



Chevron Canada Resources Limited
500 - Fifth Avenue S.W., Calgary, Alberta T2P 0L7

K.E. Godard
Chief Engineer

1986-02-04

Daly Lodgepole "A" Pool
Daly Unit No. 3
Request For Reduced Drilling
Spacing Unit Approval

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

Attention: C. S. Kang, Chairman

Gentlemen:

1. Pursuant to Section 20 (3) of the Petroleum Drilling and Production Regulations - 1984, Chevron Canada Resources Limited, as Operator of Daly Unit No. 3 in the Daly Lodgepole "A" Pool, requests approval for reduced drilling spacing units in Unit No. 3. The current approved well spacing in Daly Unit No. 3 is 16 ha and Chevron requests that the approved drilling spacing unit be reduced to 8 ha. The wells drilled on reduced spacing would be located at the intersection of the legal subdivision boundaries in order to minimize pattern skew.
2. The royalty and working interest owners within one km of Daly Unit No. 3 are shown in Table 1.
3. Daly Unit No. 3 has been developed with 16 ha well spacing and oil recovery to date is 17% of OOIP.
4. Daly Unit No. 1 has been partially developed with 8 ha well spacing and oil recovery to date is 33% of OOIP.

5. Projected ultimate recovery from Unit No. 1 using various methods is:

- a) 34% of OOIP from a oil recovery versus water cut correlation.
- b) 39% of OOIP from a log WOR versus cumulative production plot.
- c) 48% of OOIP from a log oil rate versus time curve (see Appendix A for details).

Projected ultimate recovery from Unit No. 3 is 30% of OOIP from a log oil rate versus time curve.

6. The above data indicates that reduced well spacing will increase oil recovery in Unit No. 3 by 4 to 9% of OOIP or 320 to 720 10^3 m^3 of oil.
7. Chevron plans to evaluate the effects of 8 ha well spacing in Daly Unit No. 3 by drilling four wells around Injector 6-12-10-28 (See Figure 1). If the infill drilling pilot proves economically successful, 8 ha well spacing would be implemented in other areas of Unit No. 3 where economically feasible.
8. Figure 2 shows the production forecasts for the pilot area before and after the infill drilling.
9. Manitoba Regulations require that wells be at least 100 m from a Unit boundary. Thus any infill wells drilled between the Unit boundary and existing 16 ha wells would be off pattern. At this time, Chevron does not plan to drill any 8 ha wells between the Unit boundary and existing Unit wells. Therefore, the 8 ha infill wells will not have any effect on the correlative rights of the royalty and working interest owners within .5 km of Daly Unit No. 3.
10. Chevron's interpretation of the Regulations indicates that oil production from new wells drilled on approved spacing, will have new oil royalty or mineral tax status.

Any questions regarding this Application should be directed to Doug Schierman at (403) 234-5150 at the letterhead address. Requests for additional copies should be directed to our Information Centre.

Sincerely,

Doug Schierman
for C. G. FOLDEN, P.Eng.
Supervising Engineer
Reservoir

DS/ds

cc: H. C. Moster,
Director of Petroleum Branch

TABLE NO. 1

Interest	Legal Description	Owner/Lessor	Lessee
	<u>Twp. 9, Rge. 28 WPM</u>		
Und. 1/4	E-1/2	Lillian Alemina Gray	Chevron Canada Resources
Und. 1/2	NE-1/4	John Wesley Clarke	Chevron Canada Resources
Und. 1/4	E-1/2	Canada Permanent Trust	Chevron Canada Resources
All	NW-1/4	Province of Manitoba	Chevron Canada Resources
Und. 1/4	NE-1/4	Richard Truman Perry	Chevron Canada Resources
Und. 1/4	NW-1/4	Richard Truman Perry	Chevron Canada Resources
Und. 1/8	N-1/2 & S-1/4	Stewart Harvey Lowdon	Chevron Canada Resources
Und. 1/16	SW-1/4	Stewart Harvey Lowdon	Chevron Canada Resources
Und. 1/8	N-1/2 & SE-1/4	Glen Robson Lowdon	Chevron Canada Resources
Und. 1/16	SW-1/4	Glen Robson Lowdon	Chevron Canada Resources
Und. 1/8	N-1/2 & SE-1/4	Alma May Williams	Chevron Canada Resources
Und. 1/16	SW-1/4	Alma May Williams	Chevron Canada Resources
Und. 1/8	N-1/2 & SE-1/4	Clifford Lowdon	Chevron Canada Resources
Und. 1/16	SW-1/4	Clifford Lowdon	Chevron Canada Resources
Und. 1/4	All	Trilogy Resources	Freehold
	<u>Twp. 10, Rge. 28 WPM</u>		
All	NW-1/4	Royal Trust as Execu. of J.E. Coulter	Chevron Canada Resources
All	W-1/2	Gerald Benjamin Haskett	Chevron Canada Resources
All	SE-1/4	Cecil James Williams	Chevron Canada Resources
All	SE-1/4	Dominion of Canada	Chevron Canada Resources
All	SW-1/4	Cecil James Williams	Chevron Canada Resources
All	NE-1/4	Norman R. Williams	Chevron Canada Resources
Und. 1/2	Lsds. 11 & 14	Lillian Marie Donaldson*	Chevron Canada Resources
Und. 1/2	Lsds. 11 & 14	Dorothy Mary Manser*	Chevron Canada Resources
Und. 1/2	Lsds. 6, 7 & 8 & NE-1/4	Lillian Marie Donaldson	Chevron Canada Resources
Und. 1/2	Lsds. 6, 7 & 8 & NE-1/4	Dorothy Mary Manser	Bravo Resources et al
Und. 1/2	Lsd. 9	Canada Permanent Trust	Bravo Resources et al
Und. 1/4	Lsd. 9	Scurry-Rainbow Oils	Chevron Canada Resources
Und. 1/2	Lsd. 9	Cleland H.F. Mitchell	Chevron Canada Resources
Und. 1/2	Lsd. 9	Wilfred L. Mitchell	Chevron Canada Resources
Und. 1/60	Lsd. 9	Thelma N. Mitchell	Chevron Canada Resources
Und. 1/60	Lsd. 9	Ilene A. Riddle	Chevron Canada Resources
Und. 1/60	Lsd. 9	Verna H. Mitchell	Chevron Canada Resources
Und. 1/60	Lsd. 9	Darlene G. Kellough	Chevron Canada Resources
Und. 1/60	Lsd. 9	William E. Mitchell	Chevron Canada Resources
All	Lsds. 3 & 6	Manitoba Crown	Chevron Canada Resources

All	Lsd. 15 & NW-1/4	Sec. 10	Manitoba Crown	Beaverhead Resources et al
Und. 1/8	SE-1/4	Sec. 10	Canada Permanent Trust	South Central Developments
Und. 1/4	SE-1/4	Sec. 10	Marjorie F. Andrew	
Und. 1/8	SE-1/4	Sec. 10	Canada Permanent Trust	
Und. 1/4	SE-1/4	Sec. 10	Canada Permanent Trust	
Und. 1/4	SE-1/4	Sec. 10	Canada Permanent Trust	
Und. 1/4	Lsds. 3 & 6	Sec. 15	William Witterman*	Canadian Landmaster Resources
Und. 1/24	Lsds. 3 & 6	Sec. 15	Norman F. Shoemaker*	
Und. 1/24	Lsds. 3 & 6	Sec. 15	Frederick J. Shoemaker*	
Und. 1/24	Lsds. 3 & 6	Sec. 15	Lawrence A. Shoemaker*	
Und. 1/24	Lsds. 3 & 6	Sec. 15	Robert J. Shoemaker*	
Und. 1/24	Lsds. 3 & 6	Sec. 15	Irene M. Bowe*	
Und. 1/24	Lsds. 3 & 6	Sec. 15	Herbert Shoemaker*	
Und. 1/4	Lsds. 3 & 6	Sec. 15	Donald H. Harley*	
Und. 1/4	Lsds. 9 & 10	Sec. 15	Sidney D. Parsons*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Norman F. Shoemaker*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Frederick J. Shoemaker*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Lawrence A. Shoemaker*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Robert J. Shoemaker*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Irene M. Bowe*	
Und. 1/12	Lsds. 9 & 10	Sec. 15	Herbert Shoemaker*	
Und. 1/16	Lsds. 9 & 10	Sec. 15	Laetitia Bougard*	
In Common	Lsds. 9 & 10	Sec. 15	George S. Shoemaker*	Donald Harley Ins. Agencies Ltd
3/16	Lsds. 9 & 10	Sec. 15	Albert C. Shoemaker*	
In Common	Lsds. 9 & 10	Sec. 15	David B. Smith*	
3/16	SE-1/4	Sec. 15	Sidney D. Parsons*	
Und. 1/4	SE-1/4	Sec. 15	Canada Permanent Trust*	
Und. 1/4	SE-1/4	Sec. 15	Thomas Manikowski*	Centoba Oil
In Common	SE-1/4	Sec. 15	Donald H. Harley *	
1/8	Lsd. 11	Sec. 15	Sidney D. Parsons*	Canadian Landmasters Resources
Und. 1/8	Lsd. 11	Sec. 15	Canada Permanent Trust*	
Und. 1/4	Lsd. 11	Sec. 15	Scurry-Rainbow Oils*	
Und. 1/4	Lsd. 11	Sec. 15	Earl Schwartz*	
Und. 1/8	Lsd. 11	Sec. 15	Donald H. Harley*	
Und. 1/8	Lsd. 11	Sec. 14	Norah M. Young	
Und. 1/4	Lsds. 11, 13 & 14	Sec. 14	Estate of John M. Young	
Und. 1/2	Lsds. 11, 13 & 14	Sec. 14		

Und. 1/8	Lds. 11, 13 & 14	Sec. 14	Katherine A. Angell	Rideau Pete et al
Und. 1/8	Lds. 11, 13 & 14	Sec. 14	Mary T. Young	
Und. 1/4	NE-1/4	Sec. 14	Canada Permanent	
Und. 1/2	NE-1/4	Sec. 14	Estate of John M. Young	
Und. 1/8	NE-1/4	Sec. 14	Katherine A. Angell	
Und. 1/8	NE-1/4	Sec. 14	Mary T. Young	
Und. 1/4	Led. 1	Sec. 14	Canada Permanent Trust	Chevron Canada Resources
Und. 3/4	Led. 1	Sec. 14	Estate of John M. Young	Chevron Canada Resources
Und. 1/4	Led. 7	Sec. 14	Canada Permanent Trust	Rideau Pete et al
Und. 3/4	Led. 7	Sec. 14	Estate of John M. Young	Chevron Canada Resources
Und. 1/4	Lds. 2 & 7	Sec. 23	George H. Young	Chevron Canada Resources
Und. 1/2	Lds. 2 & 7	Sec. 23	Estate of John M. Young	Chevron Canada Resources
Und. 1/4	Lds. 2 & 7	Sec. 23	Patricia J. Detmer	Chevron Canada Resources
Und. 1/4	Led. 10	Sec. 23	George H. Young	Chevron Canada Resources
Und. 2/4	Led. 10	Sec. 23	Estate of John M. Young	Chevron Canada Resources
All	Lds. 11 & 12	Sec. 23	Estate of John M. Young	Chevron Canada Resources
Und. 1/4	SW-1/4	Sec. 23	Patricia J. Detmer	Chevron Canada Resources et al
Und. 1/4	SW-1/4	Sec. 23	Estate of John M. Young	Chevron Canada Resources et al
Und. 1/4	SW-1/4	Sec. 23	Ruth Joyce Naylen	Chevron Canada Resources et al
Und. 1/4	SW-1/4	Sec. 23	Canada Permanent Trust	Chevron Canada Resources et al
Und. 1/8	Lds. 1 & 8	Sec. 26	Canada Permanent Trust	Canadian Landmasters Resources
In Common 1/4	Lds. 1 & 8	Sec. 26	Evelyn M. Simpson	Canadian Landmasters Resources
In Common 1/4	Lds. 1 & 8	Sec. 26	Vera M. Lewis	Canadian Landmasters Resources
In Common 1/4	Led. 1 & 8	Sec. 26	Margaret Hunter	Canadian Landmasters Resources
Und. 1/8	Led. 1 & 8	Sec. 26	John W. Clarke	Canadian Landmasters Resources
Und. 1/2	Led. 1 & 8	Sec. 26	Canada Permanent Trust	Canadian Landmasters Resources
All	Led. 2	Sec. 25	Frank G. Wallace	Canadian Landmasters Resources
Und. 1/2	Lds. 1 & 8	Sec. 24	Canada Permanent Trust	Chevron Canada Resources
Und. 1/6	Lds. 1 & 8	Sec. 24	Edward G. Wardle	Chevron Canada Resources
Und. 1/9	Lds. 1 & 8	Sec. 24	Mary E. Turner	Chevron Canada Resources
Und. 1/9	Lds. 1 & 8	Sec. 24	Joyce I. Williamson	Chevron Canada Resources
Und. 1/9	Lds. 1 & 8	Sec. 24	Charles K. Wardle	Chevron Canada Resources
Und. 1/12	Lds. 10 & 15	Sec. 24	Edward G. Wardle	Chevron Canada Resources
Und. 1/4	Lds. 10 & 15	Sec. 24	Canada Permanent Trust	Chevron Canada Resources
Und. 1/8	Lds. 10 & 15	Sec. 24	Crown Trust Company	Chevron Canada Resources
Und. 1/8	Lds. 10 & 15	Sec. 24	Canada Permanent Trust	Chevron Canada Resources
Und. 1/4	Lds. 10 & 15	Sec. 24	Crown Trust Company	Chevron Canada Resources

Und. 1/18	Lsds. 10 & 15	Sec. 24	Mary E. Turner	Chevron Canada Resources
Und. 1/18	Lsds. 10 & 15	Sec. 24	Joyce L. Williamson	Chevron Canada Resources
Und. 1/18	Lsds. 10 & 15	Sec. 24	Charles K. Wardle	Chevron Canada Resources
In Common				
5/36	SW-1/4	Sec. 24	Russell W. Kelly	J. D. Jeter et al
In Common				
5/36	SW-1/4	Sec. 24	Will B. Scarth	J. D. Jeter et al
Und. 1/9	SW-1/4	Sec. 24	Mark H. Danzker	J. D. Jeter et al
Und. 1/2	SW-1/4	Sec. 24	Edward G. Wardle	J. D. Jeter et al
Und. 1/4	SW-1/4	Sec. 24	North Canadian Trust Co.	J. D. Jeter et al
Und. 3/4	Lsds. 11 & 12	Sec. 24	Edward G. Wardle	J. D. Jeter et al
Und. 1/9	Lsds. 11 & 12	Sec. 24	Mark H. Danzker	J. D. Jeter et al
In Common				
5/36	Lsds. 11 & 12	Sec. 24	Russell W. Kelly	J. D. Jeter et al
In Common				
5/36	Lsds. 11 & 12	Sec. 24	Will B. Scarth	J. D. Jeter et al
All	Lsds. 9 & 16	Sec. 13	Estate of John M. Young	Chevron Canada Resources
All	Lsd. 8	Sec. 13	Joe Haskett*	Chevron Canada Resources
<u>Twp. 10, Rge. 27 WPM</u>				
Und. 1/8	SW-1/4	Sec. 19	Canada Permanent Trust	New Scope Resources
Und. 1/2	SW-1/4	Sec. 19	Crown Trust Co.	New Scope Resources
Und. 1/8	SW-1/4	Sec. 19	Charles F. Schock	New Scope Resources
Und. 1/40	SW-1/4	Sec. 19	Henry C. Laltue	Chevron Canada Resources
Und. 9/160	SW-1/4	Sec. 19	Estate of Thomas Leach	New Scope Resources
Und. 9/80	SW-1/4	Sec. 19	North American Royalties Inc.	
Und. 1/4	NW-1/4	Sec. 18	John W. Clarke	
Und. 1/4	NW-1/4	Sec. 18	Canada Permanent Trust	
Und. 1/4	NW-1/4	Sec. 18	Robert B. Haskett	
Und. 1/4	NW-1/4	Sec. 18	Diane L. Haskett	
Und. 1/8	SW-1/4	Sec. 18	Canada Permanent Trust	
Und. 1/16	SW-1/4	Sec. 18	Sam G. Harrison	
In Common				
1/8	SW-1/4	Sec. 18	Elizabeth A. Lawrence	
In Common				
1/8	SW-1/4	Sec. 18	Louis H. Carufel	
In Common				
1/8	SW-1/4	Sec. 18	Pearla Kapphahn	
Und. 1/32	SW-1/4	Sec. 18	Robert V. Hodge	
Und. 3/16	SW-1/4	Sec. 18	Estate of George R. Doidge	Chevron Canada Resources

Und. 3/16	SW-1/4	Sec. 18	Marjorie A. Doidge	Chevron Canada Resources
Und. 1/64	SW-1/4	Sec. 18	John Louis Peterson	Chevron Canada Resources
Und. 1/64	SW-1/4	Sec. 18	Vernon F. Peterson	Chevron Canada Resources
Und. 1/4	SW-1/4	Sec. 18	James O. Porter	Chevron Canada Resources
All	Lsd. 2	Sec. 18	Federal Crown Land	
Und. 1/2	Lds. 10 & 15	Sec. 7	Richard T. Perry	Chevron Canada Resources et al
Und. 1/2	Lds. 10 & 15	Sec. 7	Donald F. Mitchell	Chevron Canada Resources et al
Und. 1/4	NW-1/4	Sec. 7	Richard T. Perry	Bedford Petroleum
Und. 1/4	NW-1/4	Sec. 7	Canada Permanent Trust	Bedford Petroleum
Und. 1/4	NW-1/4	Sec. 7	Donald F. Mitchell	Chevron Canada Resources et al
Und. 1/4	NW-1/4	Sec. 7	Richard T. Perry	Bedford Petroleum
All	Lds. 3, 5 & 6	Sec. 7	Federal Crown Land	Rundie Petroleum et al
Und. 1/4	Lds. 1, 2 & 7	Sec. 7	Richard T. Perry	Westmead Limited et al
Und. 3/8	Lds. 1, 2 & 7	Sec. 7	Blaine R. Mitchell	Westmead Limited et al
Und. 3/8	Lds. 1, 2 & 7	Sec. 7	Heather A. Murphy	Westmead Limited et al

Twp. 10, Rge. 27 WPM

All	SW-1/4	Sec. 6	Province of Manitoba	Chevron Canada Resources
All	Lds. 12 & 13	Sec. 6	Province of Manitoba	Chevron Canada Resources

1. A blank in the "Lessee" column indicates that the subject land is unleased as to mines and minerals.
2. An asterisk (*) beside the Owner/Lessor's name indicates that a Gross Royalty Trust Agreement may be in effect in respect of the subject lands.

FIGURE 1.
DALY NET PAY MAP (ft)

LEGEND

⊙ 8 HECTARE INFILL
WELLS

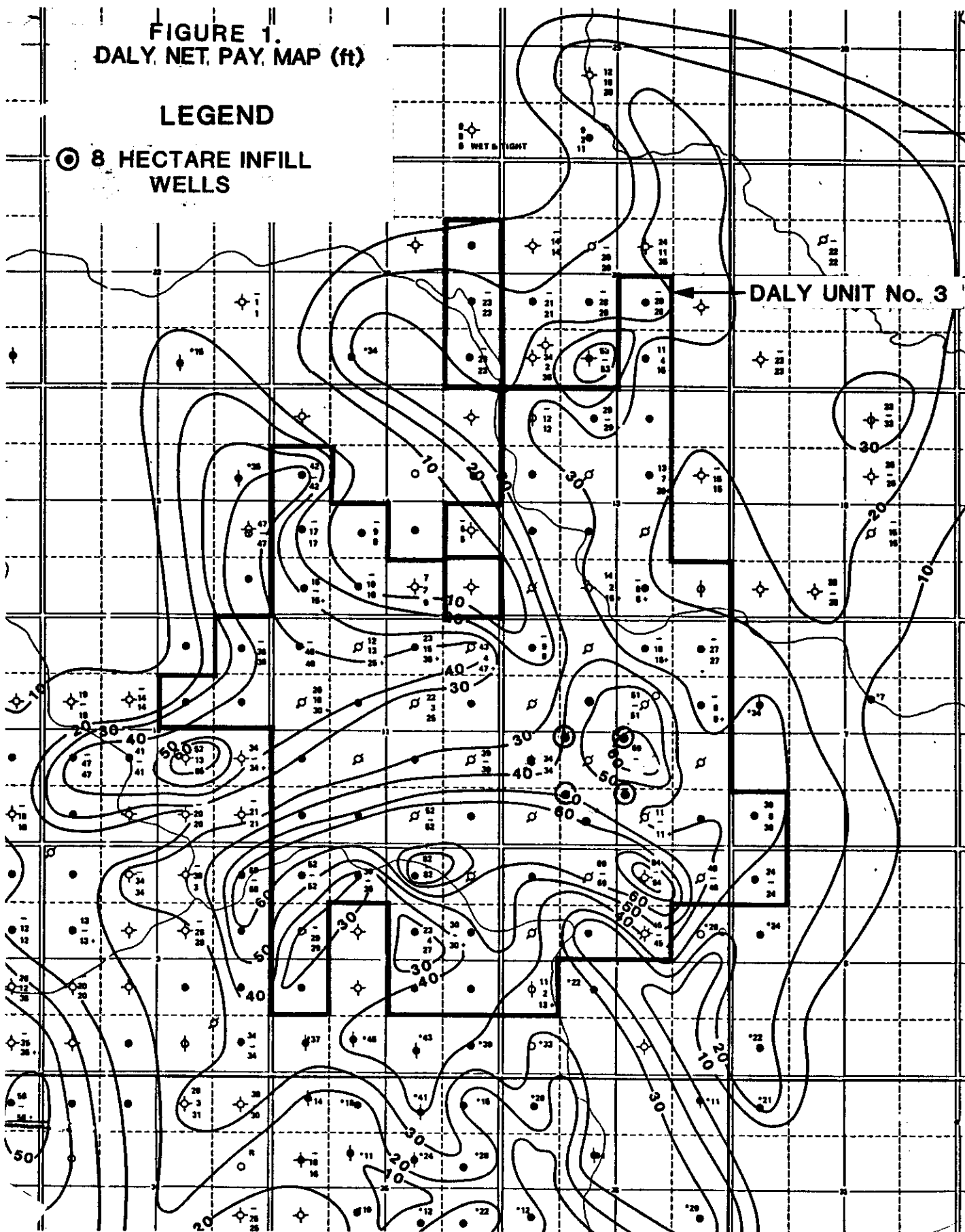
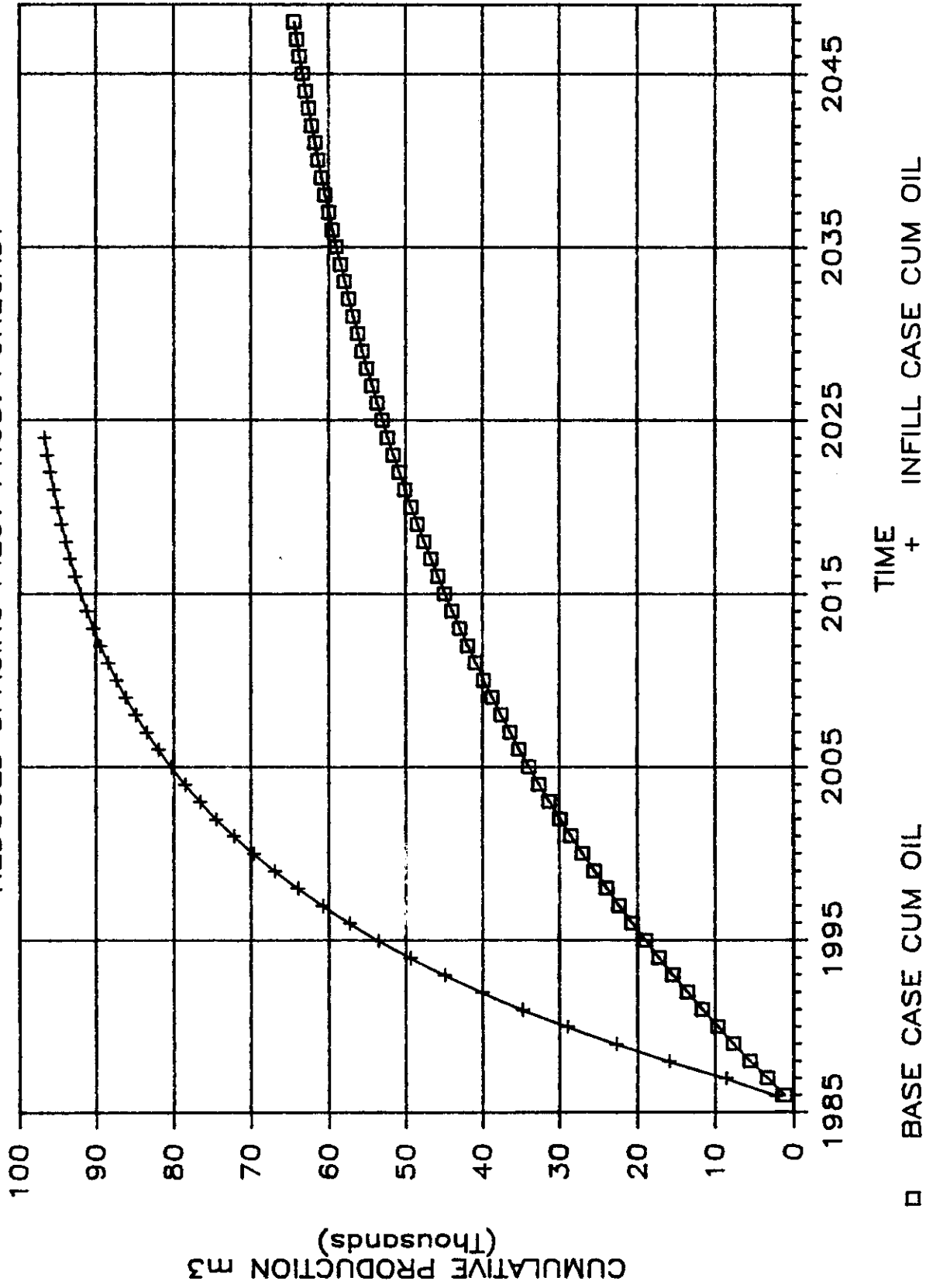


FIGURE 2

DALY UNIT NO. 3

REDUCED SPACING PILOT PROD. FORECAST



APPENDIX A

Performance of the Daly Lodgepole A Pool Waterfloods

Currently the Daly Unit No. 3 Waterflood is developed with 16 ha well spacing and 5 spot patterns. Unit No. 3 oil recovery is 17% of OOIP and the WOR is 1.3 (See Figure A1). The Daly Unit No. 1 Waterflood is partially developed with 8 ha well spacing and 5 spot patterns. Unit No. 1 oil recovery is 33% of OOIP and the WOR is 20 (See Figure A2). This production data indicates that Unit No. 1 is in a much later stage of depletion than Unit No. 3.

Ultimate oil recovery from Unit No. 3 is projected to be 30% of OOIP. The constant percentage decline formula, $q_t = q_i e^{-Dt}$ with parameters from the log oil rate versus time curve on Figure A1, was used to determine this value. The terminal oil rate was assumed to be 100 m³/mon. The log WOR versus cumulative production curve (See Figure A3) gave a projected recovery of 87%. This projected recovery is unrealistic so it was not used.

Projected ultimate oil recovery from Unit No. 1 using various methods is:

1. 34% of OOIP from extrapolating an oil recovery versus water cut correlation (see Figure A4) to a terminal WOR of 30.
2. 39% of OOIP from a log WOR versus cumulative production plot (using the equation $\log \text{WOR} = m N_p + b$ with parameters from Figure A5 and a terminal WOR of 30).
3. 48% of OOIP from a log oil rate versus time plot (using the constant percentage decline formula with parameters from Figure A2). The terminal oil rate was assumed to be 100 m³/mon.

The log oil rate versus time plot for Unit No. 1 gives a very high oil recovery compared to the other two methods. If these results are consistent with Unit No. 3, then the 30% recovery projected for Unit No. 3 could also be optimistic.

Assuming that the projected recoveries are reasonable, then Unit No. 3 oil recovery could be increased by 4 to 9% of OOIP by infill drilling to 8 ha well spacing. This amount of incremental oil is consistent with documented data. Literature on Texas carbonate oil reservoirs indicates that reducing well spacing from 16 ha to 8 ha will improve oil recovery from 4 to 8% of OOIP (see list of references). The reservoirs documented have porosities ranging from 4 to 15% and permeabilities ranging from .7 to 27 md. The Lodgepole Formation in the reduced spacing pilot area has an average porosity of 10% and permeabilities of about 6 md. Table A1 contains the well spacing and recovery efficiency for various Texas oil reservoirs (from Reference 4). This data indicates that oil recovery is significantly increased as well spacing decreases.

Reduced well spacing in Daly Unit No. 3 will increase oil recovery by:

1. Improving areal sweep efficiency.
2. Improving lateral pay continuity.
3. Reducing wedge - edge oil.
4. Reducing the life of the waterflood by accelerating oil production.

The wells on 8 ha spacing will be drilled in areas which are outside the flow paths between the current producers and injectors. These infill wells will provide new pressure sinks which will expand the flow paths and increase the areal sweep efficiency (see Reference 2).

The base case production forecast for the Reduced Spacing Pilot was based on current performance of the area. The reduced spacing production forecast was based on the performance of Daly Unit No. 1.

Figures A6 and A7 are geologic cross-sections through the Daly Lodgepole "A" Pool. These cross-sections show that some pay zones are not continuous from well to well. The result is that these noncontinuous zones cannot be effectively waterflooded. The uneven lateral extent of the pay zones also increases the wedge - edge oil losses (see Reference 2). Reduced well spacing will improve the lateral pay continuity between wells. This improved pay continuity will allow more zones to be effectively waterflooded and will also reduce wedge-edge oil losses.

In addition to improving oil recovery, infill wells will also accelerate oil production, (as indicated by the differences in current recoveries at Units 1 and 3). The Daly Unit No. 3 Waterflood is now 30 years old and casing corrosion could become more of a problem. The projected abandonment time for Daly Unit No. 3 is about 2 050. If a well should become unusable because of corroded casing and redrilling was uneconomic, loss of the well would result in lost oil reserves. With this scenario, any accelerated oil would become incremental oil. Therefore, Unit No. 3 should be depleted at a faster rate in order to maximize oil recovery.

Another benefit is that the infill wells will be cored and logged using current technology. Thus, better reservoir data will be obtained to help understand and evaluate the reservoir performance.

A reduced well spacing pilot will be used to evaluate the effects of 8 ha well spacing in Unit No. 3. Four wells will be drilled around Injector 6-12. This area was chosen because it has better quality reservoir and higher recoveries. The effects of reduced well spacing should occur sooner in better reservoir allowing a faster evaluation. The oil recovery in the 6-12 area is 21% versus a Unit recovery of 17%. If reduced well spacing is successful in this area, it should be successful in areas with lower recoveries.

In summary, reduced well spacing in Daly Unit No. 3 will help to maximize oil recovery by generating incremental and accelerated oil production.

References

1. Barber A. H., George C. J., Stiles L. H., Thompson B.B., Infill Drilling to Increase Reserves - Actual Experience in Nine Fields in Texas, Oklahoma, and Illinois, Paper SPE 11023 presented at SPE 57th Annual Fall Technical Conference, New Orleans, 1982-09-26 to 29.
2. Driscoll V. J., Recovery Optimization Through Infill Drilling - Concepts, Analysis, and Field Results, Paper SPE 4977 presented at SPE 49th Annual Fall Meeting, Houston, 1974-10-06 to 09.
3. George C. J., Stiles, L. H., Improved Techniques For Evaluating Carbonate Waterfloods in West Texas, J. Pet. Tech. 1978-11, pp. 1547 - 1554.
4. Van Everdingen A. F., Kriss H. S., Improving Recovery Efficiency by Secondary Techniques.
5. Van Everdingen A. F., Kriss H. S., New Approach to Secondary Recovery, Petroleum Engineer International, 1980-11.
6. Ershaghi I., Omoregie O., A Method For Extrapolation of Cut Versus Recovery Curves, J. Pet. Tech. 1978-02, pp. 203-204.

Table A1

<u>Field</u>	<u>Spacing</u>	<u>Recovery Efficiency</u>
East Texas	2 ha	85 - 90%
Conroe	8 ha	61%
Wesson	8 ha	60%
Mercy	16 ha	50%

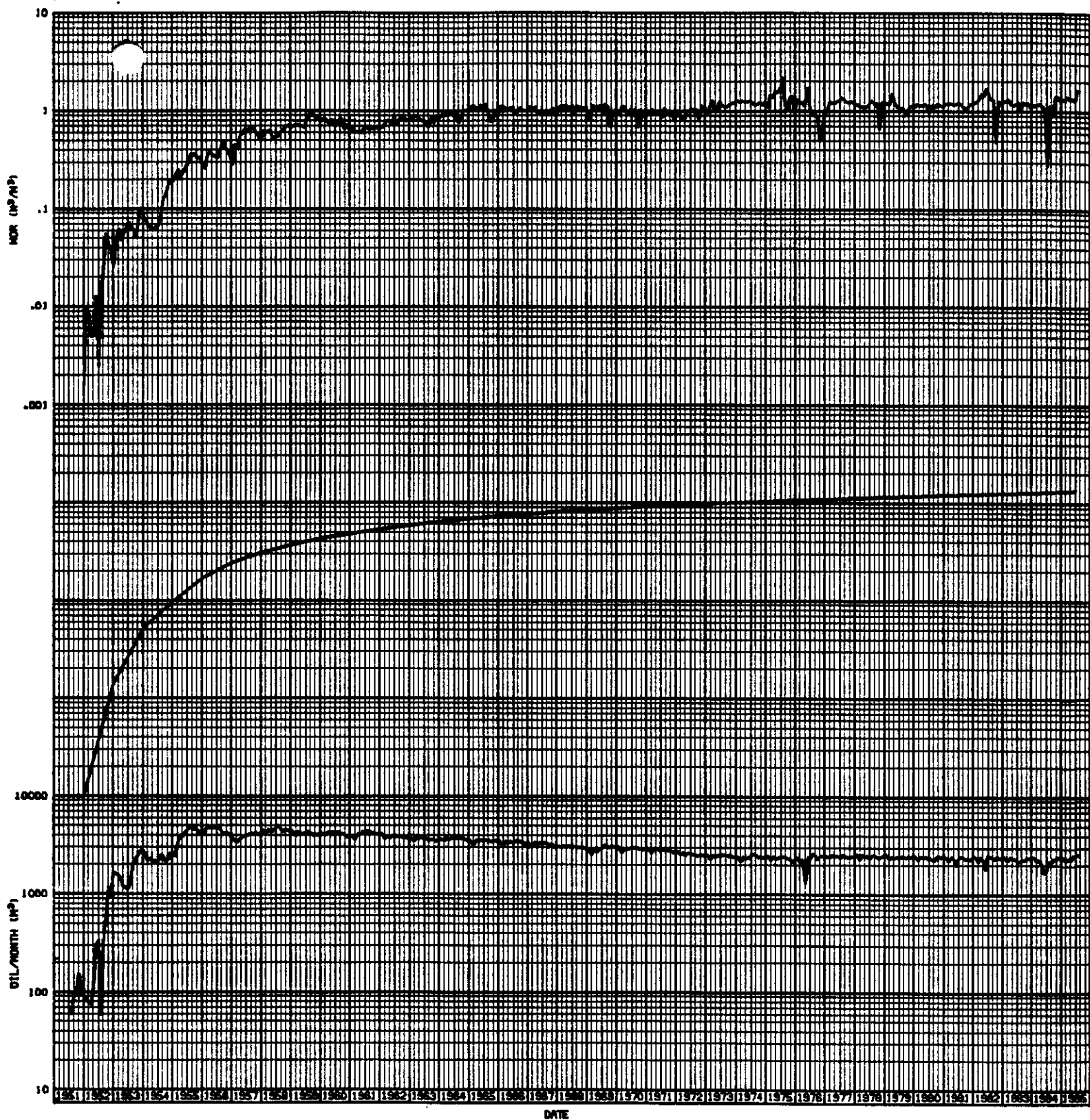


FIGURE A1
DALY UNIT NO.3
PRODUCTION PLOT

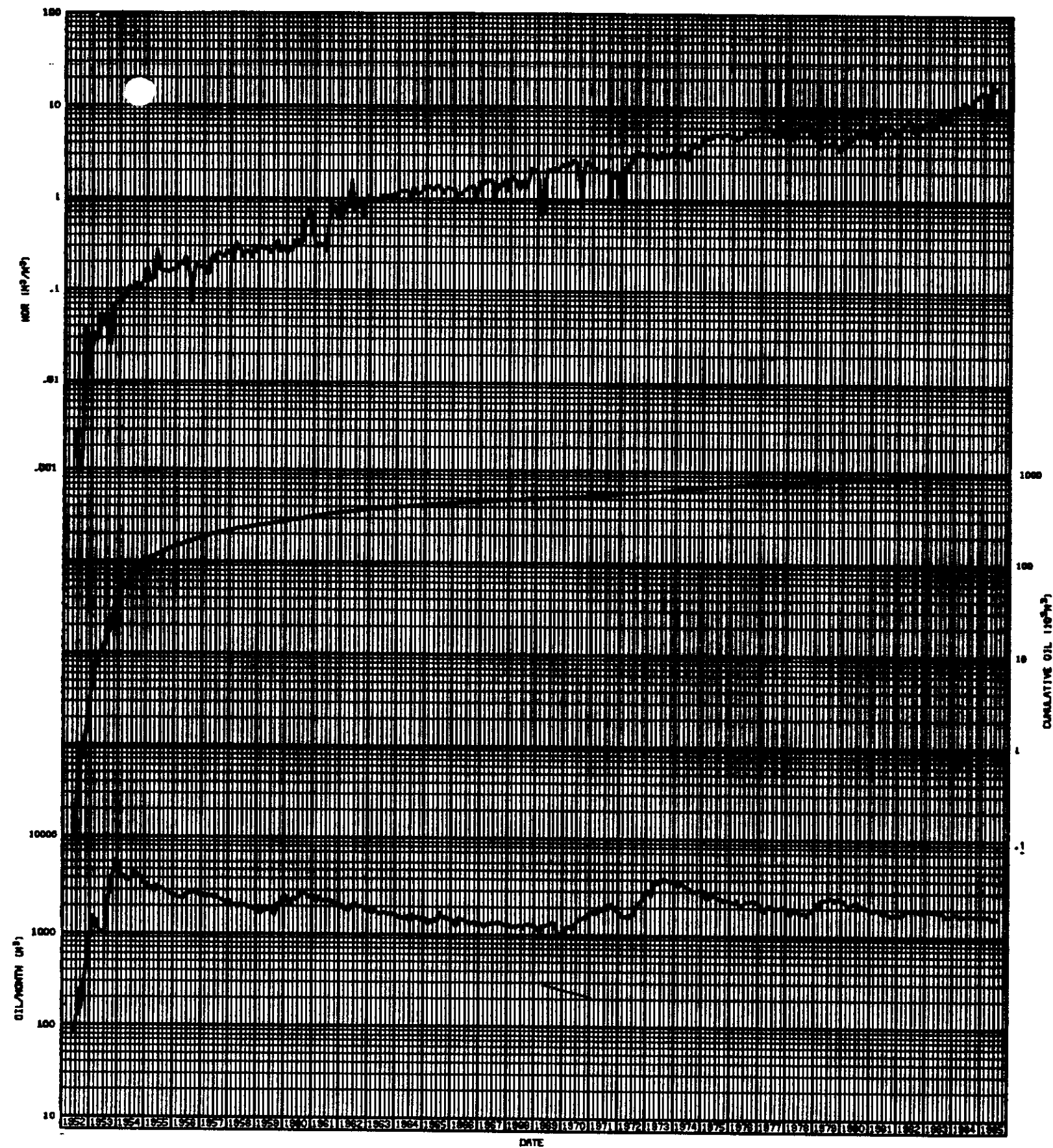


FIGURE A2
DALY UNIT NO.1
PRODUCTION PLOT

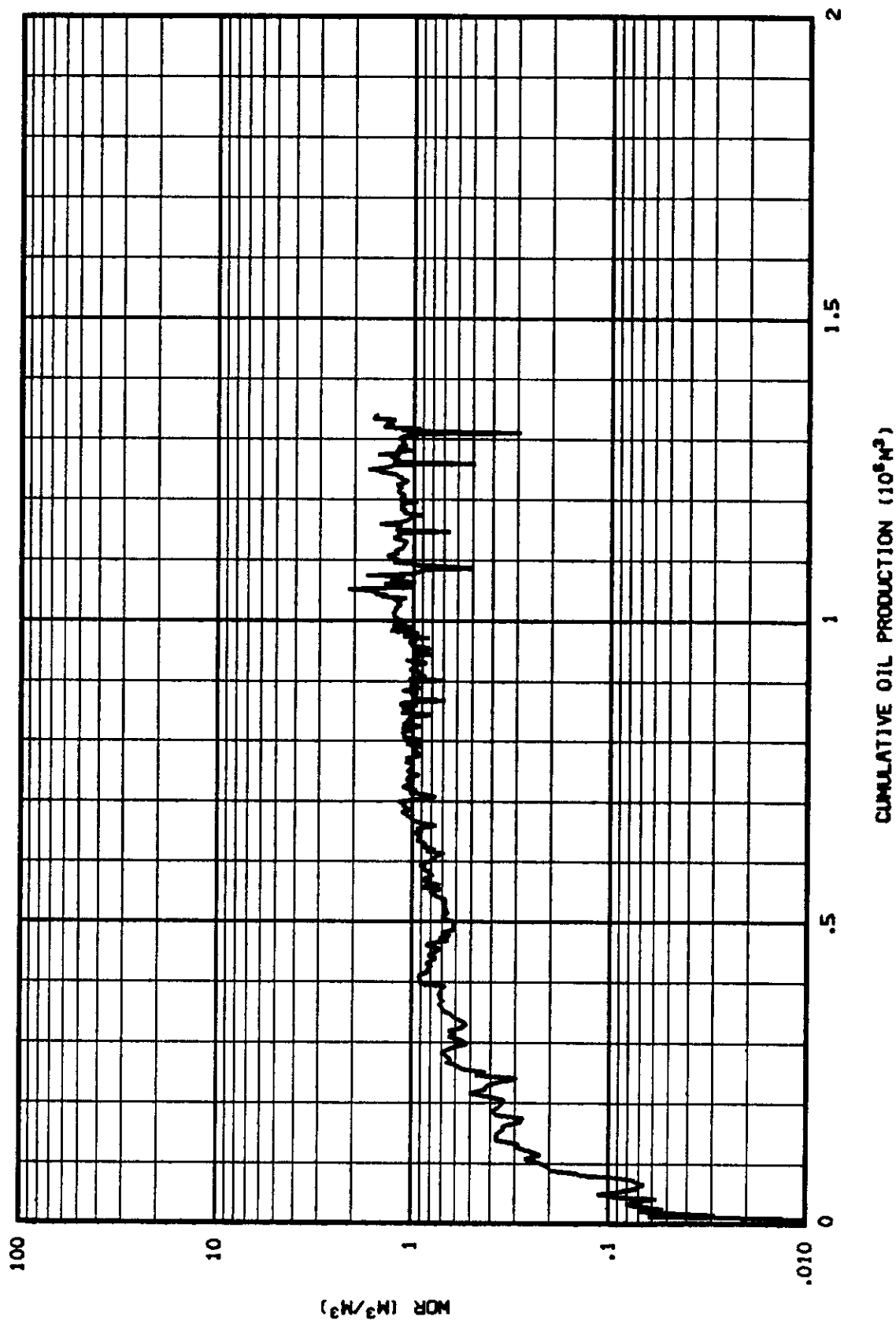
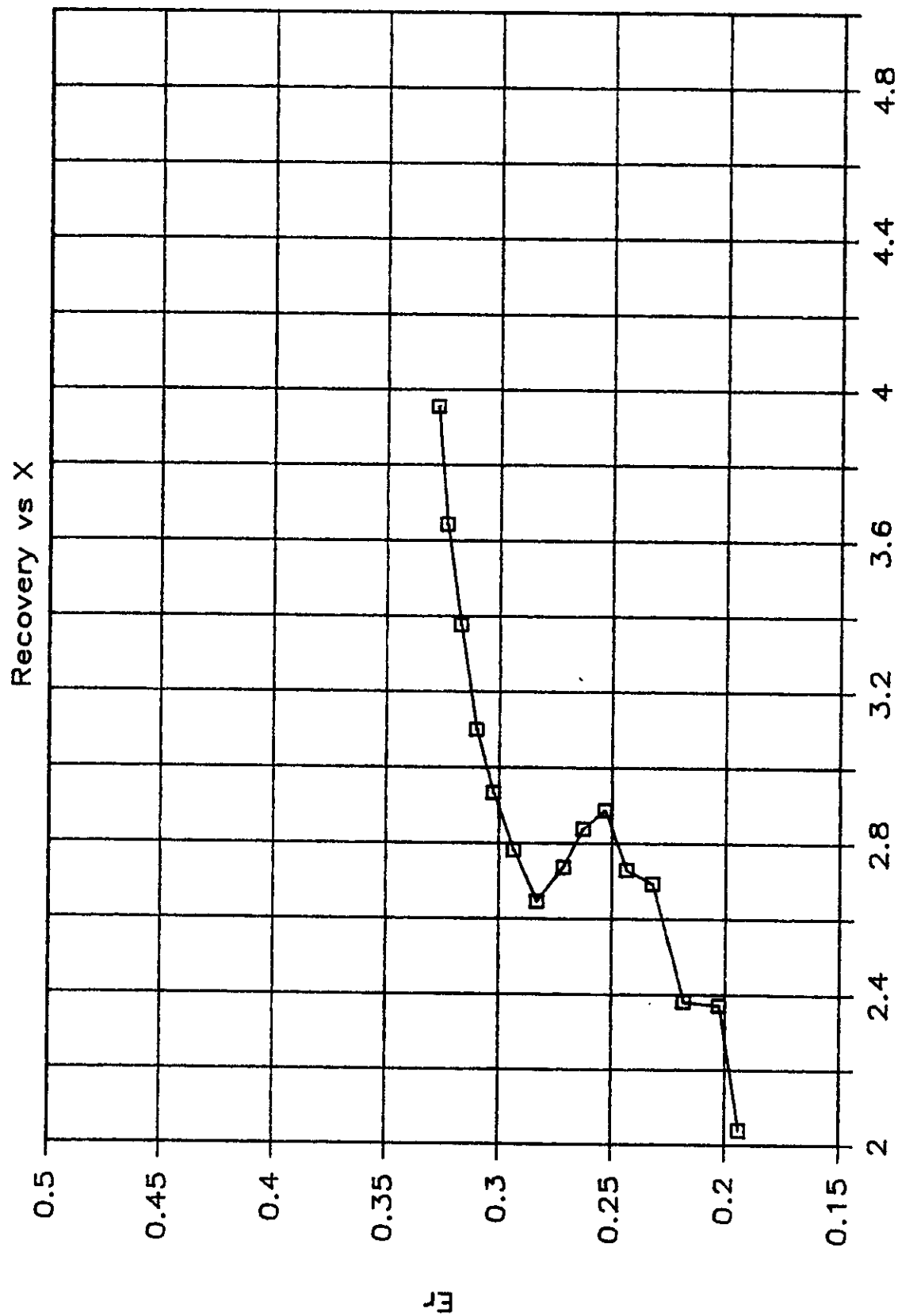


FIGURE A3
DAILY UNIT NO. 3
LOG WOR VS. CUMULATIVE PRODUCTION

FIGURE A4

DALY UNIT NO. 1



$$X = -(\ln(1/f_w - 1) - 1/f_w)$$

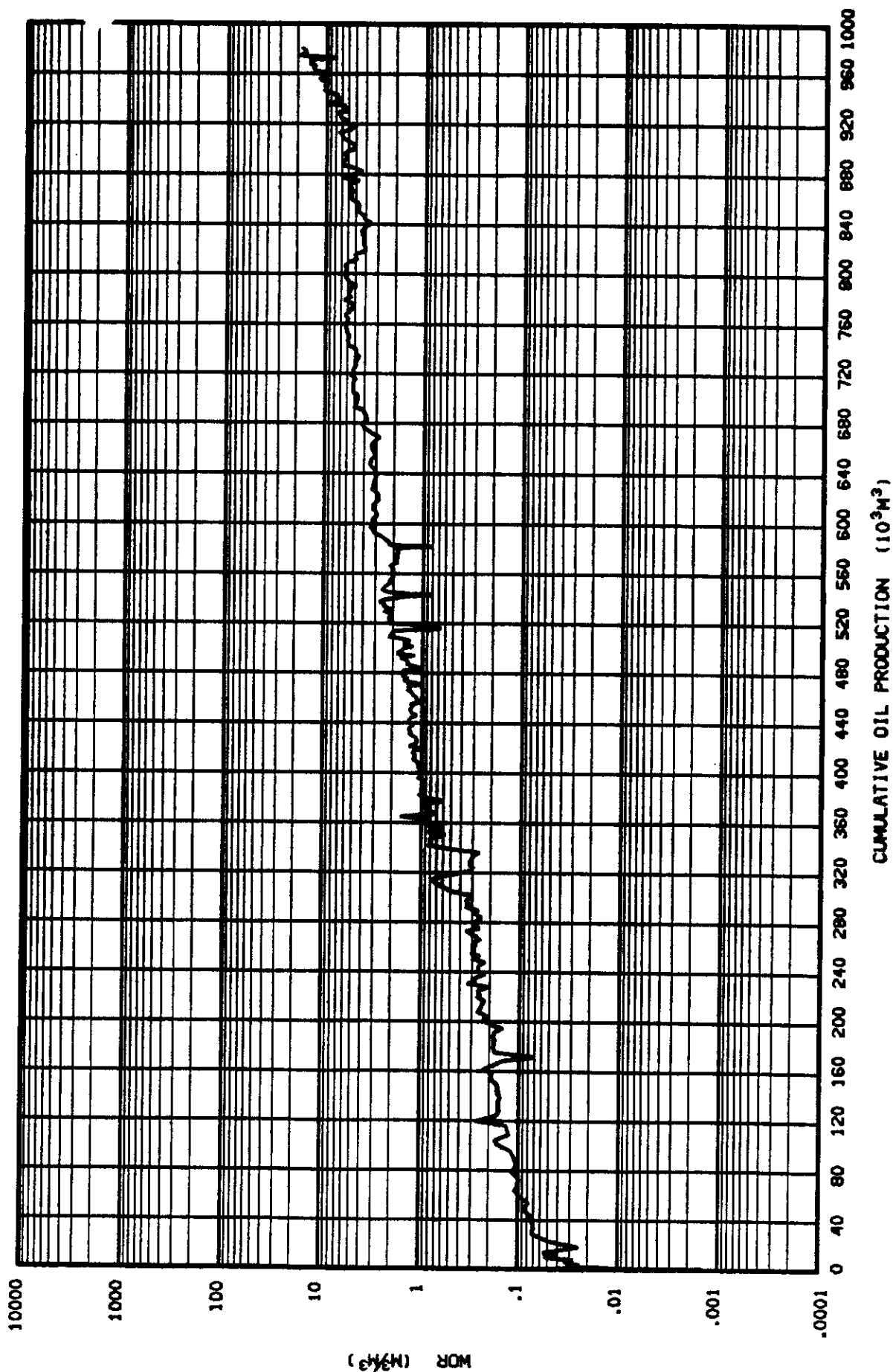


FIGURE A5
 DALY UNIT NO.1
 LOG WOR VS. CUMULATIVE PRODUCTION