sup> DAY OF OCTOBER A.D., 1989  
AT THE CITY OF WINNIPEG.

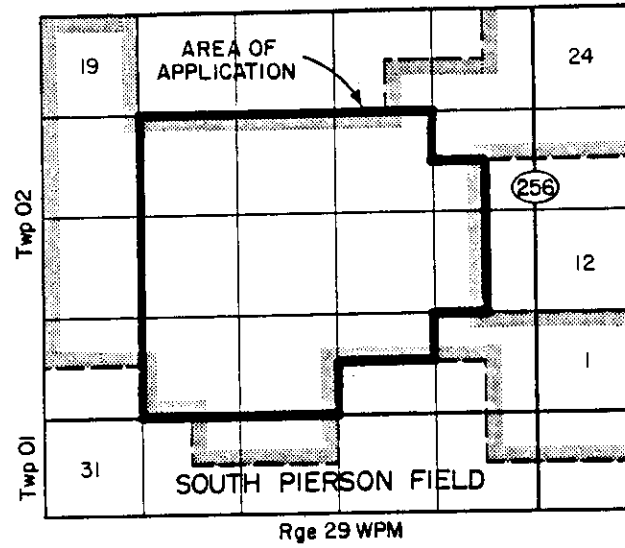
APPROVED:



Harold Neufeld  
Minister of Energy and Mines

# SCHEDULE A

## SOUTH PIERSON FIELD 32 ha DRILLING SPACING UNITS LOWER AMARANTH FORMATION





The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

October 5, 1989

Douglas David Southam  
Box 234  
Melita, Manitoba  
ROM 1L0

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

Your letter of September 2, 1989 confirming your continued objection to the subject application is hereby acknowledged.

When the application was originally advertised in March, 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns you expressed regarding reduced recovery on 32 ha spacing and inequitable drainage the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available, the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply prior to August 31, 1991 if it desires an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.

In regard to the specific concerns expressed in your objection to the application, Home Oil has estimated that on 32 ha spacing 12% of the original oil in place will be recovered from the South Pierson Lower Amaranth B Pool. This compares favourably with the Waskada Lower Amaranth A Pool where primary recovery on 16 ha spacing has been estimated at 9.1% to 12.2%.

Your statement that the 16-8-2-29 well is draining oil from the SE 1/4 of Section 17 is correct. The 16-8-2-29 well is also draining oil from the NW 1/4 of Section 9 and the SW 1/4 of Section 16. Conversely, the 6-17-2-29 on your property is draining oil from your neighbour to the north and if a well is drilled at 2-17-2-29 it will drain oil from the NE 1/4 of Section 16. This situation is referred to as "competitive drainage". When the field is fully developed on 32 ha spacing each well will competitively drain oil from neighbouring lands resulting in a balanced and equitable situation.

If you have any further questions in respect of this matter, please contact L. R. Dubreuil, Director of Petroleum, or John Fox, Chief Petroleum Engineer, at 945-6573 or 945-6574, respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
**H. CLARE MOSTER**

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

October 5, 1989

Amoco Canada Petroleum Company Ltd.  
P.O. Box 200 Station M  
Calgary, Alberta  
T2P 2H8

Dear Mr. L. G. Cyca:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

This letter is to inform you of the Board's disposition of the subject application. When the application was originally advertised in March 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns expressed in the remaining objection to the application the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply, prior to August 31, 1991 if it desires for an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.



If you have any further questions in respect of this letter, please contact L. R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at 945-6573 or 945-6574, respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
**H. CLARE MOSTER**

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum



The Oil and Natural Gas  
Conservation Board

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

October 5, 1989

(204) 945-3130

Ms. Marie Eikanger  
Box 252  
Pierson, Manitoba  
R0M 1S0

Dear Ms. Eikanger:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

This letter is to inform you of the Board's disposition of the subject application. When the application was originally advertised in March 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns expressed in the remaining objection to the application the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply, prior to August 31, 1991 if it desires for an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.

If you have any further questions in respect of this letter, please contact L. R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at 945-6573 or 945-6574, respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum



The Oil and Natural Gas  
Conservation Board

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

October 5, 1989

(204) 945-3130

Carolyn Beth Allison  
Box 96  
Elkhorn, Manitoba  
ROM ONO

Dear Ms. Allison:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

This letter is to inform you of the Board's disposition of the subject application. When the application was originally advertised in March 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns expressed in the remaining objection to the application the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply, prior to August 31, 1991 if it desires for an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.

If you have any further questions in respect of this letter, please contact L. R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at 945-6573 or 945-6574, respectively.

Yours respectfully,  
ORIGINAL SIGNED BY  
**H. CLARE MOSTER**

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum



The Oil and Natural Gas  
Conservation Board

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Winnipeg, Manitoba, CANADA  
R3C 0V8

(204) 945-3130

October 5, 1989

Robvest Minerals Ltd.  
c/o Kohaly and Elash  
Barristers & Solicitors  
1312 Fourth Street  
Drawer 580  
Estevan, Saskatchewan  
S4A 2A5

Dear Mr. P. Elash:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

This letter is to inform you of the Board's disposition of the subject application. When the application was originally advertised in March 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns expressed in the remaining objection to the application the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply, prior to August 31, 1991 if it desires for an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.

If you have any further questions in respect of this letter, please contact L. R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at 945-6573 or 945-6574, respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
**H. CLARE MOSTER**

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

October 5, 1989

Patricia Ann Boyd  
2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9

Dear Mrs. Boyd:

Re: South Pierson Oil Field  
Application for 32 ha Drilling Spacing Units  
Home Oil Company Limited

This letter is to inform you of the Board's disposition of the subject application. When the application was originally advertised in March 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

After careful consideration of the technical and economic information filed by Home Oil in support of the application and the concerns expressed in the remaining objection to the application the Board has approved, in part, Home Oil's application.

Attached for your information is a copy of Board Order SU No. 5 approving on an interim basis 32 ha drilling spacing units for the Lower Amaranth Formation in a portion of the South Pierson Field. Home Oil's request for 32 ha drilling spacing units in the Mission Canyon Formation has been denied because the geology of the Mission Canyon Formation in the area of application does not lend itself to development on 32 ha spacing.

In recognition of concerns regarding the appropriateness of 32 ha spacing for the Lower Amaranth Formation in the area of application and the limited amount of technical information presently available the Board has limited the approval to a term of two (2) years, ending October 31, 1991. Home Oil has been directed to apply, prior to August 31, 1991 if it desires for an extension of this approval. Any application for continuation of 32 ha spacing will have to address the level of incremental recovery that could be expected on reduced 16 ha spacing.



If you have any further questions in respect of this letter, please contact L. R. Dubreuil, Director of Petroleum or John Fox, Chief Petroleum Engineer at 945-6573 or 945-6574, respectively.

Yours respectfully,

ORIGINAL SIGNED BY  
**H. CLARE MOSTER**

H. Clare Moster  
Deputy Chairman

Attachment

JNF/HCM/sml

bc: Ian Haugh, Chairman  
Wm. McDonald, Member  
L. R. Dubreuil, Director of Petroleum

JOHN



# Manitoba

## Memorandum

Date October 2, 1989

To Ian Haugh, Chairman, O&NGCB  
Wm. McDonald, Member

From H. Clare Moster  
Deputy Chairman

Subject DISCUSSION WITH DOUG SOUTHAM

Telephone 1111

**RE: OBJECTION TO HOME OIL'S 32 ha SPACING APPLICATION - SOUTH PIERSON**

Phoned Mr. Southam today to inform him that the Board would be deciding on Home's application and wanted to confirm that he had nothing more to add in support of his intervention.

He indicated that his September 2, 1989 letter covered his concerns and that he had nothing more he wished to present but wished to maintain his objection.

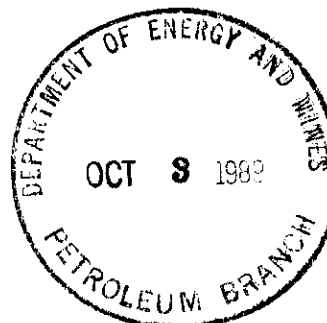
I stated that the Board would likely be making a decision early this week and he would be notified by letter when the decision was formalized.

H. Clare Moster

cc: Petroleum Branch

HCM:p

0960T



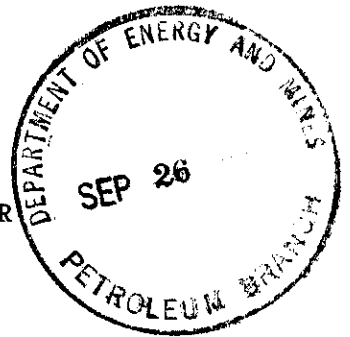
First Fold

September 26, 1989

IAN HAUGH

CC: L.R. Dubreuil

H. CLARE MOSTER




RE: OIL & GAS BOARD ORDER No. SU 5

Attached is Petroleum's recommendation on Home Oil's special enlarged spacing application in part of the South Pierson Field.

I concur with the recommendation, the drafted Order and proposed (attached) covering letter.

I would like to discuss whether and how, the Board might notify the remaining "intervenor" of the planned handling of the application without a public hearing (i.e. - a phone call from me?).

 \_\_\_\_\_  
H. Clare Moster

Attachments

HCM:P

0952T



## Memorandum

Date September 25, 1989

To The Oil and Natural Gas  
Conservation Board

From John N. Fox  
Chief Petroleum Engineer  
Petroleum Branch

Ian Haugh - Chairman  
H. Clare Moster - Deputy Chairman  
Wm. McDonald - Member

Subject

Telephone

Re: South Pierson Field  
Special Drilling Spacing Units - Home Oil

Home Oil Company Limited has made application for special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field.

When the application was advertised in March, 1989, six (6) freehold mineral owners objected. After Home Oil prepared and distributed an informational package that addressed the owner's concerns and outlined Home's development plans all but one owner withdrew their objection.

### Recommendations

It is recommended based on the technical and economic information filed in support of the application that the Board approve 32 ha drilling spacing units for the Lower Amaranth Formation and that 32 ha drilling spacing units for the Mission Canyon Formation be denied.

The approval should be limited to a term of two (2) years ending October 31, 1991. Any application for continuation of 32 ha spacing should be made prior to August 31, 1991. A copy of the proposed Board Order No. SU 5 is attached.

It is also recommended that Home Oil be directed to submit prior to August 31, 1991 a comprehensive report on the feasibility of implementing an enhanced recovery scheme on either 32 ha or 16 ha spacing in the South Pierson Lower Amaranth B Pool.

The Board should also request Home Oil conduct an annual pressure survey in the South Pierson Lower Amaranth B Pool commencing in 1989 to determine the static reservoir pressure in the pool.

## Discussion

The South Pierson Lower Amaranth B Pool is in the early stages of development. The pool was discovered in 1985 with the drilling of 16-8-2-29 (WPM) and since then Home Oil has only drilled another 16 wells in the pool (Figure 1).

Based on 32 ha well spacing only 18 of a possible 74 locations within the area of application have been drilled (well density = 133 ha/well) (Figure 2). As a result there is limited drilling, production or pressure data available to determine the appropriate well spacing for the pool. The limited production history of the South Pierson Lower Amaranth B Pool is shown in Figure 3.

The basis of Home's application for 32 ha spacing is a comparison between the estimated recoverable reserves for the 4 wells in the pool that have experienced a production decline and the calculated volumetric oil in place for the wells (Table 1). This comparison supports Home's contention that wells in the pool are draining more than 16 ha and that 32 ha spacing is more representative of the area drained by such wells.

Home estimates that on 32 ha spacing 12% of the original oil in place will be recovered. This compares favourably with the Waskada Lower Amaranth A Pool where model studies have indicated a primary recovery on 16 ha spacing of 9.2% - 12.2%. It should be noted however, that reservoir performance of the South Pierson Lower Amaranth B Pool appears to be superior to the Waskada Lower Amaranth A Pool.

Home Oil also contends that drilling on 16 ha spacing will not result in any incremental recovery. Their reason is that within the area of application the Lower Amaranth is a homogeneous blanket sand under uniform depletion and each well is capable of draining at least 32 ha.

It is difficult to accept Home's statement that 16 ha spacing will not result in some incremental recovery. However, without additional drilling, production and pressure data it is impossible to quantify the incremental recovery that could be expected on 16 ha spacing.

Home Oil has provided the economics of developing the pool on 16 ha spacing (Table 2).

Case 1 which Home believes to be representative assumes development of 16 ha spacing will only accelerate production with no incremental recovery. Case 1 also uses Home's corporate price forecast in which the price of oil in 1989 and 1990 is only \$111.09/m<sup>3</sup> and \$118.54/m<sup>3</sup>, respectively (the price for South Pierson crude has averaged \$128.34/m<sup>3</sup> over the last 6 months) and reduced capital costs of \$360 k. Under this scenario development on 16 ha spacing is uneconomic.

The parameters used in Case 2 were those requested by the Board; a 5% increase in recovery on 16 ha spacing, and a more optimistic price forecast. Case 2 also used higher capital costs of \$444 k. Case 2 is marginally economic but considered unrepresentative by Home Oil.

Case 3 run by the Petroleum Branch is identical to Case 2 except the drilling and completion costs were Home's revised costs used in Case 1. Case 3 is economically attractive with an after tax net present value of \$102 k (DCF = 12%), a 35% rate of return and a 2.5 year payout.

What the economics show is that the feasibility of 16 ha spacing is dependent on the level of incremental recovery, oil prices and the capital costs. Because of the uncertainty surrounding the level of incremental recovery on 16 ha spacing and a continued lack of confidence in oil prices it is impossible to predict which economics are more representative.

The concerns of the six (6) freehold mineral owners who originally objected to the applications were:

- 1) insufficient time and information to properly assess the application,
- 2) the effect of 32 ha spacing on recovery,
- 3) reduced royalties, and
- 4) reduced offset obligations.

After Home distributed its informational package and discussed the application with the freehold mineral owners who objected, all but one objection was withdrawn. The concerns listed in the remaining objection to the application are the possibility of reduced oil recovery on 32 ha spacing and inequitable drainage if 32 ha spacing is approved (Attachment #1). The possibility of reduced recovery on 32 ha spacing is a valid concern. However, the concern regarding inequitable drainage is not valid. What in fact would occur if the wells drain 32 ha is "competitive drainage". For example the well 16-8-2-29 will drain oil from its spacing unit and also from a portion of the NW 1/4 of Section 9, the SW 1/4 of Section 16 and the SE 1/4 of Section 17 and conversely a well at 4-16-2-29 would drain a portion of the same lands. When the field is fully developed on 32 ha spacing each well will competitively drain oil from neighbouring lands resulting in a balanced and equitable situation.

Though there is an objection to the application the Petroleum Branch believes a hearing into the matter would not bring any additional technical information to light. It is doubtful that any intervenor could place before the Board at this time any technical evidence that would substantiate a loss in recovery on 32 ha spacing.

It is suggested that the way to balance the concerns of Home Oil which presently cannot economically justify development on 16 ha spacing and the concerns of the Branch and freehold mineral owners regarding the appropriateness of 32 ha spacing is to approve 32 ha spacing on an interim basis.

By granting interim approval of 32 ha spacing the following objectives are accomplished:

- 1) the pool is developed in an orderly manner,
- 2) the correlative rights of freehold mineral owners and the Crown are protected,
- 3) additional reservoir, production and pressure data can be collected and analyzed,
- 4) the drilling of potentially unnecessary wells on 16 ha spacing is avoided,

- 5) reduction of the concern that the pool will be rapidly depleted below the bubble point before an enhanced recovery scheme can be implemented,
- 6) there is no reduction in the ultimate recovery from the pool, (i.e. approval is not irreversible) and
- 7) any uncertainty regarding the economics of development on 16 ha spacing is reduced.

Therefore approval for 32 ha spacing should only be granted for a period of two years ending October 31, 1991. The two year approval will allow Home Oil enough time to gather the additional technical data necessary to determine the continued appropriateness of 32 ha spacing for the Lower Amaranth Formation.

#### Pressure Maintenance

Home Oil has indicated, in response to the Board's deficiency letter, that special fluid and core studies will be conducted in 1989 to determine the feasibility of waterflooding the South Pierson Lower Amaranth B Pool.

Though Home has expressed some concern with the pool's waterflood potential, Omega's and other companies' success in waterflooding the Lower Amaranth in the Waskada Field and Home's statement that the pool is a homogeneous blanket sand with no apparent barriers to flow, appear to make the pool a good candidate for waterflooding.

There is a concern that if a waterflood feasibility study is not completed in the next 2 years, the reservoir pressure will be reduced below the bubble point resulting in a possible reduction in ultimate recovery. Therefore, it is suggested that Home be required to submit a comprehensive report discussing the feasibility of implementing an enhanced recovery scheme in the South Pierson Lower Amaranth B Pool on either 32 ha spacing or 16 ha spacing prior to August 31, 1991.

In order to accurately monitor the degree of depletion in the South Pierson Lower Amaranth B Pool and to ensure the timely implementation of enhanced recovery in the pool, Home Oil should also be required to conduct an annual pressure survey of the pool starting this year. If the pressure data were to indicate significant depletion the schedule for review of enhanced recovery feasibility would be accelerated.

#### Mission Canyon Spacing

Home Oil in their application also requested 32 ha spacing for the Mission Canyon Formation in the area of application. Home views the Mission Canyon as a secondary target and of the 18 wells drilled to date only 3 have encountered oil in the Mission Canyon. The location of the two Mission Canyon pools in the area of application are shown in Figure 1.

The Mission Canyon in the area of application is characterized by a series of subcropping zones the majority of which are wet (Figure 4). Where productive the Mission Canyon pay zone is thin, of limited areal extent and underlain by water. The total production from the Mission Canyon is 5.1 m<sup>3</sup> OPD with a WOR of 1.91 m<sup>3</sup>/m<sup>3</sup>.

The geology of the Mission Canyon indicates it would be more appropriate to continue develop in that formation on 16 ha spacing.

ORIGINAL SIGNED BY  
JOHN N. FOX

John N. Fox  
Chief Petroleum Engineer

JNF:sml

Attachment

Approved By: \_\_\_\_\_  
L. R. Dubreuil, Director

Approved By: \_\_\_\_\_  
L. R. Dubreuil, Director



Box 243,  
Mehla, Manitoba. R0M 1L0  
Sept 2, 1989

Mr. H. Clare Mosier,  
Deputy Chairman,  
The Oil & Natural Gas Conservation Board,  
Room 309, Legislative Building,  
Winnipeg Man.



Dear Sir:

Re South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited.

From the information received in the printed form or verbally, I have not been convinced that 32 hectare spaced wells can recover as much oil as can be recovered from the present 16 hectare spaced wells. Therefore, I am still opposed to 32 hectare spaced wells.

If recovery could be as good from 32 hectare spacings as from 16 hectare spacings, I would be the loser. Home Oil brought their discovery well on 16-8-2-29W1 into production in December, 1985. I leased SE + SW 17-2-29W1

directly north of the discovery well, to Home Oil in July, 1986. At the present time Home Oil has not done any development work on SE 17-2-29N, nor do they have any plans for drilling. Therefore, they could be draining oil from LSP 1-17-2-29W, if it is possible to recover oil from a 32 hectare well site. I think this is a good second reason for opposing 32 hectare drilling sites.

yours truly,

Doug Southam

DOUGLAS DAVID SOUTHAM.

TABLE 1

## 32 ha RESERVES

WELL	VOLUMETRIC OIL IN PLACE 32 ha SPACING (m <sup>3</sup> )	DECLINE CURVE RESERVES (m <sup>3</sup> )	VOLUMETRIC RESERVES RECOVERY FACTOR = 12% (m <sup>3</sup> )
16-05-02-29	109,825	10,600	13,179
16-08-02-29	103,933	9,000	12,472
16-09-02-29	64,783	19,071	7,774
04-15-02-29	<u>117,375</u>	<u>16,700</u>	<u>14,085</u>
	395,916	55,371	48,050

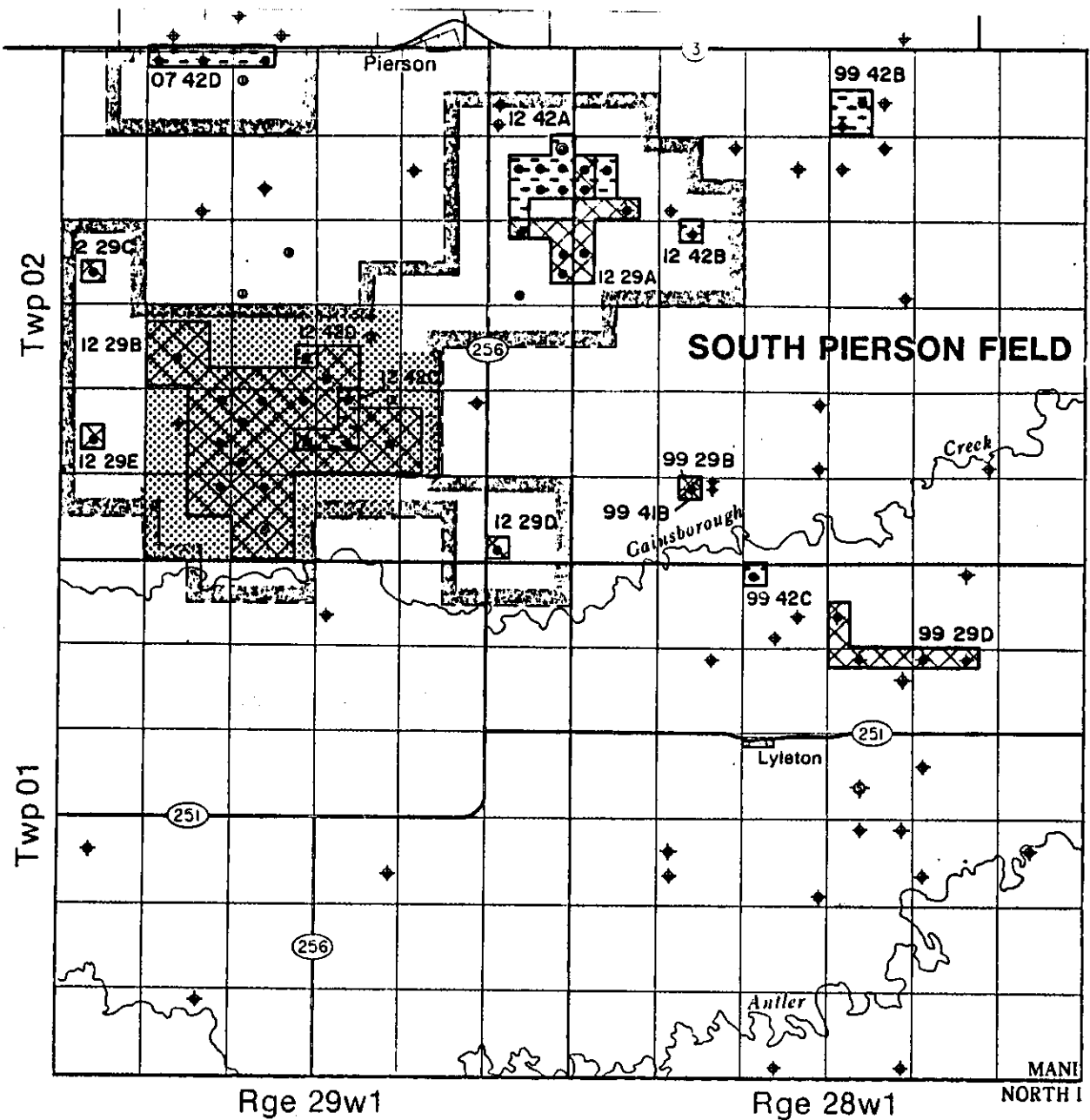
TABLE 2

16 ha Spacing Economics

	<u>CASE 1</u>	<u>CASE 2</u>	<u>CASE 3</u>
	Home Oil	Home Oil	Petroleum Branch
CAPITAL COSTS (\$k)	360	444*	360
OIL PRICE 1989 - 1997 (\$/m <sup>3</sup> )	111.09 - 152.32**	128.57 - 250	128.57 - 250
RECOVERY FACTOR (%)	12	17	17
RECOVERABLE RESERVES (m <sup>3</sup> )	5468	7775	7775
NPV (AIT, DCF = 12%) (\$k)	(40.4)	64.5	102.2
ROR (%)	3.1	20.7	35.1
PAYOUT (YRS)	-	4.3	2.5

\* Note: The costs used in Case 2 are the capital costs used by Home in their original application (89-01-14). The Case 1 costs are revised capital costs used by Home in their submission to the Board's deficiency letter (89-05-19).

\*\* Oil price in 1994.



 AREA OF APPLICATION

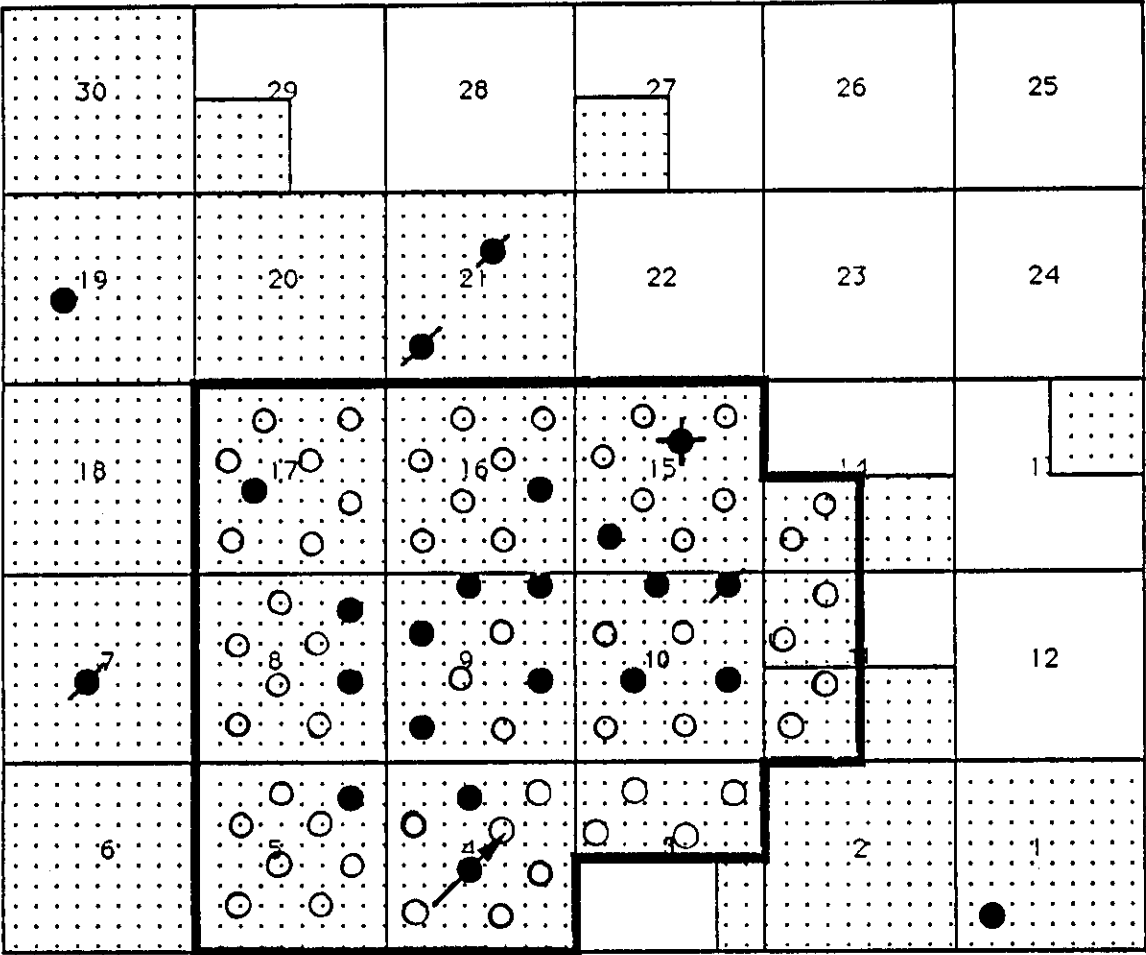
12 29B LOWER AMARANTH B POOL

12 42D MISSION CANYON 3b C POOL

12 42C MISSION CANYON 3b D POOL

FIGURE 1

SOUTH PIERSON AREA



TWP. 2 RGE . 29 W1M



**HOC/SRO LAND**



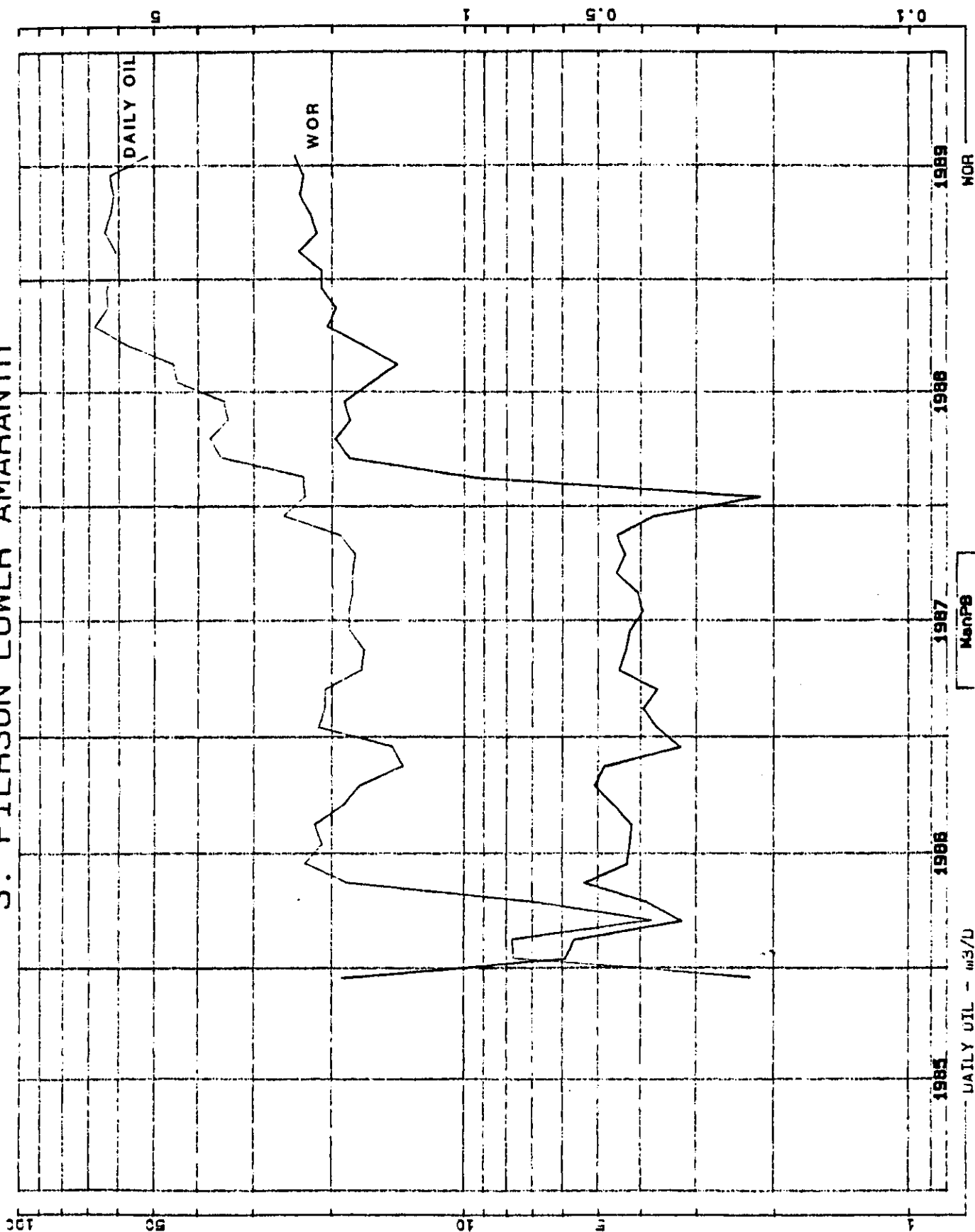
**AREA OF  
APPLICATION**



**UNDRILLED 32 ha SPACING UNITS**

**FIGURE 2**

# S. PIERSON LOWER AMARANTH



MonP8  
89-09-12  
15:54:07

DAILY OIL - m3/D

WOR

FIGURE 3

# SOUTH PIERSON REGIONAL SCHEMATIC MISSISSIPPIAN STUDY

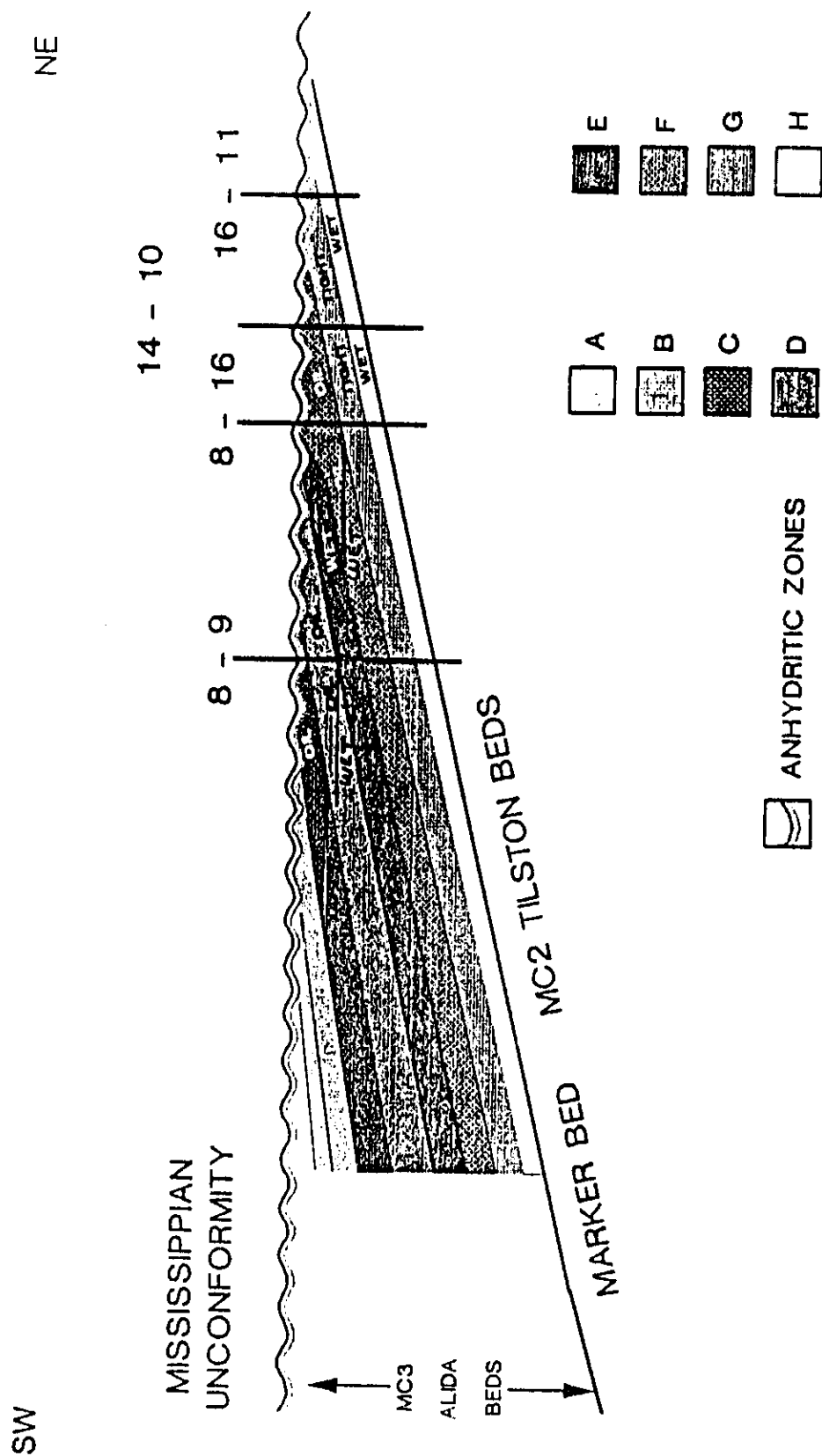


FIGURE 4





The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

## Order No. SU 5

### An Order Pertaining to Drilling Spacing Units South Pierson Field Lower Amaranth Formation

WHEREAS, subsection (9)(b) of section 62 of "The Mines Act", being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides as follows:

"62(9) Without restricting the generality of subsection (8) the board, with the approval of the minister, may make orders

(b) respecting the designation of the area that shall be allocated to a well in connection with fixing allowable production;"

AND WHEREAS, subsection (1)(f) of section 63 of "The Mines Act" being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, provides in part as follows:

"63(1) For the purpose of carrying out the provisions of this Part and Part III according to their intent, the Lieutenant Governor in Council may make such regulations and orders as are ancillary thereto, and are not inconsistent therewith; and every such regulation or order made under, and in accordance with the authority granted by, this section has the force of law; and, without restricting the generality of the foregoing, the Lieutenant Governor in Council may make regulations and orders,

(f) prescribing spacing units and the size and shape of spacing units;"

AND WHEREAS, subsection (1) of section 20 of Manitoba Regulation 430/87R under The Mines Act ("the Petroleum Drilling and Production Regulation") provides as follows:

"20(1) Notwithstanding section 19, the board may, after a public hearing or after publication of notice, prescribe by order special drilling spacing units which may differ from normal drilling spacing units in size, shape or target area."

AND WHEREAS, subsection (3) of section 21 of the Petroleum Drilling and Production Regulation provides as follows:

"21(3) Where a special drilling spacing unit is prescribed under section 20, the board may prescribe the target area within which a well shall be completed in order to qualify for a maximum permissible production rate based on the area of the special drilling spacing unit."

AND WHEREAS, the Board received an application dated January 4, 1989 from Home Oil Company Limited for approval of special 32 ha drilling spacing units for the Lower Amaranth and Mission Canyon Formations in a portion of the South Pierson Field outlined in Schedule A ("the area of application").

AND WHEREAS, upon publication of notice of the application, the Board received a number of objections to and interventions in the application.

AND WHEREAS, after Home Oil Company Limited supplied those persons who objected to and intervened in the application with additional information and discussed the application with them, all but one objection to the application, were withdrawn.

AND WHEREAS, upon due consideration of the said application and objection thereto, the Board considers temporary establishment of special 32 ha drilling spacing units for the Lower Amaranth Formation in the area of application to be reasonable and desirable.

NOW THEREFORE, the Board orders that:

1. The spacing unit for each well drilled, or to be drilled, for the purpose of obtaining oil from the Jurassic Lower Amaranth Formation within the area of application outlined on Schedule A is two legal subdivisions comprising the east half or west half of a quarter section.
2. The target area of each drilling spacing unit shall be a square area in the even-numbered legal subdivision having sides one hundred metres from the sides of the legal subdivision and parallel to them.
3. This order expires October 31, 1991 unless rescinded by the Board prior to this date.

---

H. Clare Moster  
Deputy Chairman

---

Ian Haugh  
Chairman

OIL AND NATURAL GAS CONSERVATION  
BOARD ORDER NO. SU 5 APPROVED THIS  
DAY OF A.D., 1989  
AT THE CITY OF WINNIPEG.

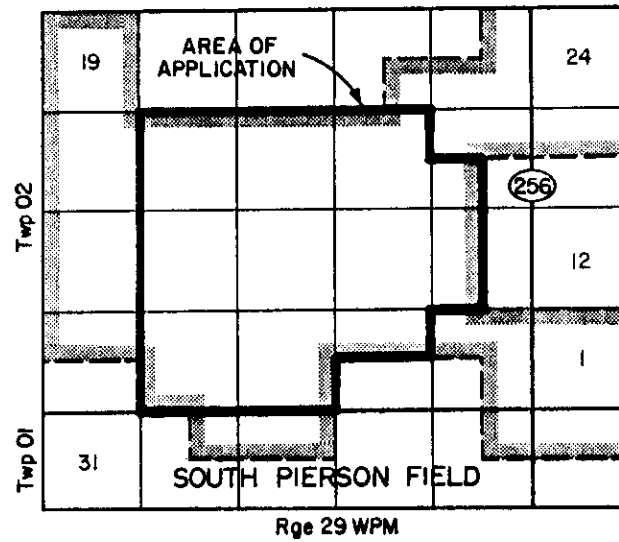
APPROVED:

---

Harold Neufeld  
Minister of Energy and Mines

# SCHEDULE A

## SOUTH PIERSON FIELD 32 ha DRILLING SPACING UNITS LOWER AMARANTH FORMATION

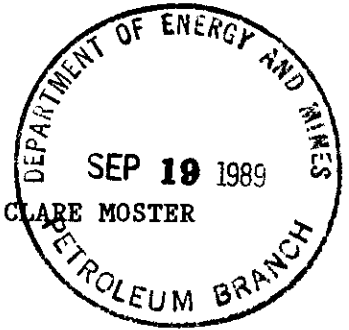


September 19, 1989

L.R. DUBREUIL

PAT FOR H. CLARE MOSTER

1111



**RE: HOME OIL - 32 ha SPACING APPLICATION:**

Attached are two (2) responses received to September 15, 1989.

Please be prepared to discuss and provide your recommendations to the Board the week of **SEPTEMBER 25-29/89**.

A handwritten signature in cursive script, appearing to read "Pat", with a long horizontal line extending from the bottom of the signature.

Attachments

HCM:P

0940T



**Amoco Canada  
Petroleum Company Ltd.**

P.O. Box 200, Station M  
Calgary, Alberta T2P 2H8

September 6, 1989

89243ACC0510

Manitoba Energy and Mines,  
Petroleum Branch,  
555 - 330 Graham Avenue,  
Winnipeg, Manitoba  
R3C 4E3.

Attention: Mr. H. C. Moster  
Deputy Chairman



Gentlemen:

Application for Enlarged Drilling Spacing Units  
South Pierson Field, Lower Amaranth B Pool

In response to your letter dated 1989-08-22, Amoco has reviewed Home's information package and as a result hereby withdraws our intervention to Home's Application for Enlarged Drilling Spacing Units in the South Pierson Field.

L. G. Cyca  
Manager Division Engineering

DPH/jm

cc:  
Home Oil Company Limited  
Attention: Mr. D. A Bertram, P. Eng.



## Memorandum

Date August 16, 1989

To The Oil and Natural Gas  
Conservation Board

From John N. Fox  
Chief Petroleum Engineer  
Petroleum Branch

Ian Haugh - Chairman  
H. Clare Moster - Deputy Chairman  
Subject Wm. McDonald - Member

Telephone

Re: South Pierson Field  
Application for 32 ha Spacing Units

Home Oil has prepared and distributed an informational package as requested by the Board, addressing the concerns raised by freehold mineral owners who objected to the application for 32 ha spacing in the South Pierson Field.

Home has also held discussions with these intervenors but in general has been unable to get a commitment from the individual intervenors on whether their concerns have been satisfied and whether they are prepared to withdraw their objections.

### RECOMMENDATIONS

It is recommended that the Board notify the freehold mineral owners who objected to the application that a decision regarding withdrawal of their objections is required before the Board can dispose of the application. A copy of the proposed letter of notification is attached.

### DISCUSSION

At the request of the Board, Home Oil has supplied all freehold mineral owners with an informational package addressing the concerns expressed by the 6 owners who objected to the application and outlining the company's development plans. Home has also held discussions with each of the 6 intervenors and requested that they indicate whether or not they are prepared to withdraw their objections. To date only one of the intervenors has offered to withdraw her objection, while the others remain hesitant to commit. A copy of the responses received by Home from each intervenor are attached.

In order to dispose of this application, the Board must know whether the concerns of the individual intervenors have been addressed. To this end, it is recommended that the Board contact the intervenors directly and ask if they are prepared to withdraw their objections.

John N. Fox  
Chief Petroleum Engineer

JNF:jtb

Approved By:

  
L. R. Dubreuil, Director

Name	Interest	Result
Douglas David Southam	S/2-17-002-29 (1/2)	Understands Home's application. Will discuss concerns with Petroleum Branch re recoveries. Does not wish to withdraw objection at the time
Amoco Canada Petroleum Ltd.	S/2-09-002-29 (1/4) SE/4-10-002-29 (1/4) NE/4-17-002-29 (1/2) SE/4-19-002-29	Management has not reached a decision on Home's request to withdraw their objection
Patricia Ann Boyd	NW/4-08-002-29 (1/2)	Has reviewed and understands Home's application. Intervention was a request for sufficient time and information to evaluate the application. Has provided a letter (attached) indicating no further objections.
Carolyn Beth Allison	NW/4-08-002-29 (1/2)	Intervention was as above. Will provide a letter withdrawing the intervention.
Marie Eikanger	NE/4-18-002-29	Intervention was a request for information. Has been contacted and is satisfied with the information provided. Does not wish to provide a written withdrawal of objection.
Rabvest Minerals Ltd.	Sec. 15-002-29	Represented by Law Firm of Kohaly and Elash. Mr. David Kreklewich of the firm has indicated their client has received all information forwarded and understands the application. Kohaly and Elash does not expect any response from their client to Home's request for a withdrawal of the objection.



2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9  
July 20, 1989

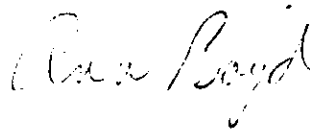
Gary Harrison  
Sr. Reservoir Engineer  
Home Oil Company Ltd.  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Dear Mr. Harrison:

Further to your letter of May 15, 1989, and our recent  
telephone conversation:

Thank you for your response to the concerns I raised in my  
letter to the Oil and Natural Gas Conservation Board. If the  
other freehold mineral owners who raised concerns are  
satisfied, then I have no objections to make to your proposal  
now.

Yours truly,

A handwritten signature in cursive script, reading "Patricia Ann Boyd".

Patricia Ann Boyd

241

Pierson, Man,  
July 31, 1989  
Oil & Natural Gas  
Conservation Board  
Lumberton, Man.

Sir - Had a phone call  
from Home Oil, Calgary  
this day, asking me to inform  
you that I have received information  
on 32 ha spacing, Sweet Heron  
area.

Sincerely,  
Marie Gekanger





The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Ms Marie Eikanger  
Box 252  
Pierson, Manitoba  
R0M 1S0

Dear Ms Eikanger:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

Home Oil has informed the Board that the informational package has been distributed and the application discussed with the freehold mineral owners who objected to the application.

In light of the additional information you have received and prior to final disposition of the application, the Board requests that you indicate whether you feel your concerns have been adequately addressed by Home Oil.

You are requested to provide your further comments to the Board prior to September 8, 1989. If the Board has not received any comments by this date, it will be assumed that your intervention has been withdrawn.

The Board will keep you informed of the further disposition of the application.

Yours respectively,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Carolyn Beth Allison  
Box 96  
Elkhorn, Manitoba  
R0M 0N0

Dear Ms Allison:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

Home Oil has informed the Board that the informational package has been distributed and the application discussed with the freehold mineral owners who objected to the application.

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Yours respectively,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Douglas David Southam  
Box 234  
Melita, Manitoba  
R0M 1L0

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

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Yours respectfully,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Amoco Canada Petroleum Company Ltd.  
P. O. Box 200 Station M  
Calgary, Alberta  
T2P 2H8

Attention: Mr. L. G. Cyca  
Manager, Engineering Department

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

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The Board will keep you informed of the further disposition of the application.

Yours respectfully,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Patricia Ann Boyd  
2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9

Dear Mrs Boyd:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

Home Oil has informed the Board that the informational package has been distributed and the application discussed with the freehold mineral owners who objected to the application.

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The Board will keep you informed of the further disposition of the application.

Yours respectively,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

August 16, 1989

Robvest Minerals Ltd.  
c/o Kohaly and Elash  
Barristers & Solicitors  
1312 Fourth Street  
Estevan, Saskatchewan  
S4A 2A5  
Drawer 580

Attention: Mr. Paul Elash, B.A., LL.B.

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

As a result of concerns expressed by a number of freehold mineral owners in regards to the subject application, the Board requested Home Oil prepare and distribute to the owners, an informational package addressing the concerns raised and outlining the company's proposed development plans.

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Yours respectfully,

H. Clare Moster

cc: Home Oil Company Limited  
Attn: Mr. D. A. Bertram, P. Eng.

bc: Ian Haugh  
Wm. McDonald  
L. R. Dubreuil



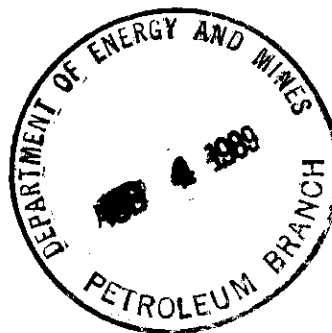
**Home Oil Company Limited**

1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta T2P 2Z5  
Telephone (403) 232-7100  
Fax (403) 232-7678



1989-08-02

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3



Attention: Mr. L.R. Dubreuil, Director

Dear Sir:

Re: South Pierson Field  
Application for Special Drilling Spacing Units

Following the directions of the Petroleum Branch regarding interventions the following actions have been taken to ensure the affected freehold mineral owners are properly informed about the application.

1. A copy of the information package previously forwarded to the Branch has been sent to all affected parties on record.
2. Attempts have been made to contact each of the six parties that have forwarded a written intervention with the results attached.

Home will await the decision of the Board as to the possible requirement of a Public Hearing.

If you require any further details please contact Mr. Gary Harrison at (403) 232-7107.

Yours truly,

HOME OIL COMPANY LIMITED

D.A. Bertram, P. Eng.  
Chief Engineer

GBH/jlc  
1599e

cc: K.R. Brown  
G.B. Harrison  
FILE: 13-PIER-0  
Day File

2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9  
July 20, 1989

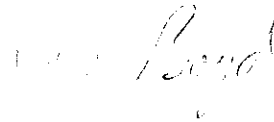
Gary Harrison  
Sr. Reservoir Engineer  
Home Oil Company Ltd.  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Dear Mr. Harrison:

Further to your letter of May 15, 1989, and our recent  
telephone conversation:

Thank you for your response to the concerns I raised in my  
letter to the Oil and Natural Gas Conservation Board. If the  
other freehold mineral owners who raised concerns are  
satisfied, then I have no objections to make to your proposal  
now.

Yours truly,

A handwritten signature in cursive script, appearing to read "Patricia Ann Boyd".

Patricia Ann Boyd

Name	Interest	Result
Douglas David Southam	S/2-17-002-29 (1/2)	Understands Home's application. Will discuss concerns with Petroleum Branch re recoveries. Does not wish to withdraw objection at the time
Amoco Canada Petroleum Ltd.	S/2-09-002-29 (1/4) SE/4-10-002-29 (1/4) NE/4-17-002-29 (1/2) SE/4-19-002-29	Management has not reached a decision on Home's request to withdraw their objection
Patricia Ann Boyd	NW/4-08-002-29 (1/2)	Has reviewed and understands Home's application. Intervention was a request for sufficient time and information to evaluate the application. Has provided a letter (attached) indicating no further objections.
Carolyn Beth Allison	NW/4-08-002-29 (1/2)	Intervention was as above. Will provide a letter withdrawing the intervention.
Marie Eikanger	NE/4-18-002-29	Intervention was a request for information. Has been contacted and is satisfied with the information provided. Does not wish to provide a written withdrawal of objection.
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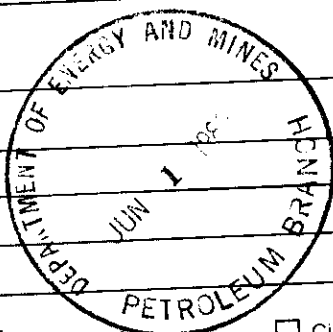


Date: May 31, 1989

To: L.R. DUBREUIL

CC: Ian Haugh

Wm. McDonald



## Action / Route Slip

From: H. CLARE MOSTER

Telephone: 1111

☐ Take Action

☐ Per Your Request

☐ Circulate, Initial and Return

☐ For Approval and Signature

☐ Make \_\_\_\_\_ Copies

☐ May We Discuss

☐ For Your Information

☐ Return With Comments or Revisions

☐ Draft Reply for Signature

☐ Please File

Comments:

RE: HOME OIL'S - SOUTH PIERSON - INCREASED SPACING APPLICATION:

Attached is Home's response to the Board's deficiency letter and a copy of their letter and information material sent to (intervening) freehold mineral owners.

- Confirm only intervenors are being approached?

- Review material

- I would like a simplified explanation of their Economics (Attachment 1)

- Check with Home on when contacts will be completed (i.e. - next step in process?)

Attachments



Date: June 1 / 89

## Action / Route Slip

To: John

From: Bob

Telephone: \_\_\_\_\_

- |                                         |                                               |                                                            |                                                     |                                            |
|-----------------------------------------|-----------------------------------------------|------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Take Action    | <input type="checkbox"/> Per Your Request     | <input type="checkbox"/> Circulate, Initial and Return     | <input type="checkbox"/> For Approval and Signature | <input type="checkbox"/> Make _____ Copies |
| <input type="checkbox"/> May We Discuss | <input type="checkbox"/> For Your Information | <input type="checkbox"/> Return With Comments or Revisions | <input type="checkbox"/> Draft Reply for Signature  | <input type="checkbox"/> Please File       |

Comments: 1) Confirm that all issues in the Bd's letter have been addressed?  
 2) Review & comment on technical & economic matters  
 3) Check with Home to confirm that only intervenors being notified and what time frame they are looking at } next wk.  
 4) Get an update on Home's 1989 drilling plans to location Thurs. } - presentation  
 5) Provide a simplified explanation / review for Chair and } Exploitation  
 I of the economics presented } Committee



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 11, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. K. R. Brown, P. Eng.  
Manager, Reservoir Engineering

Dear Sir:

Re: South Pierson Field  
Application for Special Drilling Spacing Units

Notice of the subject application was published in the Manitoba Gazette and the Melita New Era and was sent to all mineral owners in and adjacent to the area of application.

In response to this notice, the Board has received a number of letters of concern or objection from freehold mineral owners. Table No. 1 summarizes the objections received. Copies of the letters received have been forwarded to Home separately.

It appears one of the main concerns is a lack of knowledge or understanding by the freehold mineral owners of Home's plans to develop the petroleum resources in the area. Upon review, the Board finds these concerns to be reasonable and valid.

Consequently, prior to considering approval of the application, the Board requests that Home prepare and distribute an informational package to all affected freehold mineral owners. This should include, in understandable terms, Home's reasons for its proposed development program, the anticipated schedule of development of the area and should specifically address the concerns raised. It is further advised that Home contact each party that has registered an objection, discuss its proposal, including any specific concerns and request that the party inform the Board whether or not it is prepared to withdraw its objection.

If the objections are not voluntarily withdrawn, prior to June 1, 1989, the Board will consider conducting a public hearing to further consider the application.

Upon review of the application, the Board also has concerns regarding the suitability of developing the area on 32 hectare spacing. Specifically these concerns are:

- 1) The potential incremental recovery if the field were developed on 16 hectare spacing instead of 32 hectare spacing.
- 2) The potential need for pressure maintenance to enhance recovery efficiency.
- 3) Uncertainty surrounding Home's economic justification, particularly in view of the recent improvement in oil price. Specifically, you are requested to submit another economic run which assumes both a 5% OOIP increase in recovery for 16 hectare spacing and the more optimistic price forecast.

As a result of the above uncertainties, your application will be held for further disposition pending your communications with the freehold mineral owners and submission of additional information addressing the above three (3) concerns.

Yours respectively,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

cc: Charles S. Kang, Chairman  
Wm. McDonald, Member

bc: Petroleum Branch

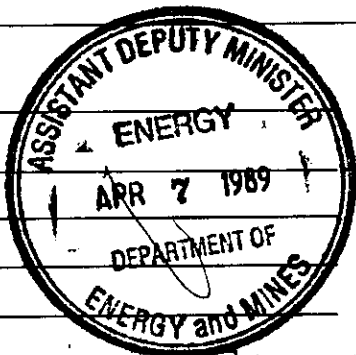
Table No. 1

South Pierson Oil Field  
Applications for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited  
Objections from Mineral Owners

<u>Party Objecting</u>	<u>Interest</u>	<u>Basis for Objection</u>
Douglas David Southam	S1/2-17-2-29 (1/2)	Poor recovery compared to Virden and Waskada
Amoco Canada Petroleum Ltd	S1/2-9-2-29 (1/4)	1)Compromise ability to call offsets.
	SE1/4-10-2-29 (1/4)	2)Home's costs higher than other operators.
	NE1/4-17-2-29 (1/2)	3)Effect on recovery
	SE1/4-19-2-29	
Patricia Ann Boyd	NW1/4-8-2-29 (1/2)	Insufficient time and information to properly assess proposal
Carolyn Beth Allison	NW1/4-8-2-29 (1/2)	
Marie Eikanger	NE1/4-18-2-29	as above
Robvest Minerals Ltd	Sec 15-2-29	Less drilling and corresponding reduction of royalty income.



To: Clare



From: *B57*

**Telephone:**

- ☐ Take Action      ☐ Per Your Request      ☐ Circulate, Initial and Return      ☐ For Approval and Signature      ☐ Make \_\_\_\_\_ Copies  
☐ May We Discuss      ☐ For Your Information      ☐ Return With Comments or Revisions      ☐ Draft Reply for Signature      ☐ Please File

**Comments:**

Comments: Re: Objection by Robvest Minerals Ltd

- It is my understanding that the only Freehold mineral owner that received a copy of the "application" was Prince (Dome)
- Our Admin well file for 4-15-2-29 indicates the following mineral ownership
  - L.G. Stevens (66 1/2)
  - E.H. Miller (66 1/2)
- Prince's app. return (addendum) indicated the following

mineral ownership

L.C. Stevens estate - Royal Trust (1/2)

Crossman Petroleum Ltd (1/2) - Pierson Mem.

A copy of the ~~notice~~ was sent to both parties.

- The leases indicate an exclusion in the SW 1/4 - mineral ownership ~~unknown~~ is Crossman Petroleum Ltd.

- It appears that the 1/2 interest originally leased to E.H. Miller was not identified by Home and did not receive a copy of the notice.

- "Robvest" does not appear in our records. We should ask them to confirm their interest.



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 7, 1989

Kohaly and Elash  
Barristers & Solicitors  
1312 Fourth Street  
Estevan, Saskatchewan  
S4A 2A5  
Drawer 580

Attention: Mr. Paul Elash, B.A., LL.B.

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

Your letter of March 29, 1989 on behalf of Robvest Minerals Ltd. objecting to the subject application is acknowledged.

The Board has received a number of letters of concern from mineral owners in regards to the application. The Board is currently reviewing options for disposition of the application, including the possibility of conducting a public hearing.

You will be notified of any further development in this regard.

A check of records in the Petroleum Branch - Manitoba Energy and Mines, does not indicate the ownership interest of your client in 15-2-29 WPM. Please provide additional information on your client's ownership interest.

Yours respectfully,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

LRD:jtb

cc: Home Oil Company Limited  
Attn: Mr. Gary Harrison

bc: Charles S. Kang, Chairman  
Wm McDonald, Member  
L. R. Dubreuil, Petroleum Branch

**KOHALY AND ELASH** *Barristers & Solicitors*

1312 FOURTH STREET  
ESTEVAN, SASKATCHEWAN  
S4A 2A5

DRAWER 580

March 29, 1989

H. C. Moster,  
Deputy Chairman,  
Room 309, Legislative Building,  
Winnipeg, Manitoba  
R3C 0V8

Dear Sir:

Re: Robvest v Home Oil Spacing  
Our file: 898512

Our office acts on behalf of Robvest Minerals Ltd. which is the registered owner of the mines and minerals on all of 15-2-29 W1 located in the south Pierson oil field. At this time, it is the position of our client that it is opposed to the proposed application of Home Oil Company Ltd. to increase the size of the drilling spacing units from 40 acres to 80 acres in this particular area. At this date, the basis for their objection to this proposed increase in drilling spacing units is that if the application is granted, it could result in less oil wells being drilled in the area thereby reducing royalty income to the various mines and mineral owners in the area.

At this time, our office is in the process of obtaining a copy of the application filed with the Board from Home Oil Company Ltd. Further details will be supplied to our objection once we have had an opportunity to review the application.

We would further point out that our client is somewhat handicapped in terms of time as, unlike other mineral owners in the affected area, Robvest did not receive any notice of this application directly from Home Oil. It first came to our client's attention when published in the Melita New Era on March 14, 1989. We assume this was an oversight on the part of Home Oil.

Yours truly,



for PAUL ELASH  
9/per

PAUL D. ELASH, B.A., LL.B.  
(Also Member of Manitoba Bar)

DAVID G. KREKLEWICH, B. ADMIN LL.B.

TIM McGEOUGH, B.A., LL.B.

COUNSEL: ROBERT KOHALY, Q.C.

TELEPHONE (306) 634-3631

FAX (306) 634-6901



## Memorandum

Date April 6, 1989

To H. Clare Moster  
Assistant Deputy Minister  
Energy Division

From Wm. McDonald  
Director  
Energy Management

Subject OIL & GAS CONSERVATION BOARD/  
HOME OIL CO. LTD.

Telephone File No. 2015.2

It seems odd to make the statement to Home Oil Co. Ltd. in the draft letter that:

"As a result of the above uncertainties, the Board is prepared to consider only interim approval (for a maximum period of 2 years) of the application."

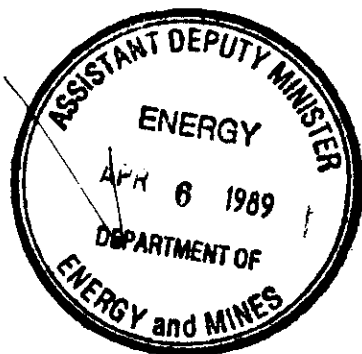
This statement pre supposes a Board position before the Board has all the information; ie. see earlier comment in the draft letter:

"Consequently, prior to considering approval of the application...."

Otherwise the recommendations in the letter are acceptable.

*fr. B. Datin*  
Wm. McDonald

Att.





The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 5, 1989

Carolyn Beth Allison  
Box 96  
Elkhorn, Manitoba  
ROM 0N0

Dear Ms Allison:

Re: South Pierson Oil Field  
Application for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited

Your letter of March 18, 1989 regarding the subject application is acknowledged.

The Board has received a number of letters of concern from mineral owners in regards to the application. The Board is currently reviewing options for disposition of the application, including the possibility of conducting a public hearing.

You will be notified of any further development in this regard.

Yours respectively,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

cc: Home Oil Company Limited  
Attn: Mr. Gary Harrison

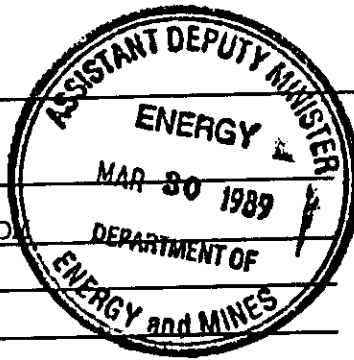
bc: Charles S. Kang - Chairman  
Wm McDonald - Member  
L. R. Dubreuil - Petroleum Branch

# Manitoba



Date: March 30, 1989

To: Clare Moster, AD  
Energy Division



## Action / Route Slip

From: Office of the Deputy Minister  
Manitoba Energy and Mines  
Room 309  
Legislative Building  
Winnipeg, Manitoba  
R3C 0V8

☐ Take Action

☐ Per Your Request

☐ Circulate, Initial  
and Return

☐ For Approval and  
Signature

☐ Make \_\_\_\_\_ Copies

☐ May We Discuss

☐ For Your Information

☐ Return With Comments  
or Revisions

☒ Draft Reply for  
Signature

☐ Please File

Comments:

Chairman

copies made: L.R. Dubreuil  
ADM Pending

Thanks

Rose

Registered Mail

241

Box 96  
Elkhorn, MB.  
Rm 010  
March 18, 1989

The Oil and Natural Gas Conservation Board  
Rm. 309, Legislative Bldg.  
Winnipeg, MB. R3C 0V5

Dear Sirs:

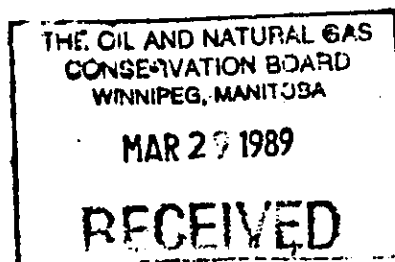
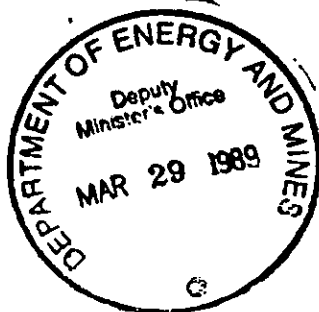
I am writing concerning the application that Home Oil Company Limited has made re special drilling spacing units in the Sourc Pearson Oil Field.

I do not feel I have enough information to make a decision as to whether I am in favour or not. As of right now, I cannot see what advantage there is to myself as an oil and mineral rights owner in this area. I am writing to Home Oil to obtain a copy of their application so I can find out more about this matter.

Thank you for your letter concerning this matter.

yours truly,

Barbara Beth Allison





# Manitoba



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 5, 1989

Ms Marie Eikanger  
Box 252  
Pierson, Man  
ROM 1S0

Re: South Pierson Oil Field  
Application for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited

Your letter of March 18, 1989 regarding the subject application is acknowledged.

The attached map indicates potential wellsites in the area of application if Home Oil's application were approved as submitted and assuming full development in the area of application. Lands outside the area of application would remain subject to normal well spacing (16 hectare or 40 acres).

The effect of approval on offset requirements in lands adjacent to the area of application would, of course, be governed by the relevant provisions of individual petroleum and natural gas leases. It is suggested, however, that approval of the application would have no negative effect on your ability, as a mineral owner of lands adjacent to the area of application, to call offsets.

Home Oil Company Limited has not specifically indicated its process in defining the area of application. By copy of this letter, Home is requested to provide its rationale for definition of the area of application.

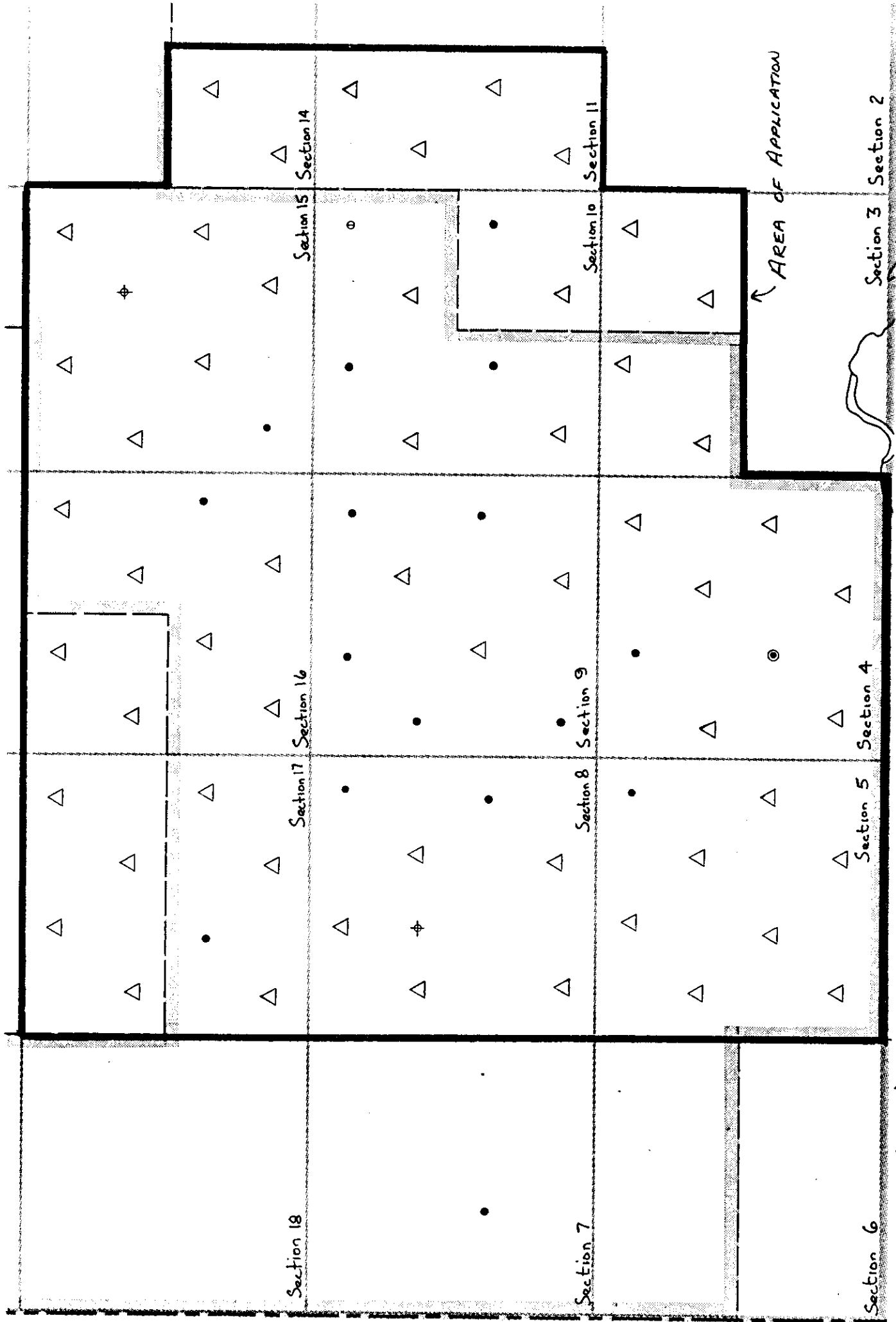
Yours respectively,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

cc: Home Oil Company Limited  
Attn: Mr. G. Harrison

bc: Charles S. Kang - Chairman  
Wm McDonald - Member  
L. R. Dubreuil - Petroleum Branch



LEGEND

- △ Potential 32 ha wellsite
- Oil Wells

TOWNSHIP 2  
RANGE 29 W 4N



Box 252,  
Pierson, Man., ROM 150  
March 18, 1989.

Manitoba Oil & Natural Gas,  
Conservation Board,  
Room 309, Legislative Bldg.,  
Winnipeg, Man.

Dear Sir:      Re:   Under the Mines Act  
                      South Pierson Field

After a telephone conversation with a member of your office earlier this week about the application for drilling by Home Oil, other questions come to mind. I realize that I have a little more time than I first thought but still feel that we are being rushed into this decision.

If this application by Home Oil is accepted, how will it affect offsets in the adjacent quarter sections? Would be pleased if you could send me a map of proposed drilling sites within the defined area.

I feel approval of this proposal would be premature until full information is made available in writing. I would also like to know why sections 6, 7, 18 and 19 were not included in the area of application.

I have been told that Home Oil have at least two producing wells within the defined area and that they are good producers.

Yours truly,

*Marie Elkanger*  
Marie Elkanger.



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

April 5, 1989

Patricia Ann Boyd  
2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9

Dear: Mrs Boyd

Re: South Pierson Oil Field  
Application for 32 Hectare Spacing Units  
Home Oil Company Limited

Your letter of March 20, 1989 objecting to the subject application is acknowledged.

Your concerns relating to limited timing have been noted. The notice period expires 14 days after the latest date of publication. In this case, the notice was published in the Manitoba Gazette on March 18, 1989 resulting in a expiry date of April 1, 1989. In addition, copies of the notice were mailed to all potentially effected mineral owners, including yourself, in the first week of March 1989. The Board feels that adequate time has been allowed for affected parties to voice their concerns as you have done.

Depending on the number and type of objections or interventions, the Board may hold a public hearing to further consider the concerns raised.

You will be kept informed of the Board's planned disposition of the application in due course.

Yours respectively,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. C. Moster  
Deputy Chairman

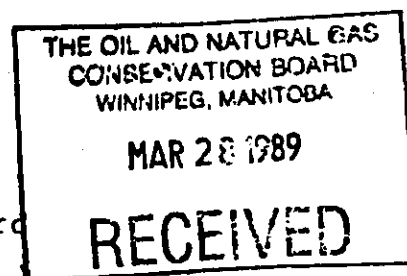
cc: Beth Allison  
Elkhorn, Manitoba

Home Oil Company Limited  
Attn: Mr. Gary Harrison

bc: Charles S. Kang, Chairman  
Wm McDonald, Member  
L. R. Dubreuil, Petroleum Branch

241 e 7.7.6

2520 Renzoni Road  
Mississauga, Ontario  
L5K 1W9  
March 20, 1989



The Manitoba Oil & Natural Gas Conservation Board  
Room 309, Legislative Building  
Winnipeg, Manitoba R3C 0V8

Dear Sir/Madam:

I understand that the Conservation Board has published in the latest edition of the Melita New Era notice of an application by Home Oil Company to double the size of the drilling spacing units in a portion of the South Pierson Oil Field, and that the Board has invited objections from interested parties.

Along with my sister, Carolyn Beth Allison of Elkhorn, Manitoba, I own and have leased to Home Oil the mineral rights for the north-west quarter of 8-2-29WPM, which falls within the area of application. I wish to object to the proposed change on the following grounds:

1. Lack of information: Neither Home Oil nor the Conservation Board has provided any justification for the proposed change. How can we make informed decisions if we have no information on which to base them?
2. Lack of time: The 14 day deadline for communication to the Conservation Board barely allows out-of-province lessors like me time to receive and respond to the Notice; it does not allow time to get a copy of the application from Calgary, study it, take counsel, and respond responsibly. Why this haste??

The public relations and public information aspects of this application (which may possibly be quite justified) seem to me to have been very badly handled. I would be glad to receive a response to the concerns I have raised, either in writing to the address above or by telephone (416-823-9381).

Yours truly,

*Patricia Ann Boyd*

Patricia Ann Boyd

cc. Beth Allison



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

March 29, 1989

Amoco Canada Petroleum Company Ltd.  
P.O. Box 200 Station M  
Calgary, Alberta  
T2P 2H8

Attention: Mr. L. G. Cyca  
Manager, Engineering Department

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited

Your letter of March 20, 1989 objecting to the subject application is acknowledged.

Notice of the application has been sent to all royalty and working interest owners in and adjacent to the area of application. In addition, the notice was published in the Melita New Era and the Manitoba Gazette. The deadline for objections and interventions is April 1, 1989.

Depending on the number and type of objections or interventions, the Board may hold a public hearing to further consider the concerns raised.

You will be notified of the Board's planned disposition of the application in due course.

Yours respectively,

Wm. McDonald  
Member

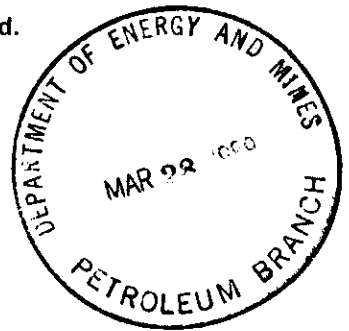
cc: Home Oil Company Limited  
Attention: Mr. G. Harrison

bc: Charles S. Kang, Chairman  
H. Clare Moster, Deputy Chairman



Amoco Canada  
Petroleum Company Ltd.

P.O. Box 200, Station M  
Calgary, Alberta T2P 2H8

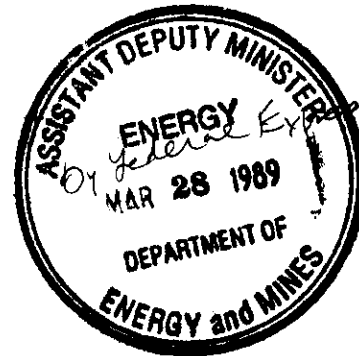


March 20, 1989

89073ACC0472

Manitoba Energy and Mines,  
Petroleum Branch,  
555 - 330 Graham Avenue,  
Winnipeg, Manitoba  
R3C 4E3.

Attention: Mr. H. C. Moster  
Deputy Chairman



Dear Sirs:

Application for Enlarged Drilling Spacing Units  
South Pierson Field, Lower Amaranth B Pool

Dome Petroleum Limited hereby registers an objection to Home Oil's application to enlarge the drilling spacing unit in a portion of the South Pierson Oil Field based on the following:

- Dome Petroleum Limited has freehold mineral interests in portions of the land within the area of application as stated in our letter dated January 16, 1989. Increasing the well spacing from 16 ha/DSU to 32 ha/DSU would compromise Dome's ability to serve freehold offset notices to protect our mineral interests from being drained by offset production.
- The correlative rights of the offset royalty interest owners will be affected by this proposal. The field developed on 32 ha spacing would have a lower production rate than the field developed on 16 ha spacing.
- The ultimate recovery on 32 ha spacing will be lower than the recovery on the current spacing. Home Oil's application assumes that oil recovery is not dependent on well spacing. Dome is concerned that the recovery of oil will not be maximized if Home Oil's application is approved thereby reducing Dome's expected revenue from this property.

- Sensitivities for drilling costs were not considered. Multi- well programs are more cost effective than a single well project and this should have been taken into consideration.
- Other operators in the area are developing these fields on the current 16 ha spacing which indicates development on the current spacing is feasible.

Should there be further inquiries please contact Mr. Brent Schaab at (403) 231-1764.

A handwritten signature in black ink, appearing to read 'L. G. Cyca', with a stylized flourish at the end.

L. G. Cyca  
Manager Division Engineering

BCS/jm



FEDERAL  
EXPRESSIN BOND  
EN DOUANEORIGIN AIRPORT / L'U  
AÉROPORT D'ORIGINEAIRPORT OF DESTINATION  
AÉROPORT DE DESTINATIONDEST. ROUTING CODE  
CODE DE DESTINATIONAIR WAYBILL NUMBER  
N° DE LA LETTRE DE TRANSPORT AÉRIEN

400-54582662



SENDER / COMMETTEE UNSHADED AREAS / EXPÉDITEUR - REMPLIR LES ZONES NON OMBRÉES

FEDERAL EXPRESS NO. / N° DE COMPTE FEDERAL EXPRESS	TELEPHONE NO. / N° DE TÉLÉPHONE
FROM (SENDER NAME) / EXPÉDITEUR	
COMPANY NAME / NOM DE COMPAGNIE	
STREET ADDRESS / ADRESSE	
CITY / VILLE	PROV. COUNTRY / PAYS POSTAL CODE
SENDER REFERENCES (IF NEEDED) / RÉFÉRENCES DE L'EXPÉDITEUR (LE CAS ÉCHÉANT)	

<input type="checkbox"/> DELIVER TO CONSIGNEE LIVRER AU CONSIGNATAIRE	<input type="checkbox"/> HOLD AND NOTIFY TEL. NO. RETENIR ET APPELER AU N°
TO (CONSIGNEE NAME) / DESTINATAIRE (CONSIGNATAIRE)	TELEPHONE NO. / N° DE TÉLÉPHONE
COMPANY NAME / NOM DE COMPAGNIE	
STREET ADDRESS (NO P.O. BOX NUMBERS) / ADRESSE (AUCUN NUMÉRO DE CASE POSTALE)	
CITY / VILLE	STATE / ÉTAT COUNTRY / PAYS ZIP CODE / CODE ZIP
DESTINATION CUSTOMS BROKER (IF KNOWN) & TELEPHONE NO. / COURTIER EN DOUANE (SI CONNU) À DESTINATION ET N° DE TÉLÉPHONE	

TYPE OF SERVICE / GENRE DE SERVICE	SPECIAL HANDLING / MANUTENTION SPÉCIALE	DANGEROUS GOODS AS PER ATTACHED SHIPPER'S DECLARATION MATIÈRES DANGEREUSES (TITLES QUE MENTIONNÉES DANS LE BORDEREAU D'EXPÉDITION	CARGO AIRCRAFT ONLY (IF APPLICABLE) CARGAISON AÉRIENNE SEULEMENT (SI NÉCESSAIRE)	SATURDAY PICKUP CUELLETTE DU SAMÉDI
1 <input type="checkbox"/> PRIORITY 1	2 <input type="checkbox"/> COURIER PAK	3 <input type="checkbox"/> SATURDAY DELIVERY (U.S. MAINLAND AND ALASKA ONLY) LIVRAISON DU SAMÉDI (É.U. ET ALASKA SEULEMENT)	4 <input type="checkbox"/> CASH IN ADVANCE PAIEMENT COMPTANT À L'AVANCE	5 <input type="checkbox"/> CREDIT CARD CARTE NO. CARTE N°
6 <input checked="" type="checkbox"/> OVERNIGHT LETTER	7 <input type="checkbox"/> BILL SENDER (TRANSPORTATION CHARGES) FACTURER L'EXPÉDITEUR (FRAIS DE TRANSPORT)	8 <input type="checkbox"/> BILL THIRD PARTY FACTURER UNE TIÈRE PARTIE	9 <input type="checkbox"/> CREDIT CARD CARTE NO. CARTE N°	
10 <input type="checkbox"/> BILL SENDER DUTIES & TAXES FACTURER DROITS ET TAXES À L'EXPÉDITEUR	11 <input type="checkbox"/> BILL CONSIGNEE FACTURER LE CONSIGNATAIRE			

THE SENDER AGREES TO THE TERMS AND CONDITIONS SET FORTH BELOW AND ON THE BACK OF YOUR COPY OF THIS NON-NEGOTIABLE AIR WAYBILL AND WARRANT THAT THE INFORMATION CONTAINED ON THIS AIR WAYBILL IS TRUE AND CORRECT. THE WARSAW CONVENTION MAY GOVERN THIS SHIPMENT AND LIMIT OUR LIABILITY FOR DAMAGE OR LOSS. OTHERWISE OUR LIABILITY IS LIMITED TO CDN \$140.00 UNLESS YOU DECLARE A HIGHER VALUE IN ACCORDANCE WITH THE TERMS ON THE REVERSE OF THIS AIR WAYBILL.

L'EXPÉDITEUR ACCEPTE PAR LA PRÉSENTE LES CONDITIONS ÉTABLIES CI-DESSOUS ET À L'ENVERS DE VOTRE COPIE DE CETTE LETTRE DE TRANSPORT AÉRIEN NON NÉGOCIABLE. DE PLUS, VOUS ATTESTEZ QUE LES RENSEIGNEMENTS CONTENUS DANS LA PRÉSENTE LETTRE DE TRANSPORT AÉRIEN SONT EXACTS. LA CONVENTION DE VARSOVIE PEUT RÉGIR LE PRÉSENT ENVOI ET LIMITER NOS RESPONSABILITÉS EN CE QUI A TRAIT AUX DOMMAGES ET AUX PERTES AUTREMENT NOTRE RESPONSABILITÉ SE LIMITE AU REMBOURSEMENT D'UN MONTANT MAXIMUM ÉGAL À \$140 CAN. À MOINS QUE VOUS NE DÉCLARIEZ UNE VALEUR SUPÉRIEURE, CONFORMÉMENT AUX CONDITIONS ÉTABLIES AU VERSO DE LA PRÉSENTE LETTRE DE TRANSPORT AÉRIEN.

RECEIVED AT / REQU À  
SENDER'S DOOR  
PORTE DE L'EXPÉDITION

SHIPPER'S SIGNATURE / SIGN. DE L'EXPÉDITEUR

1 ☐ REGULAR STOP / ARRÊT RÉGULIER

2 ☐ UN-CALL STOP / ARRÊT SUR DEMANDE

3 ☐ DROP BOX / LIEU DE DÉPÔT

4 ☐ BSC

5 ☐ STATION / AÉROGARE

DATE: 3/24/93

TIME / HEURE: 16:37

FEDEX EMP # / N° D'EMPL. FEDEX

INVOICE INFORMATION (Nature and Quantity of Goods) / RENSEIGNEMENTS - FACTURE (nature et quantité des marchandises)		COUNTRY OF ORIGIN PAYS D'ORIGINE		COUNTRY OF EXPORT PAYS EXPORTATEUR	
DATE OF SHIPMENT DATE DE L'EXPÉDITION		CANADA		CANADA	
PACKAGES COLIS		FULL AND COMPLETE DESCRIPTION OF CONTENTS DESCRIPTION DÉTAILLÉE DU CONTENU		CUSTOMS DECLARED VALUE VALEUR DECLARÉE À LA DOUANE	
WEIGHT POIDS		BUSINESS DOCUMENTS 4000000			
TOTAL PKGS N° TOTAL DE COLIS		TOTAL WEIGHT POIDS TOTAL		TOTAL DECLARED VALUE FOR CARRIAGE VALEUR TOTALE DÉCLARÉE POUR LE TRANSPORT	
SPECIFY CURRENCY DEVISES UTILISÉES		TOTAL DECLARED VALUE FOR CUSTOMS VALEUR TOTALE DÉCLARÉE À LA DOUANE			
CAD					

TOTAL CHARGES FRAIS TOTAUX
FREIGHT / FRET
VALUATION / ÉVALUATION
ADV. ORG. / AVANCE - ORIGINE
ADV. DEST. / AVANCE DEST.
DUTY TAX / DROITS DE DOUANE
OTHER / AUTRE
CDS. CONV. RATE / TAUX DE CONV.
CLEARANCE / DÉDOUANEMENT
TOTAL

RECEIVED AT / REQU À  
SENDER'S DOOR  
PORTE DE L'EXPÉDITION

SHIPPER'S SIGNATURE / SIGN. DE L'EXPÉDITEUR

1 ☐ REGULAR STOP / ARRÊT RÉGULIER

2 ☐ UN-CALL STOP / ARRÊT SUR DEMANDE

3 ☐ DROP BOX / LIEU DE DÉPÔT

4 ☐ BSC

5 ☐ STATION / AÉROGARE

DATE: 3/24/93

TIME / HEURE: 16:37

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CONSIGNEE NAME PRINTED  
NOM DU CONSIGNATAIRE  
EN MAJUSCULES

DEL. COURIER EMPLOYEE NO.  
N° D'EMPLOIE - LIVRAISON

DATE: M/M / D/J / A/A

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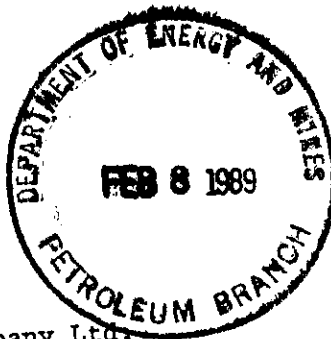
NON-NEGOTIABLE / NON-NÉGOCIABLE  
REV. 3/87INTERNATIONAL AIR WAYBILL  
LETTRE DE TRANSPORT AÉRIEN INTERNATIONAL  
54582662CUSTOMS (U.S. AND OFFSHORE)  
DOUANE (É.U. ET LITTORAL)

# Manitoba

The Oil and Natural Gas  
Conservation Board



February 6, 1989



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

(204) 945-3130

Amoco Canada Petroleum Company Ltd.  
Box 200  
Station M  
Calgary, Alberta  
T2P 2H8

Attention: L. G. Cyca  
Manager Engineering Division

Gentlemen:

Re: South Pierson Field - Drilling Spacing Units

Your letter of January 16, 1989 objecting to an application by Home Oil Company Limited to establish 32 ha spacing units in a portion of the South Pierson Field is acknowledged.

Home Oil has been requested to provide additional material in support of its application. Upon receipt of this information, formal notice of the application will be made to all potentially affected parties (including Amoco).

Any decision on establishing special spacing will be based on evidence that economic resource recovery will be maximized and that the rights of individual mineral and working interest owners will not be jeopardized.

We will keep you fully informed with respect to the application.

Yours respectfully,

*Original Signed by H. C. Moster*

H. Clare Moster  
Deputy Chairman

cc: C. S. Kang, Chairman

L. R. Dubreuil  
- Petroleum Branch

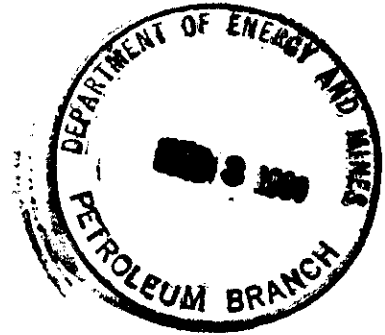
Mr. G. Harrison,  
- Home Company Limited



**Amoco Canada  
Petroleum Company Ltd.**

P.O. Box 200, Station M  
Calgary, Alberta T2P 2H8

January 16, 1989



Manitoba Energy and Mines,  
Petroleum Branch,  
555 - 330 Graham Avenue,  
Winnipeg, Manitoba  
R3C 4E3.

Attention: Mr. L. R. Dubreuil  
Director Petroleum Branch

Dear Sirs:

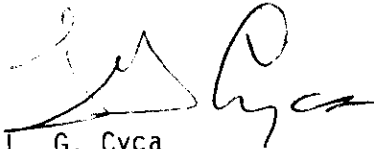
Application for Enlarged Drilling Spacing Units  
South Pierson Field, Lower Amaranth B Pool

This letter is in response to the captioned application by Home Oil, 89-01-04.

Dome Petroleum Limited has freehold mineral interests in the S/2 Section 09-02-29 W1, in the SE/4 Section 10-02-29 W1, and the NE/4 Section 17-02-29 W1. These lands lie within the area of application. Enlarging the well spacing from 16 ha/DSU to 32 ha/DSU would compromise Dome's ability to issue freehold offset notices to protect our mineral interests from being drained by offset production.

Dome Petroleum Limited hereby objects to the application by Home Oil to enlarge the Drilling Spacing Units in the South Pierson Field.

Should there be further inquiries please contact Mr. Jim Besse (403) 231-3674.

  
L. G. Cyca  
Manager Division Engineering

LGC/jm

cc: J. S. Besse (S-14)

1817m(24)



The Oil and Natural Gas  
Conservation Board

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

(204) 945-3130

March 23, 1989

Douglas David Southam  
Box 234  
Melita, Manitoba  
R0M 1L0

Dear Sir:

Re: South Pierson Oil Field  
Application for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited

Your letter of March 14, 1989 objecting to the subject application is acknowledged.

Notice of the application has been sent to all royalty and working interest owners in and adjacent to the area of application. In addition, the notice was published in the Melita New Era and the Manitoba Gazette. The deadline for objections and interventions is April 1, 1989.

Depending on the number and type of objections or interventions, the Board may hold a public hearing to further consider the concerns raised.

You will be notified of the Board's planned disposition of the application in due course.

Your respectfully,

ORIGINAL SIGNED BY  
H. CLARE MOSTER

H. Clare Moster  
Deputy Chairman

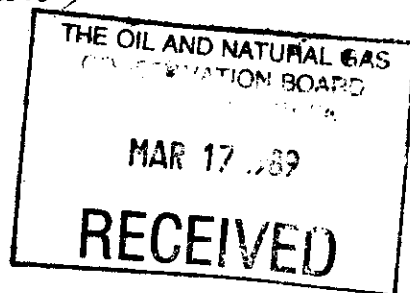
cc: Home Oil Company Limited  
Attention: Mr. G. Harrison

bc: Charles S. Kang, Chairman  
Wm. McDonald, Member

Box 243, Melita, Man.

March 14, 1989.

The Oil and Natural Gas Conservation Board,  
Room 309, Legislative Building,  
Winnipeg, Manitoba  
R3C 0V8

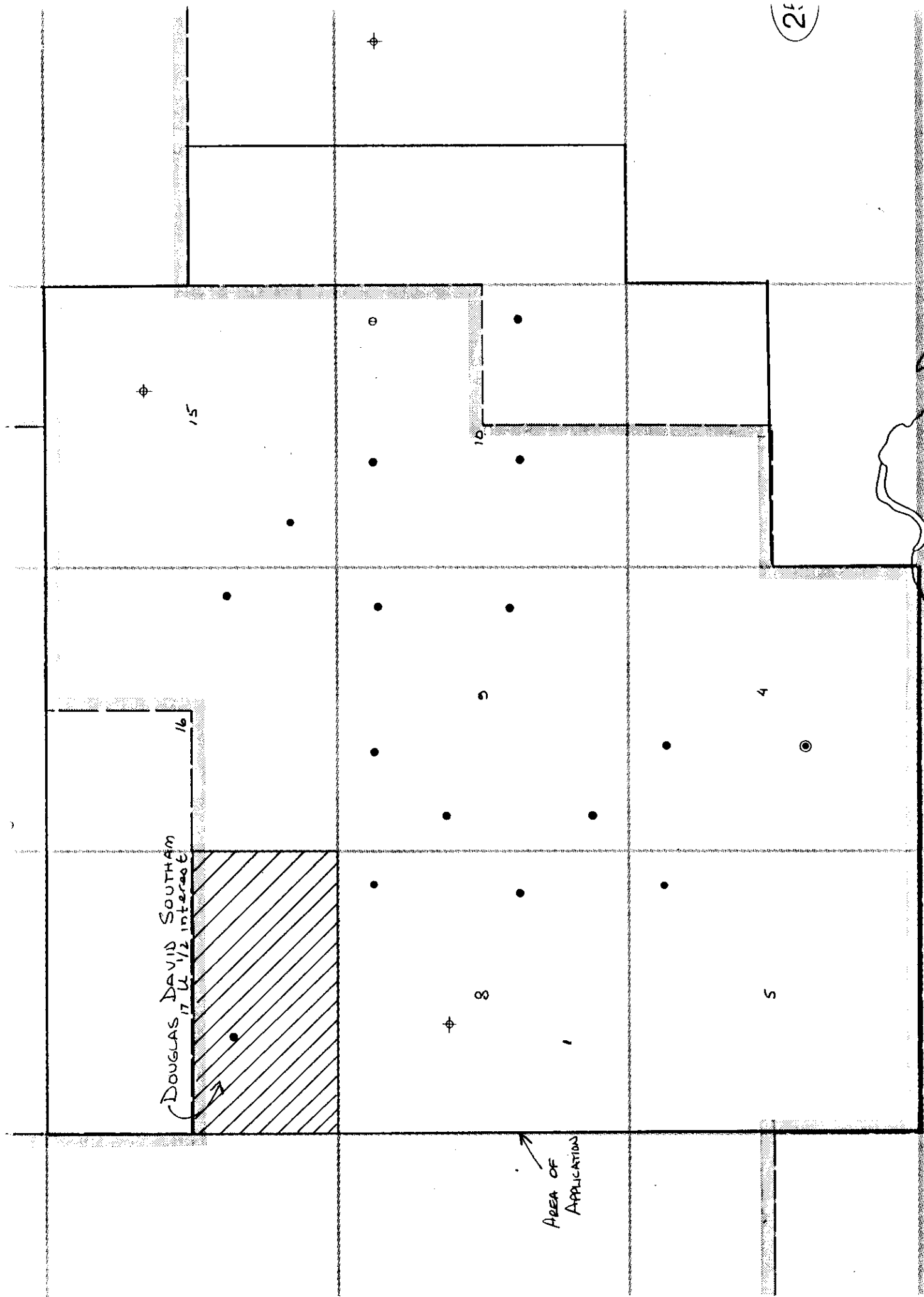


Dear Sirs,

Re South Pierson Oil Field

I object to the proposed increase in size of drilling spaces from 16 to 32 hectares by the Home Oil Company for the following reason. The amount of oil recovered from the Lower Amaranth and Mission Canyon Formations would drop substantially. The information I obtained indicates a recovery rate of only 12% compared to a 35% recovery rate at Virden and 30% at Wasbada. If Home Oil Co. does not find it economical to drill on 16 hectare subdivisions, the oil should be left in the ground until it does become economical.

Yours truly  
Doug Southam



# Manitoba



## Memorandum

Date March 23, 1989

To H. Clare Moster  
Deputy Chairman  
The Oil and Natural Gas  
Conservation Board

From L. R. Dubreuil  
Director  
Petroleum Branch

Subject

Telephone

Re: Home Oil Company Limited  
32 Hectare Spacing Application  
South Pierson

1. Douglas David Southam has an undivided 1/2 interest in the mines and minerals in the South Half of Section 17-2-29 (WPM). There is currently one well on these lands, Home Scurry S. Pierson 6-17-2-29 (WPM). This well is currently (Dec.88) producing at a rate of 1.9m<sup>3</sup>/d with a WOR of 4.3m<sup>3</sup>/m<sup>3</sup>.
2. I spoke with Myron Sereda of Saskatchewan Energy and Mines. He said they often had requests to change spacing (up or down). Generally, the primary consideration is what well density can the reserves support. He further said that objection by mineral owners is not common. He suggested we may want to consider interim approval for 1-2 years during which time:
  - additional production data would be available.
  - the need for waterflood (probably on an infill basis) could be reviewed.
  - the parties may cool off.

His comments reflect with how I suggest the application be handled.

3. I have not contacted Alberta yet. Because of the generally wider standard spacing and the limited freehold acreage, I suspect Alberta would have less exposure to this problem than Saskatchewan.

L. R. Dubreuil

LRD:jtb

First | Fold



## Memorandum

Date *March* ~~February~~ 23, 1989

To The Oil and Natural Gas  
Conservation Board

From L. R. Dubreuil  
Director  
Petroleum Branch

Charles S. Kang - Chairman  
H.C. Moster - Deputy Chairman  
Wm. McDonald - Member

Subject

Telephone

Re: South Pierson Field  
Special Drilling Spacing Units - Home Oil Company Limited

Home Oil Company Limited has made application for approval of 32 hectare drilling spacing units in the South Pierson Field. Notice of the application was published in the Manitoba Gazette (March 18, 1989) and the Melita New Era (March 14, 1989). In addition, copies of the notice were mailed to all known mineral rights owners in and within 1/2 mile of the area of application. The Board has recieved several objections to the application (see Table No. 1).

### Recommendations:

It is recommended that a letter be sent to Home Oil suggesting it prepare a brief informational package for distribution to affected mineral owners and indicating that unless objections are withdrawn, a public hearing will be considered. It is also recommended that Home be informed that for the following reasons, the Board is prepared to consider only interim approval at this time:

- a) objections received,
- b) potential incremental recovery for 16 ha spacing over 32 ha spacing,
- c) the need to evaluate feasibility of pressure maintenance, and
- d) uncertainty regarding economic justification of 32 ha spacing.

### Discussion:

Most of the objections received seem to result from lack of communication between Home Oil and the freehold mineral owners. Many of the freehold mineral owners are understandably concerned with a proposal which would result in only one half the number of wells. It is therefore proposed that Home be asked to personally contact all freehold mineral owners and attempt to explain (in layman's terms) its position. It is suggested that this could be best accomplished by a brief informational package.

It is conceivable that through the suggested approach, Home may be successful in having those parties who objected withdraw their objections. If this is not successful, the Board may wish to consider a hearing as a last resort. It is unlikely, however, that a hearing will be very productive and it would result in substantial cost and effort for all parties involved.



Some of the objections received expressed concern that development of the field on 32 hectare spacing would result in lower ultimate recovery.

In spite of assumptions to the contrary in Home's original application, it is indeed very likely that ultimate recovery is dependent on well spacing. At the request of the Petroleum Branch Home re-evaluated its economics assuming incremental recoverable reserves for 16 hectare spacing of 5% OOIP. This was arbitrarily assumed and, though probably reasonable, should be confirmed by technical studies.

One of the primary concerns of the Petroleum Branch with respect to this application is that the feasibility of pressure maintenance has not been considered. Home indicates an ultimate primary recovery of 12% OOIP. While this is reasonably favorable compared to other Manitoba fields (notably Waskada) it highlights the potential for increasing recovery through pressure maintenance operations.

Home Oil's original application included economic analysis based on an oil price forecast which now appears to be pessimistic. At the request of the Petroleum Branch, a higher price scenario was also evaluated. The two price predictions are shown on Figure No. 1 together with the current (Feb. 1989) average Manitoba price. Based on current price levels and current oil price predictions, it appears that the high price case is more appropriate.

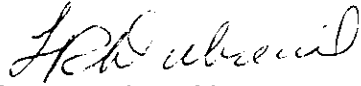
Home has stated, that it is not prepared to develop the Field on 16 hectare spacing. Based on this indication it is suggested that if the application were denied, Home would not drill 16 hectare offsets. This could lead to a situation where the Field would be simultaneously developed by two operators or more probably where Home would dispose of its interest.

Home Oil is the only large oil company to become active in Manitoba over the last five years. As noted above, denial of the application may very well result in Home Oil disposing its interest in Manitoba. Once this has occurred, it is unlikely that Home would conduct any further activity in the Province. This would be unfortunate in itself but may also send a negative signal to other larger companies considering activity in Manitoba.

In view of the foregoing, it is apparant that a balance must be struck which provides for timely development of the Field but does not alienate the major player in the area. The proposed balance is an interim approval of the application, conditional upon further necessary technical feasibility studies to optimize economic resource recovery. A two year interim period is proposed.

The attached draft letter advises Home to explain its intentions to concerned freehold mineral owners in the hope that objections may be withdrawn. If this is not successful, the Board may wish to conduct a hearing or, depending on what objections remain, may approve the application.

Appropriate Board Order(s) will be drafted when it is determined which course the Board will follow.

A handwritten signature in cursive script, appearing to read "L. R. Dubreuil".

L. R. Dubreuil  
Director of Petroleum

LRD:jtb

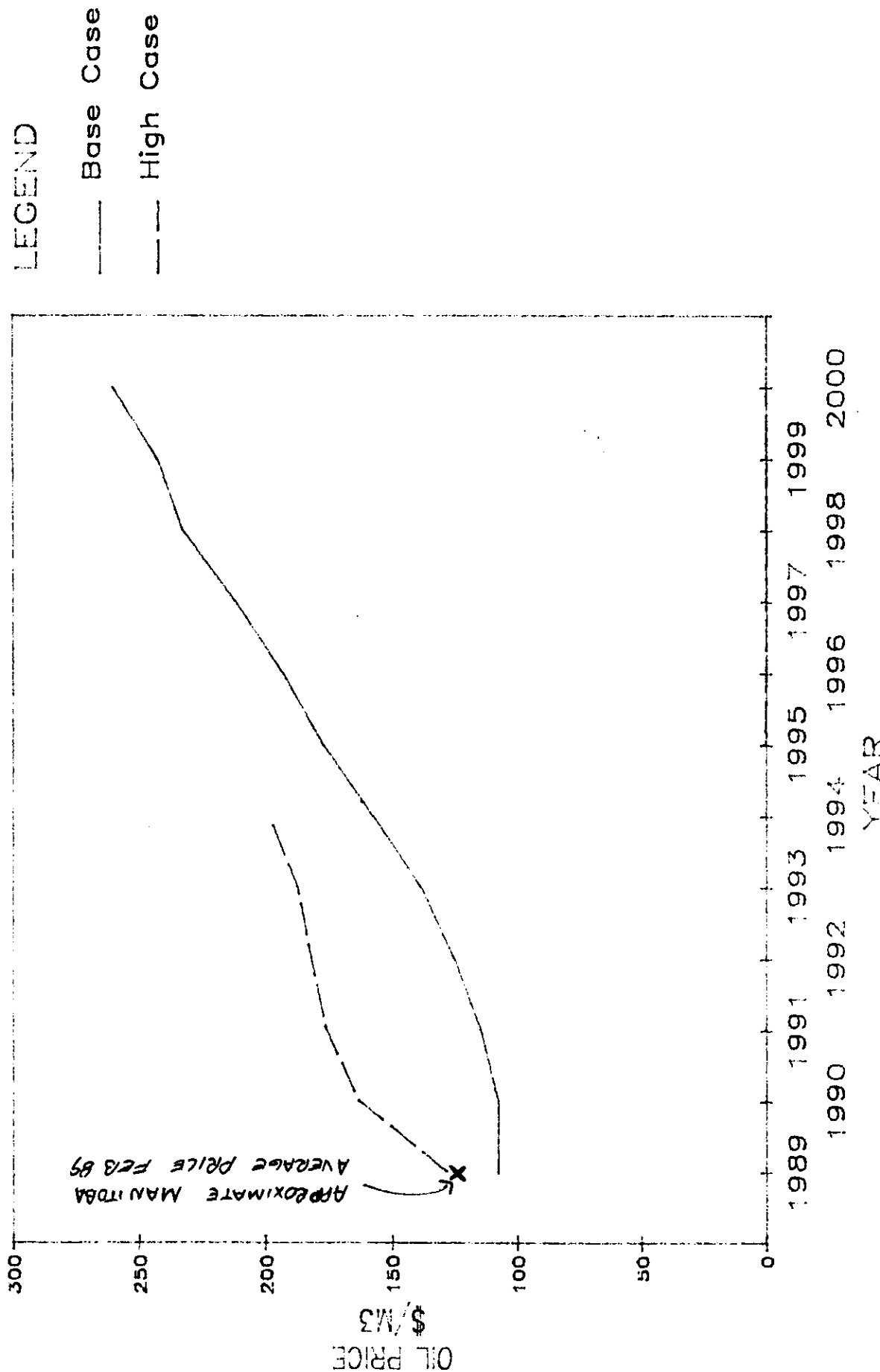
Table No. 1

South Pierson Oil Field  
Applications for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited  
Objections from Mineral Owners

<u>Party Objecting</u>	<u>Interest</u>	<u>Basis for Objection</u>
Douglas David Southam	S1/2-17-2-29 (1/2)	Poor recovery compared to Virden and Waskada
Amoco Canada Petroleum Ltd	S1/2-9-2-29 (1/4)	1)Compromise ability to call offsets.
	SE1/4-10-2-29 (1/4)	2)Home's costs higher than other operators.
	NE1/4-17-2-29 (1/2)	3)Effect on recovery
	SE1/4-19-2-29	
Patricia Ann Boyd	NW1/4-8-2-29 (1/2)	{ Insufficient time and information to properly assess proposal
Carolyn Beth Allison	NW1/4-8-2-29 (1/2)	
Marie Eikanger	NE1/4-18-2-29	as above

Fig. No. 1

# HOME OIL S. PIERSON 32 ha. SPACING OIL PRICE FORECAST



It appears one of the main concerns is a lack of knowledge or understanding by the freehold mineral owners of Home's plans to develop the petroleum resources in the area. Upon review, the Board finds these concerns to be reasonable and valid.

Consequently, prior to considering approval of the application, the Board advises that Home prepare and distribute to all affected freehold mineral owners, an informational package. This should include, in understandable terms, Home's reasons for its proposed development program and should specifically address the concerns raised. It is further advised that Home contact each party that has registered <sup>an</sup> ~~on~~ objection, discuss its proposal, including any specific concerns, and request that the party inform the Board that it is prepared to withdraw its objection.

If the objections are not voluntarily withdrawn, <sup>prior to June 1, 1989,</sup> the Board will consider conducting a public hearing to further consider the application.

Upon review of the application, the Board also has concerns regarding the suitability of developing the area on 32 hectare spacing. Specifically these concerns are:

- 1) the potential incremental recovery if the field were developed on 16 hectare spacing instead of 32 hectare spacing.
- 2) the potential need for <sup>pressure maintenance</sup> ~~secondary recovery~~ to enhance recovery efficiency.
- 3) Uncertainty surrounding Home's economic justification, particularly in view of the recent strength in oil price.

As a result of the above uncertainties, the Board is prepared to consider only interim approval (for a maximum period of 2 years) of the application.

Your application will be held for further disposition pending your communications with the freehold mineral owners.

April 3, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. G. Harrison

Dear Sir:

Re: South Pierson Field

Application for Special Drilling Spacing Units

Notice of the subject application was published in the Manitoba Gazette and the Melita New Era and was sent to all mineral owners in and adjacent to the area of application.

In response to this notice, the Board has received a number of letters of concern or objection from freehold mineral owners. Table No. 1 summarizes the objections received. Copies of the letters received have been forwarded to Home <sup>separately.</sup> ~~under separate cover.~~

Yours respectively,

H. Clare Moster  
Deputy Chairman

cc: Charles S. Kang

bc: Petroleum Branch

Table No. 1

South Pierson Oil Field  
Applications for 32 Hectare Drilling Spacing Units  
Home Oil Company Limited  
Objections from Mineral Owners

<u>Party Objecting</u>	<u>Interest</u>	<u>Basis for Objection</u>
Douglas David Southam	S1/2-17-2-29 (1/2)	Poor recovery compared to Virden and Waskada
Amoco Canada Petroleum Ltd	S1/2-9-2-29 (1/4)	1)Compromise ability to call offsets.
	SE1/4-10-2-29 (1/4)	2)Home's costs higher than other operators.
	NE1/4-17-2-29 (1/2)	3)Effect on recovery
	SE1/4-19-2-29	
Patricia Ann Boyd	NW1/4-8-2-29 (1/2)	Insufficient time and information to properly assess proposal
Carolyn Beth Allison	NW1/4-8-2-29 (1/2)	
Marie Eikanger	NE1/4-18-2-29	as above

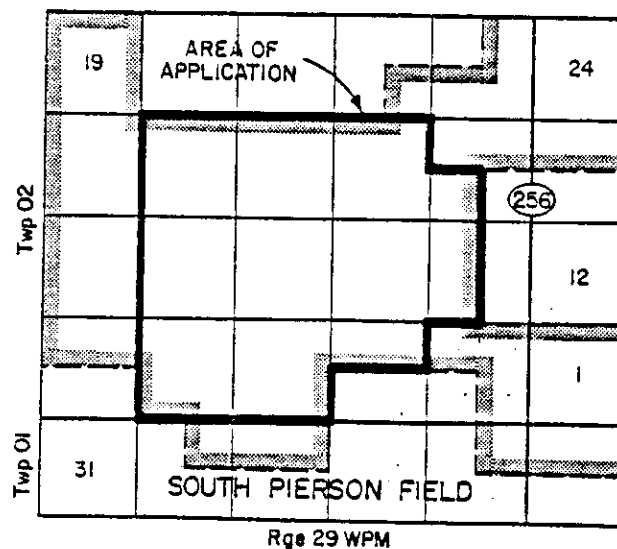




## NOTICE

### Under The Mines Act South Pierson Oil Field

Home Oil Company Limited has made application under subsection 20 (1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field. The area of application is outlined below.



It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from both Lower Amaranth and Mission Canyon Formations in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7 etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivision and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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

Copies of the application can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Ave. S.W. , Calgary, Alberta, T2P 2Z5 (phone (403) 232-7100) or can be viewed at the offices of the Petroleum Branch, 555 - 330 Graham Ave, Winnipeg, Manitoba, R3C 4E3 (phone (204) 945-6577).

Dated at Winnipeg this 2<sup>nd</sup> day of March, 1989

A handwritten signature in dark ink, appearing to read 'H.C. Moster', written over a horizontal line.

H. C. Moster  
Deputy Chairman

and the United States, has been cancelled due to lack of response from the business community.

"Business Beyond the 49th", planned for March 8 at the Westin Hotel, was a joint presentation of the Winnipeg law firm of Simkin, Gallagher, U.S. Attorneys-at-Law Robins, Kaplan, Miller & Ciresi and the Winnipeg offices of Thorne Ernst & Whinney, and Stevenson Kellogg Ernst & Whinney. The seminar was to feature several experts on the agreement including former free trade negotiators Gordon Ritchie of Ottawa and William Cavitt of Washington.

Due to the cancellation, all registrants will receive notification and full repayment.

Mr. and Mrs. Lloyd Patterson of Wawanesa are happy to announce the engagement of their second son Barry L. zann Murray, youngest daughter of Myrna Murray of Gainsborough, Saskatchewan.

The wedding is to take place April 29, 1989 in Gainsborough, Saskatchewan.

## Wanted

lications for relief fuel drivers.

rd Co-op Ltd.

Pierson, Man.

## WANTED

or Melita Telephone Office  
1989.

sevain, Man. ROK 0E0

## Control District IDERS

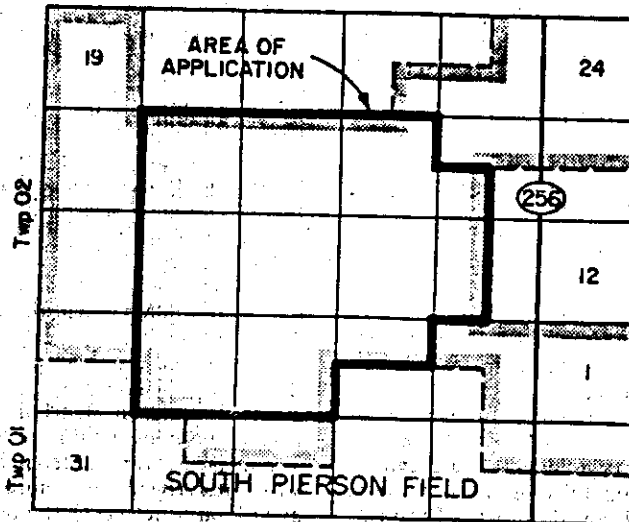
ed up to March 31, 1989 for  
d 500 litres of Estaprop.  
not necessarily accepted.

Trott, Secretary-Treasurer  
Box 100  
Pierson, Man.  
R0M 1S0

## NOTICE

### Under The Mines Act South Pierson Oil Field

Home Oil Company Limited has made application under subsection 20 (1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field. The area of application is outlined below.



It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from both Lower Anarnath and Mission Canyon Formations in the area of application. Individual drilling spacing units would consist of a north-south pair of 16-hectare units (e.g., 5-1 and 8, 5-2 and 7 etc). Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivision and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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

Copies of the application can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Ave. S.W., Calgary, Alberta, T2P 2Z5 (phone (403) 232-7100) or can be viewed at the offices of the Petroleum Branch, 555.350 Graham Ave., Winnipeg, Manitoba, R3C 4E3 (phone (204) 945-6577).

Dated at Winnipeg this 2nd day of March, 1989.

—H.C. Moster, Deputy Chairman

Melita New Era  
MARCH 14, 1989

## UNDER THE MINES ACT

PUBLIC OFFERING OF CROWN OIL  
AND NATURAL GAS RIGHTS

The undersigned will receive up to 1:00 P.M. (Manitoba official time) on the 26th day of April, 1989 offers to purchase oil and natural gas leases as described in SCHEDULE A.

Each offer should be enclosed in a separately sealed envelope with "Lease Offer — April 26, 1989" clearly indicated on the outside of the envelope, and be accompanied, where applicable, by the following:

- (a) The cash bonus bid of the bidder;
- (c) Rent for each lease for the first year at the rate of \$2.50 per hectare;
- (c) An application fee of \$50.00 per lease;
- (d) The full name and address for service of the party the agreement is to be issued to;
- (e) Where the agreement is to be issued in undivided interests, each interest should be clearly indicated.

The bonus, rental and fee in Canadian funds must be in the form of cash, bank drafts or certified cheque on a chartered bank payable to the Minister of Finance — Manitoba.

Anyone may ask that, if their offer on one or more parcels is not accepted, that it may be considered on another parcel or parcels, provided that the intent and order of choice is clearly stated and the amount of the remittance is sufficient to satisfy the bonus, rental and fee on the further choice or choices, and provided the alternative offers are for specific amounts. Any offer received contrary to these conditions, will not be considered.

All offers should be mailed to:

Director of Petroleum  
Department of Energy and Mines  
555-330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3

or handed to any person acting for him at the office of the Petroleum Branch, 555-330 Graham Avenue, Winnipeg, Manitoba.

Leases granted shall be subject to the applicable Acts and Regulations in force from time to time.

The Department also reserves the right to reject any or all offers received and to refund to the person making an offer the moneys received from them.

Printed sale results will be provided to all parties participating in the sale and to other parties upon request. Sale results, when available, may be obtained on the following afternoon by calling (204) 945-6571.

Dated at Winnipeg, Manitoba this 23rd day of February, 1989.

L. R. DUBREUIL,  
Director of Petroleum.

SCHEDULE A  
OIL AND NATURAL GAS LEASES  
APRIL 26, 1989

Parcel No.	Part	Section	Township	Range	Meridian	Hectares
A 1	SE ¼ & NW ¼	34	1	27	WPM	128
A 2	SW ¼	22	2	25	WPM	64
A 3	S ½	18	2	26	WPM	128
A 4	SE ¼	2	2	27	WPM	64
A 5	S ½	11	2	27	WPM	128
A 6	N ½	11	2	27	WPM	128
A 7	S ½	12	2	27	WPM	128
A 8	N ½	12	2	27	WPM	128
A 9	NE ¼	36	2	27	WPM	64
A 10	Lsd. 14	20	2	28	WPM	16

Commitment: A well to be drilled before December 31, 1989 to adequately test the Mississippian Mission Canyon Formation or to a total depth of 1010 metres, whichever is less.

A 11	S ½	35	7	24	WPM	128
A 12	SE ¼	29	8	27	WPM	64
A 13	NE ¼	29	8	27	WPM	64
A 14	NE ¼	10	9	28	WPM	64
A 15	NE ¼	6	9	29	WPM	64
A 16	NW ¼	6	9	29	WPM	64
A 17	SW ¼	8	9	29	WPM	64
A 18	NW ¼	8	9	29	WPM	64
A 19	S ½	32	10	28	WPM	128

3717—11

## NOTICE

UNDER THE MINES ACT  
SOUTH PIERSON OIL FIELD

Home Oil Company Limited has made application under subsection 20 (1) of the Petroleum Drilling and Production Regulation for approval of special drilling spacing units in a portion of the South Pierson Oil Field. The area of application is outlined below.

It is proposed that drilling spacing units be increased in size from 16 hectares (40 acres) to 32 hectares (80 acres) for production from both Lower Amaranth and Mission Canyon Formations in the area of application. Individual drilling spacing units would consist of a north-south pair of Legal Subdivisions (e.g. Lsd's 1 and 8, Lsd's 2 and 7 etc.) Proposed target area for the 32 hectare drilling spacing units would be located in the even numbered Legal Subdivision and would be of the same size and location as if that Legal Subdivision was a 16 hectare drilling spacing unit.

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

Copies of the application can be obtained from Home Oil Company Limited, 1700 Home Oil Tower, 324 Eighth Ave. S.W., Calgary, Alberta, T2P 2Z5 (phone (403) 232-7100) or can be viewed at the offices of the Petroleum Branch, 555-330 Graham Ave., Winnipeg, Manitoba, R3C 4E3 (phone (204) 945-6577).

Dated at Winnipeg this 2nd day of March, 1989.

H. C. MOSTER,  
Deputy Chairman.

3718—11



## Memorandum

Date February 23, 1989

To The Oil and Natural Gas  
Conservation Board  
  
Charles S. Kang - Chairman  
H.C. Moster - Deputy Chairman  
Wm. McDonald - Member

From L. R. Dubreuil  
Director  
Petroleum Branch

Subject Telephone

Re: South Pierson Field  
Special Drilling Spacing Units

Home Oil Company Limited has made application for approval of special 32 ha drilling spacing units in a portion of the South Pierson Field.

### Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Melita New Era. It is also recommended that the notice be sent to all mineral rights and working interest owners within and adjacent to the area of application (see Fig. No. 2). A copy of the proposed notice is attached.

### Discussion:

Home Oil Company Limited has drilled a total of 23 wells in the South Pierson Field. This has resulted in the development of six separate oil pools (four Lower Amaranth pools and two Mission Canyon Pools). (see Fig. No. 1).

The primary productive target in the area is the Lower Amaranth. Wells drilled are also evaluated in the Mission Canyon and completed in this Formation if potential exists.

Fig No. 2 shows the area of application and the current well status. Also shown for Lower Amaranth completions is the current productivity of each well in  $\text{m}^3/\text{d}$  and the cumulative production through December 1988. Initial production rates for wells in the area are typically at or near the established Maximum Production Rate (MPR) of  $8.0 \text{ m}^3/\text{d}$ . With production, rates have been observed to decline slowly (Fig. No. 3 shows a typical production decline). By extrapolation of production trends, Home has estimated that a given well can recover some 12% of the original oil in place in a 32 ha drilling spacing unit. By comparison with the Waskada Field, where it is estimated that primary recovery on 16 ha spacing is about 5% of the original oil in place, Home concludes that the Lower Amaranth in South Pierson can be adequately drained with 32 ha spacing.

Home further evaluates the economics of 16 ha vs 32 ha spacing and contends that due to high drilling and completion costs and limited recovery, it would be uneconomic to develop the Pool on 16 ha spacing.

The Lower Amaranth is a low permeability reservoir and must be hydraulically fractured to allow commercial production. Because of the sometimes limited separation between the Lower Amaranth and the Mission Canyon, fracturing into the Mission Canyon is a serious completion concern. Home has developed a successful technique involving careful supervision and monitoring of drilling and completion operations that has been very successful in maintaining separation between the Lower Amaranth and the Mission Canyon. The draw back to this technique is that it is extremely costly. Table No. 2 summarizes Home Oil's cost to drill complete and tie in a South Pierson well. Provide for comparison is an equivalent estimate based on other operator's experience.

Using these capital cost estimates and a 12 percent recovery factor, Home's economic calculations indicates the project to have a negative present worth on 16 ha spacing and to yield an 18.5% rate of return on 32 ha spacing (see Table. No. 3).

The calculations submitted by Home do not incorporate any increase in recovery efficiency for 16 ha spacing over 32 ha spacing. It is well accepted that unless a reservoir is homogeneous and of high quality, reducing well spacing will result in an increase in recovery efficiency. The reservoir in question, is of a heterogeneous nature and has low permeability. Other Manitoba operators have estimated an incremental recovery of some 5% of the original oil in place for similar quality reservoirs when going from 16 ha to 8 ha.

As a result of these observations, the Petroleum Branch requested that Home rerun its economics assuming a 17% recovery factor with 16 ha spacing (compared to 12% with 32 ha spacing). The results of this assumption was a 7% rate of return which fails to meet Home's minimum economic requirements. A further sensitivity run was made assuming higher wellhead prices (see Fig. No. 4). This run also failed to generate acceptable economics.

On the basis of Home's costs, assumptions and calculations, 16 ha spacing appears uneconomic (for Home) at this point. As a result, unless valid objections are received, approval will be recommended.

Home's estimate of primary recovery is 12 percent of the original oil in place. This low level of recovery strongly suggests that secondary recovery may be feasible. Any approval of increased spacing should include a requirement to review such feasibility within a reasonable time period.

Due to the secondary nature of the Mission Canyon as a potentially productive zone, Home has also requested 80 acre spacing in the Mission Canyon reservoirs. The geometry of the Mission Canyon productive area is such that 80 acre spacing may not be appropriate. Also, completions to date (see Fig. No. 5) suggest it is very unlikely, given Home's costs that an offset in the Mission Canyon would be called on economic grounds especially if the area was already productive in the Lower Amaranth. For these reasons, it is recommended that spacing for the Mission Canyon in the area remain at 16 ha.

An increase in spacing size has implications for royalty owners in the area, particularly with respect to offset commitments and correlative rights. For this reason, royalty owners and other working interest owners in the area of application should be notified of the application. (see Table. No. 1).

A letter of objection has already been received from Amoco Canada Petroleum Company Ltd. This letter states "Enlarging the well spacing from 16 ha to 32 ha would compromise Dome's ability to issue free hold offset notices to protect our mineral interests from being drained by offset production". No further technical analysis was provided. Amoco has been informed that the Board's decision will be based on maximization of economic recovery.



L. R. Dubreuil

LRD:jtb

Table No. 1

South Pierson  
Special Drilling Spacing Units  
Royalty and Working Interest Ownership \*

<u>Royalty Owners</u>	<u>Address</u>
CROWN	N/A
✓** Amoco Canada Petroleum Ltd.	Box 200 333 - 7th Avenue S.W. CALGARY, Alberta T2P 2H8
Ethel Veazie	5438 E. Baltimore MESA, Arizona U.S.A. 85205
74800 Manitoba Ltd. John Hammell	Box 102 PIERSON, Manitoba ROM 1S0
Doris A. Smith	General Delivery PIERSON, Manitoba ROM 1S0
George D. Hart	331 Wainwright Rd S.E. CALGARY, Alberta T2J 1H9
Canada Trust Company	311 - 6th Avenue S.W. CALGARY, Alberta T2P 3H2
K.P. Kielhorn	111 Youville Street WINNIPEG, Manitoba R2H 2R9
R.H. Kielhorn	171 - 32691 Garibaldi Drive ABBOTSFORD, B.C. V2S 6W8
Isabelle Boyd	Box 248 PIERSON, Manitoba ROM 1S0
Patricia A. Boyd	2520 Renzoni Rd. MISSISSAUGA, Ontario L5K 1W9
Carolyn B. Allison	Box 96 ELKHORN, Manitoba ROM ONO

*attention  
L.G. Cyco*

\* In and within 0.5 mi. of area of application.



John G. Kielhorn	13619 Klamath Falls Drive HOUSTON, Texas U.S.A. 77041
Crossman Petroleums Ltd. G.H. Crossman	Box 149 PIERSON, Manitoba ROM 1S0
John Murray	Box 3 PIERSON, Manitoba ROM 1S0
Royal Trust Corporation of Canada Estate of L.G. Stevens	Box 149 WINNIPEG, Manitoba R3C 2M2
Campbell Oil Properties Ltd.	Box 84 PIERSON, Manitoba ROM 1S0
Douglas D. Southam	Box 234 MELITA, Manitoba ROM 1L0
✓ ** Prairie Leaseholds Ltd. c/o Petro Canada Inc.	Box 2844 CALGARY, Alberta T2P 3E3
South West Oil Limited	Box 855 MELITA, Manitoba ROM 1L0
Sarah R. Caney	Box 1013 VIRDEN, Manitoba ROM 2C0
Wayne G. Tingey	Box 95 LYLETON, Manitoba ROM 1G0
✓ ** Pan Canadian Petroleum Ltd.	150 - 9th Avenue S.W. CALGARY, Alberta T2P 2S5
Charles Nichol, Mary MacLeod and William Nichol	Box 275 TREHERNE, Manitoba ROG 2V0
Mary Elkanger	Box 252 PIERSON, Manitoba ROM 1S0
Kenneth J. Lee	Box 35 PIERSON, Manitoba ROM 1S0

WORKING INTEREST OWNERS

✓** Manitoba Oil and Gas Corporation c/o Tundra Oil and Gas	1313 One Lombard Place WINNIPEG, Manitoba R3B 0X3
✓** Precambrian Shield Resources Limited	1200 - 800 - 5th Avenue S.W. CALGARY, Alberta T2P 4A4
✓** Newscope Resources Limited	1090 - 700 - 9th Avenue S.W. CALGARY, Alberta T2P 3V4
** Last Ditch Investments Ltd.	Suite 3D, 215 - 1st Avenue N.E. CALGARY, Alberta T2E 2W8
✓** Antler River Resources Ltd.	Box 267 MELITA, Manitoba R0M 1L0
✓** Sceptre Resources Ltd.	3100, 150 - 6th Avenue S.W. CALGARY, Alberta T2P 3Y7

Table No. 2

South Pierson Field  
Development Costs

	<u>Home Oil</u>	<u>Est. from other Operators</u>
Drilling	224 000	130 000
Completion	130 000	60 000
Artificial Lift	47 000	30 000
Tie In	43 000	40 000
	<hr/>	<hr/>
TOTAL	<u>444 000</u>	<u>260 000</u>

Table No. 3

Home Oil South Pierson  
Special Spacing Units - Economics

	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>	<u>Case 4</u>
NPV (\$M) (1)	(115.4)	64.4	(37.6)	(40.9)
ROR (%) (2)	--	18.51	7.0	4.9
Risked (%) ROR	--	13.6	1.9	--
Payout (years)	--	5.8	--	--

Case: 1 16 ha spacing, 12% recovery, base price

2 32 ha spacing, 12% recovery, base price

3 16 ha spacing, 17% recovery, base price

4 16 ha spacing, 12% recovery, high price

Notes: (1) Net Present Value  
 (2) Rate of Return

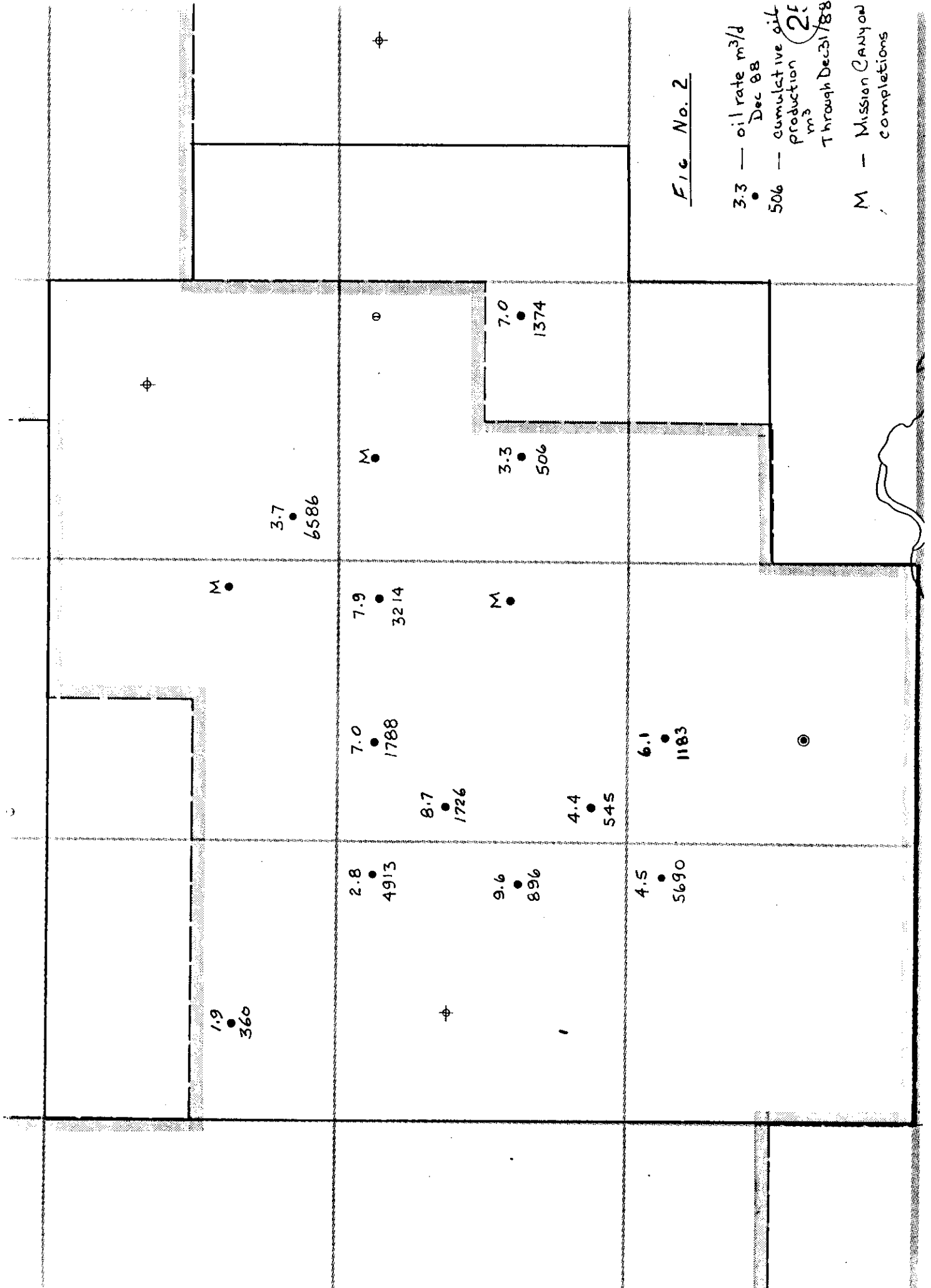


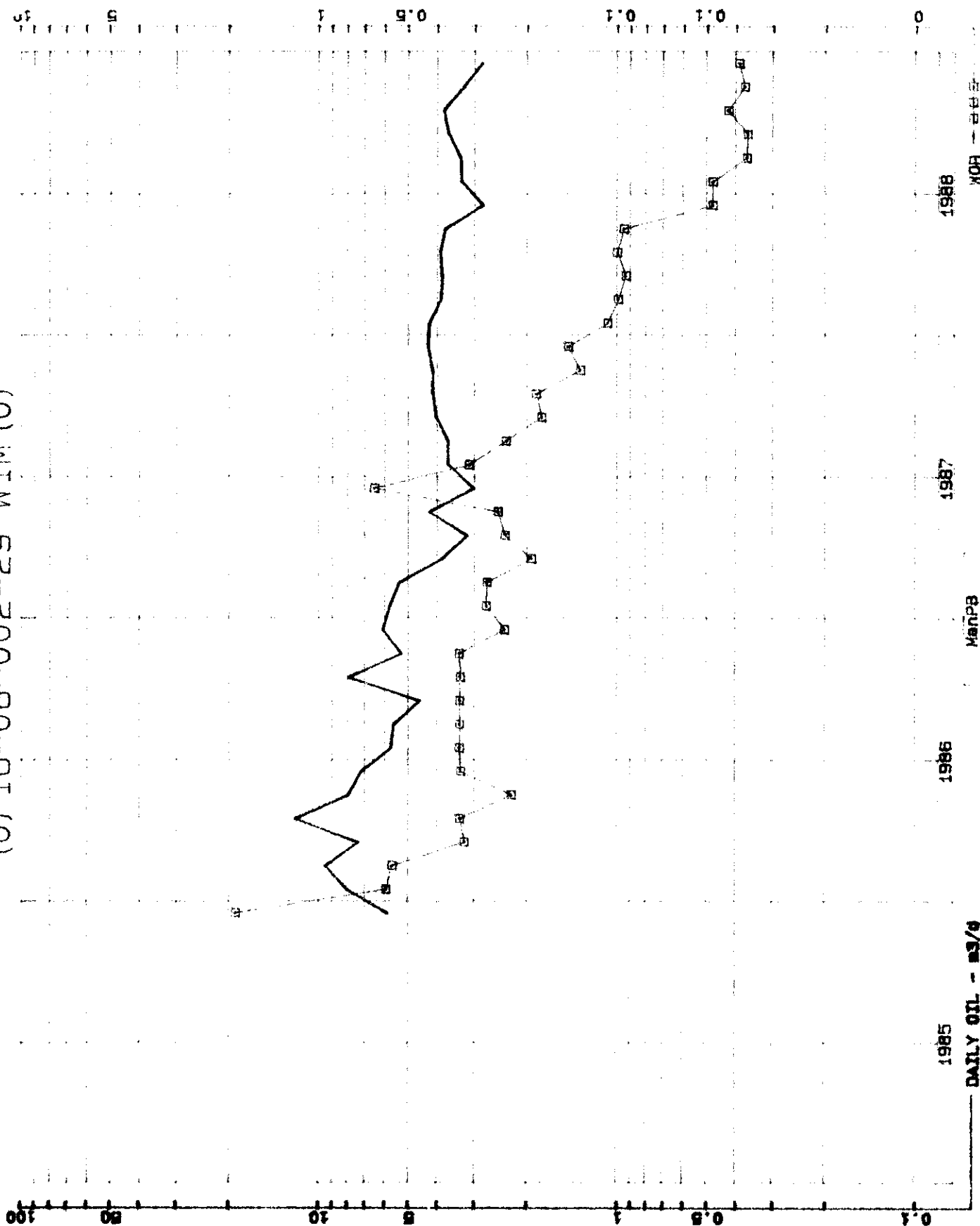
Fig No. 2

3.3 — oil rate m<sup>3</sup>/d  
Dec 88

506 — cumulative oil  
production 25  
m<sup>3</sup>  
Through Dec 31/88

M — Mission Canyon  
completions

FIG. No. 3  
(0) 16-08-002-29 W1M (0)



1985

1986

1987

1988

DAILY OIL - 03/0

MANPS

88-02-27

15:07:46

NOA - 0000

FIG. No. 4

# HOME OIL S. PIERSON 32 ha. SPACING OIL PRICE FORECAST

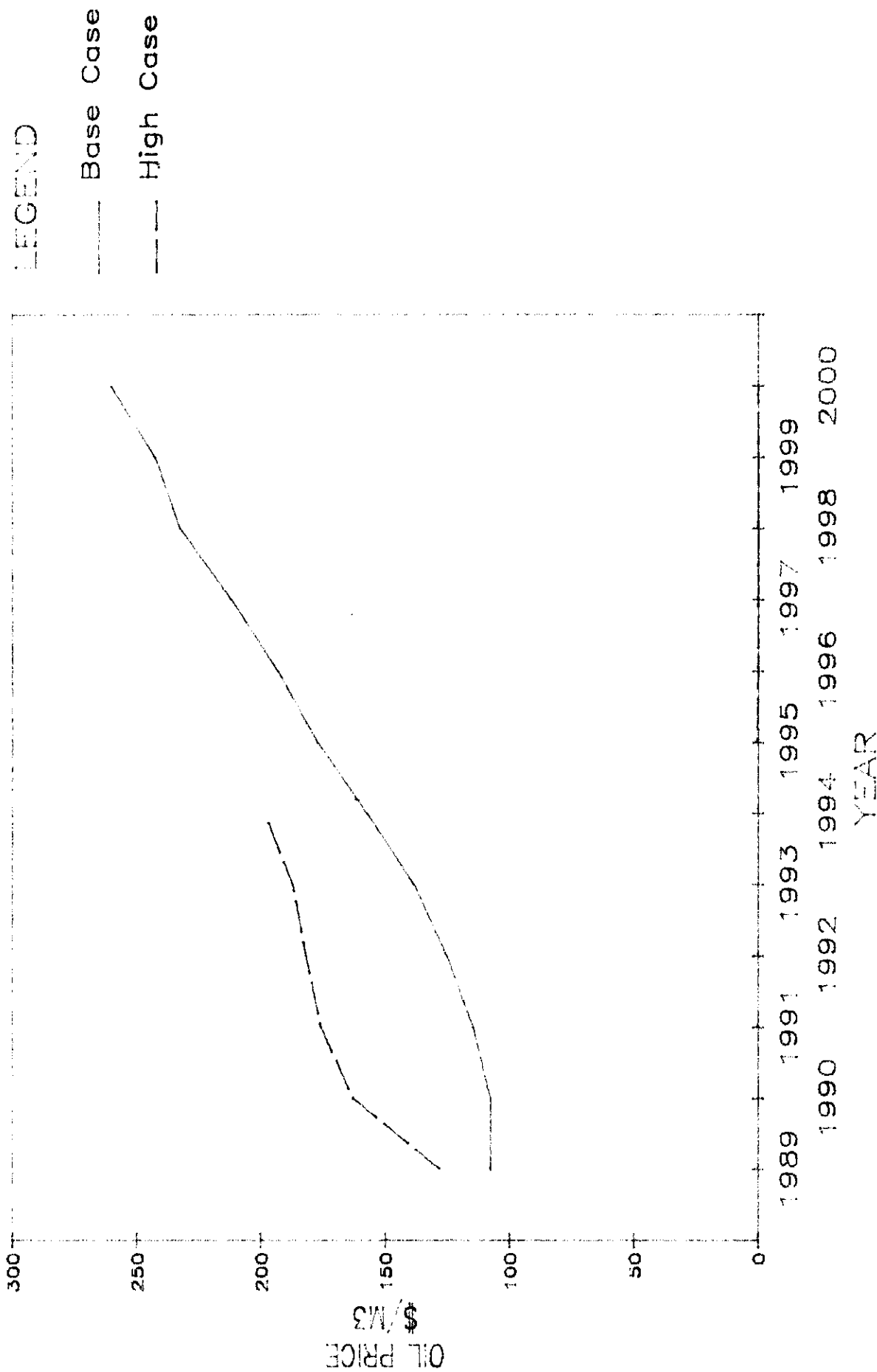


FIG No.5

1.6 - Dec 88 oil rate  
m<sup>3</sup>/d

1552 - Cumulative oil  
production through  
Dec 1988

L - Lower  
Amaranth  
Completion

(2)

1.7  
446

2.8  
795

1.6  
1552

0.8



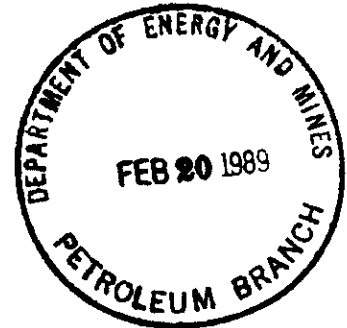
**Home Oil Company Limited**

1700 Home Oil Tower  
324 Eighth Avenue S.W.  
Calgary, Alberta T2P 2Z5  
Telephone (403) 232-7100  
Fax (403) 232-7678



1989-02-13

Manitoba Energy and Mines  
Petroleum Branch  
555 - 330 Graham Avenue  
Winnipeg, Manitoba  
R3C 4E3



ATTENTION: Mr. L.R. Dubreuil, Director  
Petroleum Branch

Gentlemen:

Re: Minutes of Meeting  
Home Oil Operated South Pierson Properties

The meeting was convened at approximately 10:45 a.m. Thursday, January 26, 1989. The following people were in attendance:

Affiliation	Name
Petroleum Branch	Mr. L.R. Dubreuil
Petroleum Branch	Mr. Brad Thiessen
Petroleum Branch	Mr. A.W. Galarnyk
Petroleum Branch	Mr. Muzaffar Husain
Home Oil Company Limited	Mr. K.R. Brown
Home Oil Company Limited	Mr. G.B. Harrison
Home Oil Company Limited	Ms. E.J. Griffiths
Home Oil Company Limited	Mr. R.A. Jamieson
Home Oil Company Limited	Mr. R.S. Bachynski

The agenda was as follows:

1. South Pierson Area Review
2. 32 ha. Spacing Application
3. Offset Obligations
4. Comingling of Zones
5. Other Business

A copy of the overhead slides used are attached.

## 1. Area Review

Home has drilled 23 wells since 1985 of which 16 are currently producing. Drilling costs have increased over time due to additional efforts to isolate the Lower Amaranth and Mission Canyon formations. Current production totals 75.6 m<sup>3</sup> oil per day. Total Capital Expenditures are approximately \$10 million to date.

Elizabeth Griffiths presented a Geological review focusing on the geology of the Mission Canyon and on the reservoir extent. A summary is attached.

## 2. 32 ha. Spacing

Gary Harrison presented the arguments contained in the application requesting enlarged spacing on the basis of drainage and economics. The Petroleum Branch requested additional economics be run to show the effect of improved recoveries of 5% OOIP for 16 ha. spacing and of higher oil prices. Supplementary pressure surveys were requested to aid in determination of reservoir depletion and possible aquifer support.

PVT analysis of a recombined sample and special core work is planned to obtain additional information regarding the fluid properties, especially the bubble point and to investigate the effectiveness of a possible waterflood. Initial concerns of Home toward waterflooding were as follows:

The lack of injectivity and the possibility of injecting into the Mission Canyon formation through fractures;

Indications of significant amounts of swelling and migrating clays on x-ray diffraction analysis;

The lack of sufficient well density at present and limited primary production history; and

The possibility that an active aquifer may provide partial pressure support.

The Petroleum Branch indicated that increased allowables are normally only granted in waterflood projects. Home's application requested an increased allowable to complement the increased spacing however few if any wells are capable of more than the basic allowable. The request will be deleted in a supplement to the spacing application.

Home will supply a list of freehold rights owners in the area of application and within a half mile corridor of the area of application.

### 3. Offset Obligations

Offset notices will be withheld by the Petroleum Branch pending the outcome of the 32 ha spacing application. The Crown is concerned about possible drainage by freehold acreage. Scurry wishes to delay drilling pending the enlarged spacing approval and some price stability to provide an acceptable economic return. Many of the Crown tracts expire in May 1990 and must be drilled to continue the leases.

### 4. 1989 Development Plans

Home wishes to delay drilling in 1989 as much as possible due to poor economics but may be required to drill several wells to retain certain leases. There is potential to drill two Exploratory wells in the province but planning is at a preliminary stage.

### 5. Comingling of Zones

Home inquired about the department policy regarding comingling of Mission Canyon and Lower Amaranth production. Department policy is to consider individual applications on their own merit. Economics must indicate that segregation is uneconomic. In such cases a segregation test is to be performed once each year to allow allocation of production between zones. The department may waive this requirement if it is clear the two zones are in communication through a fracture in the formation.

### 6. Other Business

Home inquired whether the Petroleum Branch would consider granting higher allowables for new pools if their quality could justify higher allowables. The Petroleum Branch indicated they would be receptive to such an application if the reservoir quality supported it.

A lunch break was taken from 12:15 to 1:15 and the meeting was adjourned at approximately 2:15 p.m.

If there are any errors or omissions please contact Mr. Gary Harrison  
at (403) 232-7107.

Yours truly,

HOME OIL COMPANY LIMITED

A handwritten signature in dark ink, appearing to read "K.R. Brown". The signature is written in a cursive, flowing style.

K.R. Brown, P. Eng.  
Manager, Reservoir Engineering

GBH/jlc  
1410e

c.c. Attendees  
K.R. Evans  
W.C. Tersmette  
J. Chan  
G. Raham  
FILE: 13-PIER-0  
Day File

# **SOUTH PIERSON**

## **AREA REVIEW**

### **32 HECTARE SPACING**

### **OFFSET OBLIGATIONS**

### **1989 DEVELOPMENT PLANS**

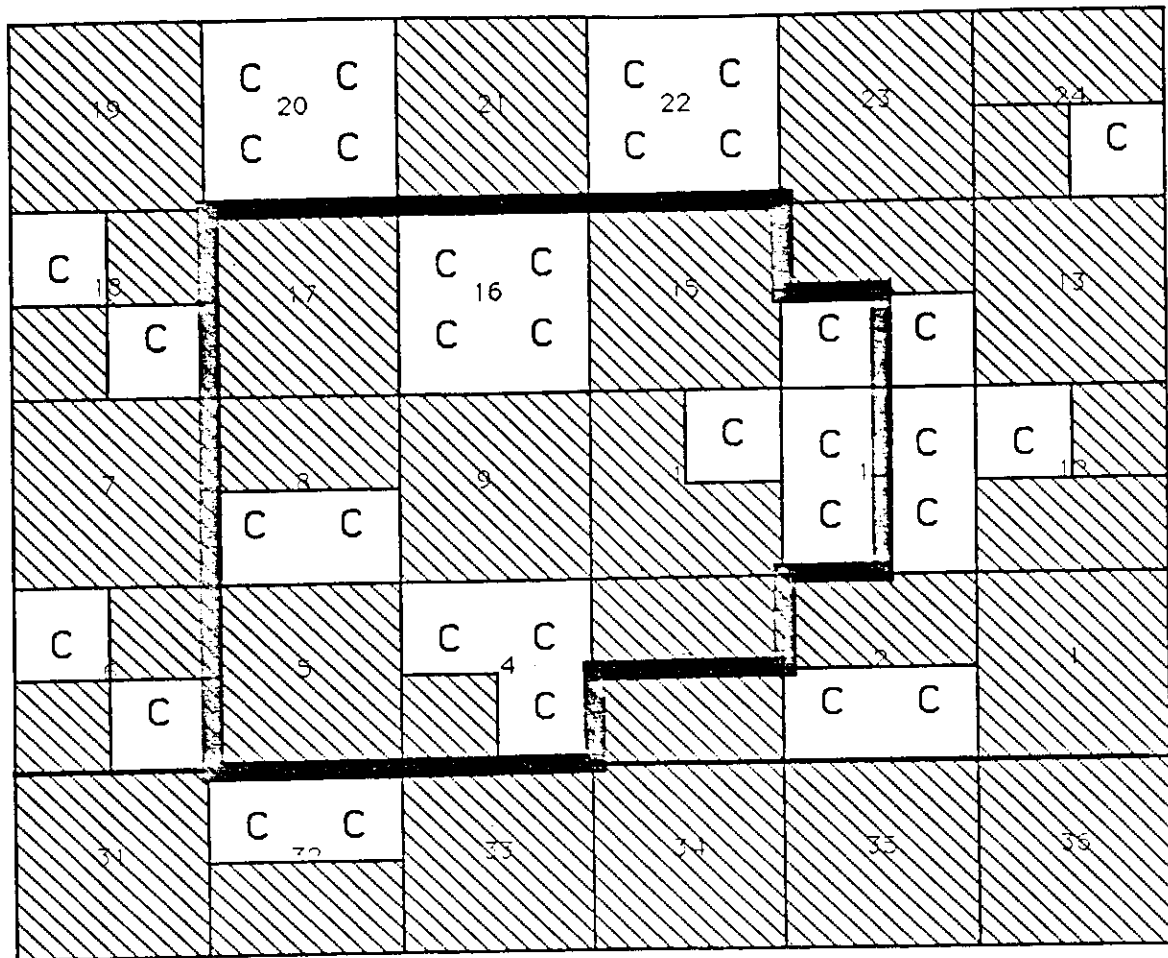
### **COMINGLING ZONES**

### **OTHER BUSINESS**



HOC / SRO LAND

# SOUTH PIERSON LESSORS MAP



RGE 29W1M



AREA OF  
APPLICATION

C CROWN LAND



FREEHOLD LAND

# **SOUTH PIERSON AREA REVIEW**

**NO. WELLS DRILLED 23**

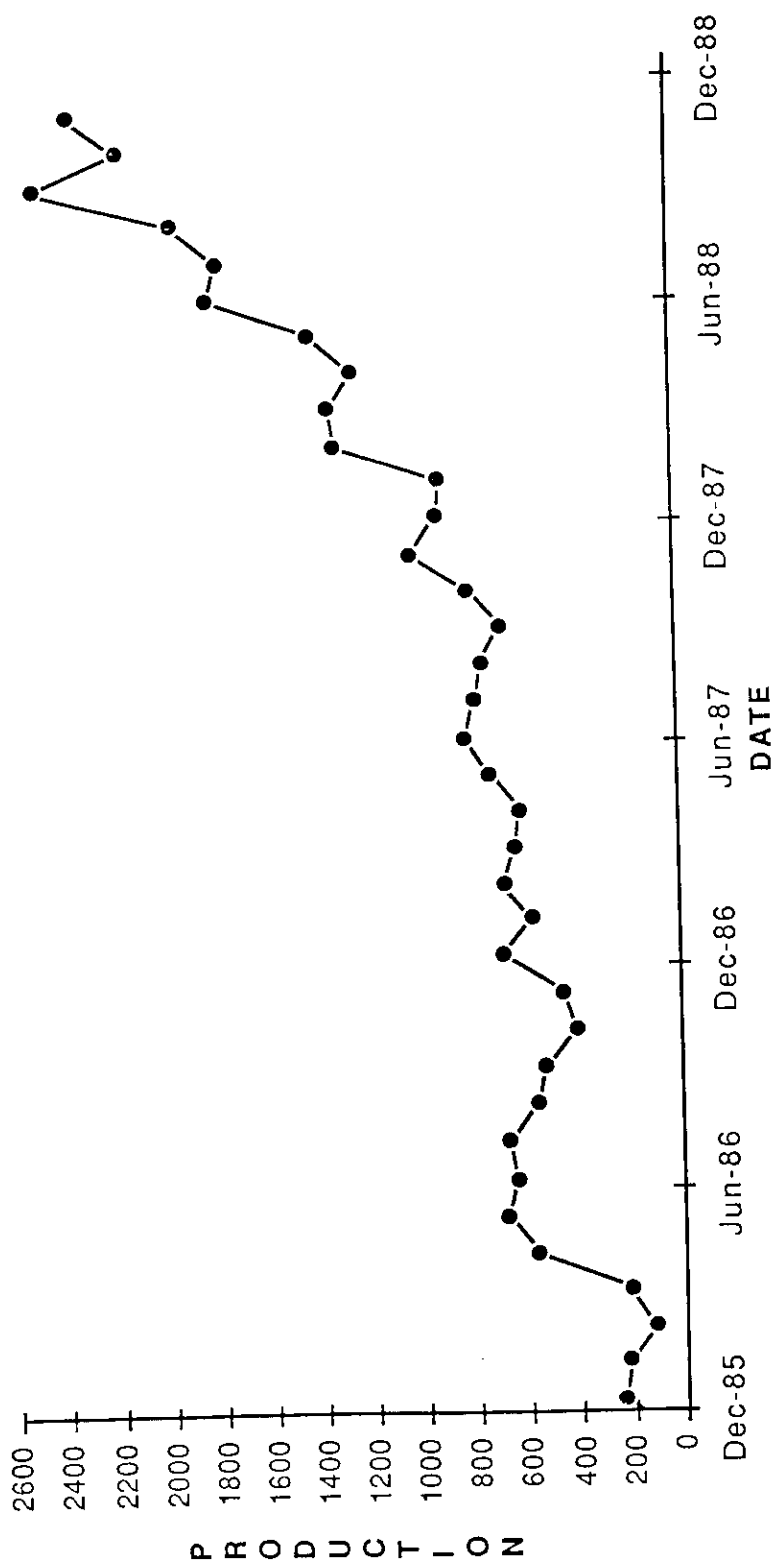
**NO. WELLS CASED 22**

**NO. WELLS COMPLETED 22**

**NO. WELLS PRODUCING 16**



SOUTH PIERSON AREA  
PRODUCTION HISTORY  
( m3/MONTH )



SOUTH PIERSON AREA REVIEW

PRODUCTION (m<sup>3</sup>/d)

DECEMBER 1988, 16 WELLS ON PRODUCTION

	OIL ---	WATER -----
LOWER AMARANTH (13 wells)	69.6	135.7
MISSION CANYON (3 wells)	6.0 ---	9.9 -----
TOTAL (m <sup>3</sup> /d)	75.6	145.6

HOC61FIN

# SOUTH PIERSON AREA REVIEW

## CAPITAL COST

M\$ (NO. OF WELLS)

	INITIAL DRILLING PROGRAM	1988 DEV. DRILLING PROGRAM	TOTAL
DRILL	2,931 (16)	1,568 (7)	4,499 (23)
COMPLETE	1,890 (14)	910 (7)	2,800 (21)
ARTIFICIAL LIFT	460 (9)	282 (6)	742 (15)
FLOWLINES	315 (5)	85 (2)	400 (7)
14-09 BATTERY	306	--	306
WATER DISPOSAL FACILITY	824	--	824
	<hr/>	<hr/>	<hr/>
<b>TOTAL M\$</b>	<b>6,726</b>	<b>2,845</b>	<b>9,571</b>

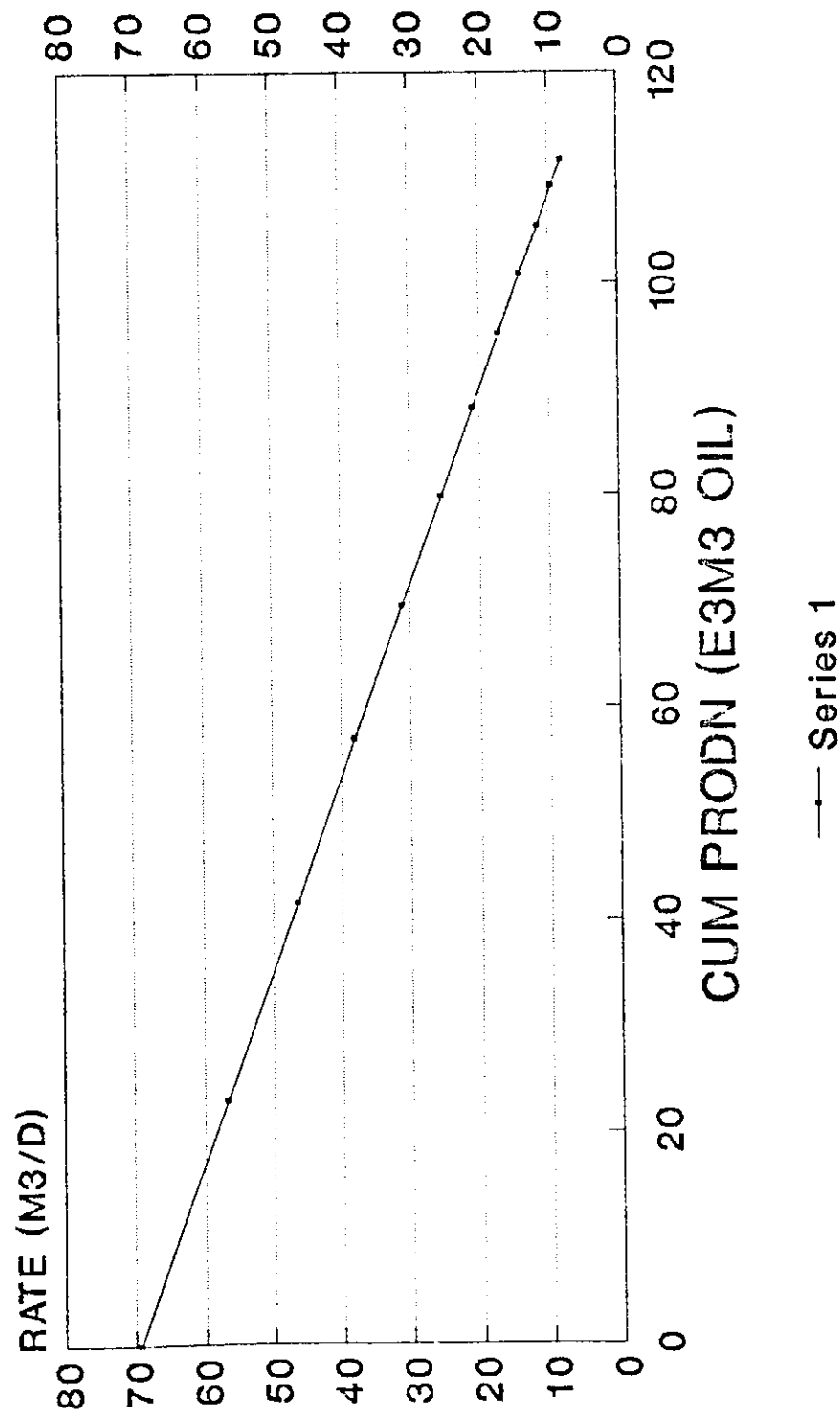
## 32 HA. RESERVES

<u>LSD</u>	<u>DECLINE</u>	<u>VOLUMETRIC</u>
16-05-02-29	10600	13719
16-08-02-29	9000	12472
16-09-02-29	19071	7774
04-15-02-29	16700	14085
	-----	-----
	55371	48050

M3 OIL, 12% R.F. VOLUME

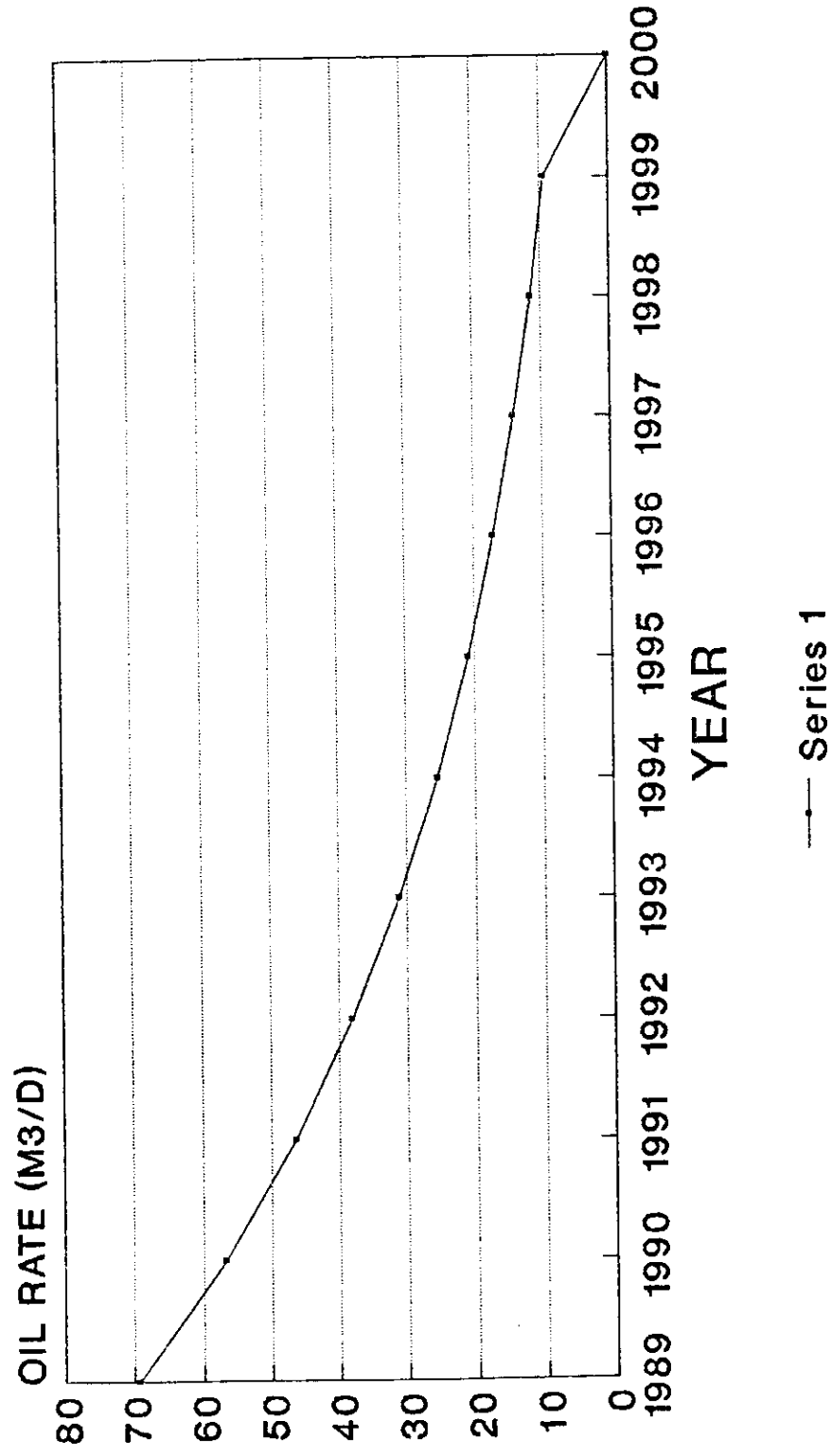
# PRODUCTION DECLINE

## LOWER AMARANTH



12% R.F., BOOKED RESERVE

# PRODUCTION DECLINE LOWER AMARANTH



SOUTH PERSON  
SPEARFISH WELL

WELL FOR P43 & E123

---

FORMATION	SPEARFISH
NET PAY	4.0 M
POROSITY	14.0 %
WATER SATURATION	45.0 %
SHRINKAGE	0.86
AREA	32.4 HA
O.O.I.P.	85 365 M3
PRIMARY RECOVERY	12.0 %
RECOVERABLE OIL	10 244 M3

# COSTS

## CAPITAL EXPENDITURES      OPERATING EXPENSES

DRILL & CASE224      FIXED      \$1500/WELL-MO.

COMPLETE      130      VARIABLE      \$15/M3 OIL

A/L      47

TIE-IN      43

---  
444

\$ THOUSANDS



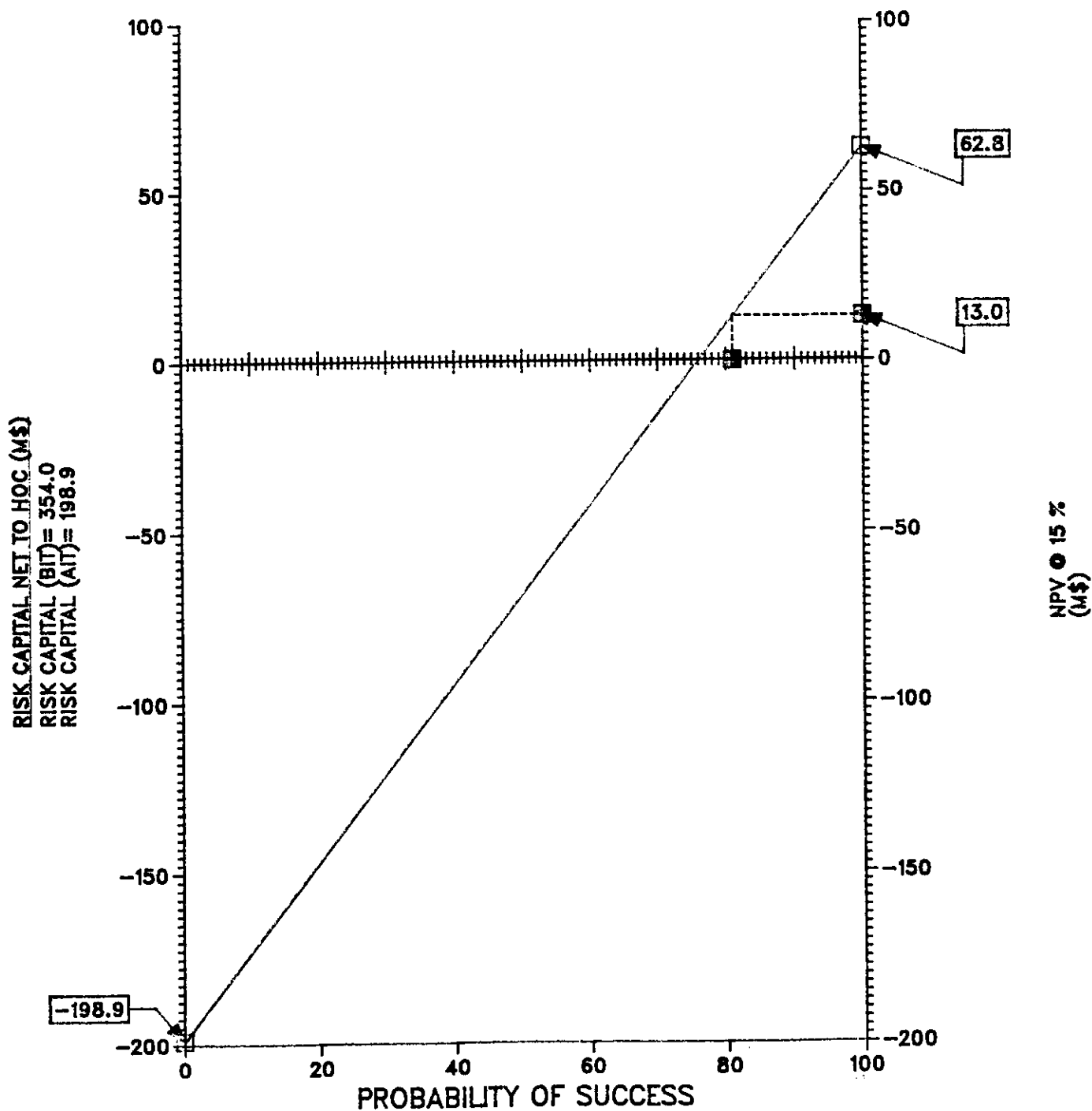
# ECONOMIC RESULTS

	<u>16 HA.</u>	<u>32 HA.</u>
NPV	<115.4>	64.4
INVESTMENT	444.0	444.0
ROR %	---	18.51
PAYOUT (YRS)	---	5.8
EMV	<131.3>	14.3
RISKED ROR %	---	13.6
RISKED CAPITAL	198.9	198.9

(AIT, 12% DCF, 81% COS, \$k)

SOUTH PIERSON: TYPICAL SPEARFISH WELL  
GROSS REC. RES.= 10244 M3

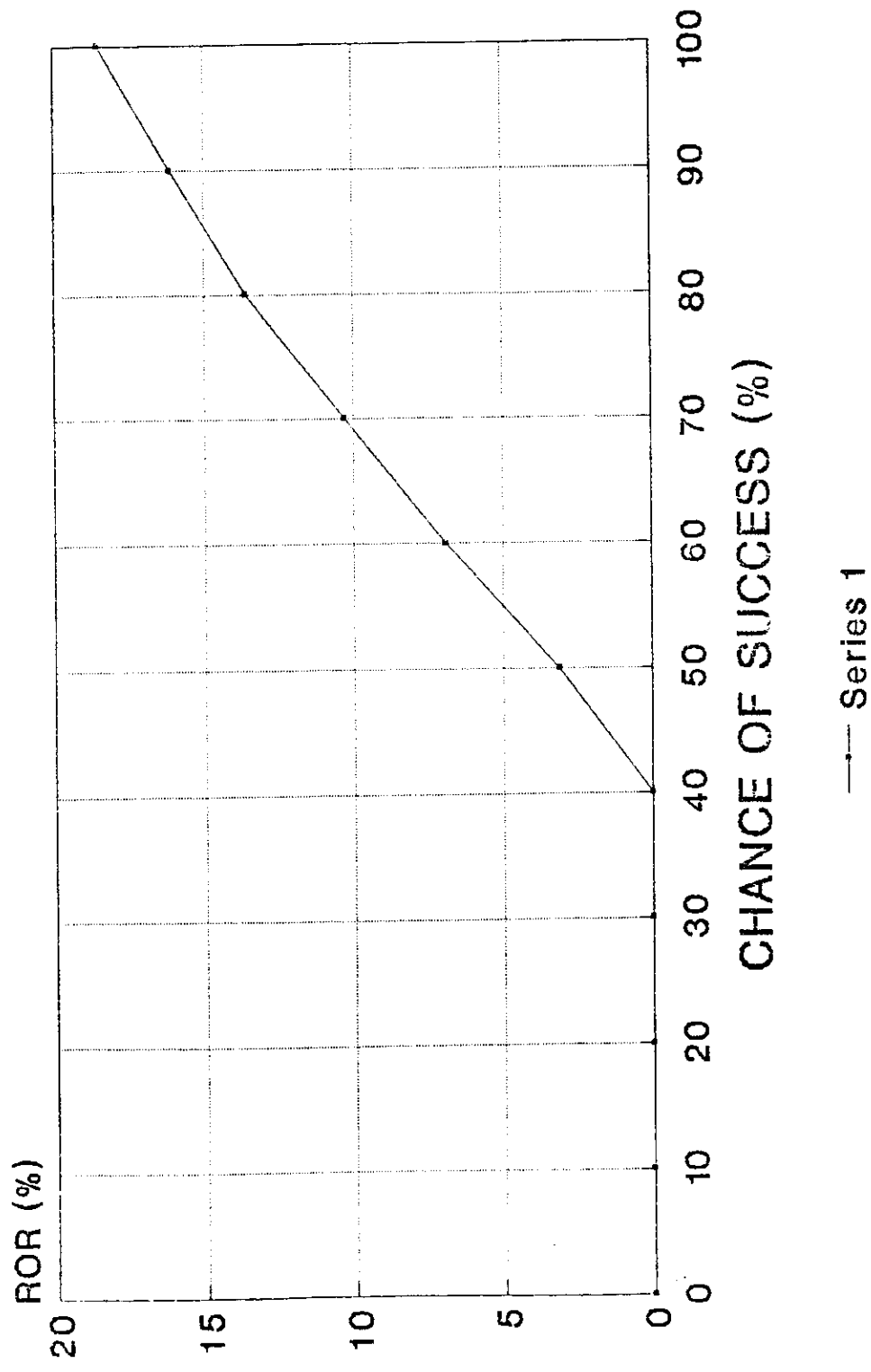
FREEHOLD LEASE HOC/SRO W.L.=100%



Legend

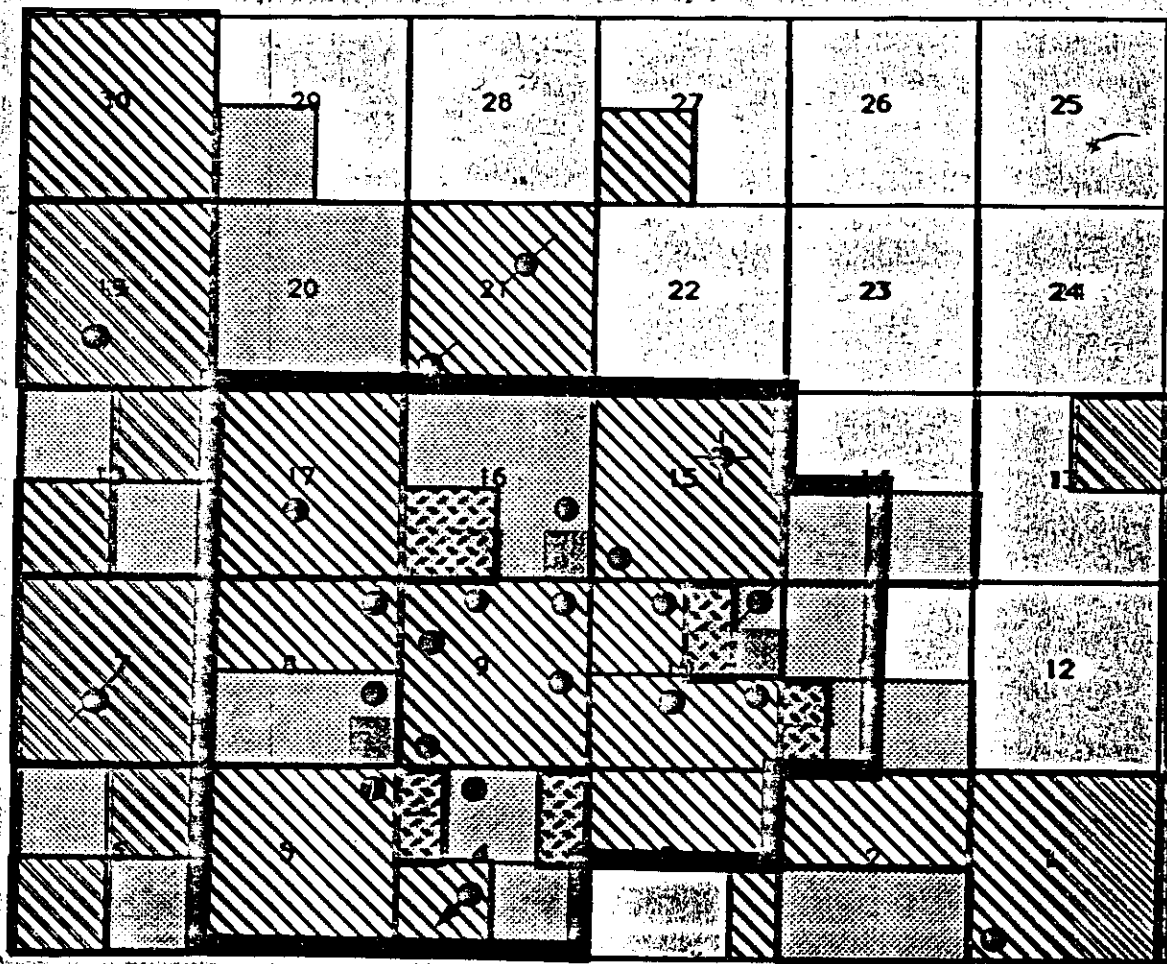
- EMV @ 81.0% POS      □ NPV @ HOC/SRO 100% W.L.

# RISKED RATE OF RETURN



AFTER INCOME TAX

# SOUTH PIERSON AREA REVIEW



TWP. 2 RGE. 29 W1M



CROWN LAND



FREEHOLD LAND



40 ACRE OFFSETS



80 ACRE OFFSETS



AREA OF  
APPLICATION

## GEOLOGICAL PRESENTATION TO MANITOBA GOVERNMENT - JAN. 26/89

### 1. General Stratigraphic Column

The S. Pierson Field in S.W. Manitoba at Twp 2 Rge 29W1 produces primarily from the Spearfish or L. Amaranth. Our company refers to the reservoir unit within the Spearfish as the "Main Sand". It lies above the Miss. unconformity and enveloped in the "Red Beds" sequence. It's close proximity to the unconformity and the nature of the Mississippian must always be considered in light of the difficulty in completing the Spearfish "Main Sand."

The Alida Beds or MC3 of the Miss. is a porous, permeability and water bearing limestone unit in most of the field. Any hydraulic fracturing of the Main Sand runs the risk of going out of zone and breaking into the Miss. water.

### 2. Facies Model

The Spearfish Main sand is a fine grained sandstone interpreted to be part of an arid tidal flat environment. The reservoir is the cleaner 'winnowed' tidal creek within the general muddier red beds.

The field is limited to the NE by anhydritization and is tight and becomes wet to the SW downdip.

### 3. Structure Map

The structure on the top of the Main Sand shows a gentle NE to SW dip and minor flexure in the middle. We have D&A and shut-in wells to the NE (e.g. 10-15, 10-21) and wet and shut-in locations to the SW (e.g. 6-7, 6-4 SWD). 6-19 is the only well producing from the Spearfish Main Sand that has not been hydraulically frac'd. I will now discuss the Miss. because of its importance in the successful completion of wells.

### 4. Mississippi Structure Map

Unlike the typical 'subcrop paleo hill' trapping mechanism for the Miss. oil, there is only very subtle relief on the unconformity in our area. Thus Miss. is considered a secondary objective at best and a real problem for completing the "Main Sand" most of the time. Note there are only 3 wells perfed and completed in the Miss. in this field: These three wells 8-9, 8-16 and 14-10, will be the key wells in the following sections.

### 5. Stratigraphic Section

We have subcropping units against the unconformity and progressive (F - H) older units to the NE and younger units (A - E) to the SW. A few of these units are oil prone and most are not.

6. Structural Section

The 8-9 location produces from a younger stratigraphic unit than the 8-16 and the 14-10. The 'oil prone' unit such as "F" (purple) has an updip eroded (16-11 not shown) limit and water leg downdip (8-9).

Because 8-9 completion is immediately above water without intervening tight zones, it is a very high water cut oil well. Note the thin pay zones in these wells - 2.5m max. and the poor production rates.

7. Schematic X-Section - of the Miss. through the field.

A series of subcropping zones (older to NE, younger to SW).

Oil at 8-9, over water

Oil at 8-16, 14-10 over tight zones - produce low rates, low water cut, all zones become water bearing to the SW (downdip).

16-11 (Shut-in Spearfish)

8. Subcrop Edge Map

This map demonstrates exposure of the older units to the NE and younger units to the SW. Note the NW/SE trends of the "edges" paralleling the general trend of the Williston subcrops in the region.

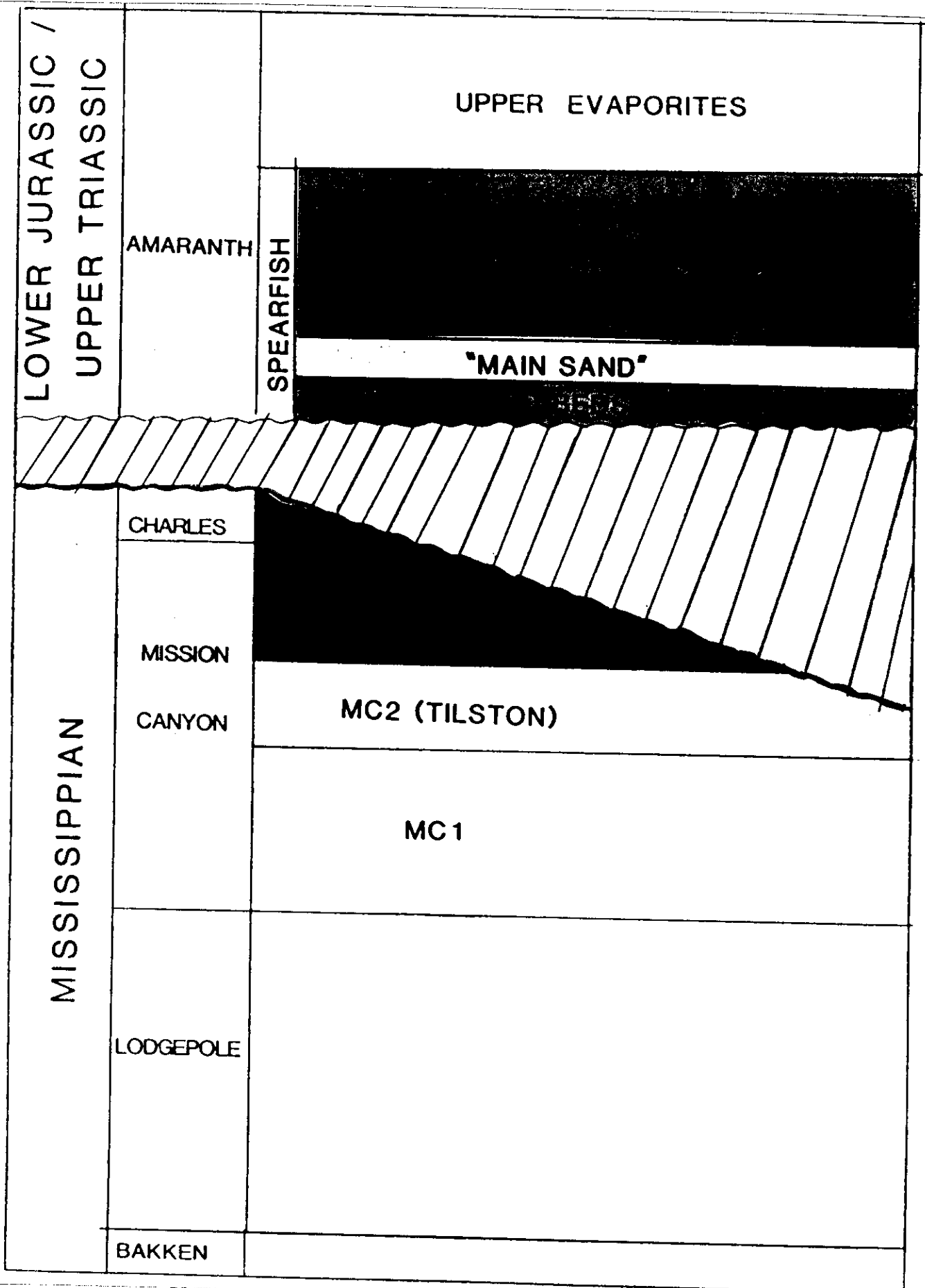
9. Completion Map

Spearfish is our main objective, Miss. is a very thin target in this area.

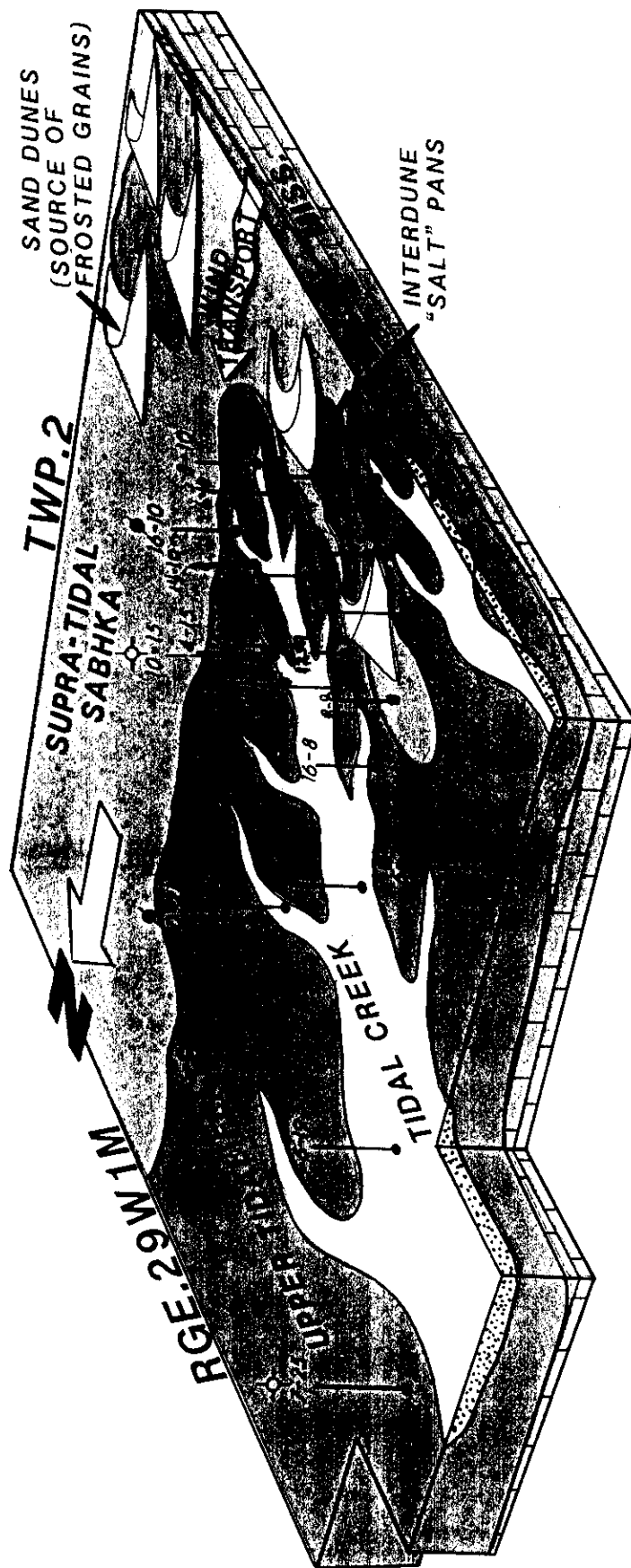
- There are 13 Spearfish completions - oil producing.
- 3 Miss. completions - oil producing.

*Elizabeth Griffiths*

JAN. 26, 1989



# SOUTH PIERSON FIELD SPEARFISH FACIES MODEL



OCTOBER, 1987  
E. GRIFFITHS

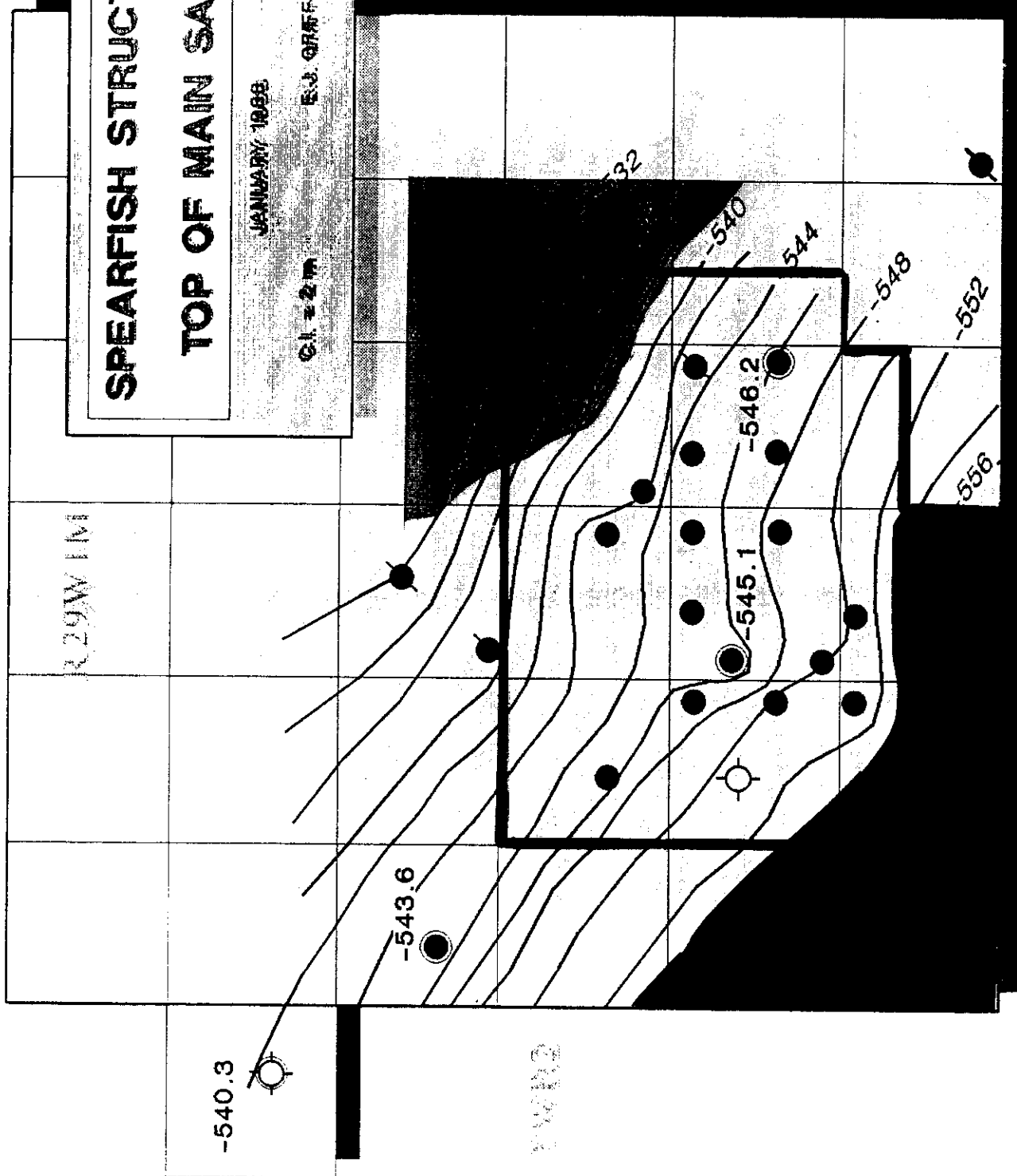


# SPEARFISH STRUCTURE

## TOP OF MAIN SAND

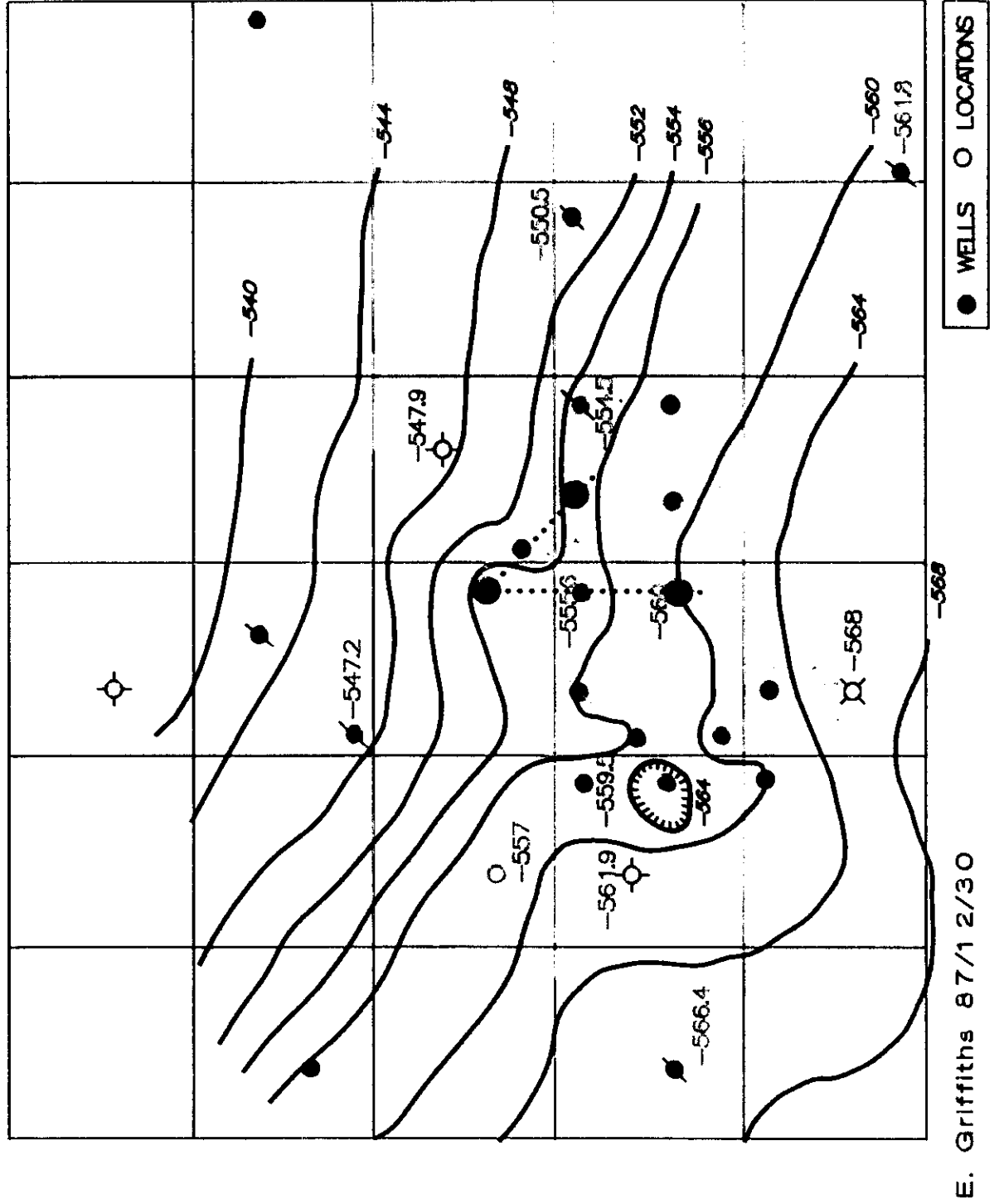
JANUARY 1988

6.1 ± 2 m E.J. GRAFFING



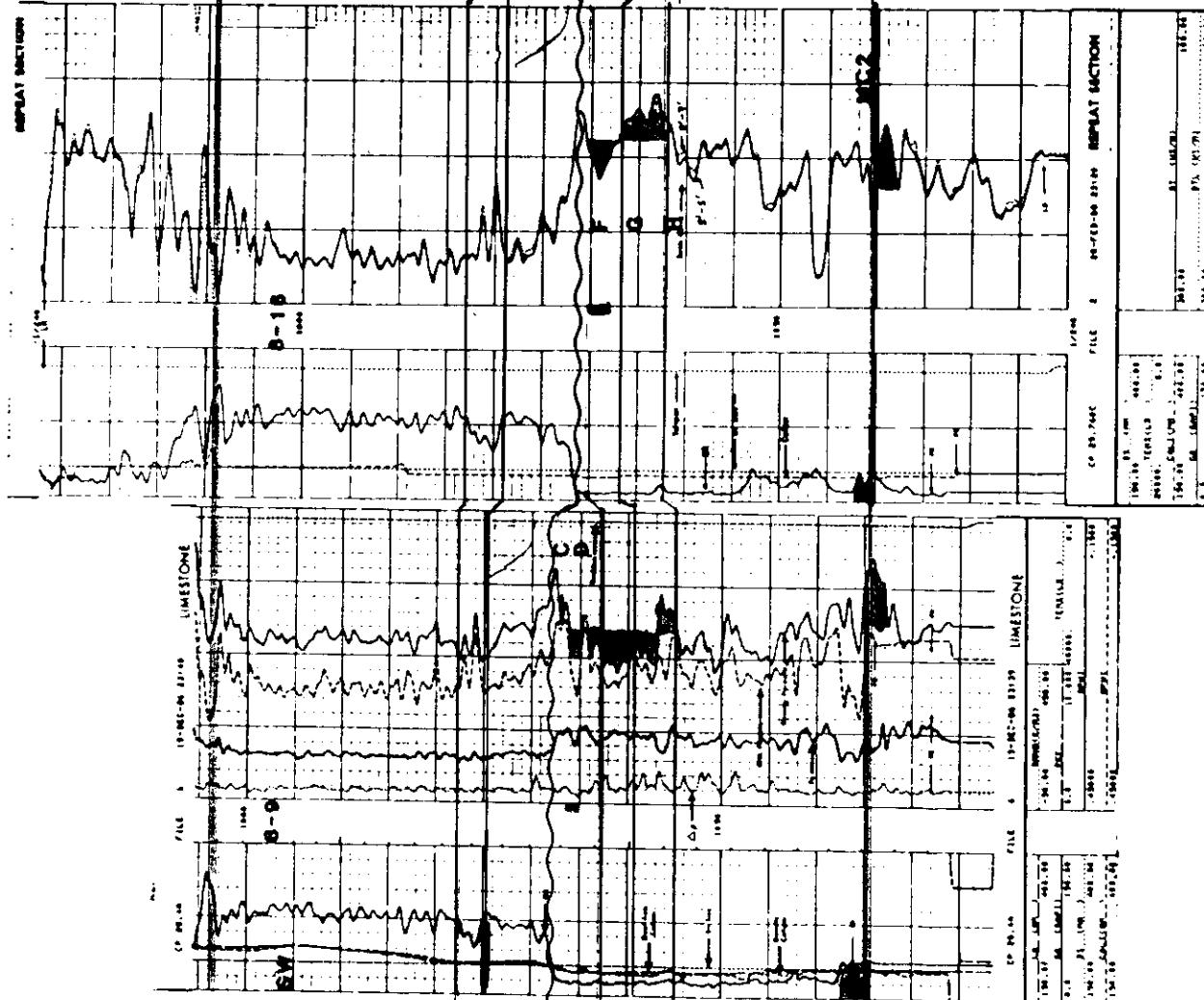
# STRUCTURE ON MISSISSIPPIAN UNCONFORMITY

C.L. 4M S. PIERSON - TWP. 2 RGE. 29 WIM



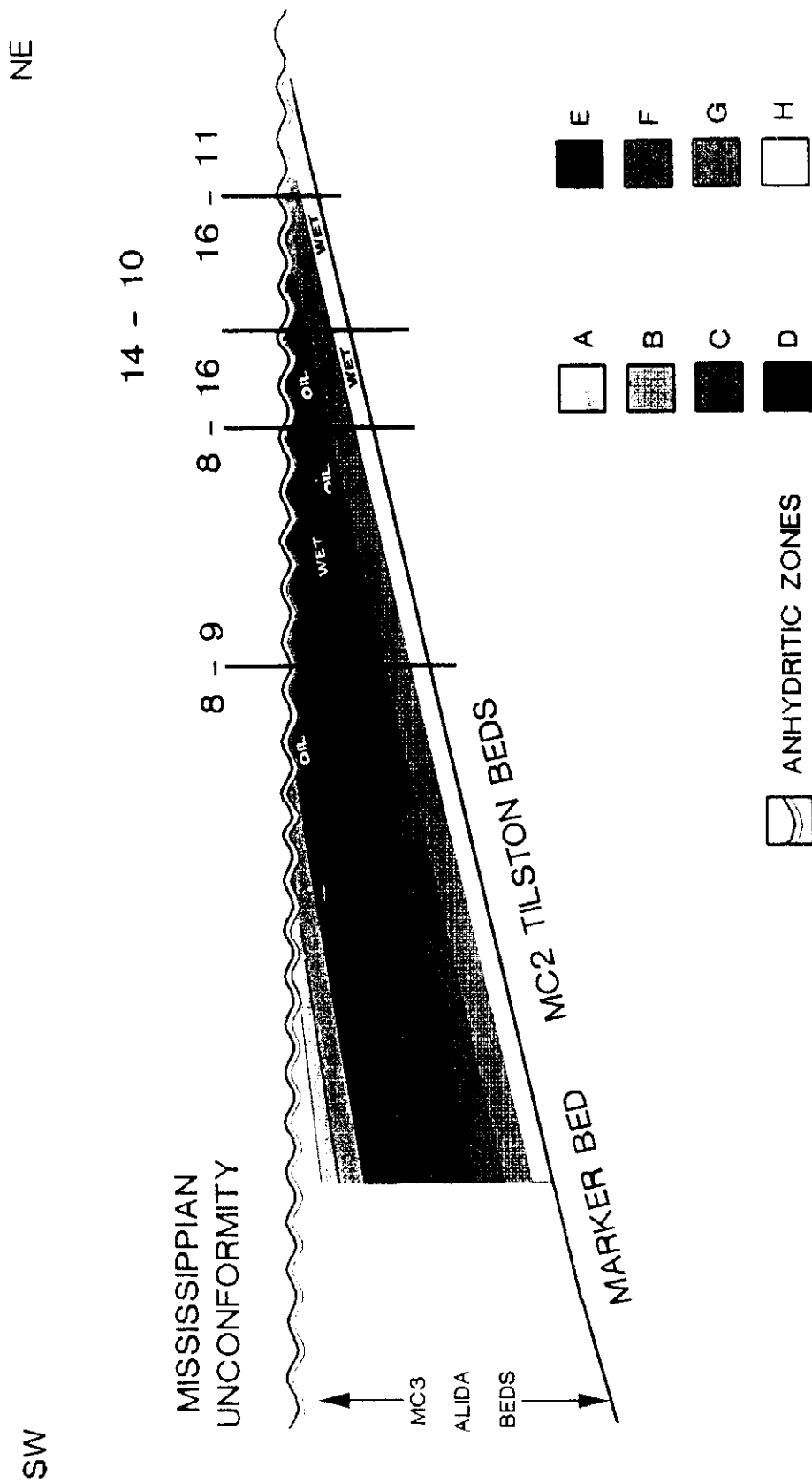
E. Griffiths 87/12/30

MISTKOC/misuser

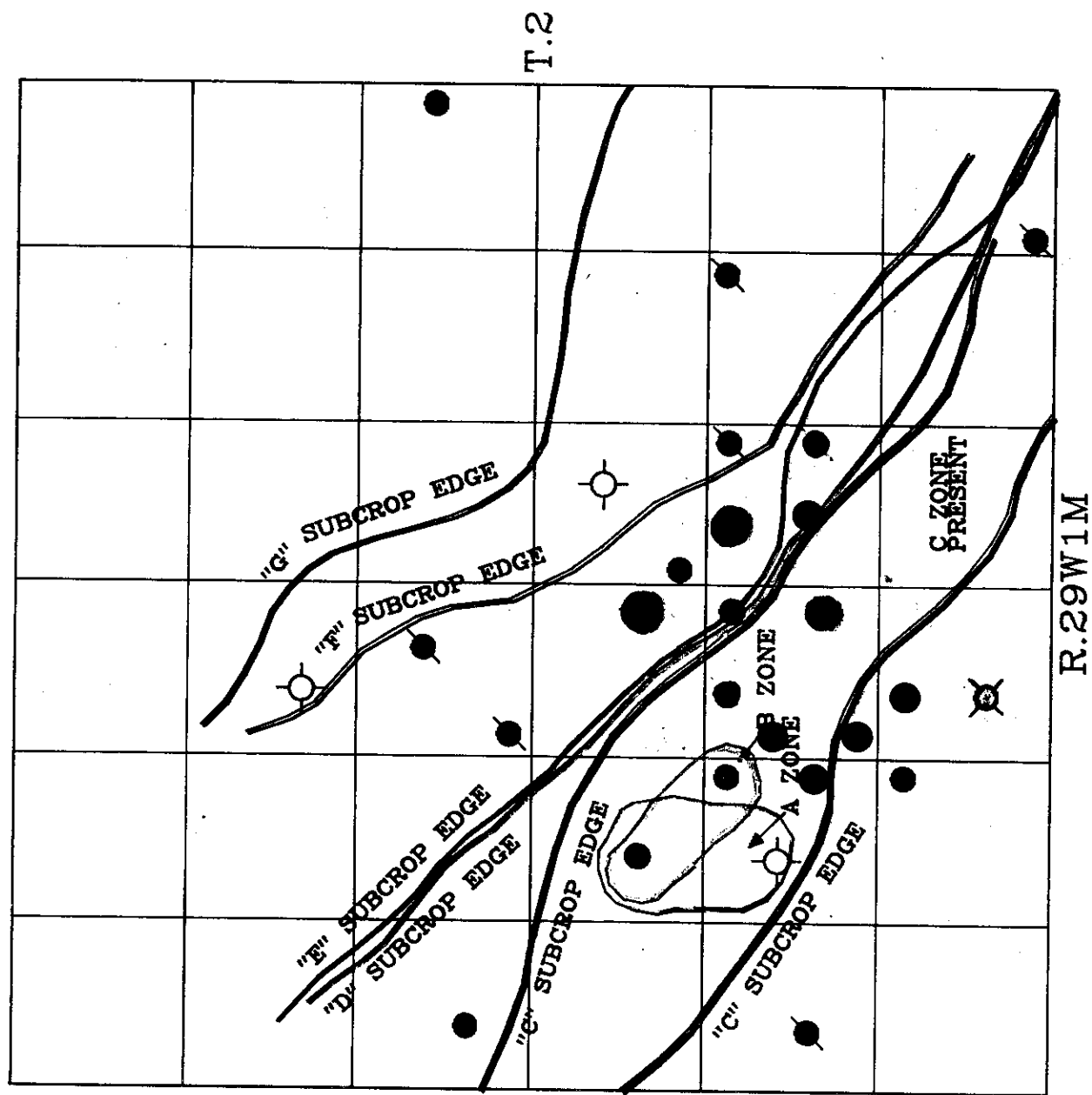


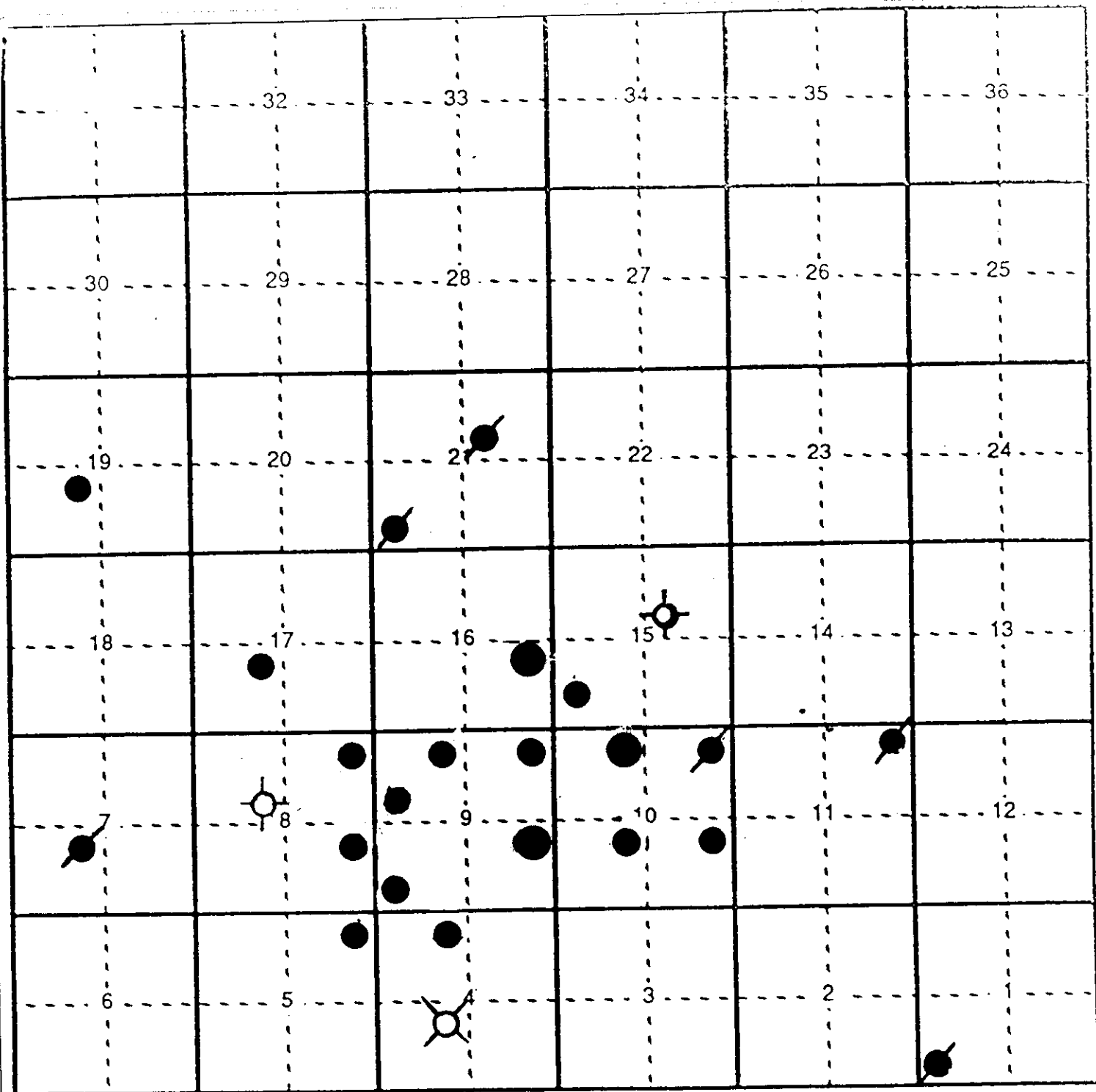


# **SOUTH PIERSON REGIONAL SCHEMATIC MISSISSIPPIAN STUDY**



# SUBCROP EDGE MAP MISSISSIPPIAN POROSITY





SPEARFISH COMPLETION  
 MISSISSIPPIAN COMPLETION  
 D+A  
 WELLS  
 LOCATIONS

TWP. 2 RNGE. 29 W1M

AUG. '88

(F)

# Manitoba



## Memorandum

Date January 25, 1989

To L.R. Dubreuil

From A. Galarnyk

Subject Home Oil Application for  
32 ha Spacing Approval

Telephone

I have attached a table which compares Home Oil's 32 ha spacing scenario with our 16 ha spacing scenario. As you can see, despite some minor variations in discount and inflation rates, our scenario clearly provides Home with a very generous rate of return (56.6% unrisked).

I recommend in our meeting with Home, that we discuss their assumptions and suggest some compromise on the numbers used. If both parties can agree to a common set of numbers, I suggest we ask Home to generate some new economy runs so that both parties are satisfied with the outcome of the most likely scenario.

A handwritten signature in cursive script, appearing to read 'A. Galarnyk'.

A. Galarnyk

First | Fold



	<u>Home Oil Scenario</u>	<u>Petroleum Branch Scenario</u>
Area (ha)	32.4	16
OOIP	91.463 x 10 <sup>3</sup> m <sup>3</sup>	91.463 x 10 <sup>3</sup> m <sup>3</sup> ÷ 2
Primary Recovery	12%	17%
Recoverable Oil	10 976 m <sup>3</sup>	7 775 m <sup>3</sup>
Capital Expenditure	\$444 m\$	\$250 m\$
Operating Expense		
Fixed	\$1500/well-month	\$1500/well-month
Variable	\$15/m <sup>3</sup> oil	\$15/m <sup>3</sup> oil
NPV \$M	64.4 (@ 12%)	138.6 (@ 15%)
Inv \$M	444.0	\$250.0
ROR% (A/T)	18.51	56.64
Payout (yrs.)	5.80	1.96
EMV \$M*	14.3	76.2
Riskd ROR%**	13.6	
Riskd Capital ***	\$198,900	\$190,000
Discount Rate	12%	15%
Reserve Life (yrs.)	11.08	7.58
Inflation	3% 1990 4% 1991 - 2000	4.5%
Price Forecast	<u>Revenue</u> Production	same as Home

$$\begin{aligned}
 * \text{ EMV} &= \text{Prob of Success} \times \text{NPV} && (\text{probability of success} - 81\%) \\
 &+ \text{Prob of Failure} \times (\text{Riskd Capital}) && (\text{probability of failure} - 19\%) \\
 &= && \text{EMV}
 \end{aligned}$$

\*\* This number only considers two possible outcomes (i.e. success at predicted production rates or failure (zero cash return). Additional possible outcomes (such as reduced or increased future cash flows from those predicted) are not considered. This assumption seems to be more of an "either/or" situation which is unlikely in this business.

\*\*\* = \$100,000 Dry Hole Cost + \$98,900 completion cost (Home assumption)

World Canada Source

1111 17th Avenue S.W., Calgary, Alberta T2P 0L7 • Phone (403) 234-5000

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CONFIRMATION

(403) 234-5953

NOTES:

Please call if you have any questions

NET  
REVENUE  
BEFORE  
DATE  
BEGIN

NET  
AMTS  
REVENUE  
AFTER  
ROYALTY  
INCOME  
\$

19-01-16596  
20-01-85851  
20-05-17352  
21-01-20135  
22-01-15702  
23-01-15139  
24-01-8731  
25-01-7356  
26-01-5017  
27-01-760

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CASE - BASE

PHYSICS FOR THE

DEVELOP COST	DEVELOP COST	EXPLORE COST	EXPLORE COST	NET	PROV. PROCEED	CASH	PROV.
BAL.	WRITE OFF	BAL.	WRITE OFF	PROFIT	PROFIT	PROFIT	PROFIT
177800	53140	0	0	0	0	0	0
374460	12446	0	0	35446	0	0	0
112014	24892	0	0	71607	0	0	0
87132	26137	0	0	83748	0	0	0
89985	18296	0	0	60000	0	0	0
42694	12607	0	0	43353	0	0	0
29883	8865	0	0	30857	0	0	0
20918	6275	0	0	14643	0	0	0
14643	4393	0	0	10250	0	0	0
10250	3075	0	0	0	0	0	0
7195	170625	0	0	0	0	0	0

11-620  
11-621  
11-622

11-620  
11-621  
11-622

[illegible]



PHONICS FOR... REPORT

1. BNMN C... CASE 1 RUN

REPORT PROC... FOR DATABASE...

OUT... 1

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REPORT-AMBL, PROT

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0 BEFORE FOUND IN DATA CASE 1

... MS/PERIOD

# S. Pierson Drilling Costs

<u>R.R. Date</u>	<u>Well</u>	<u>Gross Cost to Drill &amp; Case (\$)</u>
85-10-27	16-08-002-29 W1	157 253
86-03-14	16-05	150 342
03-19	04-15	143 713
08-16	04-21	178 830
08-23	06-07	164 848
08-29	16-10	160 276
11-06	10-21	168 101
11-12	06-04	171 757
12-12	06-19	151 404 1986 avg = \$161.2 K
87-09-12	16-09	188 268
09-20	14-09	180 235
09-26	08-10	201 525
10-04	06-17	199 340
11-17	04-01	176 367
12-18	08-09	142 000 1987 avg = \$181.3 K
88-02-09	14-04	248 715
02-16	08-08	215 866
02-23	12-09	233 021
03-01	08-16	232 018
03-07	14-10	206 849
03-13	06-10	212 295
03-20	04-09	219 426 1988 avg = \$224.0 K

7 of 7  
producing

extra expense on  
cementing / casing  
packers / coring

GBH/jlc  
1382e

success rate 88 ± 80%  
" " before 88 ± 60%





Energy and Mines

Petroleum

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

(204) 945-6577

January 12, 1989

Home Oil Company Limited  
1700 Home Oil Tower  
324 - Eighth Avenue S.W.  
Calgary, Alberta  
T2P 2Z5

Attention: Mr. K. R. Brown, P. Eng.  
Manager, Reservoir Engineer

Dear Sir:

Re: South Pierson Field  
Special Drilling Spacing Units

Your letter of January 4, 1989 with attached application is acknowledged. Please note that applications relating to well spacing and maximum production rates (MPR's) require the approval of The Oil and Natural Gas Conservation Board. Consequently, I have forwarded a copy to the Board for information.

The Petroleum Branch is responsible for technical and economic review of the application and formulation of recommendations to the Board. Therefore, I concur with your proposal of a meeting to discuss the application. Your proposed agenda is acceptable.

Yours sincerely,

Original Signed By  
**L. R. DUBREUIL**

L. R. Dubreuil  
Director

LRD/sml

cc: H. C. Moster, Deputy Chairman  
- The Oil and Natural Gas Conservation Board

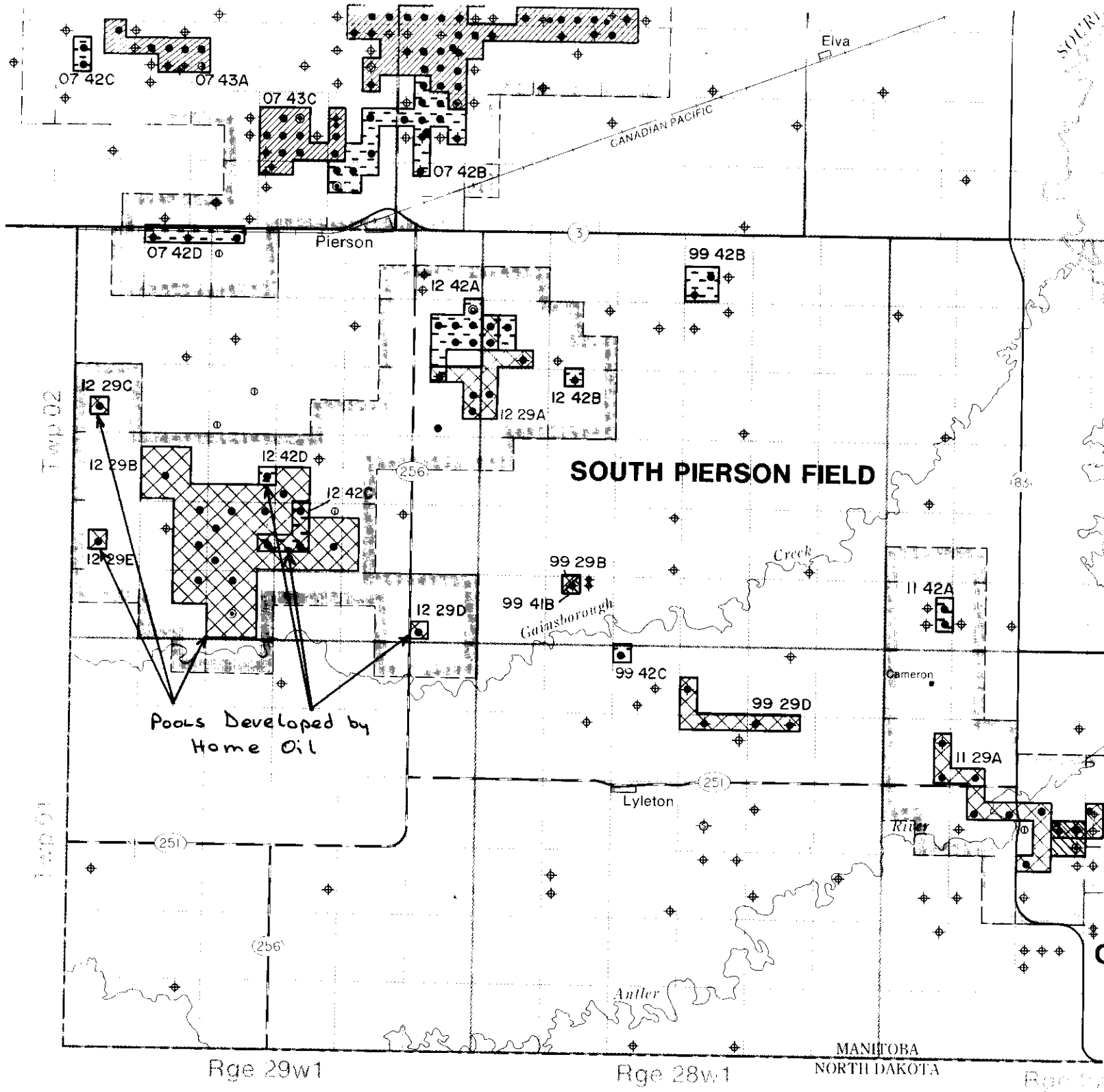
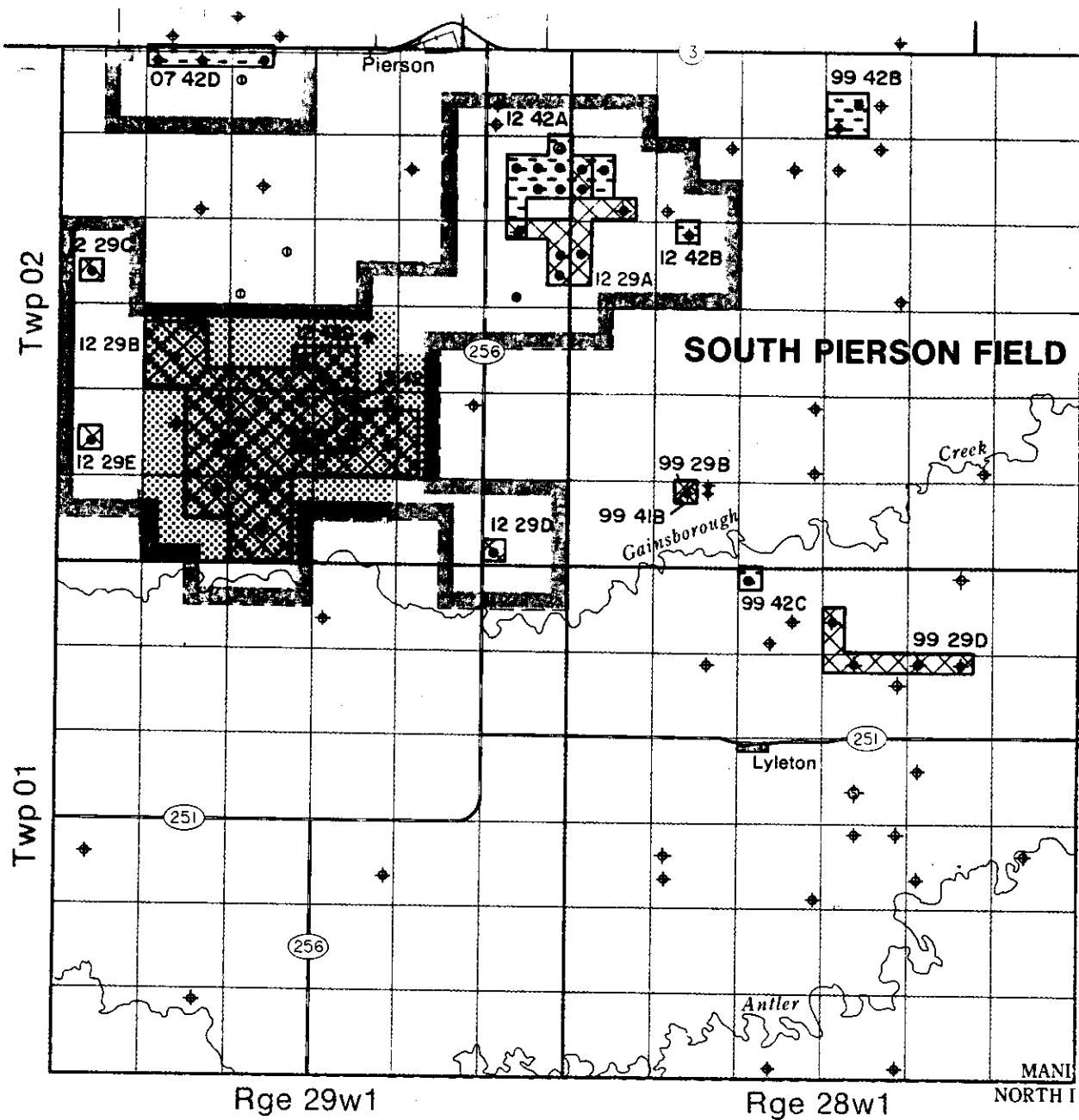


FIG No. 1

## WELL STATUS INFORMATION

- |   |                                        |   |                           |
|---|----------------------------------------|---|---------------------------|
| ⊕ | Water injection well                   | • | Dual completion           |
| ⊙ | Water injection well (former producer) | ✦ | Abandoned dual completion |



 **AREA OF APPLICATION**

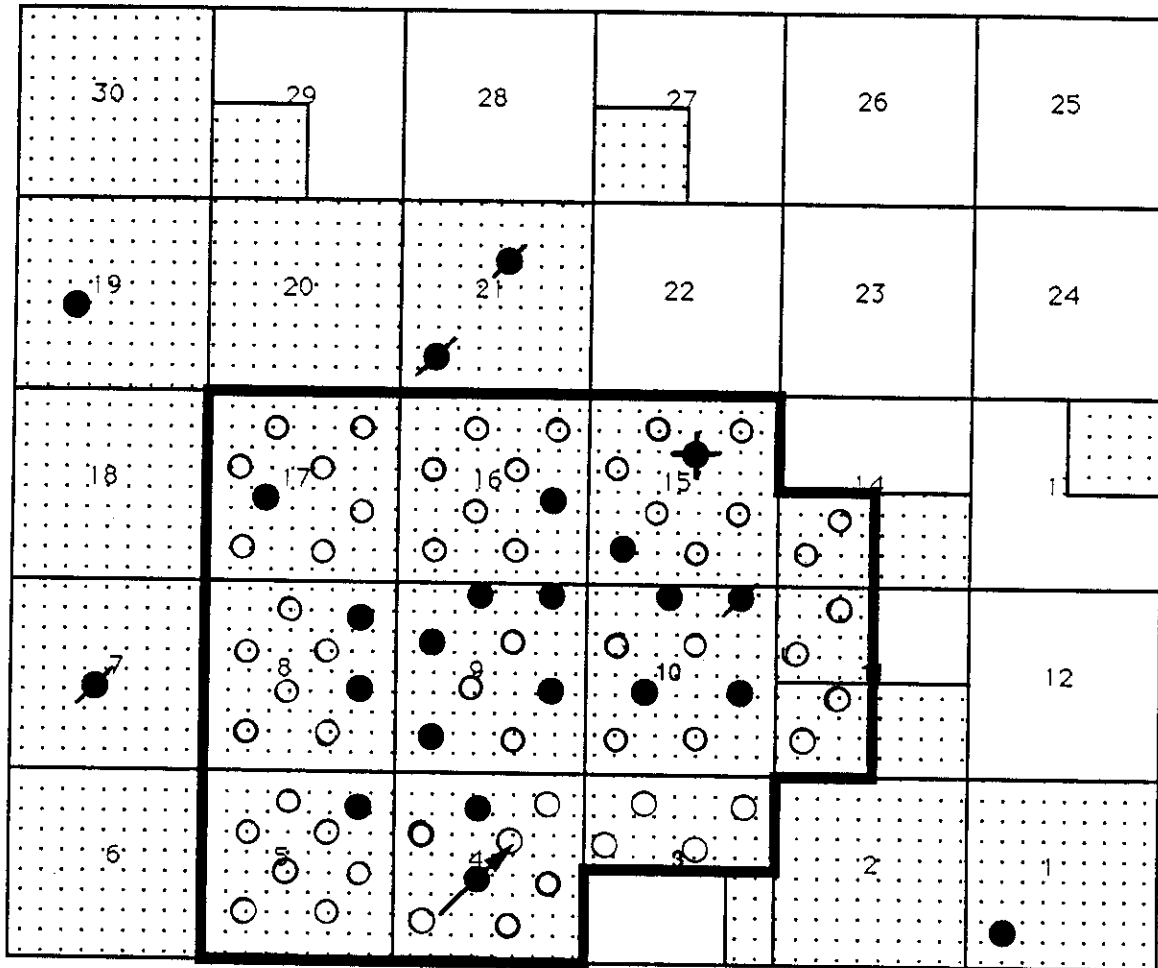
**12 29B LOWER AMARANTH B POOL**

**12 42D MISSION CANYON 3b C POOL**

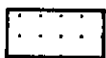
**12 42C MISSION CANYON 3b D POOL**

**FIGURE 1**

# SOUTH PIERSON AREA



TWP. 2 RGE . 29 W1M



**HOC/SRO LAND**



**AREA OF  
APPLICATION**



**UNDRIILLED 32 ha SPACING UNITS**

**FIGURE 2**

# S. PIERSON LOWER AMARANTH

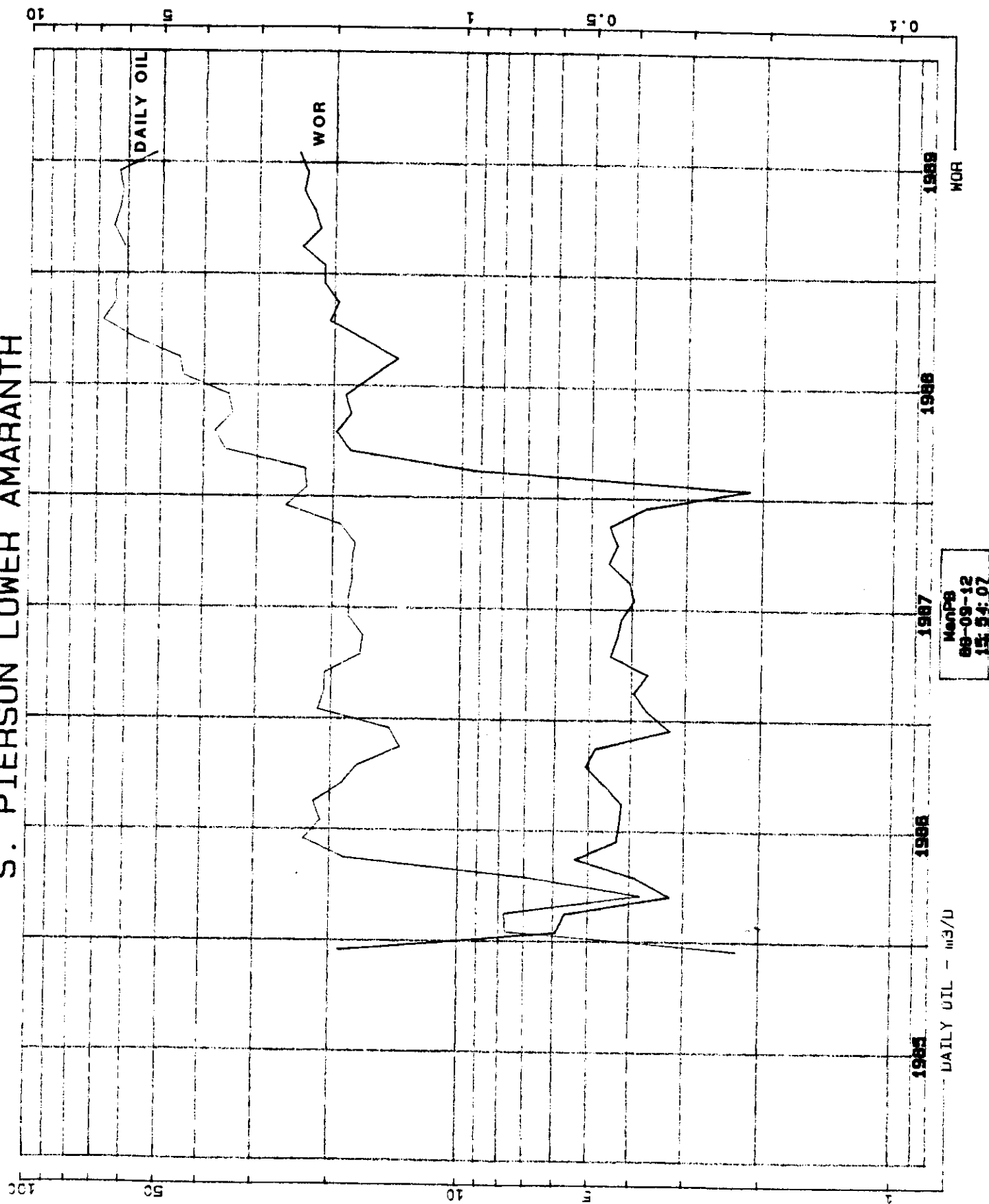


FIGURE 3

# SOUTH PIERSON REGIONAL SCHEMATIC MISSISSIPPIAN STUDY

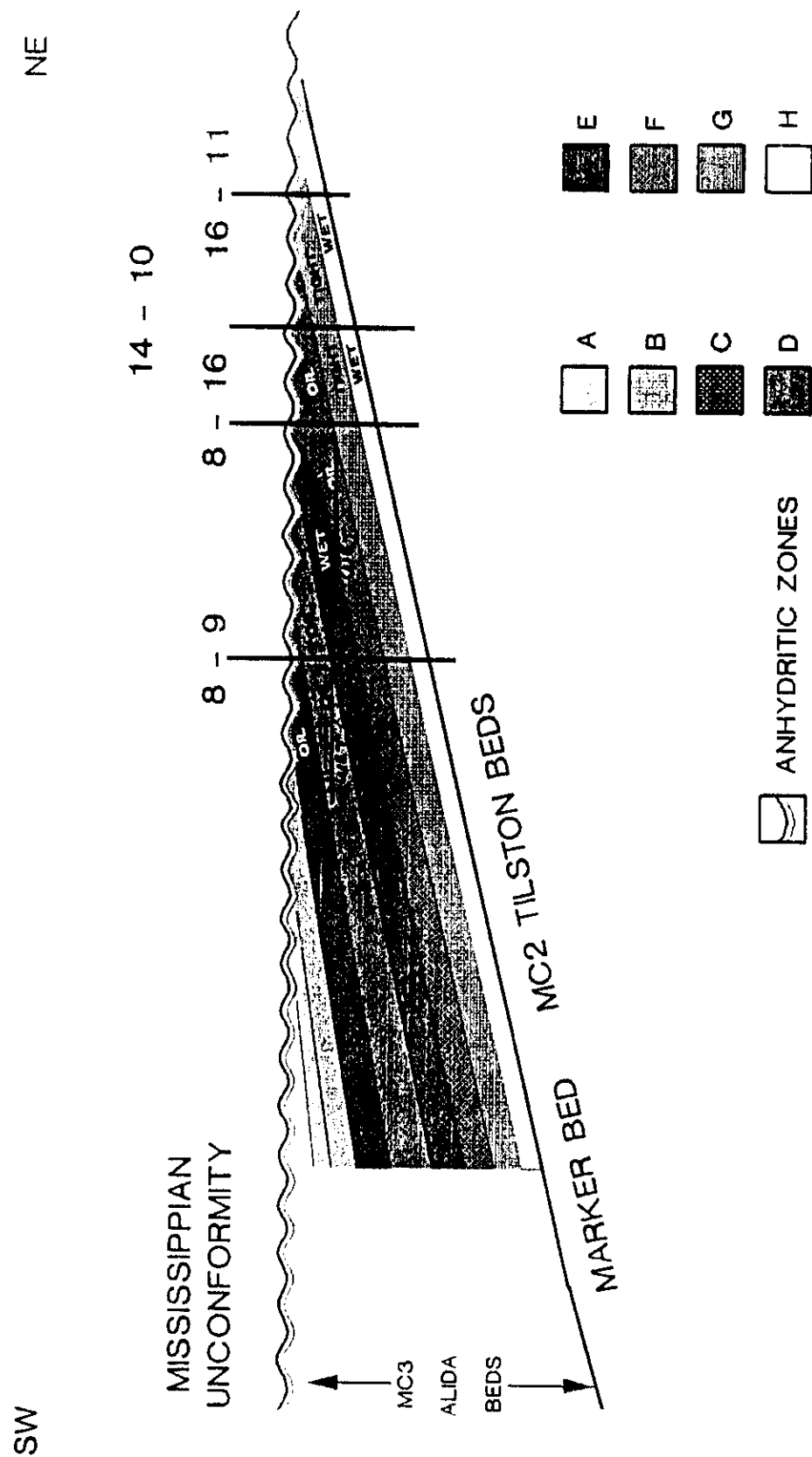
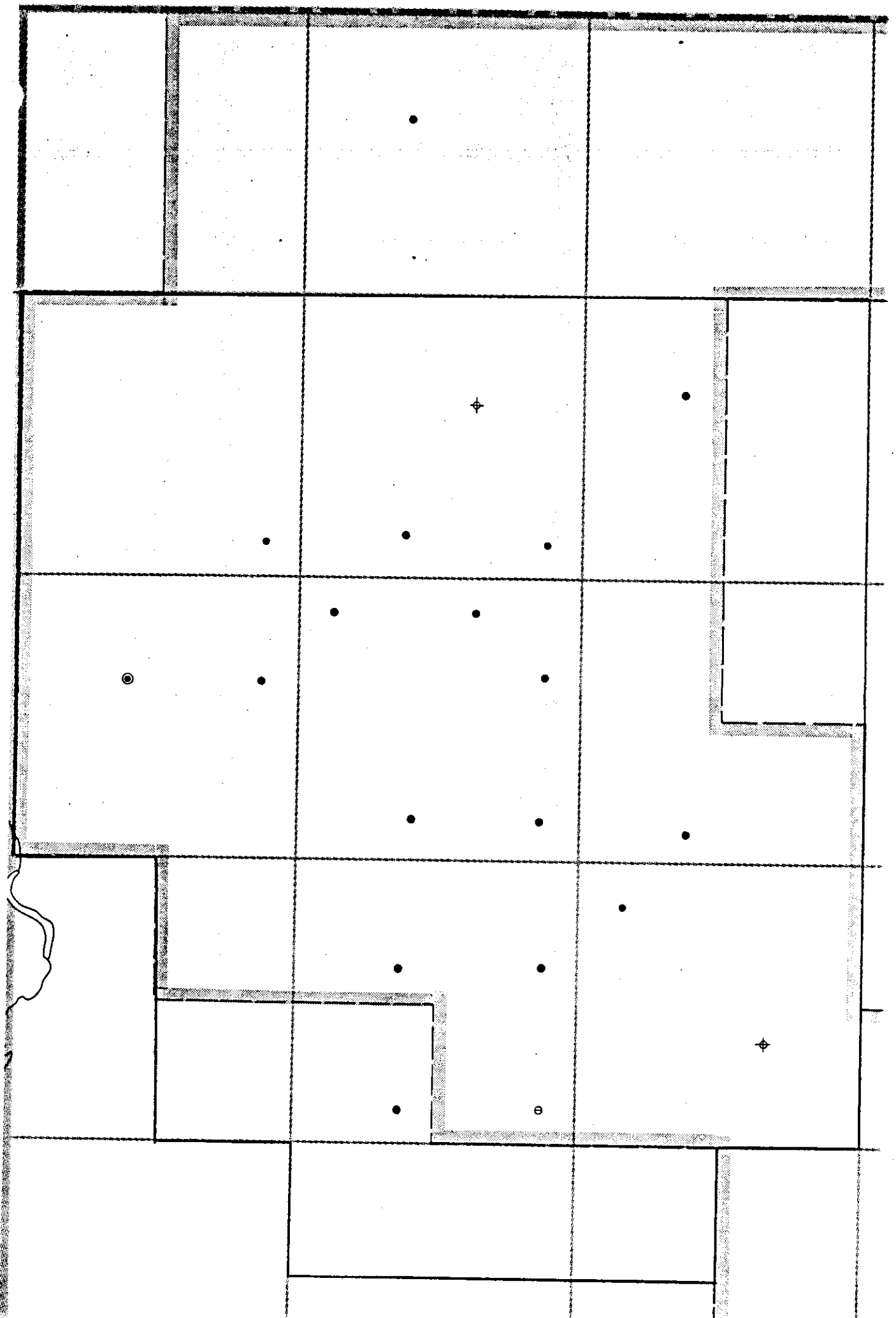


FIGURE 4



Lower Amaranth Sand

LOCATION	Main sd. Net Pay	av. Ø	av. K	Perfd Interval	
13-16-1-27	3			969.5 - 972.5	
9-20-1-27	3			959 - 965	
11-20-1-27	2.5			964 - 970	
11-21-1-27	3.5			955 - 960 IP 302.5	
A12-22-1-27	3.0			955 - 958	
3-29-1-27	3.0			960 - 963 (947.95) check	
1-30-1-27	3.0			963 - 965.5	
9-30-1-27	2.0			962-964, 966-67 957.5-958.6, 960.5 to 961.5	
13-26-1-28	3			982-984	
15-26-1-28	4			973.7-974, 976.7-977	
14-27-1-28	2.5			979.5 - 981 985-997	
5-34-1-28	2.5			986-990	
14-5-2-28	4.0	11 %		991-998	
12-19-2-28				976-990	
2-30-2-28				982-990	
12-30-2-28	2.5 (0+20)			979-986	
4-1-2-29	6.5 (3.5+3)			1016 - 1025	
6-4-2-29	4.8 (3.8+1)	16%	6.5	1028.5-1036	
14-4	3.8 (3.8+0)	14.7	4.0	1028.5 - 1032	1020 - 1037
16-05	4.0 (4+0)	15.8	2.2	1029.5-1032.5; 1036-39	1019-1037
6-7-	4.8 (2.8+2)	15.0	5.0		
8-8-	4.0 (4+0)	1			



LOCATION	Main sd NET PAY	AV. $\phi$ %	AV. K md	Perfd Int.	CORE INT:
11-8-2-29	0	+7c			
16-8	6 (4+2)			1018-1020, 1024-1029 . . . . .	1017-1035
4-9-2-29	4 (4+0)	15.5	4.5	1026-1028.5	
8-9-2-29	3 (3+0)	15.0	8.0	MC-36 Well	1010.5-1028
12-9-2-29	4 (4+0)			1022.4-1025.5	1020-1043
14-9	3.5	17.0	7.0	1022.5-1027.0	1022-1040
16-9	4.0	16.0	4.4	1018.5-1022.5	1010-1028
6-10	3.6			1019.5-1023	1010-1029
8-10	5.0	16.0	5.8	1016-1022	
14-10	3.5?			MC-36 Well	1010-1037
16-10	7 (4.5+3)	15.0	5.0	1009.5-1012.5; 1014 to 1017	1008-1026
4-15	5 3+2	16.0	4.0	1010-1013; 1016-1019	1010.5-1028.5
8-16	3.5			MC-36 Well	1010-1030
6-17	3			1026-1029.5	
6-19	5.5(3+2.5)	17.5	29.	1021-1024, 1024-1027, 1027-1031	1022-1040
4-21	7(3+4)	13.5	2.5	1012-1017	1010-1028
10-21	6(3+3)	15.0	3.0	1005-1008, 1010-1013	1003-1021
10-15-	0	12	0.6	—	1003-1021
14-24-2-29	2.5(2.5+0)	11.8	2.0	985.5-994	982.5-1000.75
4-26-3-28(KB 469.7)					

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18

06/06/89 15:38:21

FILE: hocl

CASE DESCRIPTION				NET PRESENT VALUES (M\$)						
				DISC RATE (%)	0.0	12.0	15.0	18.0	20.0	22.0
Home Oil										
S. Pierson - 16 ha. Economics										
RF=12%										
HOC - price forecast										
revised costs										
Royalty Regime: MANITOBA	Gas Holiday: NO			B.T. OPER INC	403	347	335	325	319	313
Reserve type: Probable	Oil Holiday: YES 1700 m <sup>3</sup>			B.T. CAP INV.	360	350	348	345	344	343
Royalty Type: Crwn	Eval/Prod Start: 89- 7/89- 7			B.T. CASH FLOW	43	-3	-12	-20	-25	-30
Sensitivity: NO	Proj/Econ Life: 5.5/ 5.5 yrs									
				A.T. OPER INC	371	317	306	296	290	285
				A.T. CAP INV.	360	350	348	345	344	343
				A.T. CASH FLOW	11	-33	-42	-49	-54	-58

ECONOMIC INDICATORS				PRODUCTS RECOVERY					COMPANY W.I.			

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 15:38:28  
FILE: hoc1

Case Notes

=====

Valuation Begins in 1989 7  
Production Begins in 1989 7

Parameter Files

-----

MANITOBA ENERGY AND MINES

Discount Method: ANNUAL MID PERIOD

Default Escalation Rates

Revenue	Year	Rate	Oper Costs	Year	Rate	Capital	Year	Rate
	1988	5.00		1988	5.00		1988	5.00
	1990	6.00		1990	6.00		1990	6.00
	1995	6.00		1995	6.00		1995	6.00
	2000	6.00		2000	6.00		2000	6.00

Case Parameters:

-----

Probable

Production:

-----

Royalties:

-----

Alberta par price files used

Oil price file: Gas price file

Crown Royalty Holiday Ending in 95 1, on Oil.

Maximum Exempted Crown Royalty Oil Volume = 1700 E3m3

Capital:

-----

Tax Data:

-----

Oil production is Resource.

Federal surtax of 3.0 % used.

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 15:38:30  
 FILE: hoc1  
 REPORT: peepogip

===== INPUT DATA SUMMARY =====

----- O I L ----- G A S -----

Year	Prod. Wells	Prod Rate	Prod Vol	WI Vol	New	Oil Price	Oper Cost	Trans Cost	ORR	Prod Rate	Prod Vol	WI Vol	Shr	New	Price	Oper Cost	Plant/ Bath	Plant/ Bath	ORR
		m3/d	E3m3	E3m3	%	\$/m3	\$/m3	\$/m3	%	E3m3/d	E6m3	E6m3	%	%	\$/E3m	\$/E3m	\$/E3m3	M\$/Yr	%
989	1.0	8	1.5	1.5	100	111.1	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
990	1.0	5	1.7	1.7	100	118.5	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
991	1.0	3	1.0	1.0	100	125.4	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
992	1.0	2	0.6	0.6	100	135.1	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
993	1.0	1	0.4	0.4	100	142.0	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
994	1.0	1	0.2	0.2	100	152.3	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00

5.5	5.5	5.5	0.0	0.0	0
0.0	0.0	0.0	0.0	0.0	0
5.5	5.5	5.5	0.0	0.0	0

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 15:38:36  
 FILE: hoc1  
 REPORT: peepoper

===== WORKING INTEREST OPERATING COST REPORT =====

Year	\$/BBL		OIL/GAS	\$/MCF		OTHER	\$/MCF		JPF +	
	OIL	OIL	PER	GAS	OIL/GAS	PROD	PL/GATH	PL/GATH	SCA	TOTAL
	OPER	TRUCK	WELL	OPER	OPER	OPER	OPER	OPER	OPER	OPER
	COST	COSTS	OP COST	COST	COST	COST	COST	COSTS	COST	COSTS
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	0.0	0.0	0.0	0.0	66.0	0.0	0.0	0.0	0.0	33.0
1990	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	45.0
1991	0.0	0.0	0.0	0.0	36.0	0.0	0.0	0.0	0.0	36.0
1992	0.0	0.0	0.0	0.0	30.6	0.0	0.0	0.0	0.0	30.6
1993	0.0	0.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	27.5
1994	0.0	0.0	0.0	0.0	25.7	0.0	0.0	0.0	0.0	25.7
5.5	0.0	0.0	0.0	0.0	230.8	0.0	0.0	0.0	0.0	197.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.5	0.0	0.0	0.0	0.0	230.8	0.0	0.0	0.0	0.0	197.8

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 15:38:48  
FILE: hoc1  
REPORT: peepcap

===== WORKING INTEREST TANGIBLE AND INTANGIBLE INVESTMENT DETAIL =====

Year	TANGIBLE FIELD CAPITAL M\$	FIELD CAPITAL CCA AFT ITC M\$	TANG BATH CAPITAL M\$	GATH CAPITAL CCA AFT ITC M\$	TANG PLANT CAPITAL M\$	PLANT CAPITAL CCA AFT ITC M\$	TANG OTHER CAPITAL M\$	OTHER CAPITAL CCA AFT ITC M\$	CAN O&G PROP. EXPENSE (COBPE) M\$	COBPE WRITE- OFF M\$	CAN DEVEL EXPENSE (CDE) M\$	CDE WRITE- OFF M\$	CAN EXPLOR EXPENSE (CEE) M\$	CEE WRITE- OFF M\$
	0.0		0.0		0.0		0.0		0.0		0.0		0.0	
1989	103.5	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	76.9	0.0	0.0
1990	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	0.0	0.0
1991	0.0	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.7	0.0	0.0
1992	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.4	0.0	0.0
1993	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	0.0	0.0
1994	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0

5.5	103.5	88.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	226.3	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.5	103.5	88.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	226.3	0.0	0.0

1st yr. 12.5% (?)  
2nd yr. 10%  
3rd yr. 10%

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 15:39:22  
 FILE: hoci  
 REPORT: newbtax

===== WORKING INTEREST BEFORE TAX REPORT =====														
	OIL Oper Cost \$/m3	INITIAL CROWN/ MANUAL ROYALTY M\$	FINAL CROWN/ MANUAL ROYALTY M\$	ORR/ FRHLD ROYALTY M\$	REVENUE AFTER ROYALTY	OTHER INC & ARTC M\$	TOTAL OPER COST M\$	MINERAL TAX M\$	OTHER EXP & NPI M\$	OPER INCOME M\$	TOTAL INTANG CAPITAL M\$	TOTAL TANG. CAPITAL M\$	TOTAL CAPITAL M\$	CASH FLOW BEFORE TAX M\$
Year														
											0	0	0	
1989	0.00	36	0	0	164	0	33	0	0	131	257	104	360	-229
1990	0.00	40	35	0	168	0	45	0	0	123	0	0	0	123
1991	0.00	21	21	0	109	0	36	0	0	73	0	0	0	73
1992	0.00	9	9	0	76	0	31	0	0	45	0	0	0	45
1993	0.00	4	4	0	51	0	27	0	0	23	0	0	0	23
1994	0.00	1	1	0	33	0	26	0	0	7	0	0	0	7
=====														
5.5		112	71	0	601	0	198	0	0	403	257	104	360	43
0.0		0	0	0	0	0	0	0	0	0	0	0	0	0
=====														
5.5		112	71	0	601	0	198	0	0	403	257	104	360	43

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 15:39:48  
 FILE: hoc1  
 REPORT: peepat

===== WORKING INTEREST AFTER TAX DATA =====																	
	Resorc	Resorc	Land&	Land&	Expl	Expl	Tang	Tang	Plant	Plant	Fed	Prov					
	Income	Allow	Dev	Dev	Expl	Expl	Tang	Tang	&Gath	&Gath	Taxbl	Fed	Taxbl	Prov	Inv	Total	Cash
Year	M\$	M\$	Bal	Depr	Bal	Depr	Bal	Depr	Bal	Depr	Income	Tax	Income	Tax	Credit	Tax	Flow
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	116	29	257	77	0	0	104	16	0	0	10	3	10	2	0	5	-234
1990	132	33	180	54	0	0	88	26	0	0	45	15	45	8	0	23	100
1991	76	19	126	38	0	0	62	18	0	0	19	7	19	3	0	10	63
1992	42	10	88	26	0	0	43	13	0	0	5	2	5	1	0	2	43
1993	18	4	62	18	0	0	30	9	0	0	-5	-2	-5	-1	0	-3	26
1994	2	0	43	13	0	0	21	6	0	0	-12	-4	-12	-2	0	-6	13
=====																	
5.5	385	96		226		0		89		0	62	21	62	11	0	32	11
0.0	0	0		0		0		0		0	0	0	0	0	0	0	0
=====																	
5.5	385	96		226		0		89		0	62	21	62	11	0	32	11



PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-1E

06/06/89 15:40:12

FILE: hcc1

REPORT: peeprov

===== WORKING INTEREST CROWN ROYALTIES, MINERAL TAX AND OTHER ROYALTIES =====

[illegible][illegible]

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 15:40:39  
 FILE: hoc1  
 REPORT: peepdcf

Year	===== ANNUAL DISCOUNTED B.T. AND A.T. CASH FLOW =====											
	0%	10%	12%	15%	18%	20%	0%	10%	12%	15%	18%	20%
	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash
	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	-229.0	-223.6	-222.6	-221.1	-219.7	-218.8	-233.9	-228.4	-227.4	-225.9	-224.4	-223.5
1990	123.4	112.2	110.2	107.3	104.6	102.8	100.4	91.3	89.7	87.3	85.1	83.7
1991	73.0	60.3	58.2	55.2	52.4	50.7	63.2	52.2	50.3	47.8	45.4	43.9
1992	45.1	33.9	32.1	29.7	27.5	26.1	42.7	32.1	30.4	28.1	26.0	24.7
1993	23.2	15.8	14.7	13.2	12.0	11.2	25.8	17.6	16.4	14.8	13.3	12.5
1994	6.9	4.3	3.9	3.4	3.0	2.8	12.8	7.9	7.3	6.4	5.6	5.1
1995	42.7	3.0	-3.4	-12.2	-20.2	-25.1	11.0	-27.2	-33.3	-41.6	-49.1	-53.6
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	42.7	3.0	-3.4	-12.2	-20.2	-25.1	11.0	-27.2	-33.3	-41.6	-49.1	-53.6

noc duplication

low recovery, noc. price, low cost

**PETROLEUM ECONOMICS EVALUATION PROGRAM**  
**XI Consultants Ltd.**

Version 88-11-18  
06/06/89 16:18:27  
FILE: hoc3

----- CASE DESCRIPTION -----				----- NET PRESENT VALUES ( M\$) -----						
Home Oil				DISC RATE (%)	0.0	12.0	15.0	18.0	20.0	22.0
S. Pierson - 16 ha. Economics <i>RP=17%</i>				B.T. OPER INC	751	<del>588</del>	559	533	517	502
<i>PB/PDC - HIGH PRICE FORECAST</i>				B.T. CAP INV.	360	<del>350</del>	348	345	344	343
<i>Hoc - revised lower costs</i>				B.T. CASH FLOW	391	<del>298</del>	211	188	173	160
Royalty Regime: MANITOBA	Gas Holidays: NO			A.T. OPER INC	572	<del>452</del>	431	412	400	389
Reserve type: Probable	Oil Holiday: YES			A.T. CAP INV.	360	<del>350</del>	348	345	344	343
Royalty Type: Crown	Eval/Prod Start: 89- 7/89- 7			A.T. CASH FLOW	212	<del>102</del>	83	66	56	47
Sensitivity: NO	Proj/Econ Life: 8.5/ 8.5 yrs									

----- ECONOMIC INDICATORS -----				----- PRODUCTS RECOVERY -----						----- COMPANY W.I. -----		
		B.TAX	A.TAX		GROSS	WI	ROY	NET		Init%	Avr%	Rev%
ROR	- PCNT	71.5	33.1	OIL	E3m3	8	8	1	7	REVENUE	100.0	100.0
PAYOUT PERIOD	- EVAL	1.7	2.5	GAS-RAW	E6m3	0	0			FIELD CAP	100.0	100.0
	- CAPTL	1.3	2.3	GAS-SALES	E6m3	0	0	0	0	PLANT CAP		
UNDISC PIR	- \$/\$	1.09	0.59	ETHANE	E3m3	0	0	0	0	GATH CAP		
18.0 PCT PIR	- \$/\$	0.54	0.19	PROPANE	E3m3	0	0	0	0	DRR-GAS		
22.0 PCT PIR	- \$/\$	0.47	0.14	BUTANE	E3m3	0	0	0	0	DRR-OIL		
NPV @ 18.0	- \$/M3	24.36	8.60	CONDENS.	E3m3	0	0	0	0	ROYALTY	0.0	12.1
NPV @ 22.0	- \$/M3	20.76	6.07	SULPHUR	E3t	0	0	0	0			
				OTHER	E3m3	0	0	0	0			

----- WI CASH FLOW SUMMARY -----																
YEAR	OIL PRODUCTION			TOTAL	--ROYALTY--		--OPERATING--		OPERAT	NETBACK	CAPTL	B.TAX	TOTAL	-----AFTER TAX-----		
	RATE	VOL.	PRICE	REV.	%MINTAX	%	EXPENSE	INCOME	B.TAX	INV.	CASH	TAX	CASH	18.0%	CUM	
	M3/D	E3m3	\$/M3	M\$	M\$		M\$	\$/M3	M\$	\$/M3	M\$	M\$	M\$	M\$	M\$	M\$
ZERO											0	0	0	0	0	0
1989	8	1	128.57	190	0	0	34	23.05	156	105.52	360	-204	14	-219	-210	-210
1990	5	2	137.23	274	50	18	50	25.00	175	87.31	0	175	48	126	107	-103
1991	4	1	146.91	206	38	19	42	30.00	125	89.60	0	125	36	89	64	-39
1992	3	1	162.46	161	26	16	37	37.34	98	99.06	0	98	29	69	42	3
1993	2	1	175.04	122	15	12	33	47.35	74	106.04	0	74	21	53	27	31
1994	1	0	191.84	94	8	8	31	63.27	55	112.32	0	55	15	40	17	48
1995	1	0	208.70	72	4	6	29	84.06	39	112.19	0	39	10	29	11	59
1996	1	0	227.27	55	2	4	28	115.70	25	102.06	0	25	6	19	6	65
1997	0	0	250.00	14	0	1	9	160.71	5	86.86	0	5	-1	6	2	66
SUBT		8		1188	144		293		751		360	391	179	212	66	
REM.		0		0	0		0		-0		0	0	0	0	-0	
TOTL		8		1188	144		293		751		360	391	179	212	66	
18.0% DISC				812	99		180		533		345	188	121	66		
% OF REV.				100	12		22		66		43	23	15	8		

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:18:39  
FILE: hoc3

Case Notes

=====

Evaluation Begins in 1989 7

Production Begins in 1989 7

Parameter File:

-----

MANITOBA ENERGY AND MINES

Discount Method: ANNUAL MID PERIOD

Default Escalation Rates

Revenue	Year	Rate	Oper Costs	Year	Rate	Capital	Year	Rate
	1988	5.00		1988	5.00		1988	5.00
	1990	6.00		1990	6.00		1990	6.00
	1995	6.00		1995	6.00		1995	6.00
	2000	6.00		2000	6.00		2000	6.00

Case Parameters:

-----

Probable

Production:

-----

Royalties:

-----

Alberta par price files used

Oil price file: Gas price file

Crown Royalty Holiday Ending in 95 1, on Oil.

Maximum Exempted Crown Royalty Oil Volume = 1700 E3m3

Capital:

-----

Tax Data:

-----

Oil production is Resource.

Federal surtax of 3.0 % used.

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:18:41  
FILE: hoc3  
REPORT: peepogip

===== INPUT DATA SUMMARY =====

O I L										G A S									
Year	Prod.	Prod	Prod	WI	New	Oil	Oper	Trans	DRR	Prod	Prod	WI	Shr	New	Price	Oper	Bath	Gath	DRR
	Wells	Rate	Vol	Vol		Price	Cost	Cost		Rate	Vol	Vol				Cost	OpCost	OpCost	
	m3/d	E3m3	E3m3	%		\$/m3	\$/m3	\$/m3	%	E3m3/d	E6m3	E6m3	%	%	\$/E3m	\$/E3m	\$/E3m3	M\$/Yr	%
1989	1.0	8	1.5	1.5	100	128.6	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1990	1.0	5	2.0	2.0	100	137.2	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1991	1.0	4	1.4	1.4	100	146.9	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1992	1.0	3	1.0	1.0	100	162.5	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1993	1.0	2	0.7	0.7	100	175.0	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1994	1.0	1	0.5	0.5	100	191.8	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1995	1.0	1	0.3	0.3	100	208.7	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1996	1.0	1	0.2	0.2	100	227.3	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1997	1.0	0	0.1	0.1	100	250.0	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00

8.5		7.7	7.7								0.0	0.0							0
0.0		0.0	0.0								0.0	0.0							0
8.5		7.7	7.7								0.0	0.0							0

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:18:56  
FILE: hac3  
REPORT: peepoper

===== WORKING INTEREST OPERATING COST REPORT =====

Year	\$/BBL OIL OPER COST M\$	OIL TRUCK COSTS M\$	OIL/GAS PER WELL OP COST M\$	\$/MCF GAS OPER COST M\$	OIL/GAS OPER COST M\$	OTHER PROD OPER COST M\$	\$/MCF PL/GATH OPER COST M\$	PL/GATH OPER COSTS M\$	JPF + GCA OPER COST M\$	TOTAL OPER COSTS M\$
1989	0.0	0.0	0.0	0.0	68.0	0.0	0.0	0.0	0.0	34.0
1990	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0
1991	0.0	0.0	0.0	0.0	42.0	0.0	0.0	0.0	0.0	42.0
1992	0.0	0.0	0.0	0.0	37.0	0.0	0.0	0.0	0.0	37.0
1993	0.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0	0.0	33.0
1994	0.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0	0.0	31.0
1995	0.0	0.0	0.0	0.0	29.0	0.0	0.0	0.0	0.0	29.0
1996	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0	28.0
1997	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	9.0
8.5	0.0	0.0	0.0	0.0	327.0	0.0	0.0	0.0	0.0	293.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	0.0	0.0	0.0	0.0	327.0	0.0	0.0	0.0	0.0	293.0

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version B8-11-18  
06/06/89 16:19:49  
FILE: hoc3  
REPORT: peepcap

===== WORKING INTEREST TANGIBLE AND INTANGIBLE INVESTMENT DETAIL =====

Year	TANGIBL FIELD CAPITAL	FIELD CAPITAL CCA AFT ITC	TANG GATH CAPITAL	GATH CAPITAL CCA AFT ITC	TANG PLANT CAPITAL	PLANT CAPITAL CCA AFT ITC	TANG OTHER CAPITAL	OTHER CAPITAL CCA AFT ITC	CAN O&G PROP. EXPENSE (COBPE)	COBPE WRITE- OFF	CAN DEVEL EXPENSE (CDE)	CDE WRITE- OFF	CAN EXPLOR EXPENSE (CEE)	CEE WRITE- OFF
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
	0.0		0.0		0.0		0.0		0.0		0.0		0.0	
1989	103.5	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	76.9	0.0	0.0
1990	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	0.0	0.0
1991	0.0	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.7	0.0	0.0
1992	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	0.0	0.0
1993	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	0.0	0.0
1994	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0
1995	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0
1996	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0
1997	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0
8.5	103.5	98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	246.1	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	103.5	98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	246.1	0.0	0.0



PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:21:07  
FILE: hoc3  
REPORT: newbtax

===== WORKING INTEREST BEFORE TAX REPORT =====														
Year	Oil Oper Cost \$/m3	INITIAL CROWN/ MANUAL ROYALTY M\$	FINAL CROWN/ MANUAL ROYALTY M\$	DRR/ FRHLD ROYALTY M\$	REVENUE AFTER ROYALTY	OTHER INC & ARTC M\$	TOTAL OPER COST M\$	MINERAL TAX M\$	OTHER EXP & NPI M\$	OPER INCOME M\$	TOTAL INTANG CAPITAL M\$	TOTAL TANG. CAPITAL M\$	TOTAL CAPITAL M\$	CASH FLOW BEFORE TAX M\$
											0	0	0	
1989	0.00	41	0	0	190	0	34	0	0	156	257	104	360	-204
1990	0.00	56	50	0	225	0	50	0	0	175	0	0	0	175
1991	0.00	38	38	0	167	0	42	0	0	125	0	0	0	125
1992	0.00	26	26	0	135	0	37	0	0	98	0	0	0	98
1993	0.00	15	15	0	107	0	33	0	0	74	0	0	0	74
1994	0.00	8	8	0	86	0	31	0	0	55	0	0	0	55
1995	0.00	4	4	0	68	0	29	0	0	39	0	0	0	39
1996	0.00	2	2	0	53	0	28	0	0	25	0	0	0	25
1997	0.00	0	0	0	14	0	9	0	0	5	0	0	0	5
=====														
8.5		191	144	0	1044	0	293	0	0	751	257	104	360	391
0.0		0	0	0	0	0	0	0	0	0	0	0	0	0
=====														
8.5		191	144	0	1044	0	293	0	0	751	257	104	360	391

**PETROLEUM ECONOMICS EVALUATION PROGRAM**  
**XI Consultants Ltd.**

Version 88-11-18  
06/06/89 16:22:15  
FILE: hoc3  
REPORT: peepat

===== WORKING INTEREST AFTER TAX DATA =====																	
Year	Resorc Income M\$	Resorc Allow M\$	Land& Dev Bal M\$	Land& Dev Depr M\$	Expl Bal M\$	Expl Depr M\$	Tang Bal M\$	Tang Depr M\$	Plant &Gath Bal M\$	Plant &Gath Depr M\$	Fed Taxbl Income M\$	Fed Tax M\$	Prov Taxbl Income M\$	Prov Tax M\$	Inv Credit M\$	Total Tax M\$	Cash Flow M\$
1989	140	35	257	77	0	0	104	16	0	0	28	10	28	5	0	14	-219
1990	198	50	180	54	0	0	88	26	0	0	95	32	95	16	0	48	126
1991	145	36	126	38	0	0	62	18	0	0	71	24	71	12	0	36	89
1992	111	28	88	26	0	0	43	13	0	0	57	19	57	10	0	29	69
1993	80	20	62	18	0	0	30	9	0	0	41	14	41	7	0	21	53
1994	57	14	43	13	0	0	21	6	0	0	30	10	30	5	0	15	40
1995	39	10	30	9	0	0	15	4	0	0	20	7	20	3	0	10	29
1996	24	6	21	6	0	0	10	3	0	0	12	4	12	2	0	6	19
1997	3	1	15	4	0	0	7	2	0	0	-2	-1	-2	-0	0	-1	6
=====																	
8.5	797	199		246		0		98		0	351	119	351	60	0	179	212
0.0	0	0		0		0		0		0	0	0	0	0	0	0	0
=====																	
8.5	797	199		246		0		98		0	351	119	351	60	0	179	212

```
Version 88-11-18
06/06/89 16:23:20
FILE: hoc3
REPORT: peeprpy
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GROWN ROYALTIES AND MINERAL TAX

[illegible][illegible]

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:24:28  
FILE: hoc3  
REPORT: peepdcf

===== ANNUAL DISCOUNTED B.T. AND A.T. CASH FLOW =====												
Year	0%	10%	12%	15%	18%	20%	0%	10%	12%	15%	18%	20%
	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash
	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	-204.1	-199.3	-198.4	-197.1	-195.9	-195.0	-218.6	-213.4	-212.5	-211.1	-209.7	-208.8
1990	174.6	158.7	155.9	151.8	148.0	145.5	126.3	114.9	112.8	109.9	107.1	105.3
1991	125.4	103.7	100.0	94.9	90.1	87.1	89.1	73.7	71.1	67.4	64.0	61.9
1992	98.2	73.8	69.9	64.5	59.7	56.8	69.1	52.0	49.2	45.5	42.1	40.0
1993	73.9	50.5	47.0	42.3	38.1	35.6	52.8	36.0	33.5	30.2	27.2	25.4
1994	55.0	34.2	31.2	27.4	24.1	22.1	40.0	24.8	22.7	19.9	17.5	16.1
1995	38.7	21.8	19.6	16.7	14.3	13.0	28.6	16.1	14.5	12.4	10.6	9.6
1996	24.7	12.7	11.2	9.3	7.8	6.9	18.8	9.6	8.5	7.1	5.9	5.2
1997	4.9	2.3	2.0	1.6	1.3	1.1	6.0	2.8	2.4	2.0	1.6	1.4
8.5	391.3	258.3	238.3	211.3	187.5	173.1	212.2	116.5	102.2	83.1	66.2	56.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	391.3	258.3	238.3	211.3	187.5	173.1	212.2	116.5	102.2	83.1	66.2	56.1

**PETROLEUM ECONOMICS EVALUATION PROGRAM**  
**XI Consultants Ltd.**

Version 88-11-18  
06/06/89 16:08:20  
FILE: hoc2

----- CASE DESCRIPTION -----				----- NET PRESENT VALUES ( M\$) -----						
Home Oil				DISC RATE (%)	0.0	12.0	15.0	18.0	20.0	22.0
S. Pierson - 16 ha. Economics	RF=17%			B.T. OPER INC	576	440	421	410	399	
	<i>KOC - price forecast</i>			B.T. CAP INV.	360	350	348	345	344	343
	<i>revised lower costs</i>			B.T. CASH FLOW	216	111	93	76	66	56
Royalty Regime: MANITOBA	Gas Holiday: NO			A.T. OPER INC	473	360	364	349	339	331
Reserve type: Probable	Oil Holiday: YES			A.T. CAP INV.	360	350	348	345	344	343
Royalty Type: Crown	Eval/Prod Start: 89- 7/89- 7			A.T. CASH FLOW	113	30	16	3	-5	-12
Sensitivity: NO	Proj/Econ Life: 8.5/ 8.5 yrs									

----- ECONOMIC INDICATORS -----				----- PRODUCTS RECOVERY -----					----- COMPANY N.I. -----			
		B.TAX	A.TAX		BROSS	WI	ROY	NET		Init%	Ayr%	Rev%
ROR	- PCNT	38.3	18.8	OIL	E3m3	8	8	1	7	REVENUE	100.0	100.0
PAYOUT PERIOD	- EVAL	2.4	3.4	GAS-RAW	E6m3	0	0			FIELD CAP	100.0	100.0
	- CAPTL	2.1	3.1	GAS-SALES	E6m3	0	0	0	0	PLANT CAP		
UNDISC PIR	- \$/\$	0.60	0.31	ETHANE	E3m3	0	0	0	0	BATH CAP		
18.0 PCT PIR	- \$/\$	0.22	0.01	PROPANE	E3m3	0	0	0	0			
22.0 PCT PIR	- \$/\$	0.16	-0.03	BUTANE	E3m3	0	0	0	0	DRR-GAS		
NPV @ 18.0	- \$/M3	9.87	0.41	CONDENS.	E3m3	0	0	0	0	DRR-OIL		
NPV @ 22.0	- \$/M3	7.34	-1.52	SULPHUR	E3t	0	0	0	0			
				OTHER	E3m3	0	0	0	0	ROYALTY	0.0	12.2

----- WI CASH FLOW SUMMARY -----																
YEAR	-----OIL PRODUCTION---			TOTAL	--ROYALTY--		--OPERATING--		OPERAT	NETBACK	CAPTL	B.TAX	TOTAL	-----AFTER TAX-----		
	RATE	VOL.	PRICE	REV.	%MINTAX	%	M\$	\$/M3	M\$	\$/M3	M\$	M\$	M\$	M\$	18.0%	CUM
	M3/D	E3m3	\$/M3	M\$	M\$									M\$	M\$	M\$
ZERO					1700 m <sup>3</sup> holiday						0	0	0	0	0	0
1989	8	1	111.09	164	0	0	34	23.05	130	88.04	360	-230	5	-235	-225	-225
1990	5	2	118.54	237	43	18	50	25.00	144	72.02	0	144	34	110	93	-132
1991	4	1	125.41	176	33	19	42	30.00	101	72.10	0	101	25	76	55	-77
1992	3	1	135.14	134	21	16	37	37.34	75	76.12	0	75	19	57	35	-43
1993	2	1	142.01	99	12	12	33	47.35	54	77.09	0	54	12	41	21	-21
1994	1	0	152.32	75	6	8	31	63.27	37	76.15	0	37	8	30	13	-8
1995	1	0	159.94	55	3	6	29	84.06	23	66.34	0	23	4	19	7	-1
1996	1	0	167.93	41	2	4	28	115.70	11	45.20	0	11	0	11	3	2
1997	0	0	176.33	10	0	1	9	160.71	1	13.91	0	1	-3	4	1	3
				accumulated 52												
SUBT		8		990	121		293		576		360	216	103	113	3	
REM.		0		0	0		0		-0		0	0	0	0	0	
TOTL		8		990	121		293		576		360	216	103	113	3	
18.0% DISC				685	84		180		421		345	76	73	3		
% OF REV.				100	12		26		61		50	11	11	0		

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

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Case Notes

=====

Evaluation Begins in 1989 7  
Production Begins in 1989 7

Parameter File:

-----

MANITOBA ENERGY AND MINES

Discount Method: ANNUAL MID PERIOD

Default Escalation Rates

Revenue	Year	Rate	Oper Costs	Year	Rate	Capital	Year	Rate
	1988	5.00		1988	5.00		1988	5.00
	1990	6.00		1990	6.00		1990	6.00
	1995	6.00		1995	6.00		1995	6.00
	2000	6.00		2000	6.00		2000	6.00

Case Parameters:

-----

Probable

Productions:

-----

Royalties:

-----

Alberta par price files used

Oil price file: Gas price file

Crown Royalty Holiday Ending in 95 1, on Oil.

Maximum Exempted Crown Royalty Oil Volume = 1700 E3m3

Capital:

-----

Tax Data:

-----

Oil production is Resource.

Federal surtax of 3.0 % used.

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:08:35  
FILE: hoc2  
REPORT: peepogip

===== INPUT DATA SUMMARY =====

O I L										G A S									
Year	Prod.	Prod	Prod	WI	Oil		Oper	Trans	ORR	Prod	Prod	WI	Shr	New	Price	Oper	Gath	Gath	ORR
	Wells	Rate	Vol	Vol	New	Price	Cost	Cost		Rate	Vol	Vol				Cost	OpCost	OpCost	
	m3/d	E3m3	E3m3	%	%/m3	\$/m3	\$/m3	\$/m3	%	E3m3/d	E6m3	E6m3	%	%	\$/E3m	\$/E3m	\$/E3m3	M\$/Yr	%
1989	1.0	8	1.5	1.5	100	111.1	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1990	1.0	5	2.0	2.0	100	118.5	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1991	1.0	4	1.4	1.4	100	125.4	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1992	1.0	3	1.0	1.0	100	135.1	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1993	1.0	2	0.7	0.7	100	142.0	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1994	1.0	1	0.5	0.5	100	152.3	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1995	1.0	1	0.3	0.3	100	159.9	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1996	1.0	1	0.2	0.2	100	167.9	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
1997	1.0	0	0.1	0.1	100	176.3	0.00	0.00	0.00	0.000	0.0	0.0	0.0	100	0.00	0.00	0.00	0	0.00
=====																			
8.5			7.7	7.7							0.0	0.0						0	
0.0			0.0	0.0							0.0	0.0						0	
=====																			
8.5			7.7	7.7							0.0	0.0						0	

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
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 FILE: hoc2  
 REPORT: papoper

===== WORKING INTEREST OPERATING COST REPORT =====

Year	\$/BBL		OIL/GAS	\$/MCF		OTHER	\$/MCF		JPF +	
	OIL	OIL	PER	GAS	OIL/GAS	PROD	PL/GATH	PL/GATH	GCA	TOTAL
	OPER	TRUCK	WELL	OPER	OPER	OPER	OPER	OPER	OPER	OPER
	COST	COSTS	OP COST	COST	COST	COST	COST	COSTS	COST	COSTS
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	0.0	0.0	0.0	0.0	68.0	0.0	0.0	0.0	0.0	34.0
1990	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0
1991	0.0	0.0	0.0	0.0	42.0	0.0	0.0	0.0	0.0	42.0
1992	0.0	0.0	0.0	0.0	37.0	0.0	0.0	0.0	0.0	37.0
1993	0.0	0.0	0.0	0.0	33.0	0.0	0.0	0.0	0.0	33.0
1994	0.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0	0.0	31.0
1995	0.0	0.0	0.0	0.0	29.0	0.0	0.0	0.0	0.0	29.0
1996	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0	28.0
1997	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	9.0
8.5	0.0	0.0	0.0	0.0	327.0	0.0	0.0	0.0	0.0	293.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	0.0	0.0	0.0	0.0	327.0	0.0	0.0	0.0	0.0	293.0



PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:09:41  
FILE: hoc2  
REPORT: peepcap

===== WORKING INTEREST TANGIBLE AND INTANGIBLE INVESTMENT DETAIL =====

Year	TANGIBL FIELD CAPITAL	FIELD CAPITAL CCA AFT ITC	TANG BATH CAPITAL	BATH CAPITAL CCA AFT ITC	TANG PLANT CAPITAL	PLANT CAPITAL CCA AFT ITC	TANG OTHER CAPITAL	OTHER CAPITAL CCA AFT ITC	CAN D&S PROP. EXPENSE (COGPE)	COGPE WRITE- OFF	CAN DEVEL EXPENSE (CDE)	CDE WRITE- OFF	CAN EXPLOR EXPENSE (CEE)	CEE WRITE- OFF
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
	0.0		0.0		0.0		0.0		0.0		0.0		0.0	
1989	103.5	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	76.9	0.0	0.0
1990	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.9	0.0	0.0
1991	0.0	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.7	0.0	0.0
1992	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	0.0	0.0
1993	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	0.0	0.0
1994	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0
1995	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0
1996	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0
1997	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	0.0
8.5	103.5	98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	246.1	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	103.5	98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.5	246.1	0.0	0.0

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:10:59  
FILE: hoc2  
REPORT: newbtax

===== WORKING INTEREST BEFORE TAX REPORT =====														
Year	Oil Oper Cost \$/m3	INITIAL CROWN/ MANUAL ROYALTY M\$	FINAL CROWN/ MANUAL ROYALTY M\$	DRR/ FRHLD ROYALTY M\$	REVENUE AFTER ROYALTY	OTHER INC & ARTC M\$	TOTAL OPER COST M\$	MINERAL TAX M\$	OTHER EXP & NPI M\$	OPER INCOME M\$	TOTAL INTANG CAPITAL M\$	TOTAL TANG. CAPITAL M\$	TOTAL CAPITAL M\$	CASH FLOW BEFORE TAX M\$
											0	0	0	
1989	0.00	36	0	0	164	0	34	0	0	130	257	104	360	-230
1990	0.00	48	43	0	194	0	50	0	0	144	0	0	0	144
1991	0.00	33	33	0	143	0	42	0	0	101	0	0	0	101
1992	0.00	21	21	0	112	0	37	0	0	75	0	0	0	75
1993	0.00	12	12	0	87	0	33	0	0	54	0	0	0	54
1994	0.00	6	6	0	68	0	31	0	0	37	0	0	0	37
1995	0.00	3	3	0	52	0	29	0	0	23	0	0	0	23
1996	0.00	2	2	0	39	0	28	0	0	11	0	0	0	11
1997	0.00	0	0	0	10	0	9	0	0	1	0	0	0	1
=====														
8.5		162	121	0	869	0	293	0	0	576	257	104	360	216
0.0		0	0	0	0	0	0	0	0	0	0	0	0	0
=====														
8.5		162	121	0	869	0	293	0	0	576	257	104	360	216

PETROLEUM ECONOMICS EVALUATION PROGRAM  
 XI Consultants Ltd.

Version 88-11-18  
 06/06/89 16:12:08  
 FILE: hoc2  
 REPORT: peepat

===== WORKING INTEREST AFTER TAX DATA =====																	
Year	Resorc Income M\$	Resorc Allow M\$	Land& Dev Bal M\$	Land& Dev Depr M\$	Expl Bal M\$	Expl Depr M\$	Tang Bal M\$	Tang Depr M\$	Plant &Gath Bal M\$	Plant &Gath Depr M\$	Fed Taxbl Income M\$	Fed Tax M\$	Prov Taxbl Income M\$	Prov Tax M\$	Inv Credit M\$	Total Tax M\$	Cash Flow M\$
1989	115	29	257	77	0	0	104	16	0	0	9	3	9	2	0	5	-235
1990	161	40	180	54	0	0	88	26	0	0	67	23	67	11	0	34	110
1991	115	29	126	38	0	0	62	18	0	0	49	17	49	8	0	25	76
1992	84	21	88	26	0	0	43	13	0	0	37	12	37	6	0	19	57
1993	57	14	62	18	0	0	30	9	0	0	24	8	24	4	0	12	41
1994	37	9	43	13	0	0	21	6	0	0	15	5	15	3	0	8	30
1995	22	5	30	9	0	0	15	4	0	0	7	2	7	1	0	4	19
1996	10	2	21	6	0	0	10	3	0	0	1	0	1	0	0	0	11
1997	-1	-0	15	4	0	0	7	2	0	0	-5	-2	-5	-1	0	-3	4
8.5	599	150		246		0		98		0	203	69	203	34	0	103	113
0.0	0	0		0		0		0		0	0	0	0	0	0	0	0
8.5	599	150		246		0		98		0	203	69	203	34	0	103	113

XI Consultants Ltd.

Version 88-11-18

06/06/89 16:13:13

FILE: hnc2

REPORT: peeprcy

**WORKING INTEREST CROWN ROYALTIES, MINERAL TAX AND OTHER ROYALTIES**

CROWN ROYALTIES AND MINERAL TAX

OTHER ROYALTIES

[illegible]

PETROLEUM ECONOMICS EVALUATION PROGRAM  
XI Consultants Ltd.

Version 88-11-18  
06/06/89 16:14:21  
FILE: hoc2  
REPORT: peepdcf

Year	===== A N N U A L   D I S C O U N T E D   B . T .   A N D   A . T .   C A S H   F L O W =====											
	0%	10%	12%	15%	18%	20%	0%	10%	12%	15%	18%	20%
	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	BT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash	AT Cash
	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$	M\$
1989	-230.0	-224.5	-223.5	-222.1	-220.6	-219.7	-234.5	-229.0	-228.0	-226.5	-225.0	-224.1
1990	144.0	130.9	128.6	125.2	122.1	120.0	110.0	100.0	98.3	95.7	93.3	91.7
1991	100.9	83.4	80.5	76.3	72.5	70.1	76.1	62.9	60.7	57.6	54.7	52.9
1992	75.4	56.7	53.7	49.6	45.9	43.7	56.8	42.7	40.4	37.3	34.6	32.9
1993	53.7	36.7	34.1	30.7	27.7	25.9	41.4	28.3	26.3	23.7	21.3	20.0
1994	37.3	23.2	21.2	18.6	16.3	15.0	29.6	18.4	16.8	14.7	13.0	11.9
1995	22.9	12.9	11.6	9.9	8.5	7.7	19.2	10.8	9.7	8.3	7.1	6.4
1996	10.9	5.6	4.9	4.1	3.4	3.1	10.5	5.4	4.8	4.0	3.3	2.9
1997	0.8	0.4	0.3	0.3	0.2	0.2	3.5	1.7	1.4	1.2	0.9	0.8
8.5	216.1	125.3	111.4	92.6	76.0	65.9	112.7	41.2	30.4	15.9	3.1	-4.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.5	216.1	125.3	111.4	92.6	76.0	65.9	112.7	41.2	30.4	15.9	3.1	-4.6

## VOLUMETRIC RESERVES / WELL

$$OOIP = 10000 \times A \times h \times \phi \times (1 - S_w) \times 1/B_o i$$

$$S. PIERSON (HOC) 10000 \times 32.4 \times 4 \times .15 \times (1 - .45) \times .86 = 91951 \text{ m}^3$$

$$ROI P = .12 \times 91951 = 11034 \text{ m}^3$$

## OMEGA

SEC 23, 24, 25 & 26 - 1-26

$$10000 \times 16.2 \times 11 \times .15 \times (1 - .61) \times .86 = 89652$$

$$ROI P = .091 \times 89652 = 8158$$

SEC 30 & 31 - 1-25 + SEC 25 & 36 - 1-26

$$10000 \times 16.2 \times \quad \times .13 \times (1 - .63) \times .86$$

$$ROI P = .122 \times$$

ENRON - WASKADA UNIT #16

$$OOIP = 3165 \cdot 10^3 \text{ m}^3$$

UNIT AREA

$$3165000 /$$

$$\times 16.2 =$$

$$ROI P = .093 *$$

# Model Studies

	Enns Wastade Unit No. 16	Omega Sec 23+24-1-26 1985	Hoc S. Pierson MAIN SAND
AREA	6895 1.162	1988	86
Boi	10242 1.162	1.164	86
OOIP	3165 10 <sup>3</sup>		91463 well 85365
RF primary	9.3 %	9.1	12%
$\phi$	13.7 - 19.8 % layer 3	11-17% (15% avn.)	14.7-17 14
k	1.28 - 55.94 md	3 md	2.2-8 15
h	92 - 105 m	0-12 m (11 ft avn.)	4
Sw	37 %	37-60% (61% avn.)	45
Prod. Acc. (primary)	14 % forecast		
Spacing to to.	16 L.		32.4
Original Reservoir Pressure	8670	8900	
Bubble Pt. Pressure	4220	4220	Roip 10976
	86	1973	L3
ORIGINAL STUDIES	9.9 - 11.8 %	RF = 12.2 %	

ANA Sec 30+31-1-25  
Sec 25+36-1-26

$$q = q_i e^{-dt}$$

$$\ln \frac{q_t}{q_i} = -dt$$

$\phi = 13\%$   
 $k = 3.7 \text{ md}$   
 $20 \times 63.6$   
 $24\%$   
 $20\%$   
 $17\%$   
 $10\%$   
 $P_2 = 8620$

$$(294.6 - 58) \times 1000 = \left( \frac{105.8 - 12.4}{d} \right) 365$$

# Waskada L Am A Pool

## Production

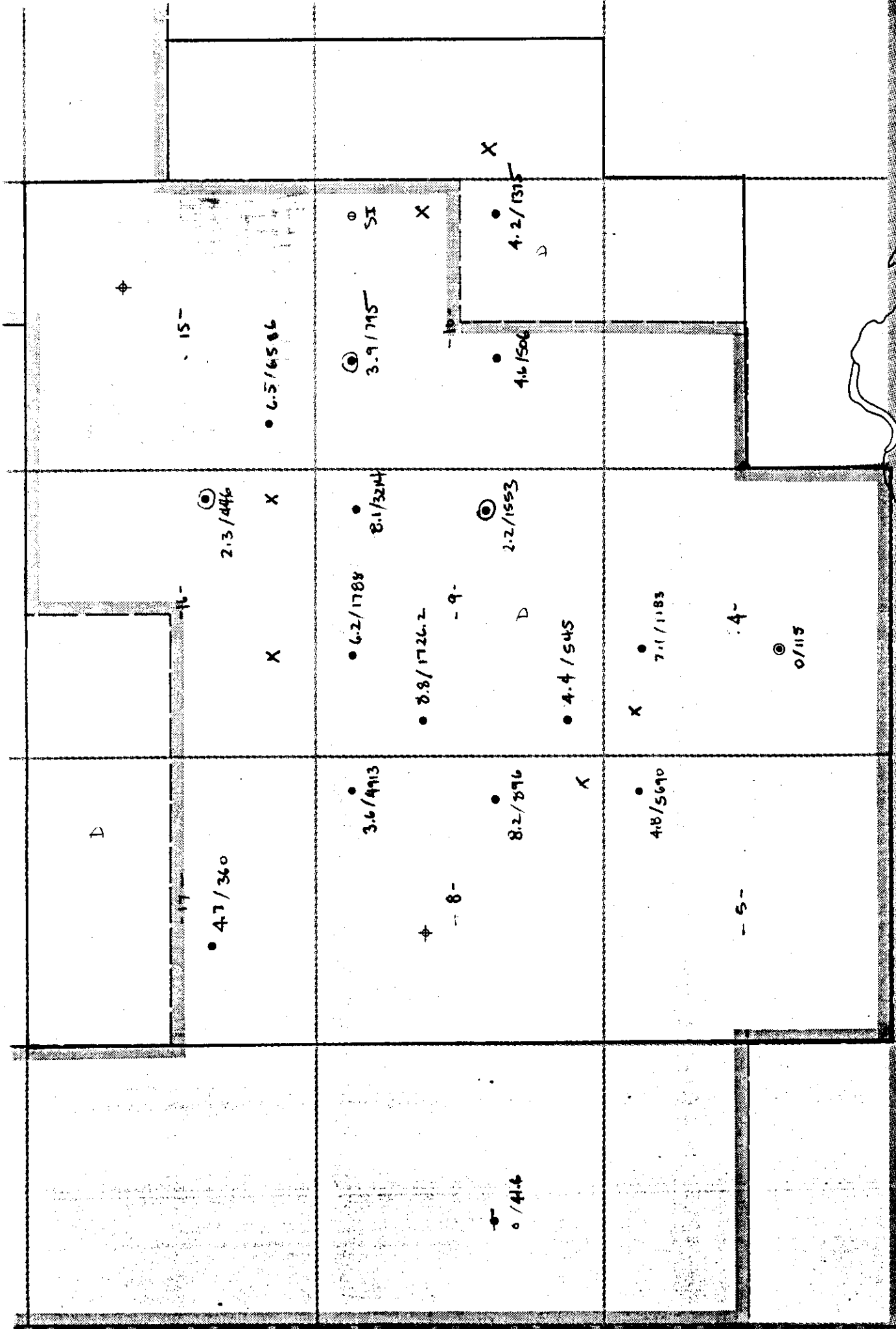
	1988 (10 <sup>3</sup> m <sup>3</sup> /mo)	1987	1986	1985	1984
JAN	14.4	16.1	20.2	19.4	20.1
FEB	13.8	14.9	18.9	18.9	18.4
MAR	15.3	15.8	18.2	19.2	18.4
APR	14.6	15.2	15.9	17.7	16.2
MAY	15.0	15.9	16.5	20.1	16.2
JUNE	14.2	14.6	16.9	17.8	17.2
JULY	14.5	14.5	17.6	19.6	18.6
AUG	14.5	14.7	18.4	20.1	19.8
SEPT	13.9	14.8	17.7	18.8	19.6 ↓
OCT	14.6	14.6	18.0	19.2	19.1
NOV	13.8	15.2	16.7	18.8	19.0
DEC	13.9	14.7	16.6	18.7	20.0



	M3/MON	TIME	LN(M3/MON)
JAN	20.1		
FEB	18.4		
MAR	18.4		
APR	16.2		
MAY	16.2		
JUN	17.2		
JUL	18.6		
AUG	19.8	0.08	9.893437
SEPT	19.6	0.17	9.883284
OCT	19.1	0.25	9.857443
NOV	19.6	0.33	9.883284
DEC	20	0.42	9.903487
JAN	19.4	0.5	9.873028
FEB	18.9	0.58	9.846917
MAR	19.2	0.67	9.862665
APR	17.7	0.75	9.781319
MAY	20.1	0.83	9.908475
JUN	17.8	0.92	9.786953
JUL	19.6	1	9.883284
AUG	20.1	1.08	9.908475
SEPT	18.8	1.17	9.841612
OCT	19.2	1.25	9.862665
NOV	18.8	1.33	9.841612
DEC	18.7	1.42	9.836278
JAN	20.2	1.5	9.913437
FEB	18.9	1.58	9.846917
MAR	18.2	1.67	9.809176
APR	15.9	1.75	9.674074
MAY	16.5	1.83	9.711115
JUN	16.9	1.92	9.735068
JUL	17.6	2	9.775654
AUG	18.4	2.08	9.820105
SEPT	17.7	2.17	9.781319
OCT	18	2.25	9.798127
NOV	16.7	2.33	9.723163
DEC	16.6	2.42	9.717157
JAN	16.1	2.5	9.686574
FEB	14.9	2.58	9.609116
MAR	15.8	2.67	9.667765
APR	15.2	2.75	9.629050
MAY	15.9	2.83	9.674074
JUN	14.6	2.92	9.588776
JUL	14.5	3	9.581903
AUG	14.7	3.08	9.595602
SEPT	14.8	3.17	9.602382
OCT	14.6	3.25	9.588776
NOV	15.2	3.33	9.629050
DEC	14.7	3.42	9.595602
JAN	14.4	3.5	9.574983
FEB	13.8	3.58	9.532423
MAR	15.3	3.67	9.635608
APR	14.6	3.75	9.588776
MAY	15	3.83	9.615805
JUN	14.2	3.92	9.560997
JUL	14.5	4	9.581903

# Regression Output:

Constant	
Std Err of Y Est	
R Squared	
No. of Observations	
Degrees of Freedom	
X Coefficient(s)	-0.09579
Std Err of Coef.	0.004644



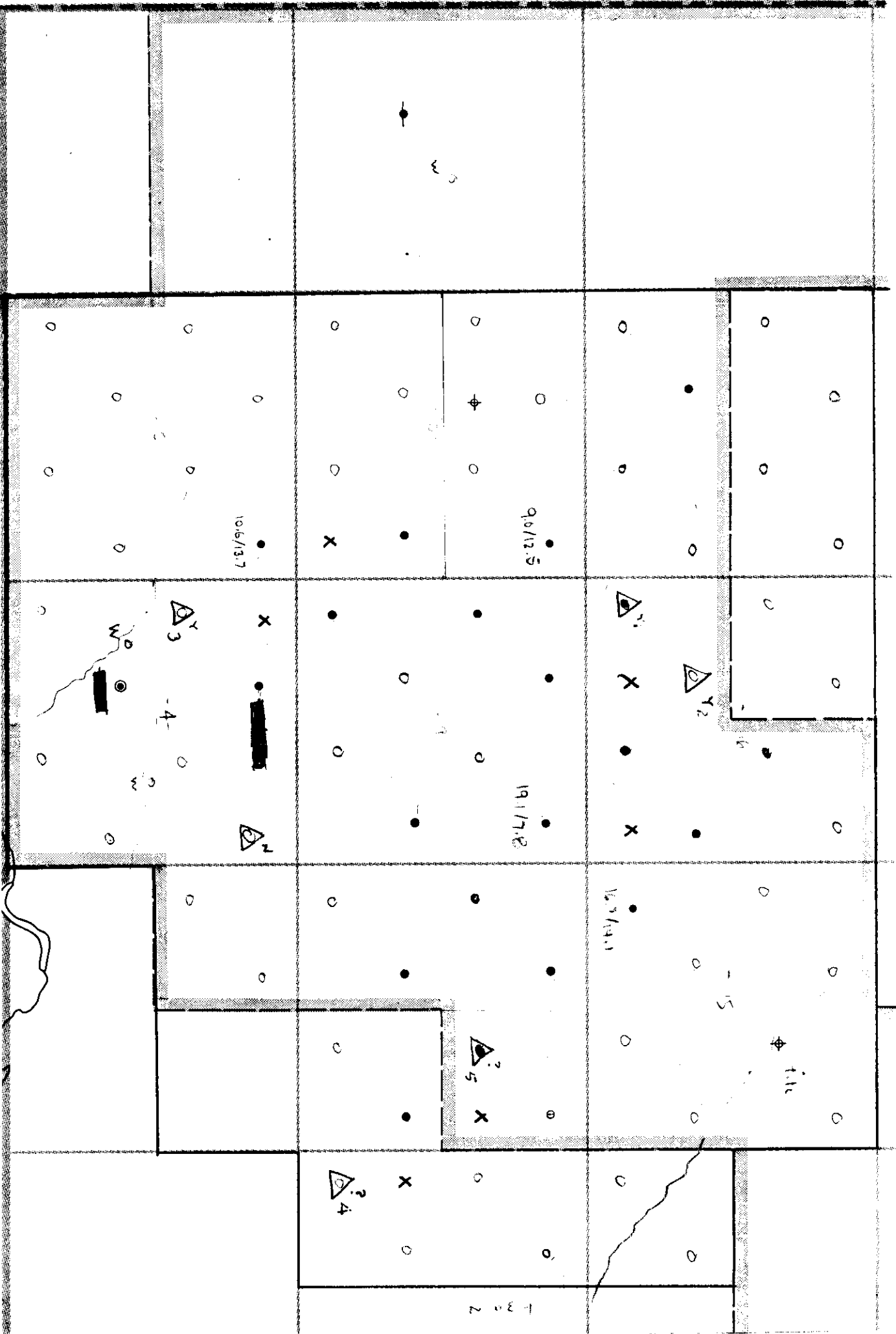
Dec/83 JPM 69.6 m200D  
 MLC 6.0 m200D

2.1/4300 Ave. Paul 1988/cum. 88-12-31

X OFFERS CAUSE 89-06-28

⊙ me completion 12 42c (nc 36c P.1)

D - Done



10.6/13.7

Boxer - Victim Cause / Victim's...

Sgt 29

Actual offsets X  
Carved 89-06-28

HOC 1989 potential locations 110-19-2-21  
no completion  
Crown offset r (called) 1' from ceiling

## SOUTH PIERSON - HOME OIL - 80 Ac. Spacing Appl<sup>n</sup>

- appl<sup>n</sup> for designation of special drilling spacing unit  
South Pierson Field - LAM & MC

- stand-up SU - target area even-number LSD (central targets as specified by S.21(1)) - same as for 40 ac. SU

- communication between pipe between LAM & MC - same for 80 ac. in both fm.

- area appl<sup>n</sup> HOC / 800 land

Geology - LAM overlies MC3 (Arida bed, porous, permeable & wet) localized

LAM (main sand) fine grained sandstone → reservoir  
winnowed tidal creek with marginal  
red beds

### ISSUES

- MAXIMIZE RECOVERY (ECONOMICS)
- PROTECTION OF CORRELATIVE RIGHTS

## RECOVERABLE RESERVES

- wells drain 32 ha in 10.8 yrs. (16 ha reserve life index 5.4 yrs)

- analysis:  $f^*$  - decline rates where available

- est exponential decline where no prod. history

- Volumetric reserves

-  $RF_{min}(volumetric) = 12\%$  typical 9.1 - 12.2%

- prod. hist. from dec. curve analysis minimal on all wells, reluctant to utilize

Reservoir Parameter LA MacArbey OOIP = 122,075  
d = 22 - 26%

h = 4  $\phi = 15\% (14\%) S_w = 45\% \frac{1}{B_{oi}} = .86 A = 32.4 \text{ ha.}$

OOIP = 91,463  $\text{m}^3$  (85365  $\text{L}^3$ )

$RF_{min} = 12\%$

ROIP = 10,976  $\text{L}^3$  (10244)

- Decline LA pool IP = 69.6  $\text{L}^{3000}$   $Q_{cum} = 109190 \text{ m}^3$  at  $t = 10 \text{ yrs}$   $P_{10} = 10 \text{ L}^{3000}$   
d = 20% est OOIP = 9099.16  $\text{m}^3$  est  
<  $1 \times 10^6 \text{ L}^3$

Waskada primary RF 16 ha = 5%

$B_{oi} = 1.1704$  find Percentage Recovery to Bubble Pt. 1

$B_{o_{pot}} = 1.173$  (flask)

$R = \frac{B_{o_{pot}} - B_{oi}}{B_{o_{pot}}} = \frac{1.173 - 1.1704}{1.173} = 0.2\%$

$B_{o_{pot}}$

1.173

could be as

high as

2% here  $B_{o_{pot}}$  (d)

can prod 85-12-31  
28938  $\text{m}^3$

Prod. to b.pt. pressure 10000-20000  $\text{m}^3$

## ECONOMICS

- 16 La limited reserves uneconomic to drill

- MPPR = 480 m<sup>3</sup>/mon f. refuel longer S.H. / withdrawn

O/C	224 ✓	aver. 2 wells	Ops. cost	\$1500/well/mth fixed
Complete	130	2 1988		+\$15 / m <sup>3</sup> variable
Mt. Lift	47			
Tie-in	43			
	444	(other operators \$250,000)		not fair to use others costs for comparison

IP = 8 m<sup>3</sup>/d } Reserves = 5468 m<sup>3</sup> dec 50% dec.  
 Production = 0.5 m<sup>3</sup>/d } 16 La

IP = 8 m<sup>3</sup>/d } Reserves = 10935 m<sup>3</sup> dec 25%  
 Production = 0.5 m<sup>3</sup>/d } 32 La

HOC	Price forecast	89-07	107. <sup>88</sup>	94	183.50
Actual					
Jan/89	\$116. <sup>00</sup> /m <sup>3</sup>	90	129. <sup>10</sup>	95	199.29
Feb	114. <sup>00</sup>	91	142. <sup>75</sup>	96	211.45
Mar	127. <sup>00</sup>	92	153. <sup>08</sup>	97	227.15
Apr.	139. <sup>00</sup>	93	166. <sup>10</sup>		

→ with existing price forecast ROI = 7,775 m<sup>3</sup> / 16 La. marginally economic @ best

~ uneconomic on 16 La spacing with increased prices & 17% reserves

## CORRELATIVE RIGHTS

- no adverse effects

- withdrawal rate / unit reservoir vol.  $\leq$  rate cu 16 ha spacing ?  
40 ac. 80 ac.

offsets Crown  
Freehold

## CONCERNS / QUESTIONS

✓ - need list of lessons learned

✓ - well locations or so on

NO DATA  
ON FILE

was there any evidence during field development  
of drainage area of existing well - pressure  
depletion

✓ - comparison of LAR PEs <sup>was there primary</sup>  $RF = 5\%$

pool prod  
plot to  
80-11

review last 8 months prod. (note: 8L-00D allowable within  
L some cases)

✓ - NO incremental recovery on 16 L<sub>a</sub> spacing <sup>- NO economics</sup>  
incremental recovery \$  
+ higher price forecast

✓ - substantiate costs NOT REQUIREMENT, ACTUAL COSTS USED

done - pool prod plots

✓ offset requirements 16/32 L<sub>a</sub>.

- try economic run

NAVE ON FILE

- pressure histories re: evidence of depletion or so on  
% recoverable  $\rightarrow$  expansion above bubble point

later

- need for investigation into WF potential

extensive  
core analysis

additional reservoir & geological work - PVT - limited prod. hist.  
 $P_b = 4551 \text{ kPa}$



-  $\phi$  vs  $k$  plot  $k_{\text{typical}} 4-7 \text{ md. mD}$

- radial flow equation use  $\bar{P}_a = 10,400 \text{ kPa}$  inconclusive

- typically HOC runs a build-up test after completing the well - no results on GLR prod production history N/A

$$q_{sc} = \frac{7.08 kh (P_2 - P_1)}{\mu B_o \ln(r_e/r_w)}$$

32 ha

$$q_{sc} = \frac{7.08 * .007 * 13 (1508)}{1.345 * 1.17 * \ln(1075 / .19)} = 71 \text{ b/d}$$

8.64

16 ha

$$q_{sc} = \frac{7.08 * .007 * 13 * 1508}{1.345 * 1.17 * \ln(745 / .19)} = 74 \text{ b/d}$$

0.27

## PB Recommendations

Notice to freehold mineral owners - explanation of appl<sup>n</sup> of  
↑ spacing → hope results in withdrawal of objections  
+ specific discussions objecting parties

### Objections

① lower ult. recovery

PB ② incremental reserves on 16 ha spacing

PB ③ feasibility of pressure maintenance

④ insufficient time, not enough information

⑤ HUC/seo economics - 16 ha spacing RF = 45% + ↑ prices

⑥ reduced royalties

- Have not developed field on 16 ha

PB - interim approval 2 yrs. → technical review

	14		16
12		10	
	6		8
4		2	

$$q_t = q_1 \times e^{-\alpha t}$$

$$10 = 69.9 \times e^{-10D}$$

$$Q_+ = \frac{q_1 - q_+}{D}$$

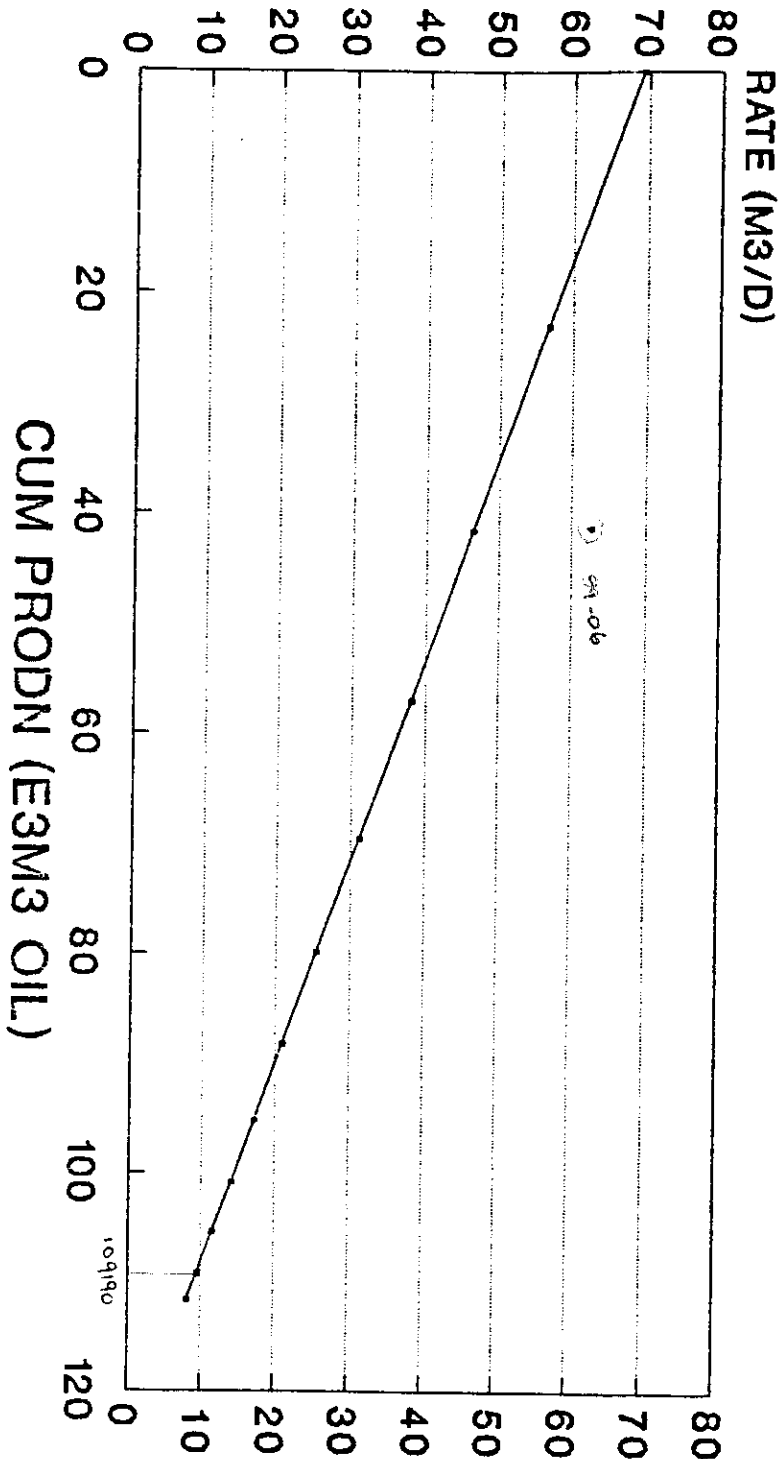
$$\ln \frac{10}{69.9} = -10D$$

$$D = .19$$

$$109190 = (69.9 - 10) \times 365$$

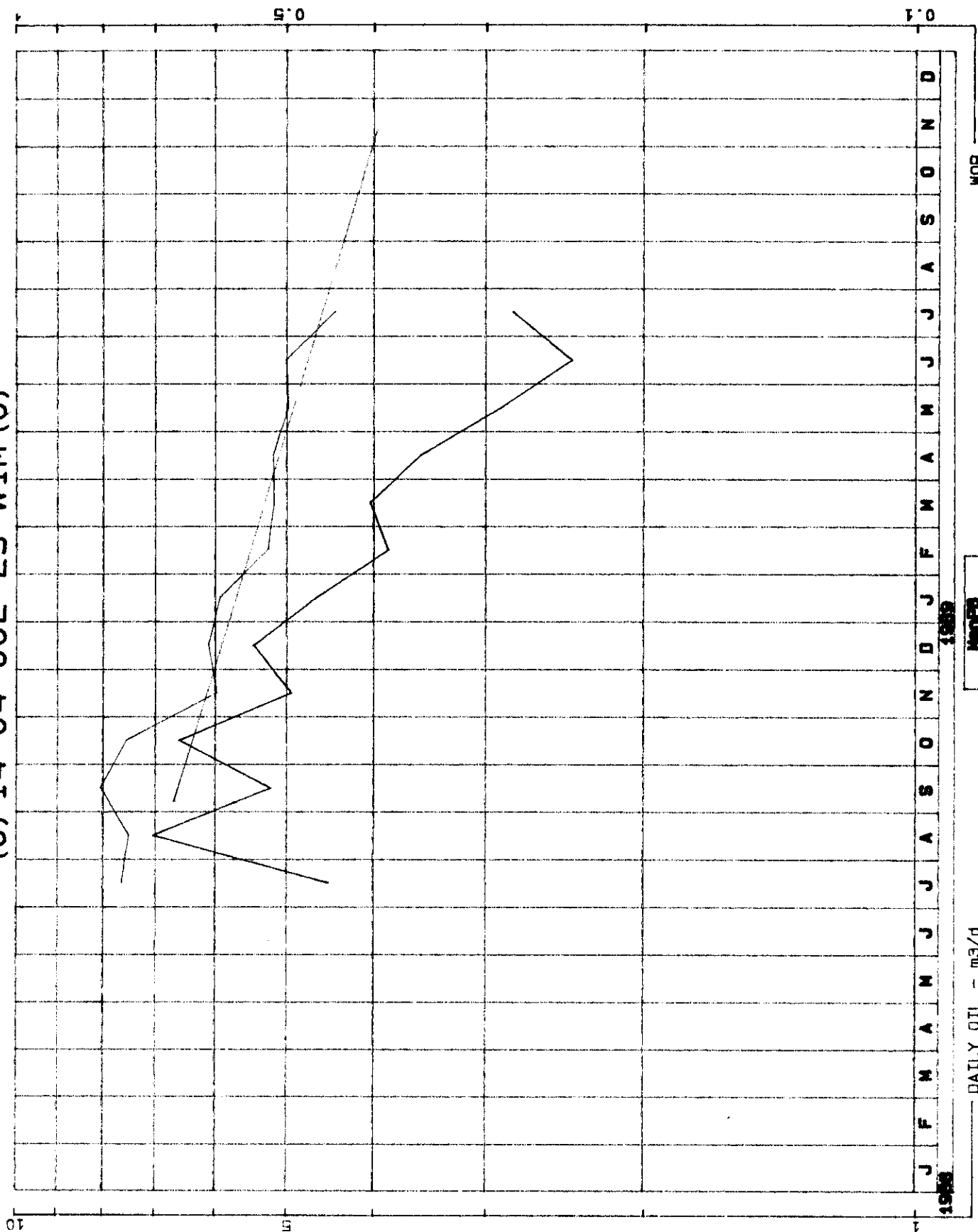
$$D = 202$$

# PRODUCTION DECLINE LOWER AMARANTH



Series 1

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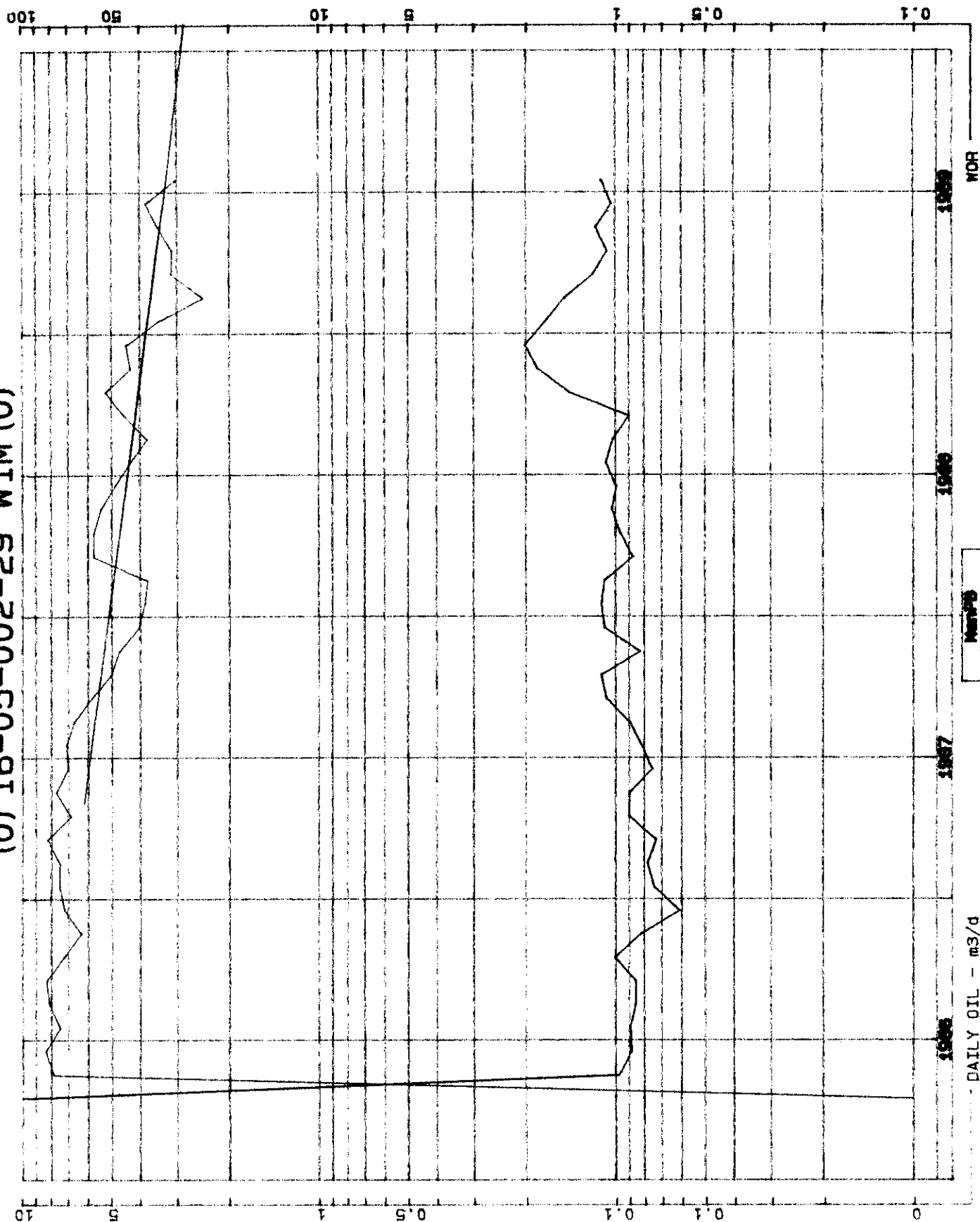


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DAILY OIL - m3/d

W1M (0)

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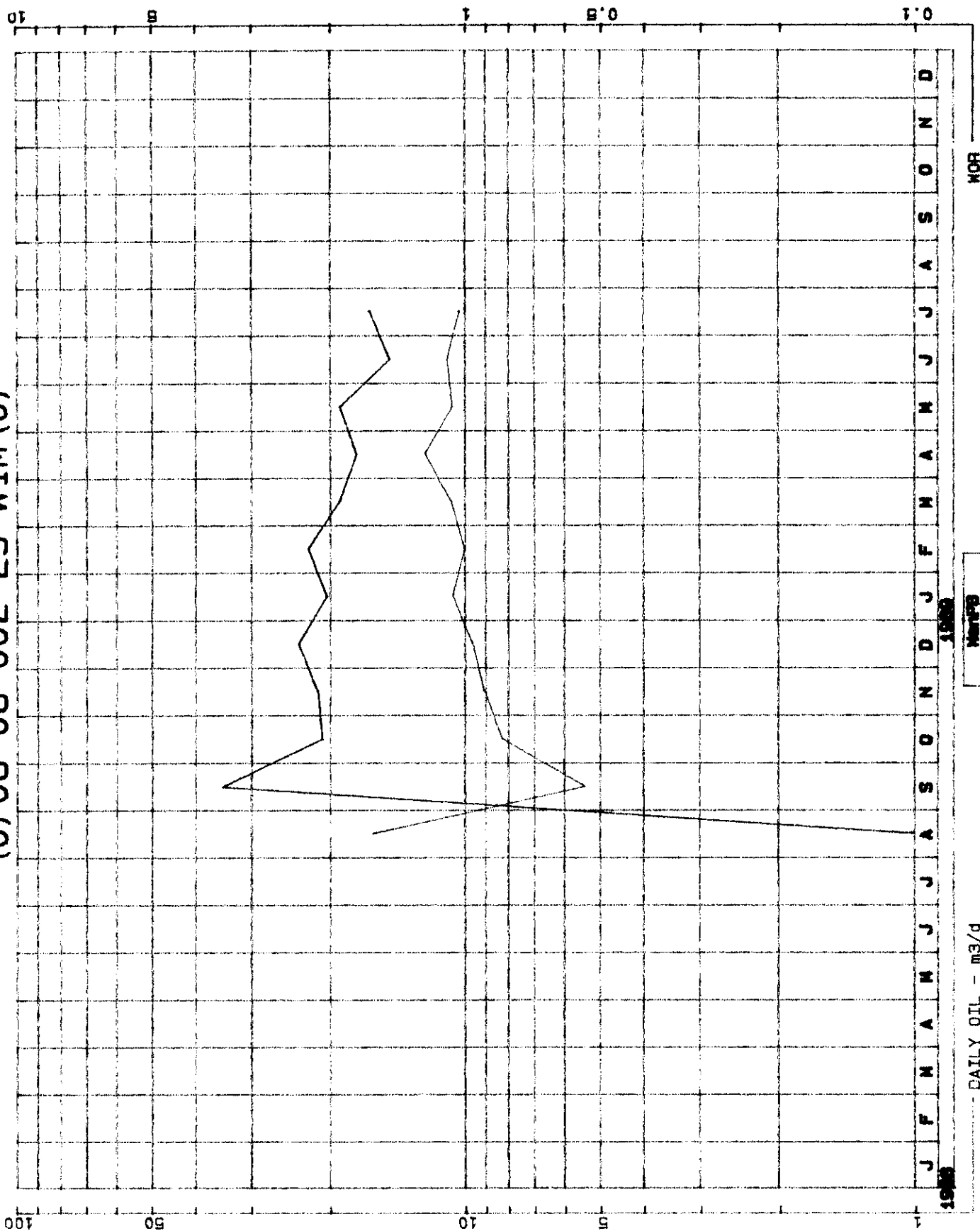


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DAILY OIL - m3/d

NOR

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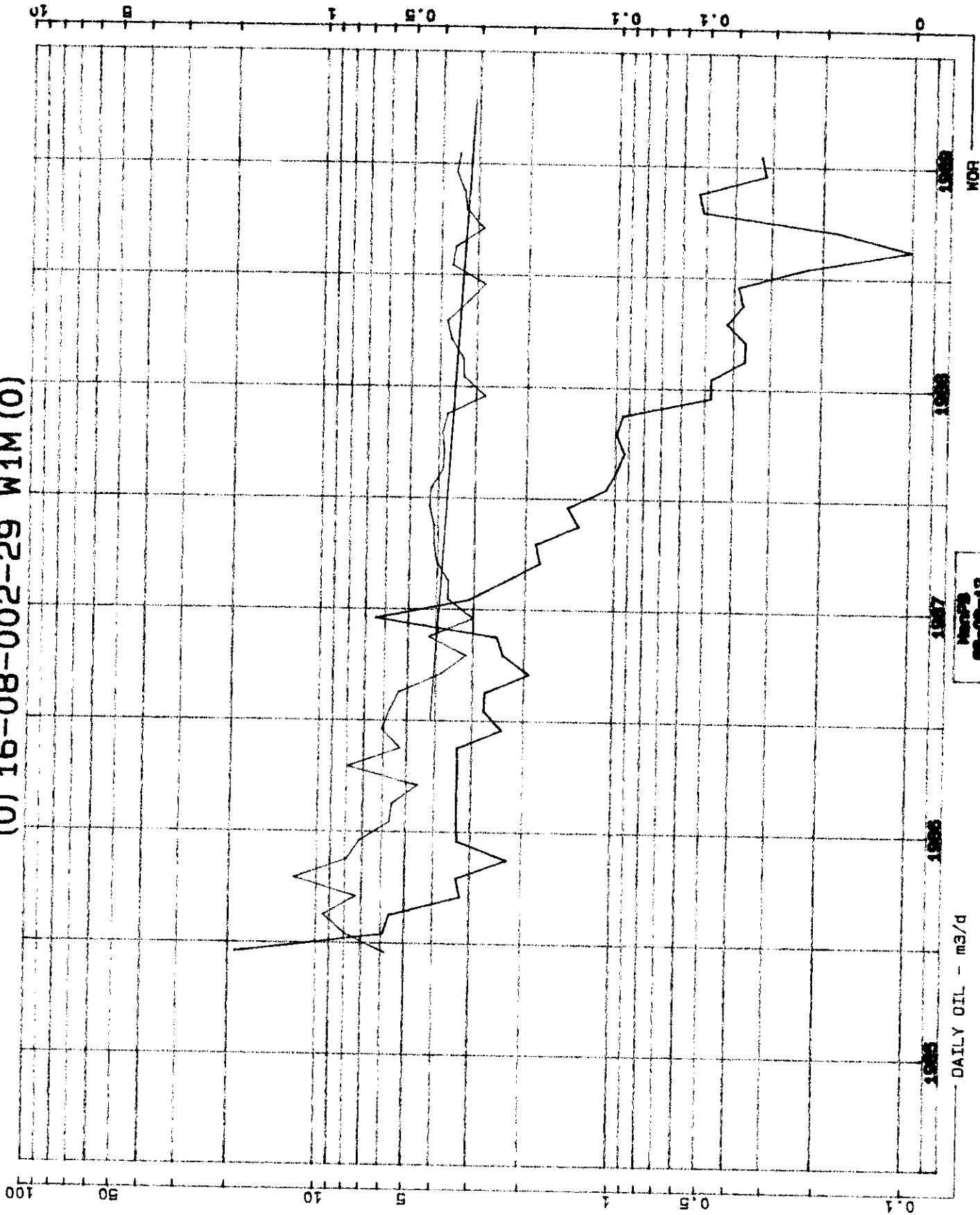


DAILY OIL - m3/d

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08-08-12  
15-12-03

NOR

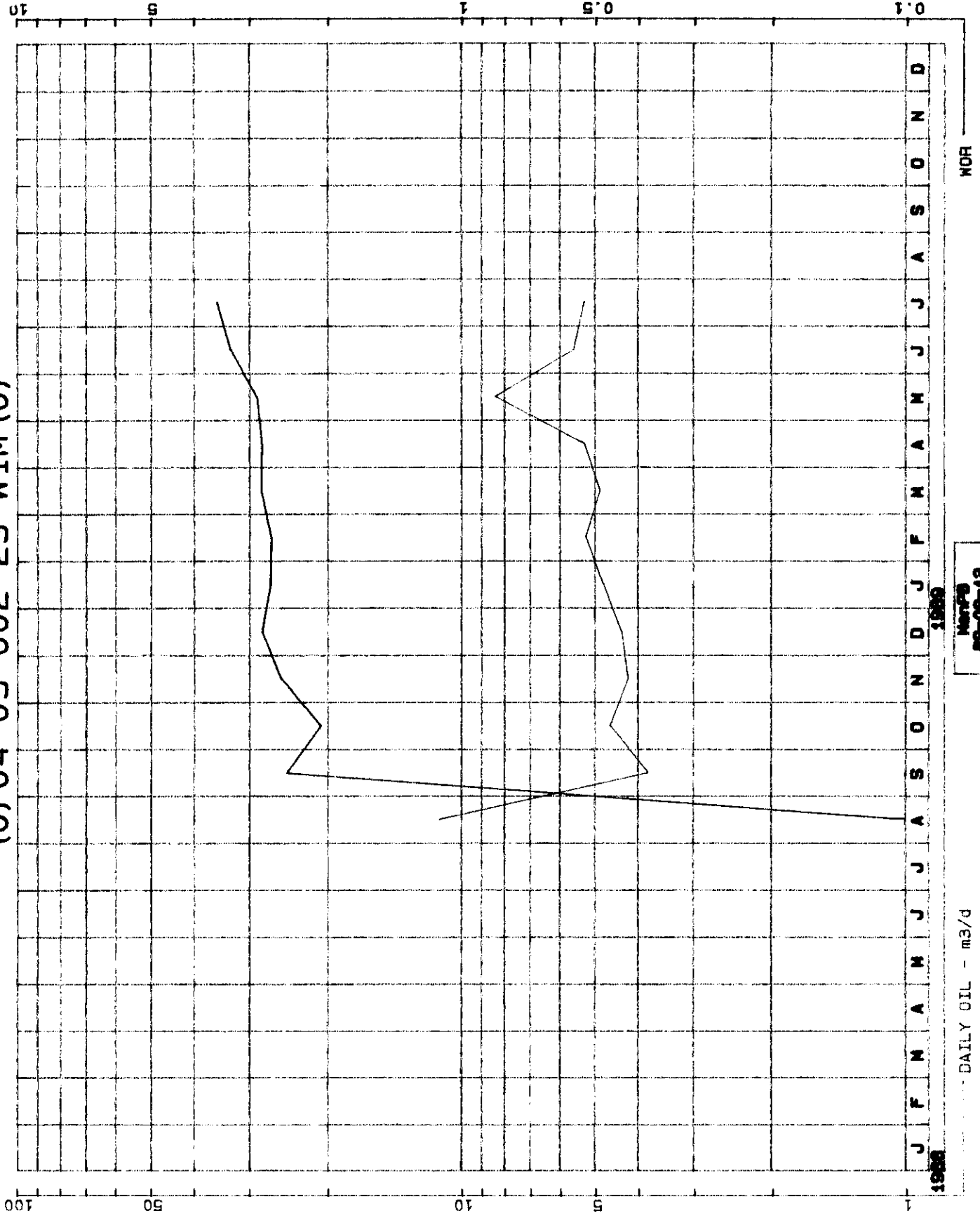
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North  
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15:17:46

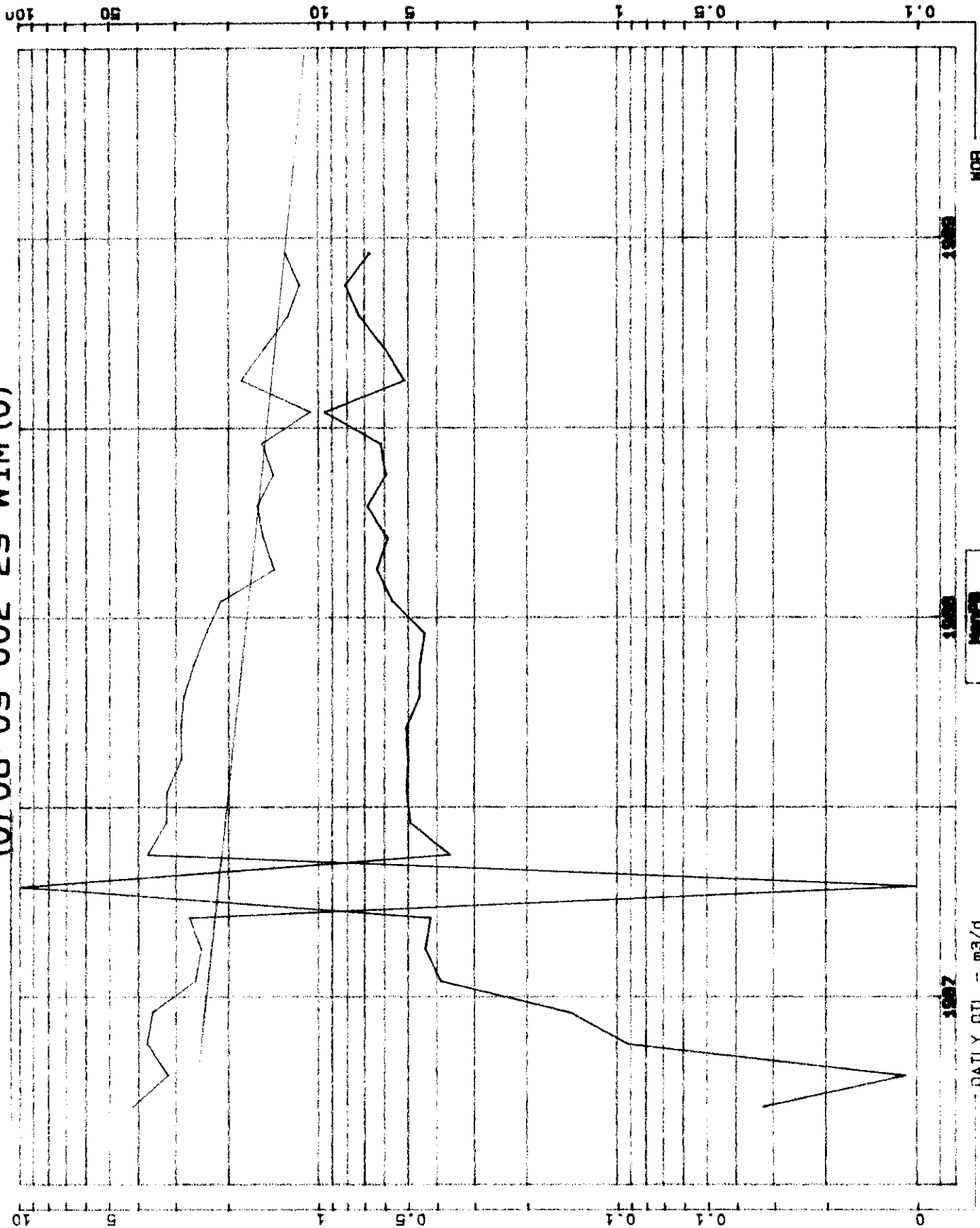


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0.35 0.16

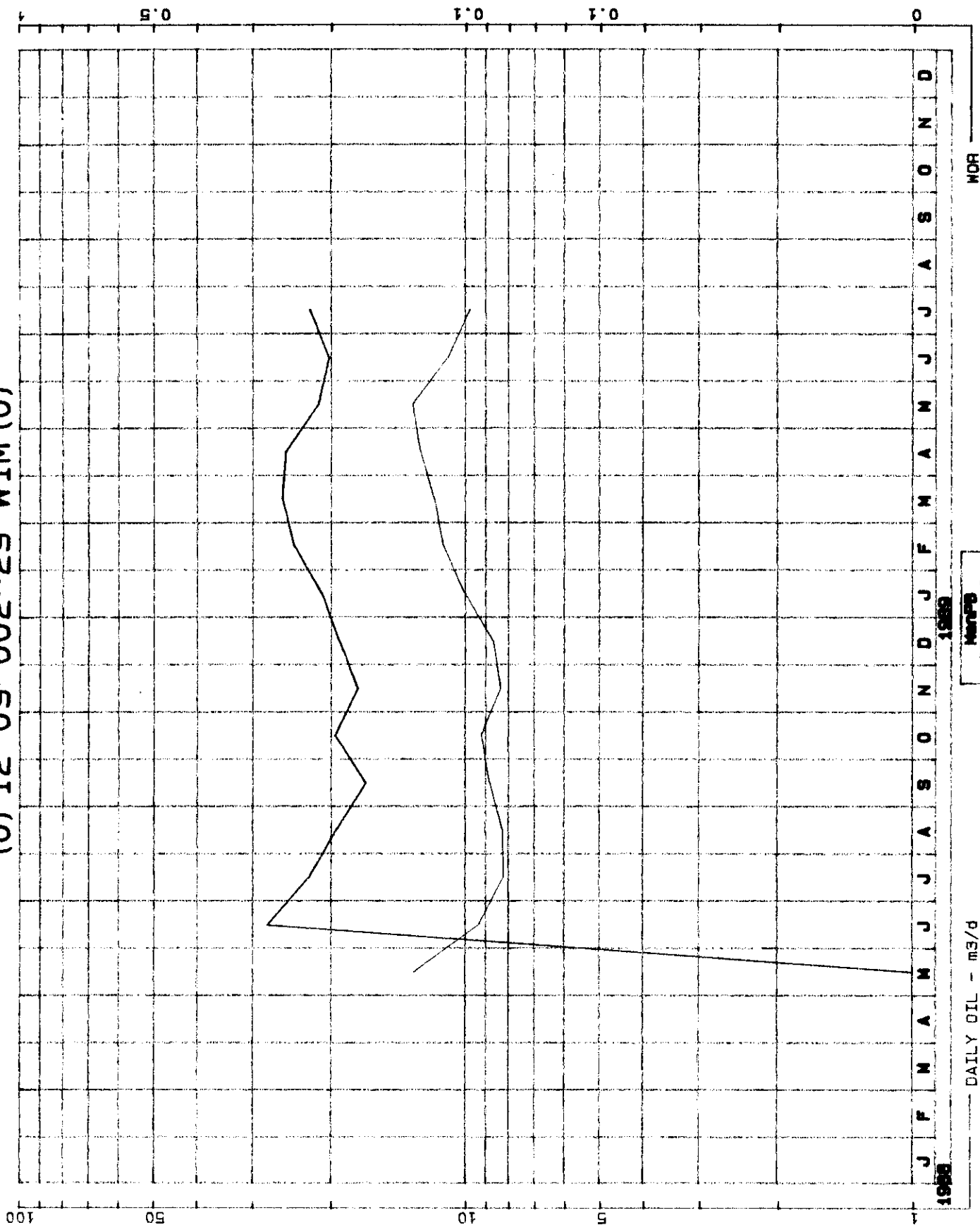
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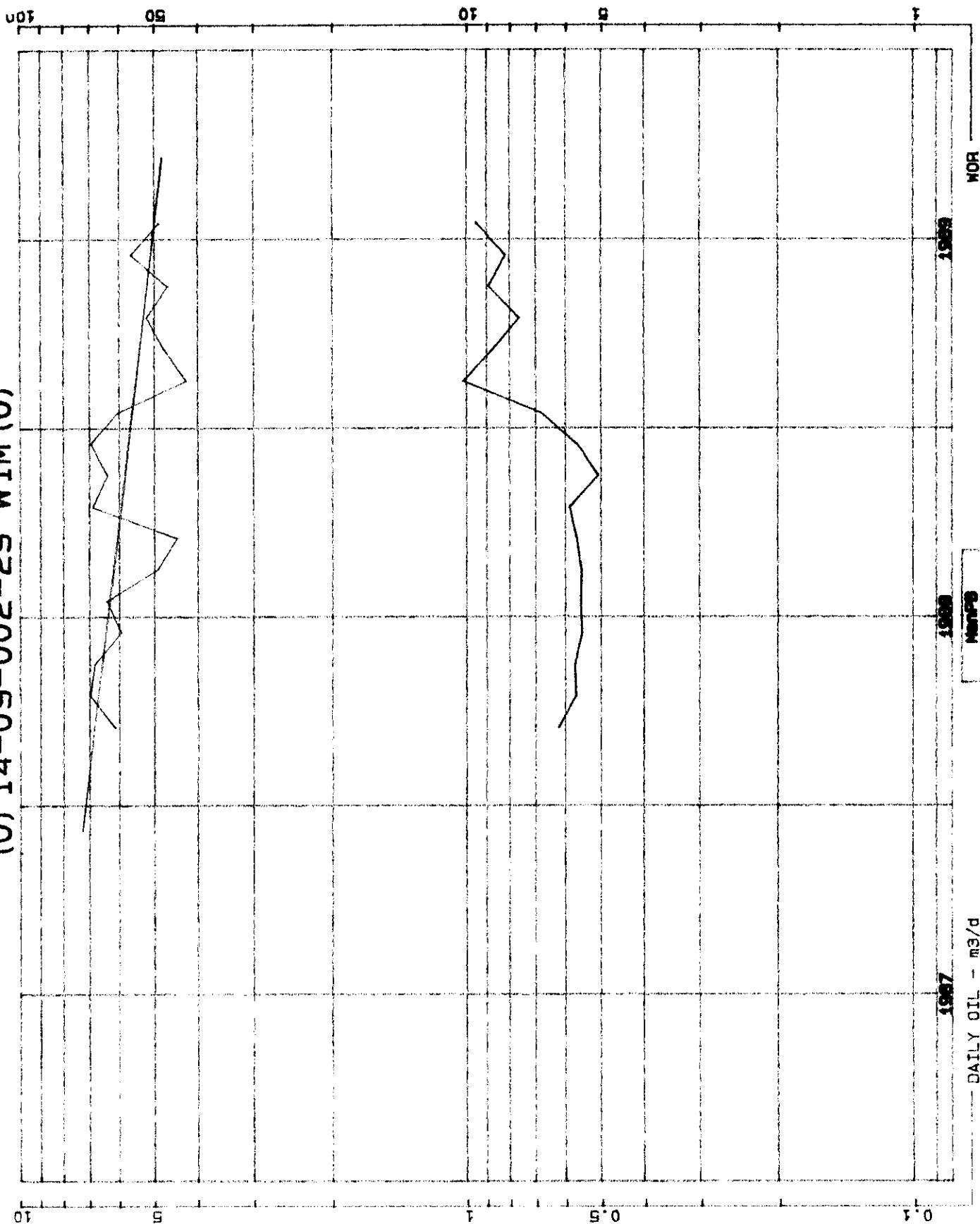
DAILY OIL - m3/d

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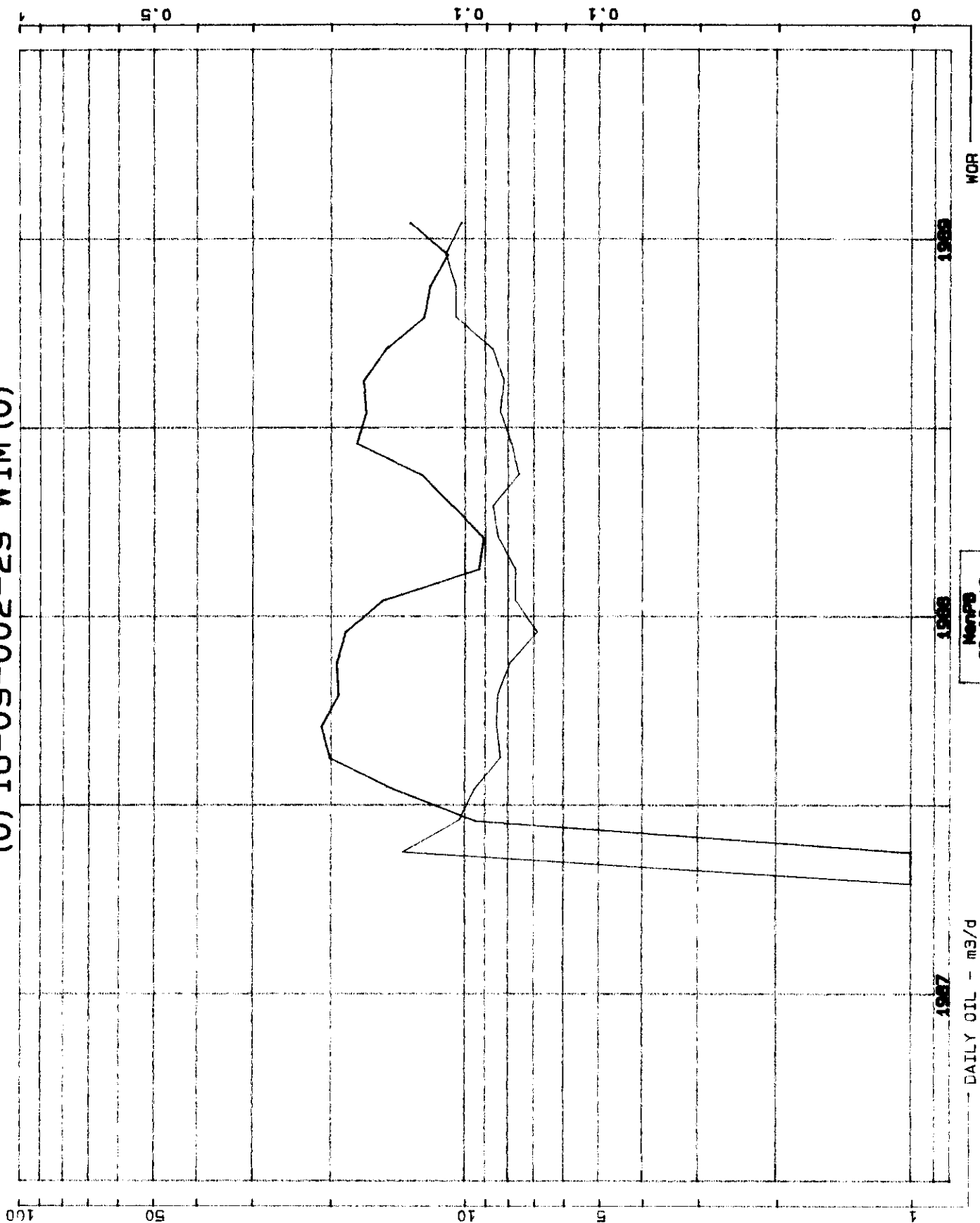
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1989  
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DAILY OIL - m3/d

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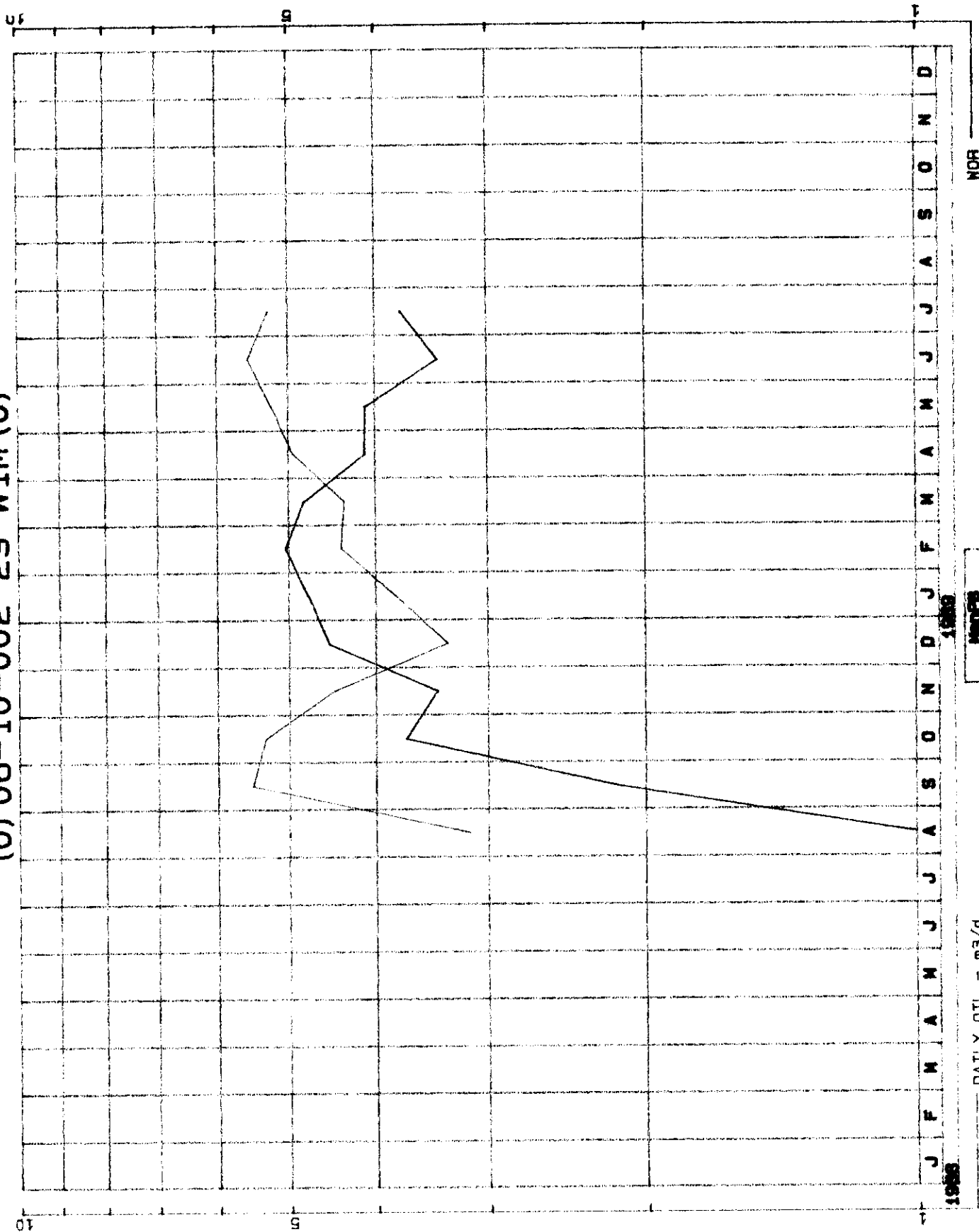


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DAILY OIL - m3/p

WOR

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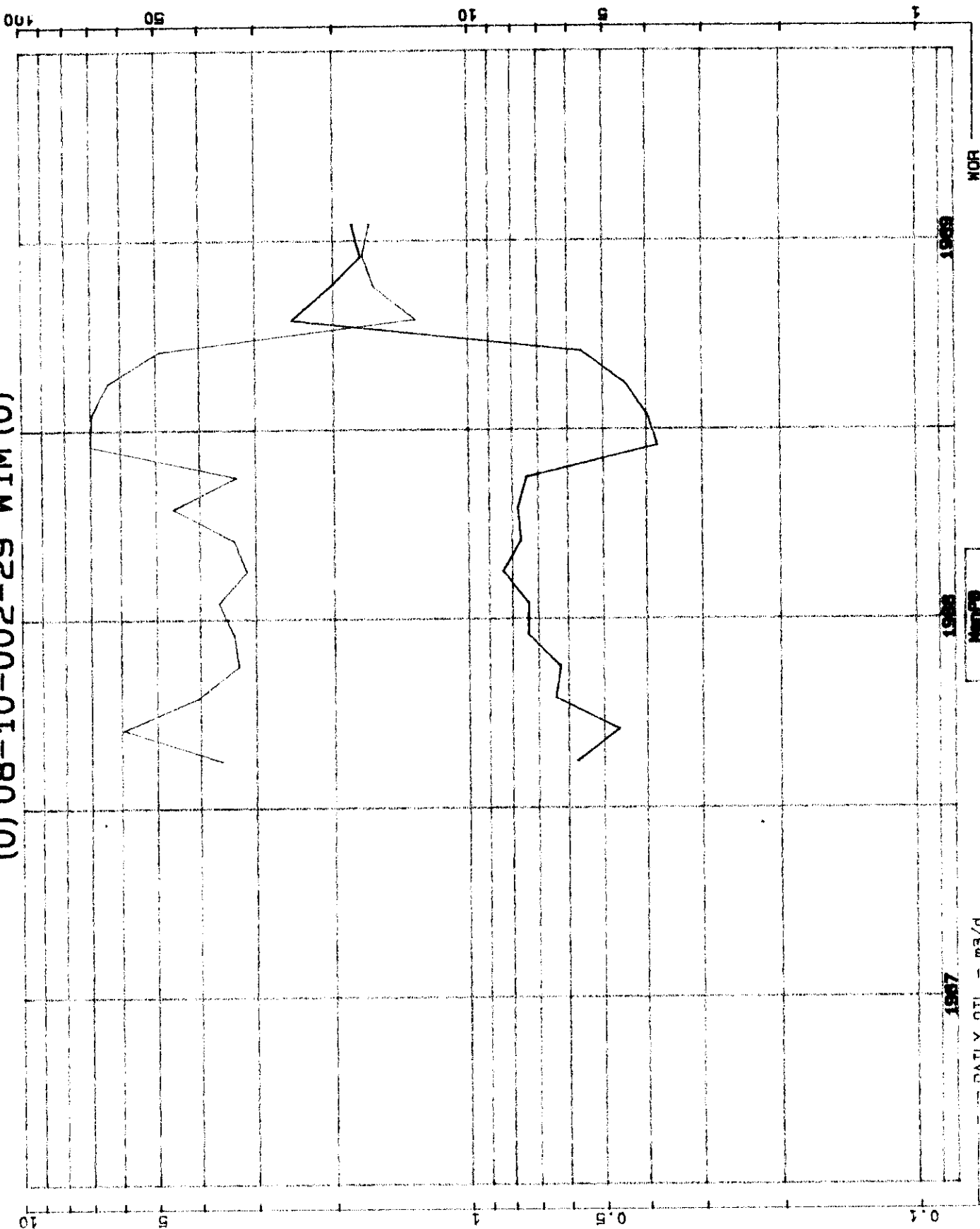


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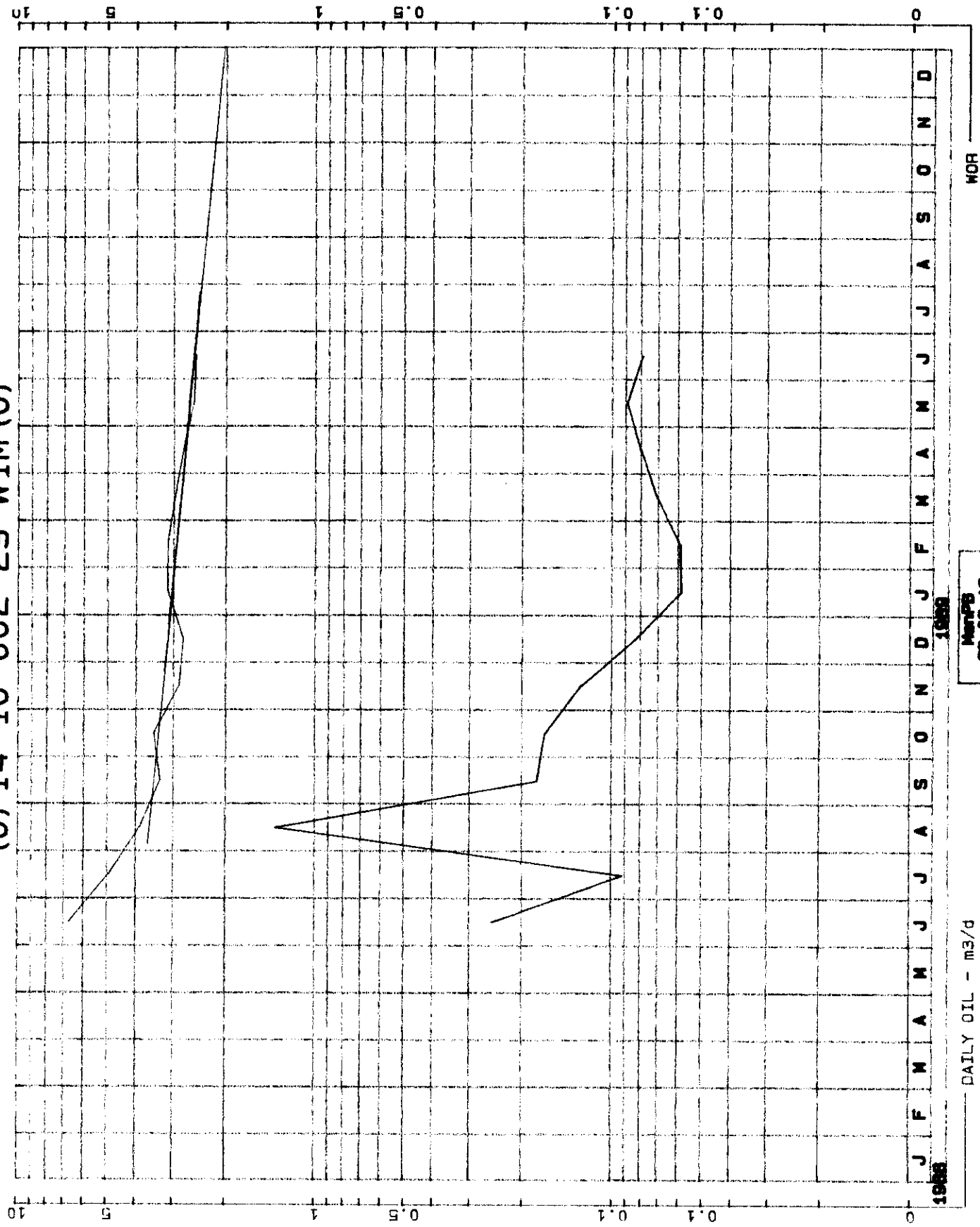


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--- DAILY OIL -- m3/d

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10036 C (00)



DAILY OIL - m3/d

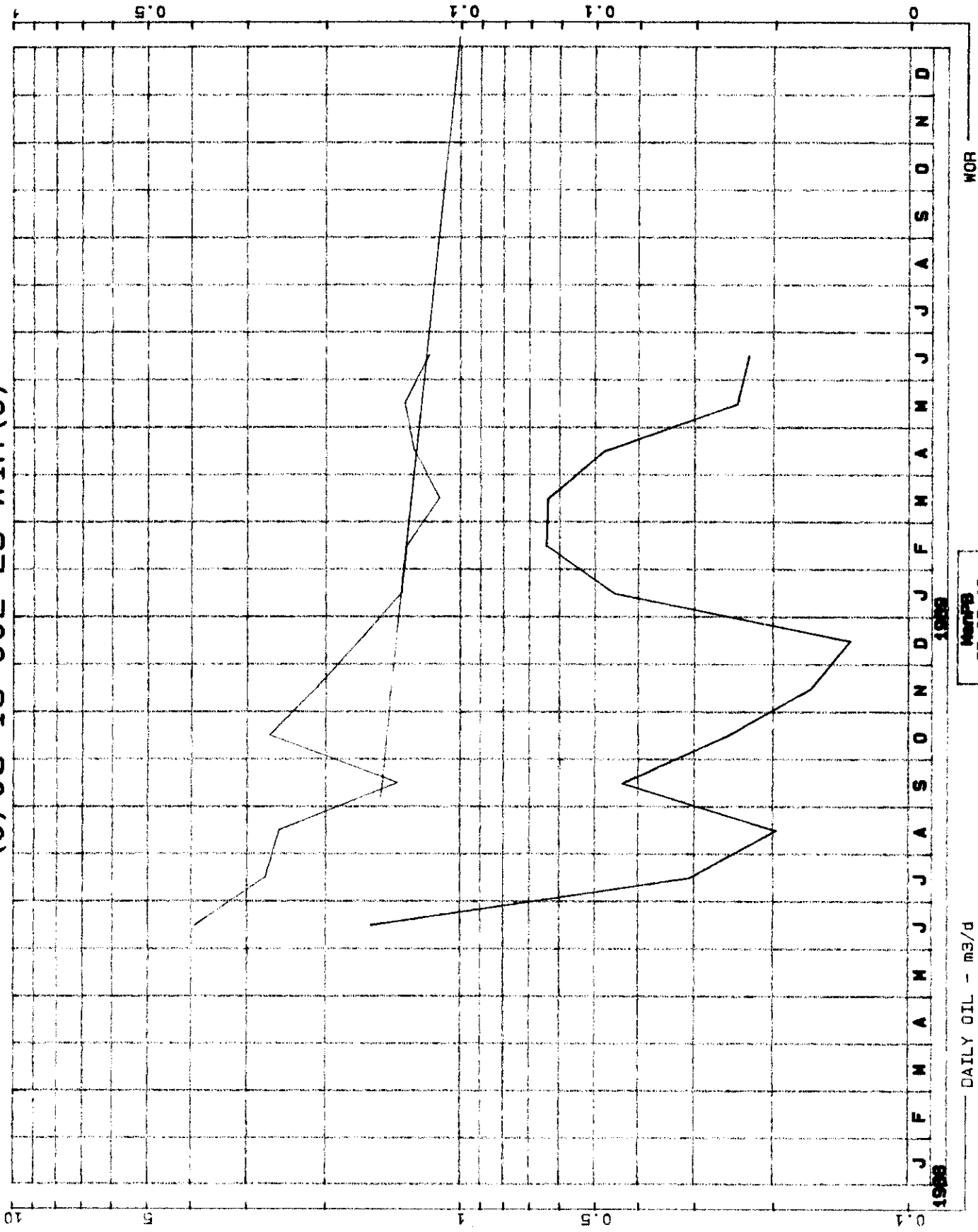
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WOR



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ME 36 D 200

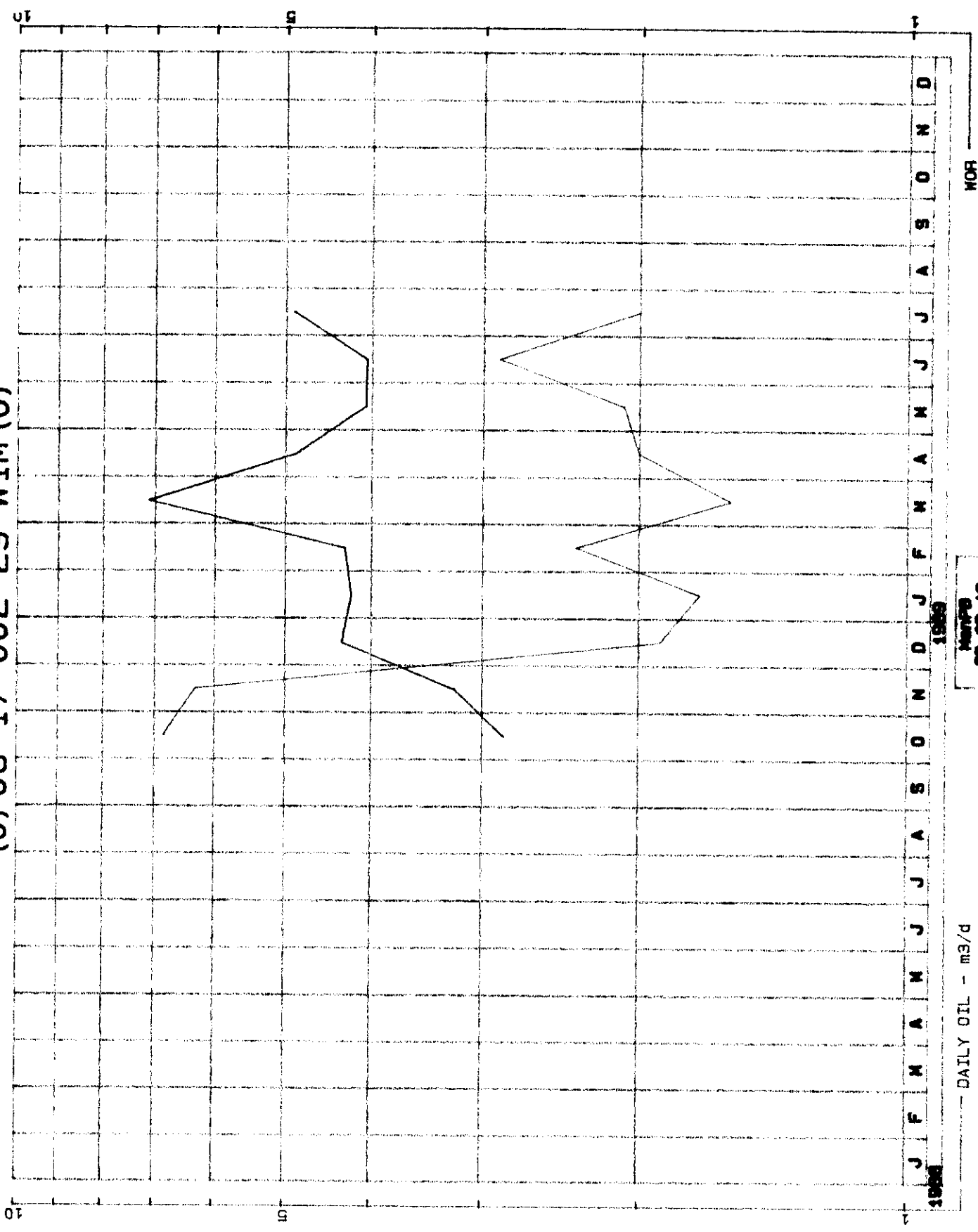


DAILY OIL - m3/d

WOR

WAPB  
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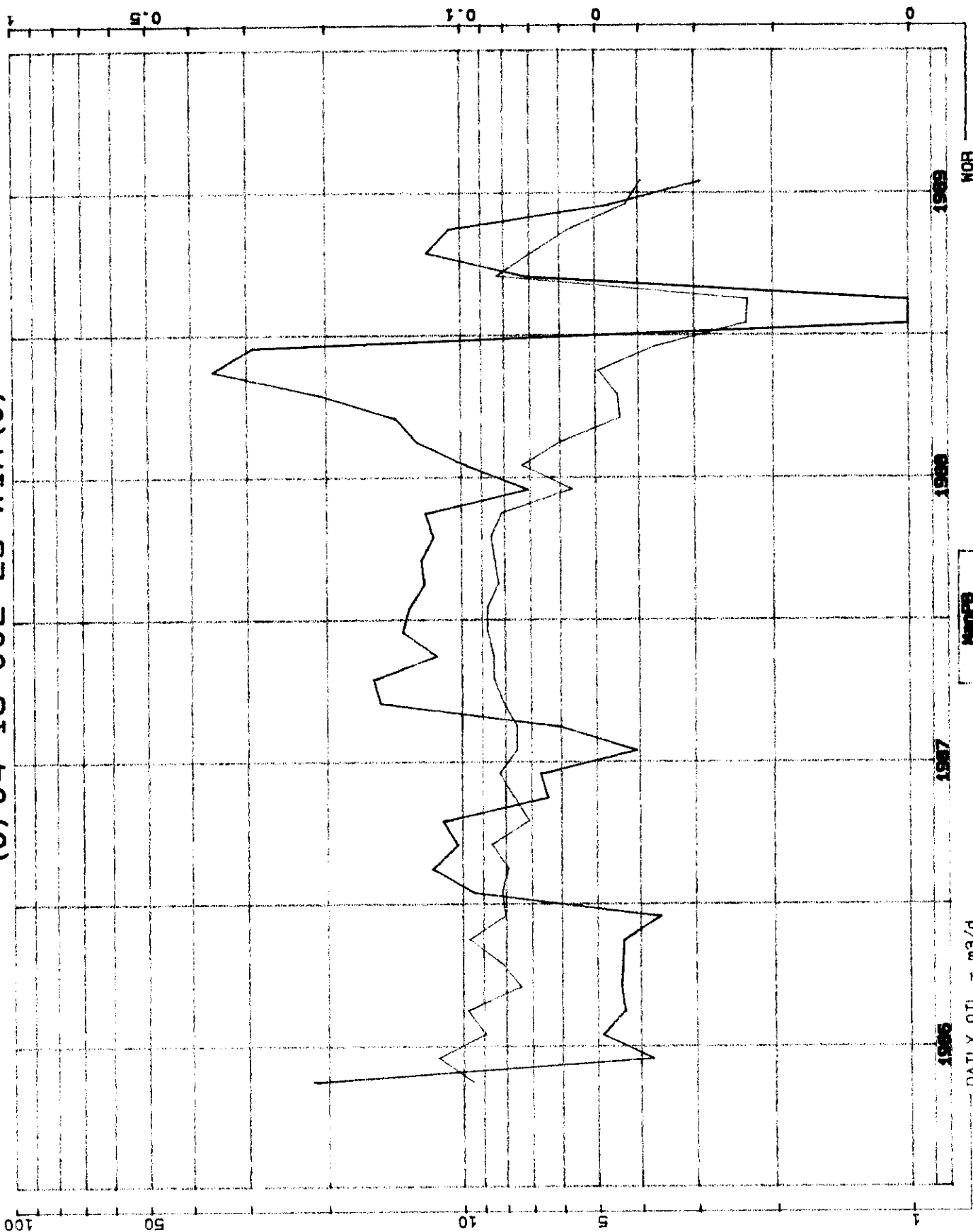


DAILY OIL - m3/d

DATE  
00-00-12  
12 44 38

WDR

(0) 04-15-002-29 W1M (0)



DAILY OIL - m3/d

NAFEB  
88-08-12  
15:32:09

NOR

## NOTES ON HOME OIL'S APPLICATION TO INCREASE SPACING

1.- Basis of 12% recovery factor.

2.- Are you assuming the same recovery factor for 40 acres as for 80 acres? Basis?

- The literature plus some Manitoba examples suggest recovery can be improved by reducing spacing from 40 to 20 acres by  $\pm$  5%. The increase in recovery is normally associated with reservoir heterogeneity.

- Conceptually, one would anticipate that a similar, perhaps even greater difference in recovery would result in going from 80 acres to 40 acres.

- What evidence do you have to support reservoir homogeneity? *geological?*

3.- Concern that estimated ultimate recovery is very low (12% of OO1P).

- Has the feasibility of enhanced recovery (waterflood) been considered?

- Would infilling to 40 acres be required?

Suggest that if the current application is approved, a requirement for a comprehensive feasibility study of waterflooding as a means of enhancing recovery will be required.

4.- Should provide maps showing reservoir limits for both Lower Amaranth and Mission Canyon pools. Does the geology and configuration of the Mississippian pools lend itself to 80 acre development?

5.- Well investment total to drill complete and tie in \$m<sup>444</sup> appears high. (Tundra estimate \$m<sup>250</sup>). With experience gained from current wells, is there any opportunity to reduce the cost? (ie: is there a learning curve effect?) Similarly, operating costs appear high (fixed = \$18 000/yr vs \$15 000/yr for Tundra variable \$15/m<sup>3</sup> vs for Tundra).

6.- MPR rates. Approval of an increased MPR is not automatic based on spacing. This would require separate approval. Home's application does not provide sufficient technical justification for the proposed increase in MPR. Justification should include a technical analysis of the effect of increased rates on ultimate recovery and/or an economic analysis of the need for increased MPR's. Note that normally, the only provision for increased MPR's has been in pressure maintenance projects. Any approval may have to include a buffer zone to protect correlative rights.

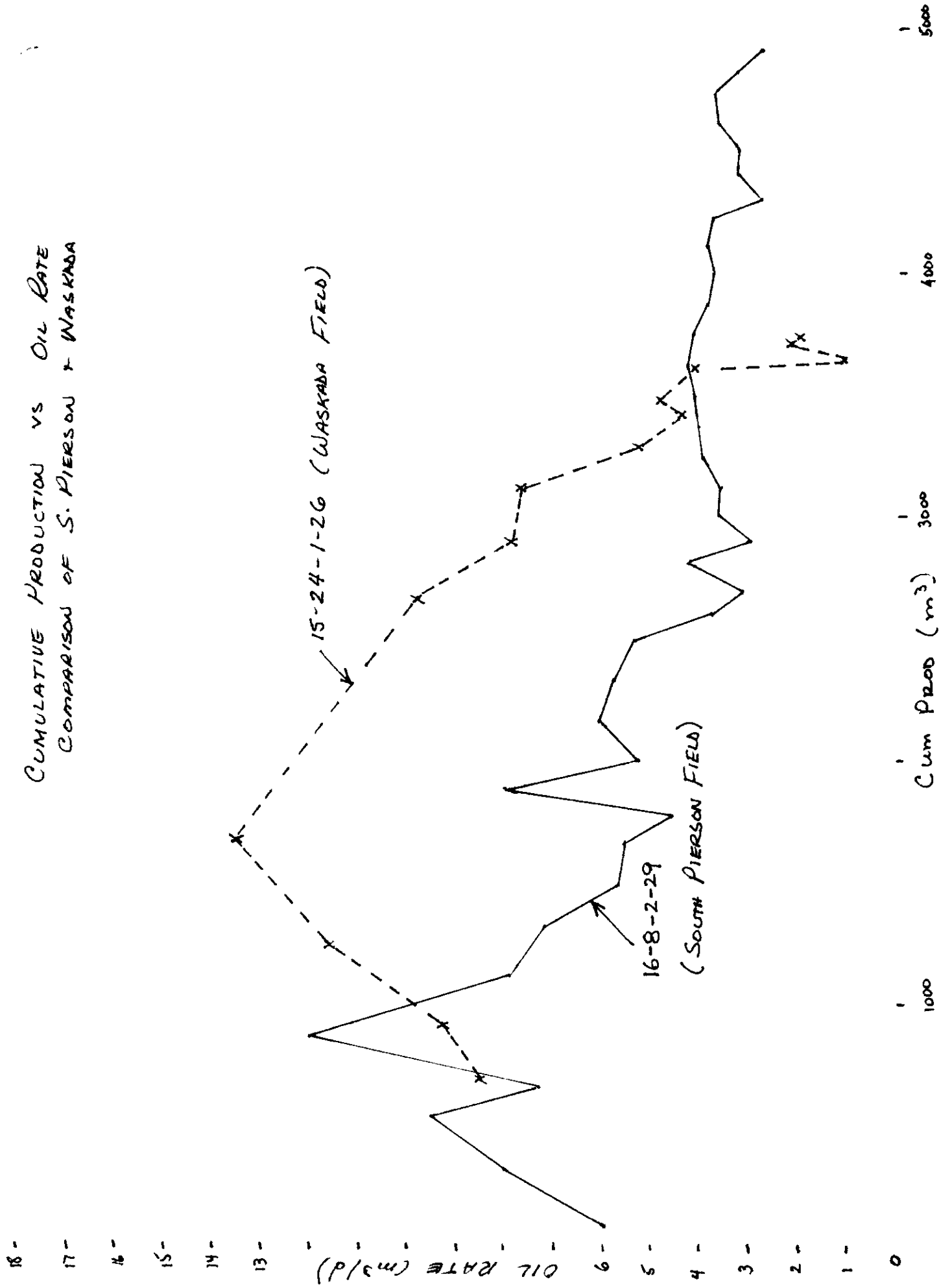
*Would like to see economic runs re done at more reasonable oil prices and assuming some incremental recovery for 40 acre cases.*

*- Pb = 4551  
What is estimate of current pressure  
- Any evidence that when newer wells were drilled that pressures had declined?*

*expect to be 2 years away.*

7. Completion technology. Has risk of unsuccessful completions been eliminated? How would 80 acre spacing be affected if a completion was unsuccessful?
8. Maps showing Crown offsets assuming 80 and 40 acre spacing.

# CUMULATIVE PRODUCTION VS OIL RATE COMPARISON OF S. PIERSON & WASKADA



Reserves comparison  
 $\frac{MC}{1}$   $\frac{LA}{10}$

vertical  
fracturing of  
attached zones

- main sand  
variables  
6-19 best well  
20 md.  
average 5 md - 15 md  
core plugs

9.1 to 12.2  
90 recovery  
in Washed.

Tentative Agenda  
Home Oil - South Pierson

1. Application for Special Drilling Spacing Units
2. Offset Obligations
3. 1989 Development Plans
4. Commingling of Lower Amaranth and Mission Canyon Production
5. Other Business

will get a bottom hole  
PUT

22/23 wells cased

16/22 prod.

13 L. Am

3 MC

6 wells - 1 SWB

- 5 fraced into MC.

Prod 2000 m<sup>3</sup> +

Cap. expenditure  $\approx$  \$10 million  
not including land/op costs

## INCREASED SPACING APPLICATION

1- REQUIRES APPROVAL OF O+N6CB.

PETROLEUM has responsibility to evaluate application and provide recommendations to the Board.

~~2. While~~

2. We've reviewed the material you provided in some detail

3. While we are not necessarily against 80 acre spacing, we do have some concerns and questions regarding your application.

4. 80 acre spacing must be justified on technical <sup>economic</sup> grounds. (i.e. you must convince us that economic recovery will be maximized.)

5. Upon review of your application we feel additional justification and support is needed in some areas.

6. Because the decision on spacing will have an impact on offsets and because there are free hold offsets as well as Crown, we will have to give free hold owners an opportunity to present their views (i.e. advertisement)



1989 development plans.

success of 7 well program  
what happened to other 10 wells

Commingling (Wastuda & Daly)

- Production reported separately for each zone
- Yearly isolation and production testing of one zone req'd
- ~~Down~~ Fluid level kept low.
- Testing of the non producing zone prior to commingling
- Bimonthly status reports

# Home's WH Prices.

<u>Year</u>	<u>Revenue</u>	<u>Prod</u>	<u>Price</u>	
89	158 942	1477	107.61	17.11
90	184 577	1715	107.62	17.11
91	119 158	1040	114.58	18.22
92	78 908	630	125.25	19.91
93	52 872	382	138.40	22.00
94	35 095	223	157.38	25.02

CURRENT (JAN 89) PRICE IS 122.78

## OFFSET Requirements

- 40 acres      8
- 80 acres      7
- some are definitely sub economic and will not be called at this time
- due to low oil prices a few more would likely be deferred.
- this leaves 2 or 3 that we are concerned about
  - a) offset production would suggest they can be economically drilled at current prices
  - b) continued offset production may cause drainage and loss of revenue to the Crown
- Prepared to wait on any offset call until spacing issue is resolved.
- Does S. Person 1989 activity depend on oil prices.
- At what price could we see active development of the Field.

## OIL AND NATURAL GAS LEASES

TOWNSHIP 2

RANGE 29

<u>Location</u>	<u>Area (ha)</u>	<u>Lease No.</u>	<u>Holder*</u>
1/2 Sec. 2-2-29	128	L862-769	Home Oil Company Limited
SE 1/4 Sec. 4-2-29	64	L861-692	Scurry-Rainbow Oil Limited
N 1/2 Sec. 4-2-29	128	L861-693	Home Oil Company Limited
SE 1/4 Sec. 6-2-29	64	L861-694	Scurry-Rainbow Oil Limited
NW 1/4 Sec. 6-2-29	64	L861-695	Home Oil Company Limited
S 1/2 Sec. 8-2-29	128	L861-696	Scurry-Rainbow Oil Limited
NE 1/4 Sec. 10-2-29	64	L851-528	Home Oil Company Limited
S 1/2 Sec. 11-2-29	128	L862-771	Scurry-Rainbow Oil Limited
NE 1/4 Sec. 11-2-29	64	L862-776	Home Oil Company Limited
NW 1/4 Sec. 11-2-29	64	L862-770	Scurry-Rainbow Oil Limited
NW 1/4 Sec. 12-2-29	64	L881-860	Lastditch Investments Ltd.
S 1/2 Sec. 14-2-29	128	L862-772	Home Oil Company Limited
All Sec. 16-2-29	256	L851-529	Scurry-Rainbow Oil Limited
SE 1/4 Sec. 18-2-29	64	L861-697	Home Oil Company Limited
NW 1/4 Sec. 18-2-29	64	L861-698	Scurry-Rainbow Oil Limited
All Sec. 20-2-29	256	L851-530	Home Oil Company Limited
All Sec. 22-2-29	256	L851-550	Scurry-Rainbow Oil Limited
SE 1/4 Sec. 24-2-29	64	L862-790	Newscope Resources Limited
S 1/2 & NE 1/4 Sec. 28-2-29	192	L881-861	Manitoba Oil and Gas Corp.
SE 1/4 Sec. 29-2-29	64	L871-810	Brosco Fund Limited
SW 1/4 Sec. 29-2-29	64	L871-796	Pioneer Energy Resources Ltd.
NW 1/4 Sec. 29-2-29	64	L871-811	Omega Hydrocarbons Ltd.
NE 1/4 Sec. 29-2-29	64	L871-812	Omega Hydrocarbons Ltd.
Ptn. NE 1/4 Sec. 32-2-29	64.004	L852-623	Omega Hydrocarbons Ltd.
SE 1/4 Sec. 32-2-29	64	L852-648	Copperhead Oil Company Ltd.
Ptn. E 1/2 Sec. 34-2-29	132.891	L881-862	Brosco Fund Limited
SW 1/4 Sec. 36-2-29	64	L852-633	Pioneer Energy Resources Ltd.
			Omega Hydrocarbons Ltd.
			Manitoba Oil and Gas Corp.

2000/08/14  
M-12/14