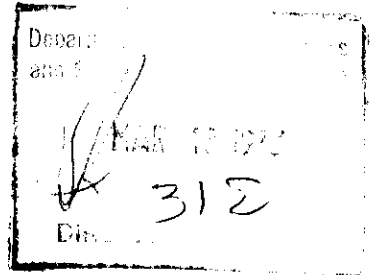


TRANSMITTAL SLIP



TO The Oil and Natural Gas Conservation Board
 Winnipeg, Manitoba Attention: Mr. JAS T. Cawley
 On March 9, 1973 We shipped to you by mail the following

10 copies of Virden-Roselea Unit no. 3 Voidage Balance Requirements
 Order PM7, Section 2 Clause 6
 Chevron Standard Ltd.

REMARKS:

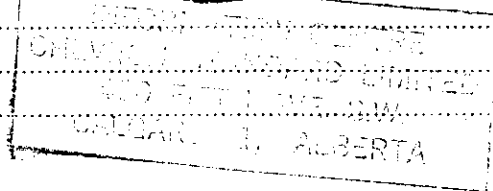
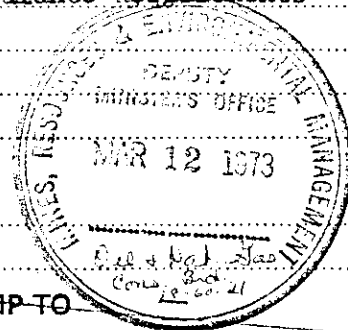
Sent by: ASSISTANT DEPUTY
 Brenda Strathairn MINISTER'S OFFICE

Received above

Signed

Date

RETURN THIS SLIP TO



60-4A-CS

to N.J. Gilbert
 March 21/73
 L.

- March 12, 1973. Original Transmittal Slip
 returned to Chevron Standard.

- 1 copy returned to N.J. Gilbert
 Feb 9/73 - 14-5 V.R. Unit 13/6 in file



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

May 31, 1973

5928

The Oil and Natural Gas Conservation Board
Department of Mines, Resources and
Environmental Management
Room 310, Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. J. T. Cawley, P. Eng.
Chairman

Gentlemen:

Chevron Standard Limited, as Unit Operator of Virden-Roselea Unit No. 3, under and pursuant to The Mines Act, Chapter M160, Revised Statutes of Manitoba, 1970 and Amendments thereto, hereby, on behalf of the Working Interest Owners in Virden-Roselea Unit No. 3, and on behalf of Chevron Standard Limited and Mineraloid Limited request the Oil and Natural Gas Conservation Board to hold a hearing to consider for approval the following:

1. Proposal for Unit Enlargement and Expansion of Water Injection System, Virden-Roselea Unit No. 3, pursuant to Section 79 of The Mines Act.
2. Application for a Maximum Permissible Rate of Production for the Enlargement Tracts, pursuant to Section 62 of The Mines Act.
3. Amendment to Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3" pursuant to Part VI, Clause 6.03 (j) of the above "Plan" and also Section 78 (3) of The Mines Act.

In support of this application, Chevron Standard Limited will endeavour to file with the Board, consents to this application signed by at least 75% of the Working Interest Owners in Virden-Roselea Unit No. 3 and consents to the application for enlargement only signed by at least 75% of the owners of the royalty interest and working interest in the enlargement tracts.

An early consideration of our request would be greatly appreciated.

Respectfully submitted,

for John D. Brown P. Eng.
J. D. BROWN, Chairman
Virden-Roselea Unit No. 3
Operating Committee

BNMcLean/lw
Attach.

Proposal for Unit Enlargement of Virden-Roselea Unit No. 3

It is proposed that the following tracts be included in Virden-Roselea Unit No. 3 by means of an enlargement: (Figure 1)

Lsd. 2-18-10-25 WPM

Lsd. 7-18-10-25 WPM

Lsd. 10-2-10-26 WPM

The above tracts adjoin the present Virden-Roselea Unit No. 3 area and have wells situated thereon which are completed in the producing horizon that is a lateral extension of the formation that is unitized in Virden-Roselea Unit No. 3.

Each enlargement tract was considered on an individual well basis as to present worth and possible future worth to the Unit.

The well Mineraloid Virden 10A-2-10-26, during a current six month production period specified as August 1, 1971 to January 31, 1972, produced an average of 25 BOPD at a water cut of 69 percent. This well is an economic producer and should be included in the enlargement.

The wells Chevron East Virden Prov. 2A-18-10-25 and Chevron South Virden Prov. 7-18-10-25 have low producibility and are uneconomic to produce under non-Unit operating conditions. The wells may be economically produced under Unit operation but the primary incentive to include these tracts in the Unit by enlargement is derived from their future worth to the Unit.

It is proposed that, contingent upon enlargement, the well Chevron East Virden Prov. 2A-18-10-25 be converted to an injector by installing two inch cement lined tubing and a two inch cement lined steel injection line from 2A-18 to the well on tract 14-7 (Figure 1). The conversion procedure that was used in previous injection well conversions in the Unit will be followed.

Tract Participation

As a result of theoretical and experimental analyses of the displacement of oil by an injected fluid, it is generally recognized that two distinct bands of saturation move through the reservoir. The first zone or band has low displacing fluid saturations and is termed the "Primary or Stabilized Phase," the second region has a much higher displacing fluid saturation and is termed the "Subordinate Phase."¹

The Virden-Roselea Unit No. 3 waterflood had been in operation for approximately six years at year end 1972. In the Unit areas of high rate and effective injection it would be reasonable to assume that the "stabilized" high response phase is passed and "subordinate" production is now predominant. Conversely, in specific areas of low rate and less effective injection (notably boundary or edge wells) it would be reasonable to assume that "primary" or "stabilized" type response may yet occur. Therefore, to provide an equitable participation basis, the tract factors should reflect only the present worth or demonstrable future worth to the Unit of the proposed enlargement tracts.

In an attempt to recognize the above factors, a tract participation formula was derived by comparing the oil production of the proposed enlargement tracts to the oil production of the Unit over a six month period of August 1, 1971 to January 31, 1972. The enlargement tracts were penalized by an "economic limit" factor of 5 BOPD.

Two major considerations entered into the "economic limit" factor determinations as follows:

1. A Unit well can be produced economically at lower rates than one operating outside the Unit. Non-Unit well expenses usually require over 5 BOPD production for economic operation. Major costs leading to this economic limit are oil and water trucking charges, single well battery operating costs and supplementary fuel requirements.

¹Craig, Forrest F. Jr.: "The Reservoir Engineering Aspects of Waterflooding," Monograph Volume 3, Henry L. Doherty Series, Society of Petroleum Engineers of AIME, 1971 - P. 33.

2. Enlargement tracts may be benefitting from response to injection of Unit wells and should in effect share increased production with offsetting injectors. The original determination of tract factors were based on production by 108 wells. After conversion of 25 wells to injection the remaining 83 wells in effect share their actual production with the wells that were converted to injectors. Enlargement tracts should similarly "share" production (which in part may already be response) with offsetting injectors.

The reduction of the actual current production of the enlargement tracts by the "Economic Limit" factor of 5 BOPD, is therefore an attempt to recognize the more efficient Unit operations and the obligation of the enlargement tracts to share production with offsetting injectors. By this device the relative worth of the enlargement tracts to all Working Interest Owners should be approximated as fairly as possible.

Wells were assigned token participation factors when they produced less than 5 BOPD over the current production period. The tract participation factors were arrived at as follows:

1. Oil production for the current period (C.P.) August 1, 1971 to January 31, 1972 (184 days) was recorded.

Viriden-Roselea Unit No. 3	= 214,948 Bbls. ✓
Mineraloid Viriden 10A-2-10-26	= 4,670 Bbls. ✓
Chevron East Viriden Prov. 2A-18-10-25	= 601 Bbls.
Chevron South Viriden Prov. 7-18-10-25	= 371 Bbls.

2. The economic limit (E.L.) of 5 BOPD (920 Bbls.) was deducted from the enlargement wells current period production and the percentage of total production calculated.

	<u>C.P. Minus E.L.</u>	<u>% of Total</u>
Viriden-Roselea Unit No. 3	214,948	98.28531
Mineraloid Viriden 10A-2-10-26	3,750	1.71469
Chevron East Viriden Prov. 2A-18-10-25	0	0
Chevron South Viriden Prov. 7-18-10-25	0	0

3. Adjust the Unit factor to allow for token participation factors to be assigned to the two tracts under E.L. production. Final adjusted tract participations are:

<u>Tract</u>	<u>Tract Participation</u>
108 Well Unit	98.18531
10-2	1.71469
2-18	.05000
7-18	.05000

The total participation of the three enlargement tracts in the enlarged Unit would be 1.81469 percent. It is proposed that upon these tracts being admitted into Virden-Roselea Unit No. 3 area, the tract participation of all tracts within the Unit area prior to enlargement and after enlargement will remain the same one to the other by multiplying each of the tract participations by the factor $(1.000000 - .0181469)$ or .9818531.

Production, Reserves, Incentives

Assuming no further response from waterflooding, the estimated remaining primary reserves under Unit operations as of December 31, 1972 for the well Mineraloid Virden 10A-2-10-26 is 65,000 bbls. (See Figure 2) as compared to 57,000 bbls. estimated recoverable under single well operations.

Incentive for the Working and Royalty Interest Owners of this enlargement tract to enter the Unit is the allocation of a guaranteed share of proven Unit production for the life of the Unit, an ultimate increase in reserves and the elimination of risk associated with single well operations. Incentive for the Working and Royalty Interest Owners of the Unit to include this tract is the inclusion in the Unit of a proven oil producing well and the improvement of Unit areal sweep efficiency through the potential production of Unit waterflood oil at the enlargement tract. All Working Interest Owners would benefit further in the event of increased waterflood recovery from the enlargement tract.

The wells, Chevron East Virden Prov. 2A-18-10-25 and Chevron South Virden Prov. 7-18-10-25 under non-Unit operation are uneconomic to produce. (See Figures 3 and 4). Incentive for the Working and Royalty Interest Owners of both the Unit and the enlargement tracts is based solely on the demonstrable future worth of the wells under Unit operations. While the tracts could probably be produced economically under Unit operations due to the elimination of trucking charges, the primary incentive is contingent on the conversion of the well on tract 2-18 to water injection.

A comparison of the structural cross sections and core analysis of 2A-18 and 7-18 with offsetting Unit wells indicates that the wells have very similar pay, porosity and permeability profiles. Therefore, low producibility of the wells could be attributable to a lack of reservoir energy. By converting the well 2A-18 to an injector, additional response should be experienced at offsetting Unit producers 15-7 and 3-18 in addition to the proposed enlargement well 7-18. Assuming successful conversion to injector the well on tract 2-18 should accept a minimum of 250 BWPd and with a moderately efficient flood an estimate of waterflood reserves recoverable by the Unit would be 95,000 barrels, with an initial production rate increase of 30 BOPD.

Enlargement Tract Requirements

Upon the proposed enlargement tracts being admitted to the Unit, it is proposed that the Working Interest Owners of these enlargement tracts participate in the investment account established by Part X of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3," as of the effective date of this enlargement.

It is proposed that the Working Interest Owners of all the enlargement tracts be responsible for the cost required to tie-in the wells to Unit facilities, the Owner retaining possession and control of surface fluid handling facilities presently on the well leases, and a cash payment to the joint account representing a proportionate share in Unit capital expenditures since inception plus pre-Unit and inventory costs. In addition to these expenditures the two enlargement tracts being allocated token participation factors will make a cash payment to the joint account representing a contribution towards abandonment costs. The cash sums mentioned above will be due on or before effective date of Unit enlargement.

Application for a Maximum Permissible Rate of Production for Wells on the Enlargement Tracts

The applicants propose that the same production flexibility that has been permitted for the original Virden-Roselea Unit No. 3 also be provided for the enlarged Unit.

Currently, the production at all the enlargement tracts may be considered to be unrestricted since all the wells on these tracts are producing at capacity. It is the applicants' contention that no reservoir damage has resulted from producing these wells at capacity.

By being included in the waterflood project it is anticipated that the productive capacity of certain of the wells on the enlargement tracts will be significantly increased. There is no reason to believe that reservoir damage, either within the Unit area or outside the Unit area, would result from producing these increased capacity wells at unrestricted rates.

It is the applicants' contention that producing wells on the enlargement tracts, when offset by non-Unit producing wells, should also be allowed to produce at unrestricted rates. There is no reason to believe that non-Unit oil would be produced within the Unit by such a practise since the Unit well capacities would increase only as a direct result of the unitized waterflood and therefore the increased production would be made up of oil from within the Unit area only. There is also no reason to believe that the production at future offsetting non-Unit wells would be affected by the production of the new Unit boundary wells at unrestricted rates.

The applicants respectfully request that, on and after the effective date of the Unit enlargement, the wells on the tracts brought in by the enlargement be excluded from any provisions governing the limitations of oil production.

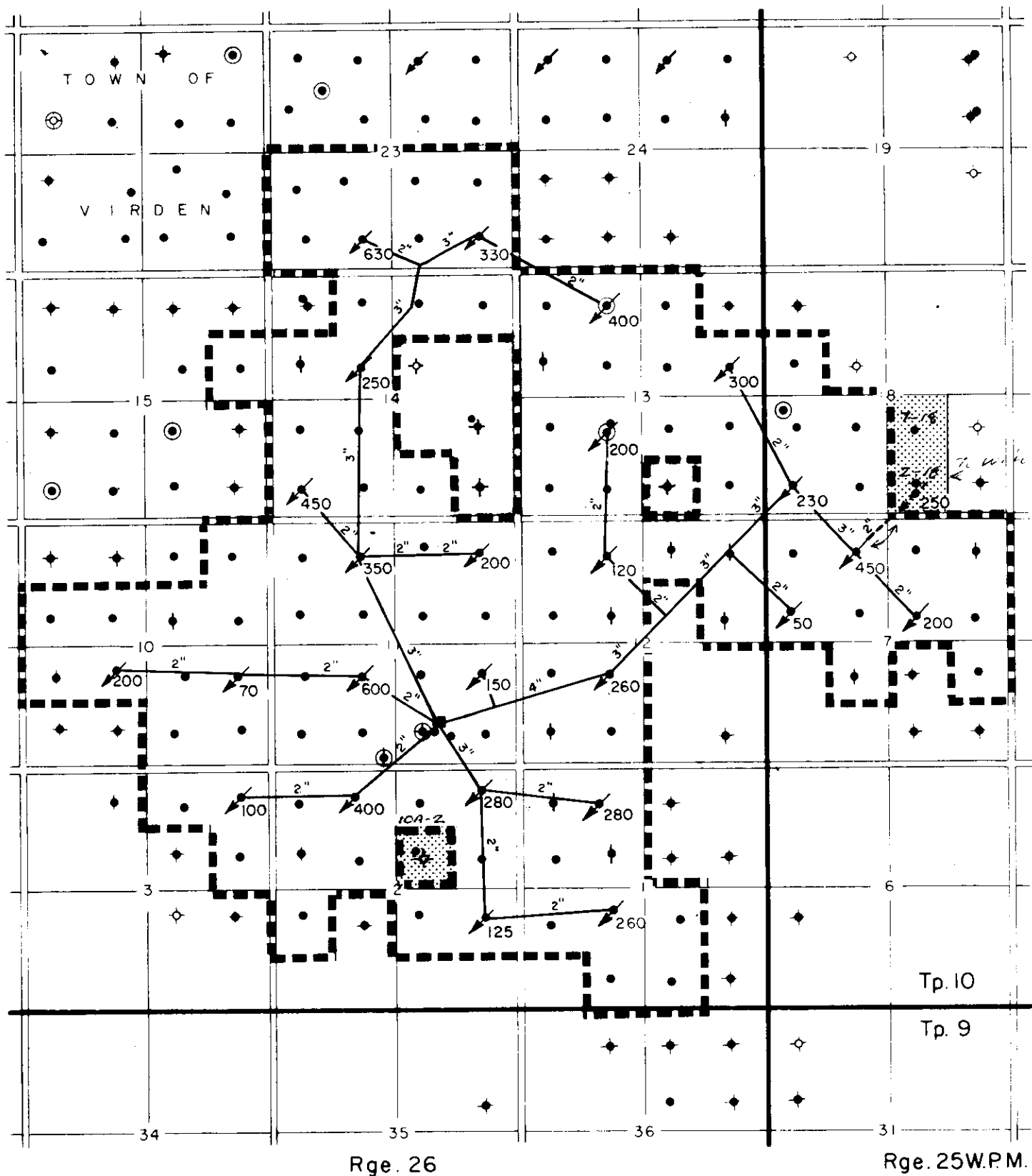
Amendment to Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3"

The Unit Operator has reviewed the district and administrative overhead charges to the Unit under Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan" resulting from the proposed addition of three wells to the 108 well Unit. The result of this review is a proposed increase of \$165 per month.

Approval to increase the charges, under the subject clause, by \$165 per month to a new total of \$6,265 per month was obtained at an Operating Committee meeting held on November 22, 1972. It is therefore requested that the "Plan" be amended by replacing the wording in Part XXVI, Clause 26.07 (k) (iii) (a) with the following:

"\$6,265 per month for all producing operations."

Pursuant to Part VI, Clause 6.03 (j) of the "Plan" and Section 78 (3) of The Mines Act, the applicants hereby respectfully request the Board to consider and approve the proposed district and administrative overhead charges and proposed amendment to the "Plan," in conjunction with the proposed Unit enlargement.



VIRDEN ROSELEA UNIT No. 3 AND PROPOSED ENLARGEMENT

- 200 INJECTION WELL & RATE (1972)
- S.W.D. WELL
- 2" INJECTION LINE & SIZE
- INJECTION PLANT
- UNIT BOUNDARY

- PROPOSED ENLARGEMENT TRACTS
- 250 INJECTION WELL, EST. RATE
- 2" PROPOSED INJECTION LINE, SIZE

Scale 1" = 3000'

MINERALOID VIRDEN IOA-2-10-26WPM

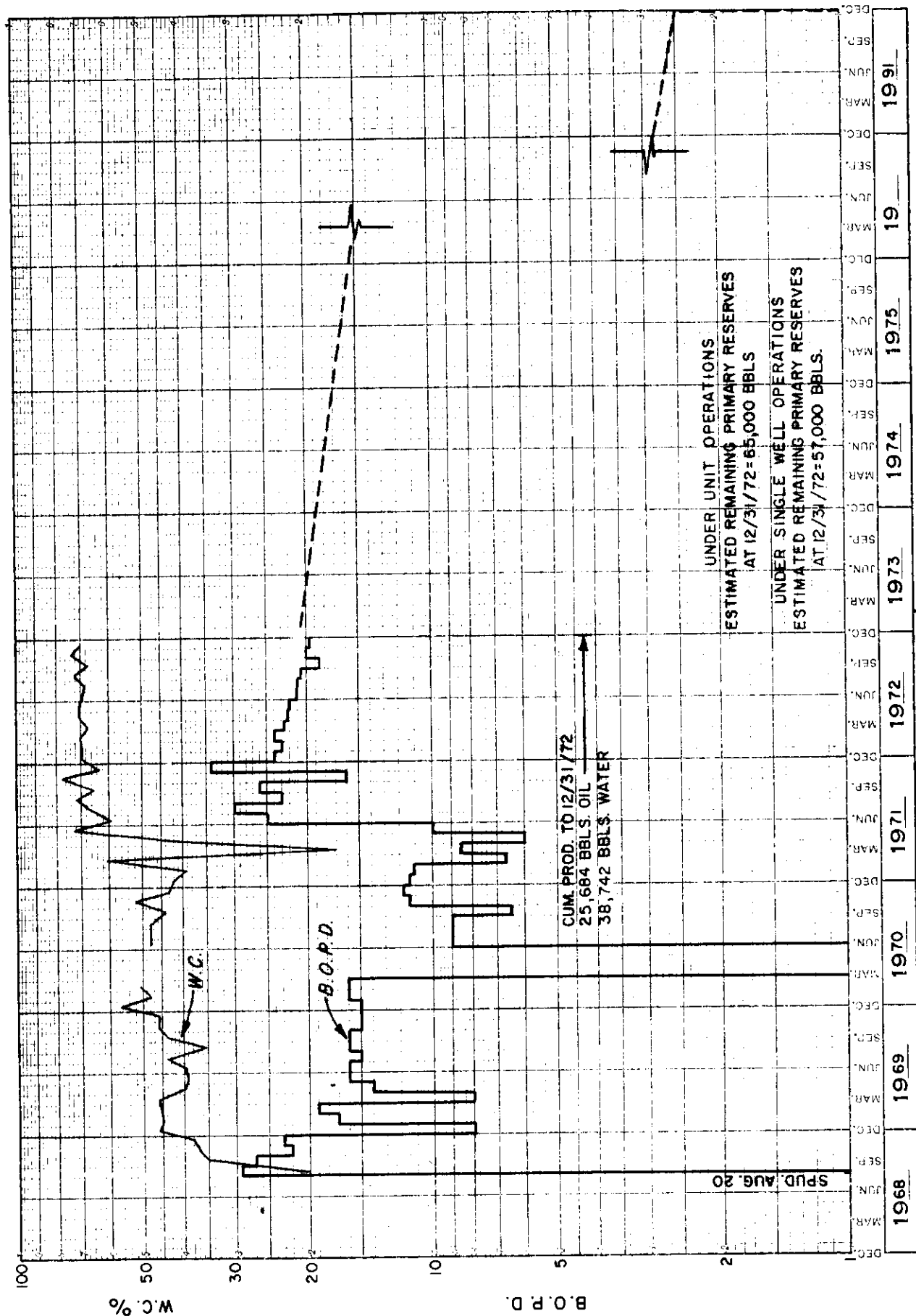


FIGURE 2

CHEVRON EAST VIRDEN PROV. 2A-18-10-25WPM.

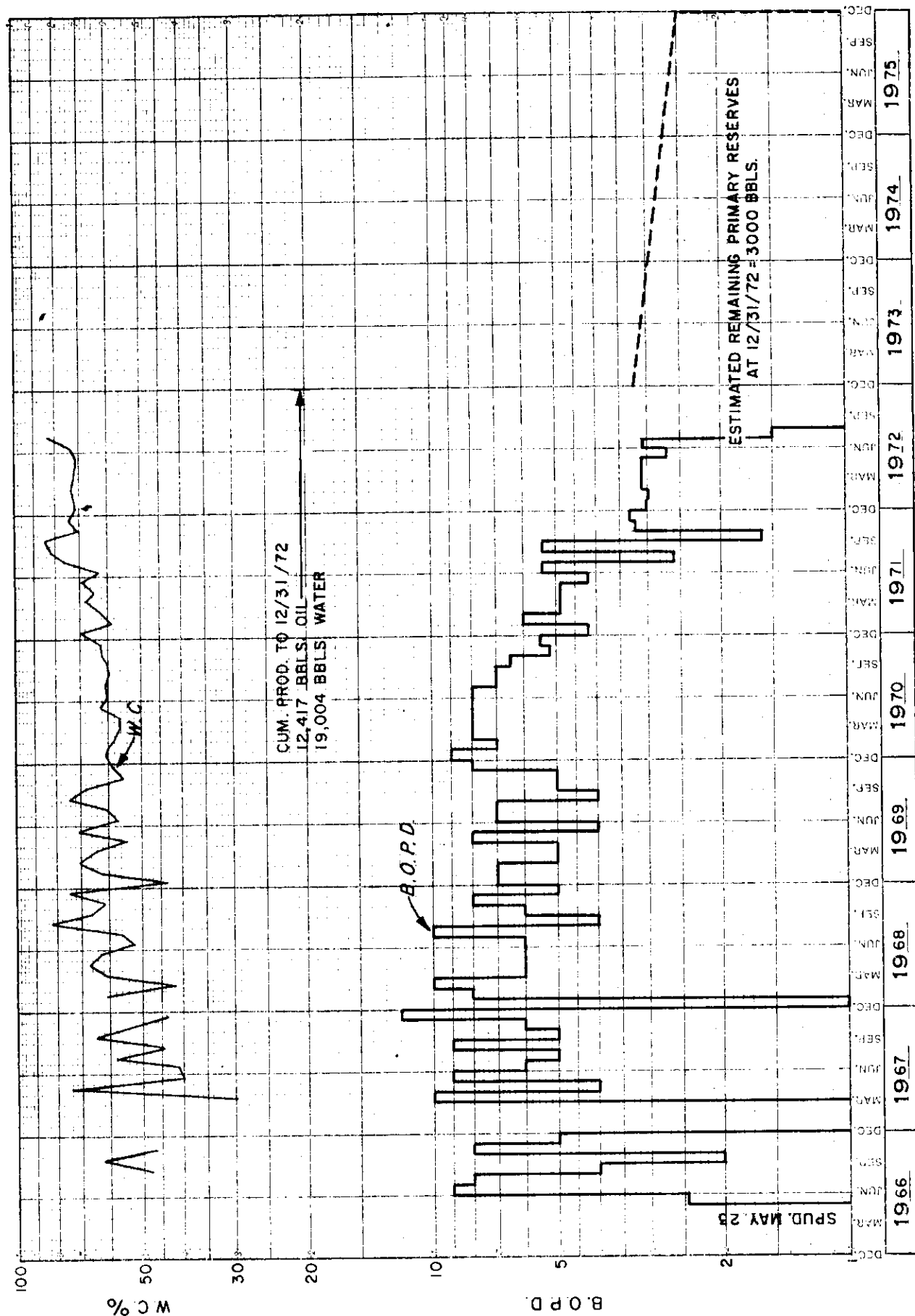


FIGURE 3



CHEVRON SOUTH VIRDEN 7-18-10-25WPM.

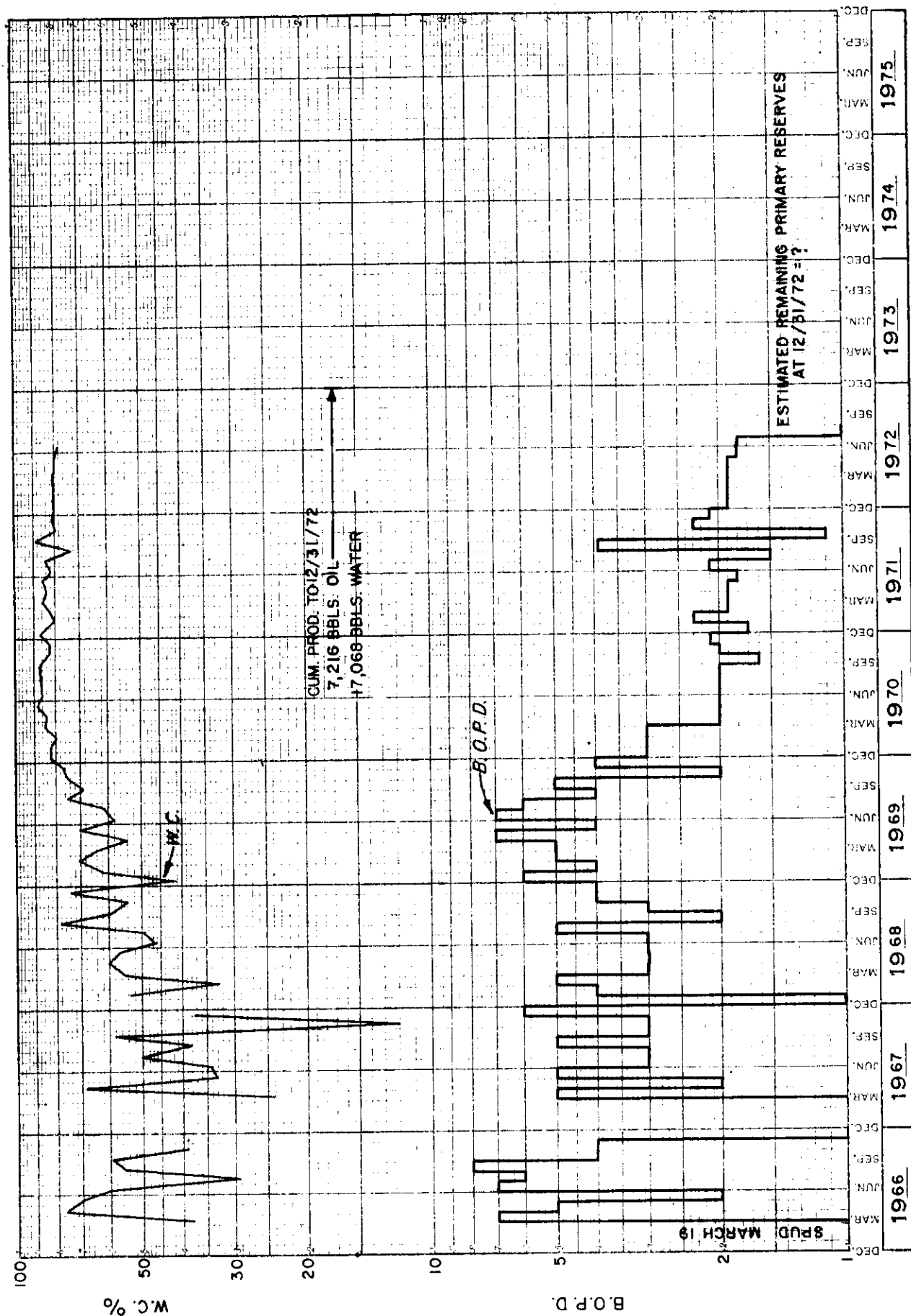


FIGURE 4

Jas. T. Cawley, P. Eng.

XXXXXXXXXXXX

R3C OP8

April 23, 1973

Mr. R.R. McDaniel
McDaniel Consultants (1965) Ltd.
900 Western Union Building
640 - 8th Avenue S.W.
CALGARY 2, Alberta

Dear Sir:

- Re: (1) Virden-Roselea Unit #3 (April 1973)
(2) Submission to Conservation Board (March 1973)

A copy of the progress report, 1972, for the above Unit is being forwarded under separate cover.

It is noted that the operator, Chevron Standard Limited, has requested that the voidage balance of fluids in the areas listed in Section 10 and 15 (see page 4 of the Unit #3 progress report) be excluded from future reports, as, "a voidage balance is being naturally maintained by active water drive."

A copy of the submission to the Conservation Board dated March 6, 1973 is enclosed for your information. An original copy was forwarded to you on March 14, 1973.

Your comments and any recommendations regarding the submission would be appreciated.

Yours sincerely,


J.S. Roper
Deputy Chairman

FSG/evh
Enclosure

March 6, 1973

Virden-Roselea Unit No. 3
Voidage Balance Requirements
Order PM7, Section 2 Clause 6

The Oil and Natural Gas Conservation Board
Room 310
Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. Jas T. Cawley, P. Eng.
Chairman

Gentlemen:

In accordance with the Oil and Natural Gas Conservation Board Order No. PM7, Pressure Maintenance Rule No. 2, Clause 6, Chevron Standard Limited as Unit Operator of Virden-Roselea Unit No. 3, hereby submits that a voidage balance is being naturally maintained by an active water drive, and that artificial maintenance of voidage balance by injection of water is not required in the Submission Area as shown on attached Figure 1 and listed as follows:

Lsd. 2-10-10-26 WPM
Lsd. 5-10-10-26 WPM
Lsd. 6-10-10-26 WPM
Lsd. 7-10-10-26 WPM
Lsd. 10-10-10-26 WPM
Lsd. 11-10-10-26 WPM
Lsd. 12-10-10-26 WPM
Lsd. 9-15-10-26 WPM

The following information is offered in support of this submission:

I. GENERAL

Over the five year period from the initiation of injection in Virden-Roselea Unit No. 3 on January 1, 1967 to December 3, 1971, approximately forty percent of the water required for injection was produced from the Devonian WSW 2-11-10-26 (WPM).

The Devonian formation in the water supply well was abandoned in December 1971 because of irreparable corrosion damage to the casing in the well. An alternate source of injection water from the Mississippian formation was developed utilizing the following three wells:

Chevron S. Virden Province 2-10-10-26
Chevron South Virden 12-10-10-26
Mineraloid Virden 9-15-10-26

Produced Mississippian formation water is presently the only source of injection water with approximately two-thirds of the injection water being supplied by the above three wells.

II. BOTTOM HOLE PRESSURE HISTORY

The Province of Manitoba Department of Mines and Natural Resources Publication #60-5, published in 1963, and entitled "Mississippian Oil Fields of Southwestern Manitoba" by H. R. McCabe records an initial reservoir pressure of 976 psig for the producing formation in the Virden-Roselea area. Drillstem test records for wells drilled in the area indicate formation pressures in the range of 850 to 900 psig. The drillstem test information is not considered reliable and is assumed to indicate lower than true initial reservoir pressure because of probable formation damage and incomplete pressure build-ups. The initial formation pressure recorded by McCabe is considered to be high. For the purpose of this study the original discovery pressure was assumed in the range of 900 to 950 psig.

The results of bottom hole pressure surveys taken in 1969, 1971 and 1972 are shown on Figures 2 and 3. The isobaric maps indicate that the reservoir pressure in the Submission Area is at or near original discovery pressure. Withdrawals from the Submission Area since Unit inception to August 31, 1972, the approximate time of the 1972 pressure survey, amounted to 2,999,982 reservoir barrels whereas injection during the same period amounted to 174,384 reservoir barrels. Therefore, a net voidage of 2,825,598 reservoir barrels has not resulted in a reduction of reservoir pressure.

III. GEOLOGICAL

Oil is produced from seven zones in the Virden-Roselea field. Zones of higher porosity and permeability are generally separated by dense impermeable zones and therefore fluid communication between zones would not be anticipated. However, fluid communication is likely in areas containing vertical fractures. The results of an analysis of vertical fractures as observed in cores is shown on Figure 4. Two or more open vertical fractures were observed in the cores from all cored wells in the Submission Area. No core data is available for the well Mineraloid Virden 9-15-10-26.

The proximity of the aquifer interface in the lowest producing horizon, the cherty zone, is shown on Figure 5. This figure shows the gross pay of the cherty zone above the original oil-water interface at approximately -680 feet subsea. This evidence of the proximity of the aquifer in the cherty zone, vertical fractures and high reservoir pressure in the Submission Areas, indicates it would be reasonable to expect the high producibility and water cuts as shown on Figures 6 and 7.

The well Mineraloid Virden 9-15-10-26 WPM was not cored, therefore, geological information is lacking on this well. However, the producing characteristics of this well are similar to those of other wells in the Submission Area which suggests that the well is subject to the active water drive. In addition, the high withdrawal rate from the 9-15 well has little, if any, effect on the bottom hole pressure at the off-setting suspended well 12-14-10-26.

IV. SUMMARY AND CONCLUSIONS

Chevron Standard Limited hereby submits that fluid withdrawals from the Submission Area are being replaced by an active water drive from the underlying aquifer and, therefore, reservoir voidage need not be replaced by injection of water in this area. The evidence supporting this submission is summarized as follows:

1. The reservoir pressure in the Submission Area is presently at or near original discovery pressure, even though reservoir voidage has exceeded 2.8 million reservoir barrels.
2. All wells in the Submission Area are in good communication with the aquifer because of vertical fractures in the reservoir and the close proximity of the oil-water contact in the cherty zone. All producing wells exhibit high water cuts.
3. The producing capability of most wells in the Submission Area is in excess of 300 barrels of fluid per day with some wells capable of producing as much as 1,480 barrels of fluid per day.

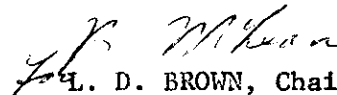
With the concurrence of the Board, Chevron Standard Limited, as Operator of Virden-Roselea Unit No. 3, proposes to report in the annual progress report, the voidage balance of fluids in the Unit area exclusive of the Submission Area. Water and oil production from the Submission Area will not be considered as voidage withdrawals and any water injected will not be credited as voidage replacement. At present, the water injected in the well 6-10-10-26 WPM in the Submission Area is limited to excess water that cannot be injected into other injection wells in the Unit due to pumping equipment limitations and wellhead injection pressure limitations.

A comparison of the present and proposed methods for calculating reservoir voidage, for the calendar year 1972, is shown on Tables I and II attached. It is apparent that sufficient Mississippian water was produced from the Submission Area to adequately supply the voidage requirements for the remainder of the Unit (Table II).

As shown on Figure 7, it is evident that sufficient water for injection requirements is available from the Submission Area. Wells in the Submission Area are capable of producing a minimum of 4,800 barrels of fluid per day at high water cuts. Fluid level measurements on the four wells presently producing from the Submission Area indicates that three of the wells were full while producing. The fourth well, Mineraloid Virden 9-15-10-26 WPM, was approximately one-half full while producing at a rate of 1,400 barrels of fluid per day.

If additional information is required regarding this submission, please contact Mr. E. N. McLean at the above letterhead address. Additional copies of this submission may be obtained from the Information Centre in our Calgary Office.

Yours very truly,


L. D. BROWN, Chairman
Virden-Roselea Unit No. 3
Operating Committee

BNMcLean/lw
Attachments

TABLE I
VIRDEN-ROSELEA UNIT NO. 3
RESERVOIR VOIDAGE RATES - 1972

	<u>First Quarter</u>	<u>Second Quarter</u>	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>Total For Period</u>
Oil Produced (Bbls)	105,920	109,310	111,273	105,135	431,638
Gas Produced (MSCF)	9,533	9,833	10,015	9,462	38,847
Water Produced (Bbls)	498,945	598,716	632,172	562,098	2,291,931
Average Solution GOR	90	90	90	90	90
Formation Volume Factor	1.05	1.05	1.05	1.05	1.05
Voidage Oil (Res. Bbls)	111,216	114,775	116,837	110,392	453,219
Voidage Water (Res. Bbls)	498,945	598,716	632,172	562,098	2,291,931
Total Voidage (Res. Bbls)	610,161	713,491	749,009	672,490	2,745,149
Water Injected (Res. Bbls)	500,064	598,716	632,172	562,098	2,293,050
Net Voidage (Res. Bbls)	110,097	114,775	116,837	110,392	452,100
Net Void. Rate (Res. Bbls/D)	1,223	1,261	1,270	1,200	1,239
Cum. Net Void. (Res. Bbls)	-2,158,314	-2,043,538	-1,926,701	-1,816,309	

Gas Produced = Solution Gas

Pre-Unit Voidage: Oil ~ 6,226,190
 Water ~ 10,851,490

 Total ~ 17,077,680

TABLE II
VIRDEN-ROSELEA UNIT NO. 3
RESERVOIR VOIDAGE RATES - 1972*

	<u>First Quarter</u>	<u>Second Quarter</u>	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>Total For Period</u>
Oil Produced (Bbls)	98,166	98,758	100,269	97,065	394,278
Gas Produced (MSCF)	3,835	3,888	9,024	8,738	35,485
Water Produced (Bbls)	306,617	311,170	327,899	315,483	1,261,169
Average Solution GOR	90	90	90	90	90
Formation Volume Factor	1.05	1.05	1.05	1.05	1.05
Voidage Oil (Res. Bbls)	103,074	103,696	105,282	101,939	413,991
Voidage Water (Res. Bbls)	306,617	311,170	327,899	315,483	1,261,169
Total Voidage (Res. Bbls)	409,691	414,866	433,181	417,422	1,675,160
Water Injected (Res. Bbls)	484,342	581,004	613,405	545,950	2,224,701
Net Voidage (Res. Bbls)	-74,651	-166,138	-180,224	-123,528	-549,541
Net Void. Rate (Res. Bbls)	-329	-1,826	-1,959	-1,397	-1,506
Cum. Net Void. (Res. Bbls)	-2,343,061	-2,509,199	-2,689,422	-2,817,949	

Gas Produced = Solution Gas

Pre-Unit Voidages: Oil - 6,226,190
 Water - 10,851,490

 Total - 17,077,680

*Excluding oil, gas and water produced from and injected to the following Submission Area:

Lsd. 2-10-10-26 WPM
Lsd. 5-10-10-26 WPM
Lsd. 6-10-10-26 WPM
Lsd. 7-10-10-26 WPM
Lsd. 10-10-10-26 WPM
Lsd. 11-10-10-26 WPM
Lsd. 12-10-10-26 WPM
Lsd. 9-15-10-26 WPM

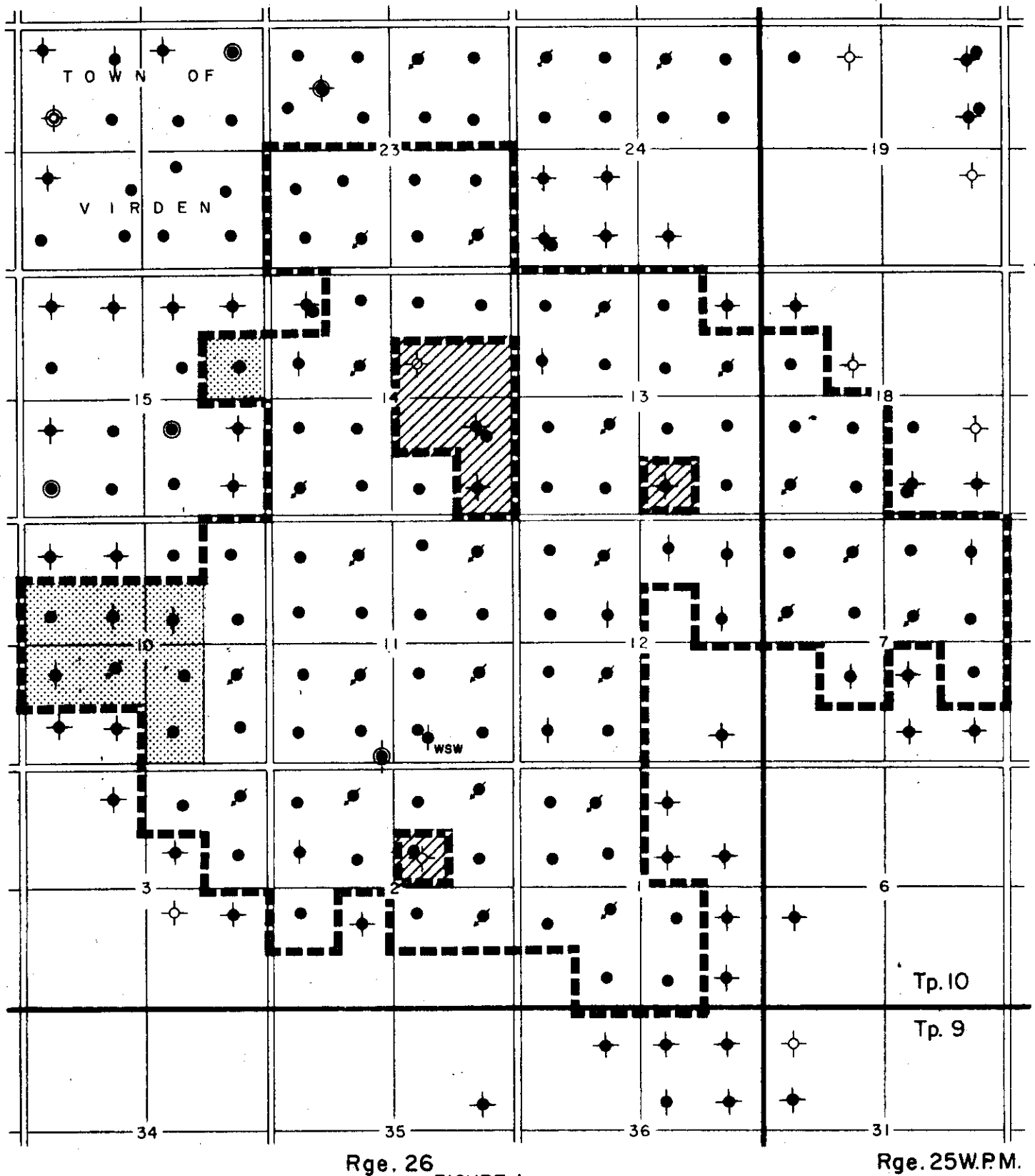
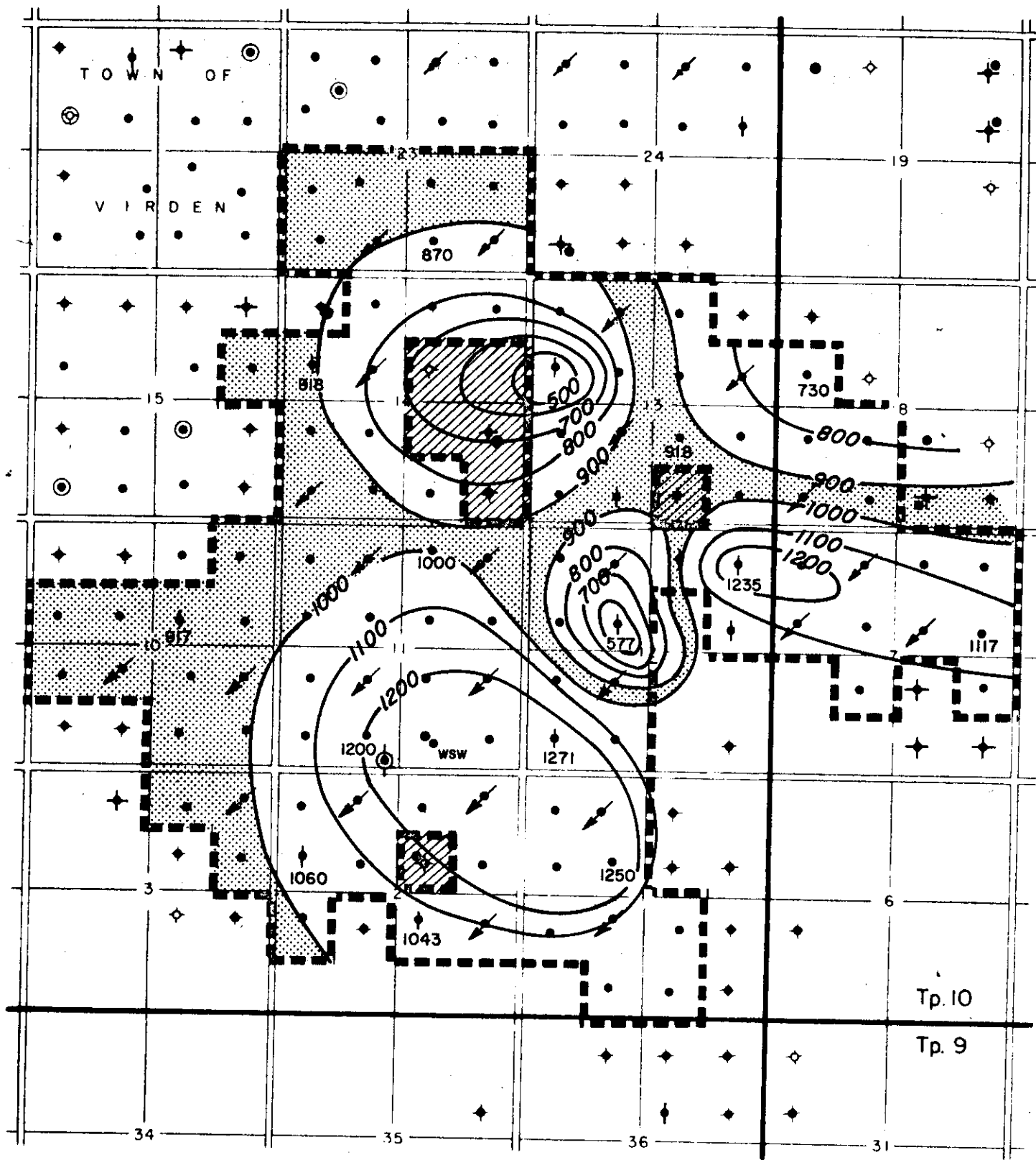


FIGURE 1
VIRDEN ROSELEA UNIT No. 3
SUBMISSION AREA

LEGEND

 **AREA FOR PROPOSED VOIDAGE
BALANCE EXEMPTION**

Scale 1" = 3000'



Rge. 26

FIGURE 2

Rge. 25W.P.M.

VIRDEN ROSELEA UNIT No. 3

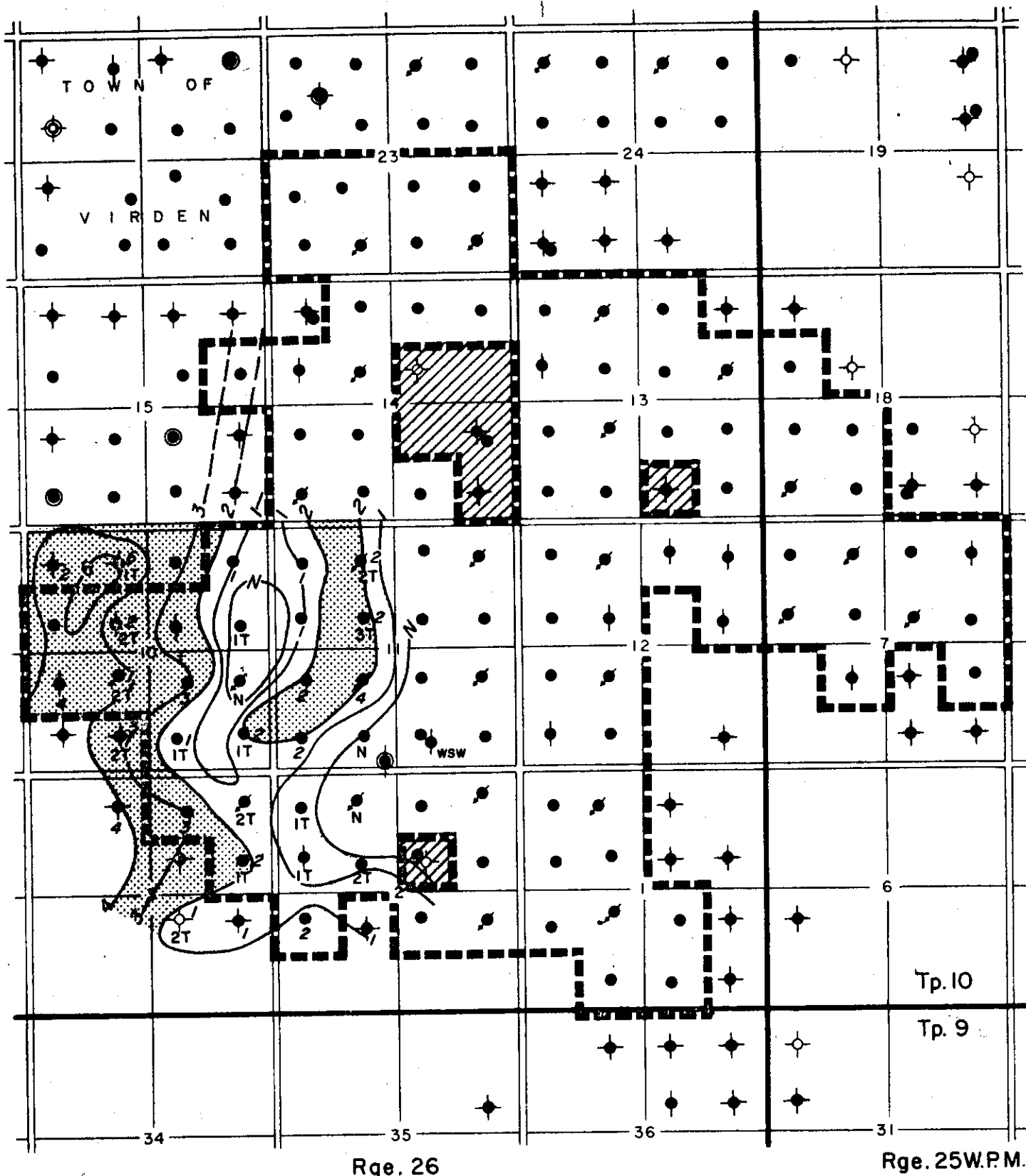
ISOBARIC MAP

BASED ON 1969 BHP SURVEY

LEGEND

AREAS NEAR
DISCOVERY PRESSURE

Scale 1" = 3000'



Rge. 26

FIGURE 4

Rge. 25W.P.M.

VIRDEN ROSELEA UNIT No. 3

SHOWING

WEST SEGMENT

VERTICAL FRACTURE PATTERNS

LEGEND

N NO FRACTURES

2T NO ZONES WITH TIGHT
VERTICAL FRACTURES

★ NO ZONES WITH OPEN
VERTICAL FRACTURE(S)

▨ AREAS WITH 2 OR MORE ZONES
WITH OPEN VERTICAL FRACTURES

Scale 1" = 3000'

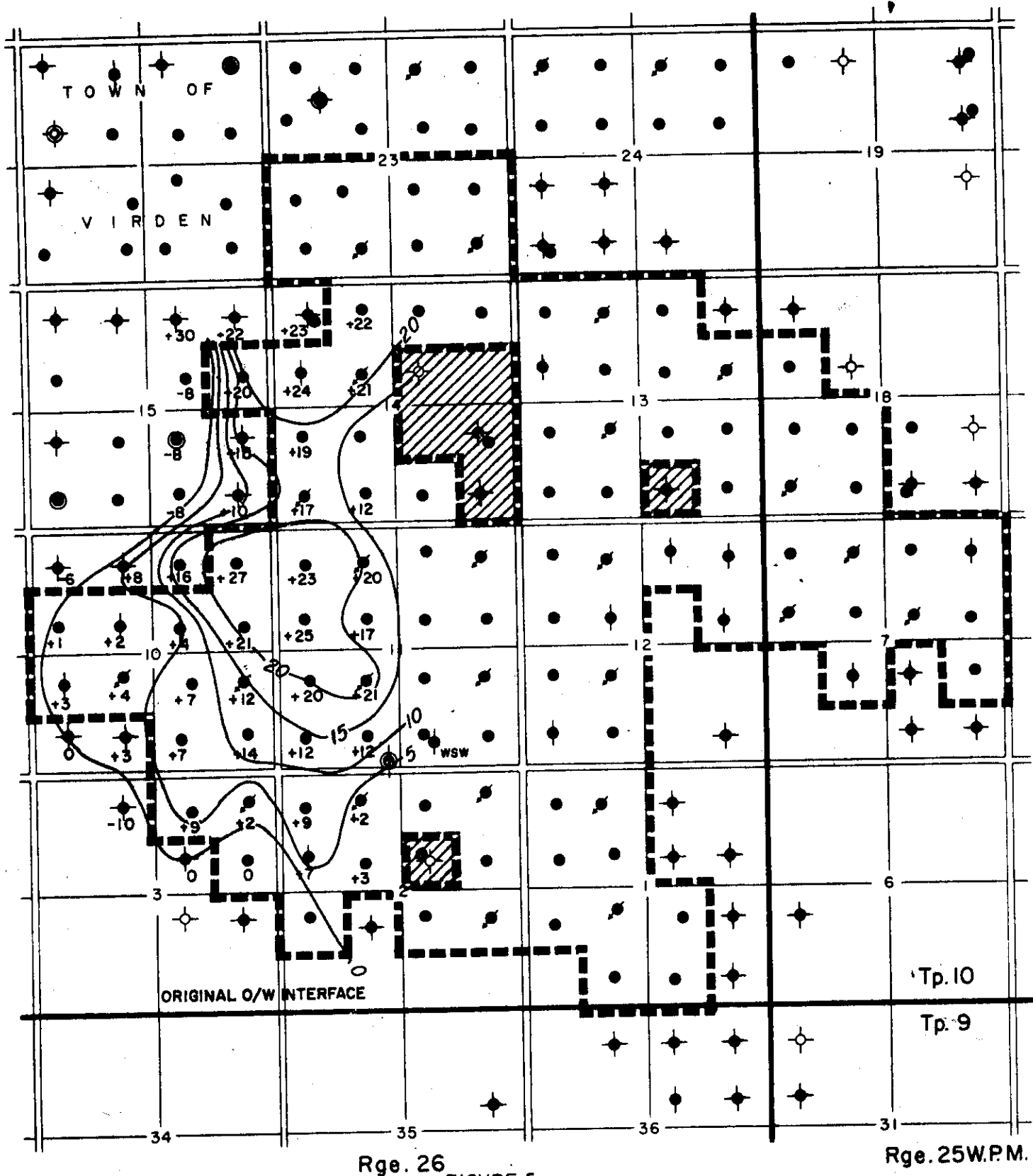


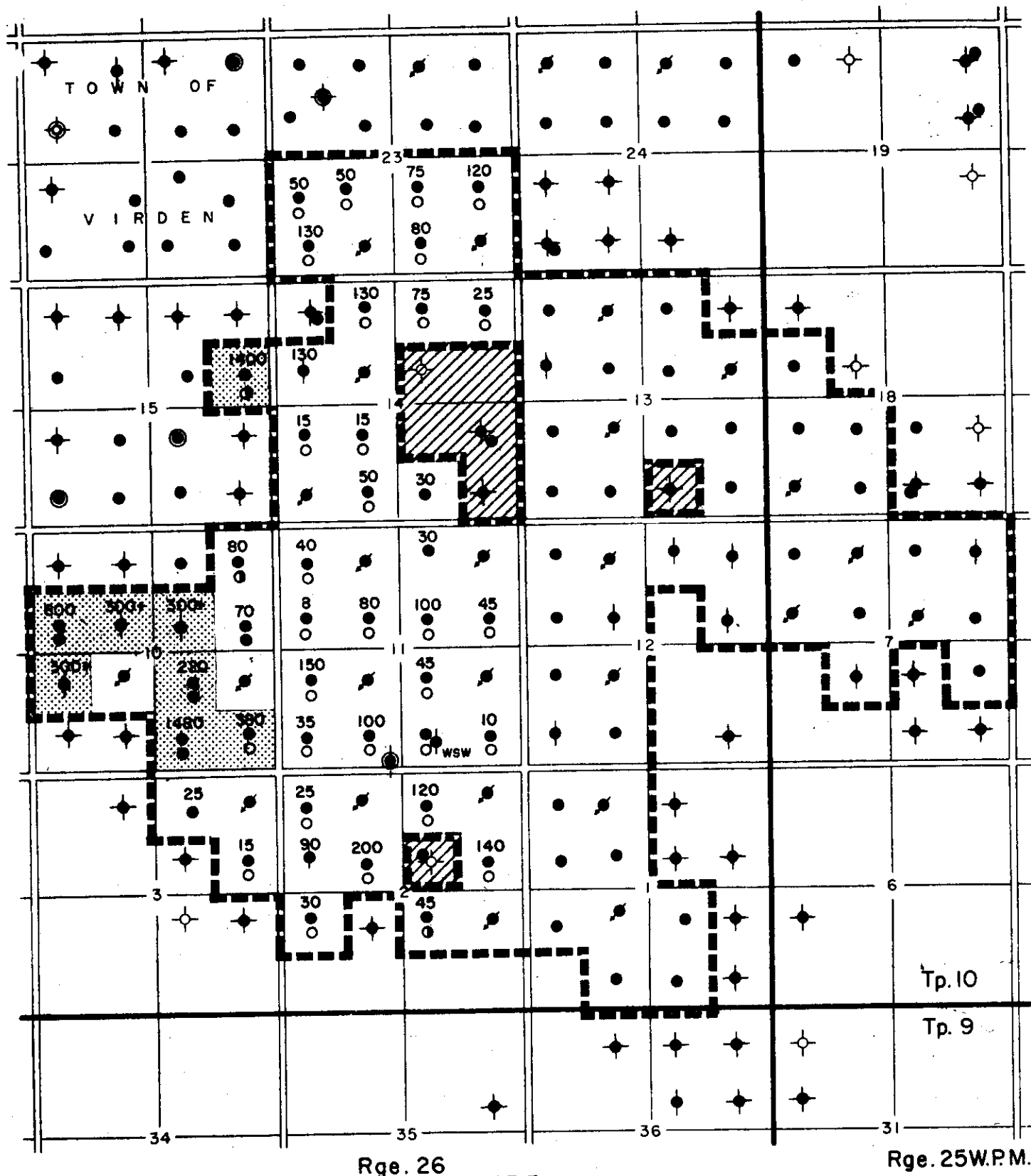
FIGURE 5

VIRIDEN ROSELEA UNIT No. 3

GROSS PAY OF CHERTY ZONE

ABOVE

ORIGINAL OIL/WATER INTERFACE



R3C 0P8

April 20, 1972.

Mr. E.R. McDaniel,
800 Western Union Building,
640 - 8 Avenue, S.W.,
Calgary 2, Alberta.

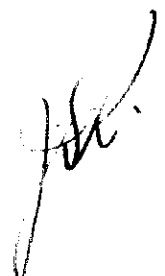
Dear Mr. McDaniel:

Re: Progress Report No. 3 - 1971 -
Virden-Roselea Unit No. 3

We are forwarding a copy of the above noted Progress Report, prepared by the Unit Operator.

We would appreciate receiving any comments that you may have on the report.

Yours sincerely,

A handwritten signature in dark ink, appearing to be 'JHR' or similar, written in a cursive style.

JSR/ch

1 Copy to FSG
1 Copy to Virden

INTER-DEPARTMENTAL MEMORANDUM

FROM F. S. GRIMLEY



DATE DEC. 17/71

TO THE OIL & NATURAL GAS CONSERVATION BOARD
W. WINSTON MAIR - CHAIRMAN
J. S. ROBERT - DEPUTY
M. J. GUBERT - MEMBER

SUBJECT APPLICATION BY CHEVRON STANDARD LIMITED

TO CONVERT INJECTION WELL OPERATIONS FROM
DEVONIAN SOURCE WATER TO MISSISSIPPIAN SOURCE WATER - VARDEN
ROSEDALE UNIT #3

Approval of the Board is requested for the proposed conversion of NINE (9) injection wells as outlined in the letter of application from J. G. TROWELL, ~~here attached~~ here attached.

A similar conversion was carried out on four (4) injection wells during June 1971, under the Board's letter of approval dated June 25, 1971.

Attached is a suggested letter approving the change of source water pursuant to Pressure Maintenance rules for Order PM 7. For signature of the Chairman.

J. G.

Sent.
Dec. 17/71

December 17, 1971

Mr. J. G. Trowell, Division Manager,
Chevron Standard Limited,
400 Fifth Avenue S.W.,
Calgary 1, Alberta.

Dear Mr. Trowell:

Re: Application to change source of water being injected
Virden-Roselea Unit #3
Order No. PM 7

Pursuant to subsection (2) of Section 2 of the Pressure Maintenance Rules for the above Order, the Board hereby grants permission to the Unit Operator to -

- (1) convert the following injection wells from Devonian water supply to produced Mississippian water supply:

WIW 8-11-10-26
WIW 6-12-10-26
WIW 14-12-10-26
WIW 6-13-10-26
WIW 9-13-10-26
WIW 10-7-10-25
WIW 12-7-10-25
WIW 14-7-10-25
WIW 4-18-10-25

subject to the following condition -

- (1) a pad of 100 barrels of 10,000 PPM to 20,000 PPM acetic acid shall be placed between the Devonian and the Mississippian water, in each of the above wells, at the time of the change-over of the source water.

cc: Mr. Lindsay Brown,
Area Supervisor,
Chevron Standard Limited,
Box 100, Virden, Manitoba.

Yours sincerely,

W. Winston Mair,
Chairman.

*copy to Mr. Mair
17 Dec 11 10:24 AM*

December 17, 1971

Mr. F. S. Gamey
Chief Petroleum Engineer

The Oil & Natural Gas Conservation Board
W. Winston Mair - Chairman
J. S. Roper - Deputy
M. J. Gobert - Member

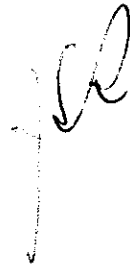
Application by Chevron Standard Limited to convert injection well operations
from Devonian source water to Mississippian source water - Virden-Roselea Unit #3

Approval of the Board is requested for the proposed conversion of nine (9) injection wells as outlined in the letter of application from J. G. Trowell, here attached.

A similar conversion was carried out on four (4) injection wells during June, 1971 under the Board's letter of approval dated June 25, 1971.

Attached is a suggested letter approving the change of source water pursuant to Pressure Maintenance rules for Order PM 7, for signature of the Chairman.

FSG/ah

A handwritten signature, possibly "J. S. Roper", written in dark ink.

one to be done
17 Dec 71



Chevron Standard Limited

400 Fifth Avenue S.W., Calgary 1, Alberta

December 15, 1971

The Oil and Natural Gas Conservation Board
Box 42
Legislative Building
Winnipeg 1, Manitoba

Attention: Mr. F. S. Gamey

Gentlemen:

In reference to our letter dated December 13, 1971 regarding the proposal to convert eight injection wells in the Virden-Roselea Unit No. 3 from a Devonian water source to a produced Mississippian water source, we wish to make the following correction.

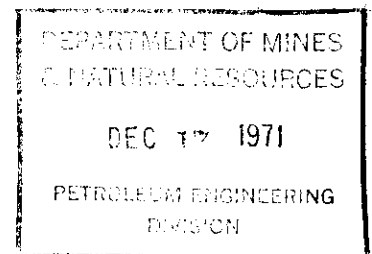
To the list of the eight wells proposed for conversion please add WIW 4-18-10-25 which was inadvertently omitted from the tabulation.

If additional information is required please contact the undersigned.

Yours very truly,

B. McLean
for J. G. TROWELL
Division Manager
Producing Department
Calgary Division

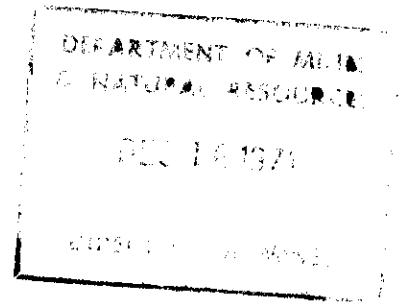
BNM/bv





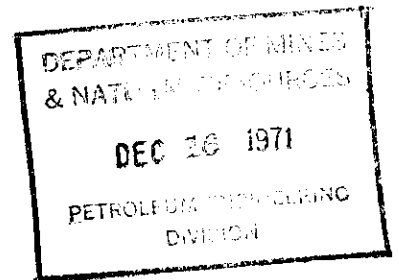
Chevron Standard Limited
400 Fifth Avenue S.W., Calgary 1, Alberta

December 13, 1971



The Oil and Natural Gas Conservation Board
Box 42
Legislative Building
Winnipeg 1, Manitoba

Attention: Mr. F. S. Gamey



Gentlemen:

In accordance with Manitoba Regulation 103/66, The Oil and Natural Gas Conservation Board Order No. PM7, Section 2, Subsection (2), Chevron Standard Limited as Operator of Virden-Roselea Unit No. 3, hereby submits the following for your consideration and approval:

1. Chevron Standard proposes to convert the following eight injection wells from a Devonian water source to a produced Mississippian water source:

WIW 8-11-10-26
WIW 6-12-10-26
WIW 14-12-10-26
WIW 6-13-10-26
WIW 9-13-10-26
WIW 10-7-10-25
WIW 12-7-10-25
WIW 14-7-10-25
WIW 4-18-10-25

2. The subject wells commenced injection of Devonian water during July 1967. The source well for these injectors (WSW 2-11-10-26) has developed casing leaks and a liner repair job would be required to return the well to production. It is believed that the well cannot be restored to its previous level of production due to pump size restrictions of the liner and as a consequence the previous level of voidage replacement would not be maintained.

In view of this consideration, in addition to economic and practical reasons, an alternate source of injection water should be developed at this time.


*PC to Mr. Milne
17 Dec 71*

3. The well, Mineraloid Virden 9-15-10-26, suspended since December 1969, is considered a primary source for the subject well's injection requirements. The last production rate of the well was 12 BOPD and 916 BWPD. It was suspended when the flowline developed leaks and high volume pumping and flowline replacement were not economic. The well is located in an active water drive area and would be capable of 1400 to 2000 BWPD, which would be adequate for the requirements of the injection wells.
4. The Devonian and Mississippian injection waters are not compatible. The incompatibility problem was discussed in a previous application dated June 17, 1971, when four wells in the Virden-Roselea Unit No. 3 were proposed for conversion from Devonian to Mississippian water source. The conversions were successfully carried out with no change in the injectivity characteristics of the wells.

To eliminate any chance of plugging at the wellbore Chevron Standard proposes to employ the same intermediary treatment, on the eight subject wells in that a pad of 100 barrels of 15,000 ppm acetic acid would be squeezed to each well prior to the source water changeover.

If additional information is required, please contact the undersigned.

Yours very truly,

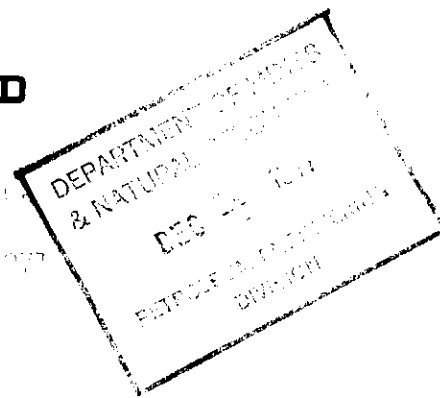
for 
J. G. TROWELL
Division Manager
Producing Department
Calgary Division

BNM/bv



CHEVRON STANDARD LIMITED

Box 100
 2200, 1st Floor
 10000
 November 10, 1971



Director of Mines
 2200, 1st Floor
 10000
 Ottawa, Ontario

Situation: Mr. J. S. Brown

Dear Sir:

Enclosed for you are two copies of a report on the investigation of the fire in the "A" tank, which occurred on November 10, 1971, at the Chevroton Refinery.

The report was prepared by the Chevroton Refinery on October 11-12-10-26 and was submitted to the Department of Mines and Technical Surveys on October 11-12-10-26.

We believe that the report will be of interest to you in connection with the investigation of the fire in the "A" tank, which occurred on November 10, 1971, at the Chevroton Refinery.

The following list of references is for your information:

- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓
- Chevroton Refinery, Report, DES 11-12-10-26 ✓

Very truly,

J. S. Brown, P. Eng.
 Area Engineer

WJ/10

Enclosed/10-11

Attached

FILE
VIR-R-2-10-36
Injection Wells

June 25, 1971

Mr. J. G. Trowell, Division Superintendent,
Chevron Standard Limited,
400 Fifth Avenue S.W.,
Calgary 1, Alberta.

Dear Mr. Trowell:

Re: Application to change source of water being injected
Virden-Roselea Unit 43
Order No. PM 7

Pursuant to subsection (2) of Section 3 of the Pressure Maintenance Rules for the above Order, the Board hereby grants permission to the Unit Operator to -

- (1) convert the following injection wells from Devonian water supply to produced Mississippian water supply:

WIM 16-2-10-36 ✓
WIM 17-1-10-36 ✓
WIM 18-1-10-36 ✓
WIM 3-2-10-36 ✓

*Application to
convert
signed July 2/71
JSL*

subject to the following condition -

- (1) a pad of 100 barrels of 10,000 PPM to 20,000 PPM acetic acid shall be placed between the Devonian and the Mississippian water, in each of the above wells, at the time of the change-over of the source water.

Yours sincerely,

WJL
for W. Winston Mair,
Chairman.

FSG/h

cc: Mr. Lindsay Brown, Area Supervisor
Chevron Standard Limited,
Box 100, Virden, Man.

Mailed July 2/71

INTER - DEPARTMENTAL MEMORANDUM

FROM F. S. GAMEY
Reservoir Engineer



PROVINCE
OF
MANITOBA

DATE JUNE 22, 1971

TO THE OIL & NATURAL GAS CONSERVATION BOARD
J. S. ROPER - Deputy Chairman
M. J. GOBERT - Member
W. WINSTON MAIR - Chairman

SUBJECT APPLICATION BY CHEVRON STANDARD

TO CONVERT INJECTION WELL OPERATIONS FROM
DEVONIAN SOURCE WATER TO PRODUCED MISSISSIPPIAN WATER - VIRDEN-ROSELEA UNIT #3

Approval of the Board is requested for the proposed conversion of four injection wells, as outlined in the attached material submitted by J. G. Trowell.

Chemical tests have indicated that the Devonian and Mississippian waters, when mixed, caused iron sulphide precipitation. This could be eliminated by the addition of acetic acid in excess of 1000 p.p.m.

To prevent plugging of the well bore, Chevron Standard proposes to run 100 barrels of 10,000 p.p.m. to 20,000 p.p.m. acetic acid ahead of the change-over of the injection water from Devonian source to Mississippian source.



Chevron Standard Limited

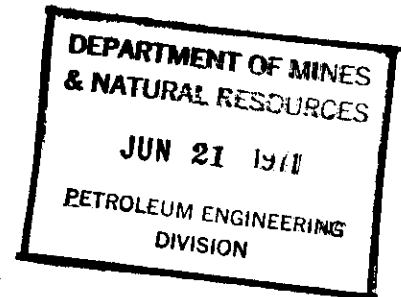
400 Fifth Avenue S.W., Calgary 1, Alberta

June 17, 1971

The Oil and Natural Gas Conservation Board
Box 42, Legislative Building
Winnipeg 1, Manitoba

Attention: Mr. F. S. Gamey

Gentlemen:



We wish to apologize for an oversight in procedure regarding Chevron Standard's proposed conversion of four injection wells in the Virden Roselea Unit No. 3 from a present Devonian water supply to a Mississippian produced water supply. In accordance with Manitoba Regulation 103/66, The Oil and Natural Gas Conservation Board Order No. PM7, Section 2, Subsection (2), we hereby submit the following information for your consideration:

1. Chevron Standard proposes to convert the following injection wells from a Devonian water source to a produced Mississippian water source:

WIW 16-2-10-26
WIW 14-1-10-26
WIW 6-1-10-26
WIW 8-2-10-26

2. The subject wells commenced injection of Devonian water during July 1967. A high volume pump recently installed in well 2-10-10-26 which was producing with a full casing at a water cut of 97% has increased production from 6 BOPD and 165 BWPD to approximately 35 BOPD and 1,500 BWPD. This source of produced water will be adequate for the subject well's injection requirements.
3. Produced Mississippian water is preferred to Devonian water for injection purposes because of economic, and practical considerations.
4. The two injection waters are not compatible (Chemical and Geological Laboratories Limited Report No. E70-1598 attached). Although no precipitation problems were evident in the initiation of the Devonian waterflood it is recognized that the flood front was primarily an oil-Devonian water interface.

In the present proposal a second flood front consisting of a Mississippian water-Devonian water interface will result.

*File:
VIR-ROS Unit 3
Injection wells*

5. Tests performed on similar waters from the N.V.S. field in 1963 by Chemical and Geological Laboratories Limited (Report No. E22532 attached) indicated that 1,000 PPM of acetic acid would effectively eliminate iron sulphide precipitation when the waters were mixed.

In view of the above factors Chevron Standard proposes to convert the four subject wells to Mississippian water source. It is felt the danger of plugging the formation in these four wells due to the waters' incompatibility is very small, however a pad of 100 barrels of 10,000 PPM to 20,000 PPM acetic acid would be squeezed to each well prior to the source water changeover. The Devonian front would be displaced a minimum of 30' from the well bore. This would effectively eliminate any chance of plugging at the well bore and subsequent decrease of injectivity. Any possible precipitation in the formation beyond 30' from the well bore would have little or no effect on the injectivity.

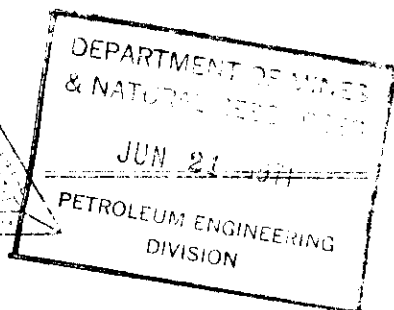
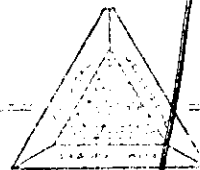
If additional information is required please contact the undersigned.

Yours very truly,

for *KC/Trowell*
J. G. TROWELL
Division Superintendent
Producing Department
Calgary Division

BM/bv
Attachments

EDMONTON - CALGARY - FORT ST. JOHN



Date Reported: November 22, 1963.

Laboratory Report Number: E22532.

THE CALIFORNIA STANDARD COMPANY

- E22532-1: Calstan Scallion W.S.W. 6-27-11-26. Devonian water supply well. Sampled November 18, 1963.
- E22532-2: Can. Sup. Scallion 8-16-11-26. Mississippian oil well. Sample obtained November 18, 1963 by L.D. Brown.
- E22532-3: Calstan Prov. 9-16-11-26. Mississippian produced water. Sample obtained November 18, 1963 by L.D. Brown.

This report is a continuation of the analysis on our Report Number: E22478, however the compatibility tests were repeated by co-mingling E22532-1 with each of E22532-2 and E22532-3. The results were similar to the findings in Report E22478 but there was a difference in that the precipitation was immediate. This may be due to the retention of all the hydrogen sulfide in the Mississippian waters. In the previous samples some of the hydrogen sulfide may have been lost due to aeration and method of sampling. The present samples were obtained with the exclusion of air and in narrow mouth gallon glass containers while the previous samples were taken in wide mouth quart sealers and were very likely exposed to air.

The incompatibility in these samples as in the previous ones was caused mainly by the formation of iron sulfide with smaller quantities of sulfates and carbonates of sodium, calcium and magnesium.

To determine the chemicals most effective in preventing or minimizing the formation of precipitates, the Devonian water with chemicals added to it was mixed 50-50 with the Prov. 9-16. The Can. Sup. water was not used because preliminary tests revealed that the Magna 35 present in the Prov. 9-16 water did not interfere with the tests.

Following is the summary of the tests with the chemicals used:

1. Citric Acid.

10, 20 and 50 ppm. - Precipitates slightly decreased from the untreated mixtures.

In excess of 1000 ppm. - No iron sulfide precipitation. Free sulfur precipitating from the reaction of the excess acid with hydrogen sulfide. Carbonates and sulfates present in small amounts.

(continued)

2. Gluconic Acid.

10, 20 and 50 ppm. - Traces of iron sulfide present as a suspension. Small amounts settling 4 hours after treatment, decreasing as the concentration of acid is increased.

In excess of 1000 ppm. Same as in citric acid.

3. Acetic Acid.

10, 20 and 50 ppm. - Similar to Gluconic acid, but the iron sulfide settling in slightly larger amounts.

In excess of 1000 ppm. Same as citric acid.

4. Kullapon BF-73.

(a chelating product of Chemical Developments Of Canada Ltd.)

In all concentrations it prevents the precipitation of the carbonates and sulfates but does not prevent the formation of iron sulfide.

5. Sodium Carboxymethylcellulose.

Ineffective in all concentrations. Formed other precipitates.

6. Sodium Hexa - Meta - Phosphate.

Ineffective in all concentrations. Formed other precipitates.

From the preceding tests, the Gluconic and Acetic acids were found to be the most effective with the Gluconic being the better of the two. Further tests have shown that when up to 25% Devonian water containing 10 ppm. Gluconic acid was mixed with the Mississippian water, there was no precipitation of iron sulfide. In similar tests, the acetic acid was not as effective.

The tests were performed on an open system basis and any variation from them may yield different results. Tests on a closed system basis are difficult to duplicate in the laboratory and should be performed at the source of the samples.

CHEMICAL & GEOLOGICAL LABORATORIES LIMITED

OPERATOR: CHEVRON STANDARD LIMITED

REPORT NUMBER: E70-1598

DATE SAMPLED: June 23, 1970

DATE RECEIVED: June 25, 1970

DATE REPORTED: June 30, 1970

KIND OF SAMPLE: Water

Sampled by: A. Young

E70-1598-1: Chevron Virden WSW 2-11 LSD 2-11-10-26WI Devonian Water, sampled from wellhead.
 E70-1598-2: 2-11 Plant. Mississippian produced water, sampled at discharge line on filter.

COMPATIBILITY

The samples were filtered and mixed in 10% increments.

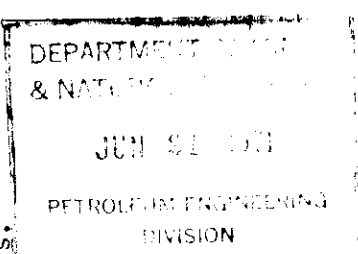
The test was carried out on an open system basis at room temperature, over a period of 24 hours.

Results are as follows:

MIXTURES

E70-1598-1 V.S. E70-1598-2

E70-1598-1 (%)	E70-1598-2 (%)	PRECIPITATION			
		Immediate	1 Hour	4 Hours	8 Hours
0	100	↑	Elemental Sulfur	No change	No change
10	90		↑		
20	80	Trace Air	Darkening	↑	"
30	70	Oxidized	Due To	Further	"
40	60	Elemental Sulfur	Iron Sulfide Formation	Darkening	"
50	50		↓		"
60	40				"
70	30				"
80	20				"
90	10		Elemental Sulfur	No change	No change
100	0	Nil	Nil	"	Trace Iron Oxide
				Nil	Further Iron Oxide Precipitation
					↑
					Iron Sulfide Coagulating and Settling Out.

Observation:

The black iron sulfide precipitation increased in intensity, from a trace in the 10-90 mixture, to a maximum in the 60-40 mixture. No iron sulfide could be detected in the 80-20 and 90-10 mixtures.

continued.....

CHEMICAL & GEOLOGICAL LABORATORIES LIMITED

OPERATOR: CHEVRON STANDARD LIMITED

REPORT NUMBER: E70-1598

Conclusions:

The Mississippian water will deposit a trace of elemental sulfur upon exposure to air.

The Devonian water will deposit a trace of iron oxide upon exposure to air.

The two samples are incompatible due to the formation of iron sulfide, resulting from the H_2S present in the Mississippian water and the iron present in the Devonian water.

INTER-DEPARTMENTAL MEMORANDUM

FROM Mr. F. S. Gamey
Reservoir Engineer



DATE June 10, 1971.

TO Oil & Natural Gas Conservation Board
W. Winston Mair, Chairman
J. S. Roper, Deputy Chairman
M. J. Gobert, Member

SUBJECT

Re: Virden Roselea Unit #3
Water Injection Wells
Chevron Standard Limited

We have received application to convert two water injection wells in the above unit, from Devonian source water used for injection to Mississippian source water. Chevron proposed to run a 'pad' of acetic acid between the Devonian and Mississippian water to prevent an emulsion block.

Pressure Maintenance Order No. PM7, (Virden-Roselea Unit #3) requires:

"2(2) Before any change is made in the source of water being injected, the Unit Operator shall satisfy the board as to the suitability of the water to be injected".

I have contacted Mr. J. G. Trowell of Chevron Standard Limited who has agreed to submit an application to the Board for the above conversion application, and information relating to the use of a pad of acetic acid between the source waters injected.

F. S. Gamey
F. S. Gamey,
Reservoir Engineer.

FSG/hf

B.F. - done 29/71



Chevron Canada Resources

P.O. Box 100, Virden, Manitoba R0M 2C0
Phone (204) 748-1334 Fax (204) 748-6762

December 31, 1991

1991 Summary of Injection Well Packer Installations

Department of Energy and Mines
Petroleum Branch
Attention: Mr. John Fox
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Dear Sir:

In reply to your request letter dated 1985-12-09, Chevron installed packers in thirteen (13) injection wells in 1991. These were as follows:

<u>NVSU #1</u>	2-10-11-26	<u>VRU #1</u>	15-23-10-26
	12-10-11-26		11-25-10-26
	10-21-11-26		3-26-10-26
	14-13-11-26		
	14-23-11-26	<u>VRU #3</u>	14-2-10-25
	6-24-11-26		8-2-10-26
	14-33-11-26		14-1-10-26

Since implementation (1986-01), a total of 68 injection wells have had packers installed, which is above the proposed target of 10 per year. Twelve (12) packer installations are planned for 1992.

The following are the number of wells in each unit that do not yet have packers installed:

NVSU #1	7
Daly #3	1 (Suspended well)
VRU #1	4
VRU #3	<u>10</u>
Total	22

If further information is required, please contact Mr. Kevin Anderson at 748-1334 or at the letterhead address.

Yours truly,

for

J. E. CAUSGROVE, P. Eng.
Area Superintendent
Virden

JEC/tjs

Esso Resources Canada

Avis L. Roemer
Supervisor

Esso

Esso

Land Administration

605 Fifth Avenue SW
PO Box 3333 Station M
Calgary, Alberta T2P 2P8

Esso Resources Canada
605 Fifth Avenue SW
P.O. Box 3333, Station M
Calgary, Alberta
Canada T2P 2P8
Tel. 403 267 0652
Res. 403 282 4197

file
NYC 1
Imperial Oil

1989-09-11

Manitoba Oil and Natural Gas
Conservation Board
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Dear Sirs:

**SUBJECT: Unit Interests in North Virden Scallion Unit #1 and
 Virden Roselea Unit #3**

We have attached, hereto, the documentation required to have our name changed effected in your records.

If you have any questions regarding this matter please contact the undersigned.

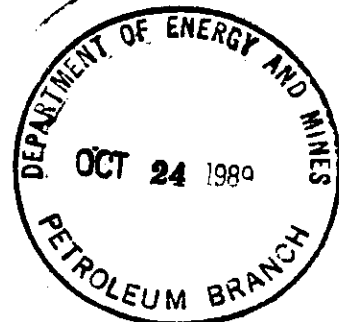
Yours very truly,



**Avis L. Roemer
Supervisor,
Land Administration
267-0652**

ALR/jmm

Attach.



Imperial Oil



THE CORPORATIONS ACT
SUPPLEMENTARY CERTIFICATE
OF REGISTRATION



FOR DEPARTMENTAL USE ONLY -
Manitoba Corporation No. - 0001872

THIS ENDORSEMENT CONSTITUTES A SUPPLEMENTARY
CERTIFICATE OF REGISTRATION AND THE BODY CORPORATE
CONTINUES TO BE REGISTERED UNDER THE CORPORATIONS
ACT.

DATED: SEPTEMBER 14 1989

Branch

A- *[Signature]*
Acting Director, Corporations Branch

NEW NAME: MCCOLL-FRONTENAC INC.

FORM 6

THE CORPORATIONS ACT
APPLICATION FOR SUPPLEMENTARY CERTIFICATE OF REGISTRATION

1 - Name of Body Corporate

Texaco Canada Inc.

2 - Manitoba Corporation Number

001872

3 - Jurisdiction of Incorporation

Federal

4 - Date of original Registration in Manitoba

5 - That the Articles of the body corporate were amended on August 23, 1989
and the corporation requests that its registration be amended accordingly as follows:

The corporate name be changed from Texaco Canada Inc. to
McColl-Frontenac Inc.

Date:

September 8, 1989

Signature:

[Signature]

Description of Office:

Corporate Secretary

Note: A Certificate of Status is required if the application is made more than 90 days from the date of the amended articles.

The application in duplicate shall set out the changes in point form and shall correspond with the relevant amendment. A schedule may be attached if necessary.

Where a body corporate currently registered in Manitoba is amalgamated, the application must set out the names of all the amalgamating bodies corporate, the date of registration in Manitoba and the Manitoba Corporation Number if known.



MANITOBA

FOR DEPARTMENTAL USE ONLY -
Manitoba Corporation No. -

2158656

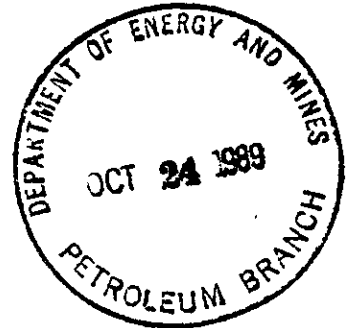


THE CORPORATIONS ACT SUPPLEMENTARY CERTIFICATE OF REGISTRATION

THIS ENDORSEMENT CONSTITUTES A SUPPLEMENTARY
CERTIFICATE OF REGISTRATION AND THE BODY CORPORATE
CONTINUES TO BE REGISTERED UNDER THE CORPORATIONS
ACT.

DATED: AUGUST 30 1989

[Signature]
Acting Director, Corporations Branch



NEW NAME: ESSO RESOURCES (1989) LTD.

FORM CA 6

THE CORPORATIONS ACT APPLICATION FOR SUPPLEMENTARY CERTIFICATE OF REGISTRATION

- Name of Body Corporate
TEXACO CANADA RESOURCES LTD.

- Manitoba Corporation Number
49118 2158656

- Jurisdiction of Incorporation
Alberta

- Date of original Registration in Manitoba
August 28, 1979

- That the Articles of the body corporate were amended on August 1, 1989
and the corporation requests that its registration be amended accordingly as follows:

Change of name from Texaco Canada Resources Ltd. to Esso Resources (1989) Ltd.

Date:
August 1, 1989

Signature:

[Signature]

Description of Office:

Assistant Secretary

Note: A Certificate of Status is required if the application is made more than 90 days from the date of the amended articles. Fee for Supplementary Certificate is \$50.00.

The application in duplicate shall set out the changes in point form and shall correspond with the relevant amendment. A schedule may be attached if necessary.

Where a body corporate currently registered in Manitoba is amalgamated, the application must set out the names of all the amalgamating bodies corporate, the date of registration in Manitoba and the Manitoba Corporation Number if known.



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

1979-10-29

R. A. Park
Manager - Production

Representative Change
Operating Committee
Virden-Roselea Unit No. 3

The Oil and Natural Gas Conservation Board
Province of Manitoba
310 Legislative Building
Winnipeg, Manitoba
R3C 0V8

Gentlemen:

We wish to advise you that as of October 1, 1979, the representative of Chevron Standard Limited on the Operating Committee for the subject unit will be:

D. A. Zeeuwen
Chevron Standard Limited
P.O. Box 100
Virden, Manitoba
ROM 2C0

The alternates are Messrs. P. Pisio and D. R. Henderson who are located at the letterhead address.

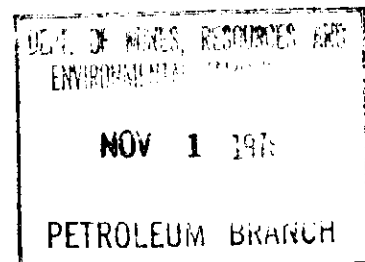
Yours very truly,



R. A. PARK

DRH/njs

cc: Mr. D. A. Zeeuwen



MICROFILMED

TO

HERE

June/79

INTER-DEPARTMENTAL MEMORANDUM



PROVINCE
OF
MANITOBA

DATE July 12/66

FROM

TO

SUBJECT VIRDEN-ROSELEA UNIT NO. 3 - PUBLIC HEARING - June 16, 1966

(CONTINUATION) - October 6, 1966

Copies of Hearing sent to -

2 copies - Imperial Oil Limited, Regina - Att: G.L. Haight

1 copy - Stuart Anderson

- J. S. Richards

- M. J. Gobert

- D. Moylan

- R. R. McDaniel

- Chevron Standard - Calgary - J.G.Trowell

- Chevron Standard - Virden

— UNDER THE MINES ACT —

Virden-Roselea Unit No. 3 — Schedule
"A"

The following error occurred on page
129 of the Gazette dated February 2,
1974:

The percentage of Working Interest

Ownership of Gulf Oil Canada Limited
in Tract No. 10-13 was omitted. The
interest should have been shown as "50".

E. H. GAUDET, Chairman,
Virden-Roselea Unit No. 3,
Legal Committee.

—————9

UNDER THE MINES ACT
(VIRDEN-ROSELEA UNIT No. 3)
SCHEDULE "A"

TRACT NUMBERS AND THE PRIMA FACIE WORKING INTEREST OWNERS
OF THE TRACTS IN THE VIRDEN-ROSELEA UNIT No. 3
(October 1, 1973)

Tract Number	Working Interest Owner	Percentage Working Interest Ownership	Tract Number	Working Interest Owner	Percentage Working Interest Ownership
6-7	Chevron Standard Limited	100		Mineraloid (Developments) Ltd.	37.5
8-7	Chevron Standard Limited	100	11-2	Chevron Standard Limited	100
9-7	Chevron Standard Limited	100	12-2	Chevron Standard Limited	100
10-7	Chevron Standard Limited	100	13-2	Chevron Standard Limited	100
11-7	Chevron Standard Limited	100	14-2	Chevron Standard Limited	100
12-7	Chevron Standard Limited	100	15-2	Mineraloid Ltd.	
13-7	Chevron Standard Limited	100		(No Personal Liability)	50
14-7	Chevron Standard Limited	100		Canadian Superior Oil Ltd.	50
15-7	Chevron Standard Limited	100	16-2	Mineraloid Ltd.	
16-7	Chevron Standard Limited	100		(No Personal Liability)	50
2-18	Chevron Standard Limited	100		Canadian Superior Oil Ltd.	50
3-18	Sun Oil Company	100	9-3	Chevron Standard Limited	100
4-18	Sun Oil Company	100	15-3	Chevron Standard Limited	100
5-18	Sun Oil Company	100	16-3	Chevron Standard Limited	100
6-18	Sun Oil Company	100	1-10	Chevron Standard Limited	100
7-18	Chevron Standard Limited	100	2-10	Chevron Standard Limited	100
12-18	Lochiel Exploration Ltd.	20	5-10	Gulf Oil Canada Limited	75
	Francana Oil & Gas Ltd.	20		Hudson's Bay Oil and Gas Company Limited	25
	3 Sons Investments Ltd.	60	6-10	Gulf Oil Canada Limited	100
2-1	Canadian Export Gas & Oil Ltd.	100	7-10	Chevron Standard Limited	100
3-1	Chevron Standard Limited	100	8-10	Chevron Standard Limited	100
5-1	Chevron Standard Limited	100	9-10	Chevron Standard Limited	77.5
6-1	Chevron Standard Limited	100		Canadian Reserve Oil and Gas Ltd.	22.5
7-1	Canadian Export Gas & Oil Ltd.	100	10-10	Canadian Reserve Oil and Gas Ltd.	100
11-1	Chevron Standard Limited	100	11-10	Chevron Standard Limited	100
12-1	Chevron Standard Limited	100	12-10	Chevron Standard Limited	100
13-1	Chevron Standard Limited	100	16-10	Chevron Standard Limited	77.5
14-1	Chevron Standard Limited	100		Canadian Reserve Oil and Gas Ltd.	22.5
5-2	Chevron Standard Limited	100	1-11	Chevron Standard Limited	100
7-2	Chevron Standard Limited	100	2-11	Chevron Standard Limited	100
8-2	Chevron Standard Limited	100	3-11	Chevron Standard Limited	100
9-2	Mineraloid Ltd.		4-11	Chevron Standard Limited	100
	(No Personal Liability)	50	5-11	Chevron Standard Limited	100
	Canadian Superior Oil Ltd.	50			
10-2	H. L. and V. E. Berry	12.5			
	G. A. Pierson	50			

Tract Number	Working Interest Owner	Percentage Working Interest Ownership	Tract Number	Working Interest Owner	Percentage Working Interest Ownership
6-11	Chevron Standard Limited	100	12-13	Mineraloid Ltd.	
7-11	Chevron Standard Limited	100		(No Personal Liability)	100
8-11	Chevron Standard Limited	100	13-13	Mineraloid Ltd.	
9-11	Chevron Standard Limited	100		(No Personal Liability)	100
10-11	Chevron Standard Limited	100	14-13	Mineraloid Ltd.	
11-11	Chevron Standard Limited	100		(No Personal Liability)	100
12-11	Chevron Standard Limited	100	15-13	Gulf Oil Canada Limited	50
13-11	Chevron Standard Limited	100		Union Oil Company of	
14-11	Chevron Standard Limited	100		Canada Limited	50
15-11	Chevron Standard Limited	100	2-14	Canadian Export Gas &	
16-11	Chevron Standard Limited	100		Oil Ltd.	100
3-12	Chevron Standard Limited	100	3-14	Francana Oil & Gas Ltd.	20
4-12	Chevron Standard Limited	100		Lochiel Exploration Ltd.	20
5-12	Chevron Standard Limited	100		3 Sons Investments Ltd.	60
6-12	Chevron Standard Limited	100	4-14	Francana Oil & Gas Ltd.	20
8-12	Chevron Standard Limited	100		Lochiel Exploration Ltd.	20
11-12	Chevron Standard Limited	100		3 Sons Investments Ltd.	60
12-12	Chevron Standard Limited	100	5-14	Francana Oil & Gas Ltd.	20
13-12	Chevron Standard Limited	100		Lochiel Exploration Ltd.	20
14-12	Chevron Standard Limited	100		3 Sons Investments Ltd.	60
15-12	Chevron Standard Limited	100	6-14	Francana Oil & Gas Ltd.	20
16-12	Chevron Standard Limited	100		Lochiel Exploration Ltd.	20
1-13	Canadian Export Gas &			3 Sons Investments Ltd.	60
	Oil Ltd.	100	11-14	Francana Oil & Gas Ltd.	20
3-13	Canadian Export Gas &			Lochiel Exploration Ltd.	20
	Oil Ltd.	100		3 Sons Investments Ltd.	60
4-13	Canadian Export Gas &		12-14	Francana Oil & Gas Ltd.	20
	Oil Ltd.	100		Lochiel Exploration Ltd.	20
5-13	Canadian Export Gas &			3 Sons Investments Ltd.	60
	Oil Ltd.	100	14-14	Mineraloid Ltd.	
6-13	Canadian Export Gas &			(No Personal Liability)	100
	Oil Ltd.	100	15-14	Chevron Standard Limited	100
7-13	Canadian Export Gas &		16-14	Chevron Standard Limited	100
	Oil Ltd.	100	9-15	Mineraloid Ltd.	
8-13	Canadian Export Gas &			(No Personal Liability)	100
	Oil Ltd.	100	1-23	Bracell Explorations Limited	100
9-13	Gulf Oil Canada Limited	50	2-23	Imperial Oil Limited	100
	Union Oil Company of		3-23	Imperial Oil Limited	100
	Canada Limited	50	4-23	Imperial Oil Limited	100
10-13	Gulf Oil Canada Limited		5-23	Imperial Oil Limited	100
	Union Oil Company of		6-23	Imperial Oil Limited	100
	Canada Limited	50	7-23	Imperial Oil Limited	100
11-13	Mineraloid Ltd.		8-23	Bracell Explorations Limited	100
	(No Personal Liability)	100			

VIRDEN-ROSELEA UNIT No. 3

SCHEDULE "B"

PRIMA FACIE WORKING INTEREST OWNERS AND THEIR INTERIM AND FINAL PARTICIPATING INTEREST IN VIRDEN-ROSELEA UNIT No. 3

(October 1, 1973)

Working Interest Owner	Final Participating Interest	Working Interest Owner	Final Participating Interest
Chevron Standard Limited	53.34448	Bracell Explorations Limited	.78370
Canadian Export Gas & Oil Ltd.	12.39256	Francana Oil & Gas Ltd.	.61805
Mineraloid Ltd. (No Personal Liability)	7.74510	Lochiel Exploration Ltd.	.61805
Imperial Oil Limited	6.99708	Canadian Reserve Oil and Gas Ltd.	.45131
Sun Oil Company	4.26756	Hudson's Bay Oil and Gas Company Limited	.09875
Gulf Oil Canada Limited	3.55185	H. L. and V. E. Berry	.21434
Union Oil Company of Canada Ltd.	2.78285	G. A. Pierson	.85734
Canadian Superior Oil Ltd.	2.77984	Mineraloid (Developments) Ltd.	.64301
3 Sons Investments Ltd.	1.85413	772-5	100.00000



Manitoba Regulation 155/74

Being

**THE OIL AND NATURAL GAS CONSERVATION BOARD
ORDER NO. PM 27**

**An Order pertaining to Pressure Maintenance by Water Flooding
VIRDEN-ROSELEA UNIT NO. 3**

*Made and Passed Pursuant to "The Mines Act", Cap. M160, R.S.M.,
1970, and Amendments Thereto, by The Oil and Natural Gas
Conservation Board of Manitoba*

(Filed June 27, 1974)

Order No. PM 7, of The Oil and Natural Gas Conservation Board, made and passed on the 19th day of October, A.D., 1966 and filed as Regulation 103/66, is amended as follows:

1. Subclause (1) of Clause 1 of the Pressure Maintenance Rules of the Order is amended by adding to the list of wells therein set out, the following well:

Chevron South Virden Prov. 12-11-10-26

Oil and Natural Gas Order No. PM 27 made and passed this 19th day of June, A.D., 1974, at the City of Winnipeg, in the Province of Manitoba, by The Oil and Natural Gas Conservation Board.

Approved:

"S. Green"

Sidney Green,
Minister of Mines, Resources and
Environmental Management.

"Jas. T. Cawley"

Jas. T. Cawley, P. Eng.,
Chairman,
The Oil and Natural Gas
Conservation Board.

"J. S. Roper"

J. S. Roper,
Deputy Chairman,
The Oil and Natural Gas
Conservation Board.

2—Order of the Minister under Section 23

AND WHEREAS, the said pipe line does not exceed five miles in length, as provided by Section 23 of the said Act;

AND WHEREAS, Chevron Standard Limited has complied with the provisions governing exemption under the said section, and the application by Chevron Standard Limited is considered in other respects to be reasonable;

NOW, THEREFORE, I, the Minister of Mines, Resources and Environmental Management, order:

That the pipe line to be constructed by Chevron Standard Limited, and to be located in the North-west Quarter of Section 11, Township 10, Range 26, West of the Principal Meridian, and to be known as an Extension to the Virden-Roselea Unit No. 3 Salt Water Injection System, for the transport of salt water from the existing pipe line located on Legal Subdivision 11 of Section 11, Township 10, Range 26, West of the Principal Meridian to the water injection well known as Chevron South Virden Prov. WIW 12-11-10-26, be exempt from the provisions of Section 5, Section 9, Section 10, Section 16 except subsection (5) thereof, and all of Part III of The Pipe Line Act.

This exemption is subject to the condition that Chevron Standard Limited, or its successor, in respect of the construction or operation of the above mentioned pipe line conform with all the provisions of the said Act, except those from which the pipe line is specifically exempted as though a construction permit or operating licence had been issued in respect of the pipe line.

DATED at Winnipeg, Manitoba, this day of , A.D., 1974.

Sidney Green,
Minister,
Department of Mines, Resources
and Environmental Management.

May 24, 1974

NW 11-10-26, WPM

Owner: Her Majesty the Queen in
the Right of the Province of Manitoba

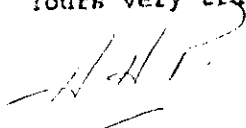
Tenant: David Judd

Mr. Robert Winston
Crown Lands
1007 Century Street
Winnipeg, Manitoba

Dear Sir:

Please be advised that Chevron Standard Limited wishes to construct a water injection line from Lsd. 11 to Lsd. 12 on the above captioned lands. Chevron Standard Limited will be responsible for any crop loss suffered by the tenant and will attend on him after construction has been completed.

Yours very truly,


A. S. McCRAE

HMP/em

cc: Mr. David Judd
Virden, Manitoba

cc: Mr. L. D. Brown ✓

MA
MA



Chevron Standard Limited

Box 100
Virden, Manitoba
R0M 2C0
June 4, 1974

CM

Mr. J. D. Russell
Act. Director of Mines
Department of Mines, Resources
and Environmental Management
993 Century Street
Winnipeg, Manitoba
R3H 0W4

Dear Sir:

Re: Virden Roselea Unit # 3 Salt
Water Injection Line Extension

9/11 F

BF June 17/74

Chevron Standard Limited proposes the construction of a salt water injection line from 11-11-10-26 WPM to 12-11-10-26 WPM as shown on the attached plan. This proposed line will consist of approximately fourteen hundred (1400) feet of 2 3/8" O.D. cement-lined yellow-jacketed steel pipe which will convey salt water from the existing line at 11-11-10-26 WPM to the well 12-11-10-26 WPM at a maximum pressure of 1000 psi.

We believe that this line comes within the definition of a pipeline as defined by Section 2(h) of "The Pipeline Act", being Chapter 26, Statutes of Manitoba, 1954 and would ordinarily be subject to all provisions contained there in. We hereby apply pursuant to the provisions of Section 23 of the said Act, for an order exempting this injection line from the provisions of "The Pipeline Act".

As noted in the attached letter we have contacted Mr. Robert Winston, Crown Lands, who advises that since we have a General Permit covering this property it is not necessary to obtain any further consents.

We trust that this is satisfactory and that your approval will be received.

Yours truly,

[Signature]
L. D. BROWN, P. Eng.
Area Supervisor

PL/jl

Attach.

cc J. Barton
R. Billy

INTER-DEPARTMENTAL MEMORANDUM

PROVINCE
OF
MANITOBA

DATE July 12, 1974

FROM H. C. Moster

TO J. S. Roper

Acting Chief Petroleum Engineer

Acting Senior Assistant Deputy Minister

SUBJECT RE: Virden-Roselea Unit No. 3 Salt Water Injection Line Extension

Chevron Standard Limited has applied for exemption under Section 23 of The Pipe Line Act for an extension to the salt water injection line system in Virden-Roselea Unit No. 3.

Enclosed herewith are:

- (1) Original letter of application, dated June 4, 1974.
- (2) Copy of a letter of authority from the Lands Section plus copies of Crown General Permits on the surface of the subject lands.
- (3) Three copies of the plan of survey.
- (4) Original and 2 copies of a proposed Order of the Minister.

No road crossings are involved.

Should this application meet with your approval, please forward for appropriate signature and return the signed Order and approved plans to this office to be forwarded to the company.

HCM
H. C. Moster

HCM/evh

Encls.

c.c.: J. D. Russell ✓



Province of Manitoba

Department of Mines, Resources and Environmental Management

Mines Branch

Petroleum Engineering Division

Telephone: (204) 786-7931 Ext. 252 & 253

993 Century Street

Winnipeg, Manitoba

R3H 0W4

July 23, 1974

John

Chevron Standard Limited
Box 100
VIRDEN, Manitoba
ROM 200

Attention: Mr. L.D. Brown, P. Eng.,

Dear Sir:

Re: Salt Water Injection Line Extensions

Enclosed are three Ministerial Orders exempting the pipe lines described therein from certain provisions of The Pipe Line Act.

An approved copy of a plan of survey for each line has also been included.

The pipe lines referred to above are extensions to salt water injection lines located as follows:

1. North Virden Scallion Unit # 1 --
From 3-11-11-26 to the well Chevron Scallion Prov. WIW 6-11-11-26
2. Virden-Roselea Unit # 1 --
From 5-25-10-26 to the well Chevron Virden WIW 11-25-10-26
3. Virden-Roselea Unit # 3 --
From 11-11-10-26 to the well Chevron South Virden Prov. WIW 12-11-10-26

Yours truly,

H. C. Moster

H. C. Moster, P. Eng.,
Acting Chief Petroleum Engineer

HCM/evh

Encls.

c.c. - J. D. Russell ✓

G. E. Johnson

INTER-DEPARTMENTAL MEMORANDUM

DATE June 5, 1974

FROM H. C. Moster

PROVINCE
OF
MANITOBA

TO The Oil and Natural Gas Conservation Bd.:

Jas. T. Cawley, P. Eng., Chairman,

J. S. Roper, Deputy Chairman.

Assistant Chief Petroleum Engineer

SUBJECT RE: CONVERSION TO TWO PRODUCING WELLS TO W.I.W.

Chevron Virden 11-25-10-26 WPM

Chevron South Virden Prov. 12-11-10-26 WPM

Per [redacted]

JUN 5 1974

715 F

Chevron Standard Limited, as unit operator, has made formal applications to convert the subject two producing oil wells to water injection wells.

BF June 26/74

Chevron Virden 11-25-10-26 WPM (Virden-Roselea Unit No. 1)

Figure 11 of the application for this well indicates pressure surveys taken in 1971 - 73. These surveys support Chevron's contention that a low pressure area exists around the 11-25 location. To date the well in 11-25 has shown only limited response to water flooding (Figure 3). Chevron's application to convert it to a water injection well should not be detrimental to final recovery from this area of the reservoir. The proposed conversion should increase the reservoir pressure in this region of the reservoir and flush recoverable oil to offsetting producers. The well is situated away from the unit boundaries so that no oil should be swept away from unit producers. No water compatibility problems are expected.

Chevron South Virden Prov. 12-11-10-26 WPM (Virden-Roselea Unit No. 3)

Figure 10 of the application for this well indicates an extremely low pressure sink in the vicinity of this well. The production decline curve for this well (Figure 4) would indicate the well has received little or no response from the waterflood. The proposed conversion should alleviate the low pressure problems in this region of the reservoir and aid in effectively flooding the reservoir. No problems with respect to trapped oil or water compatibility should exist.

RECOMMENDATIONS

It is recommended the requested two conversions be approved.

Amendments to the two PM Orders involved have been drawn up and are enclosed.

NOTE: It is Chevron's intention to complete the subject well by running cement lined tubing in the hole, putting the well on injection, and once the well has pressured up fill the annulus with oil. The pressure differential between the annulus and tubing is then monitored once a month to check for possible leaks. This has been the practise approved

in the past. A review of casing leaks to date is presently being undertaken. It is hoped this review will aid in confirming whether such completions are satisfactory or whether all SWD and water injection wells handling salt water should be required to have packers set immediately above the disposal or injection interval and the annulus filled with a corrosion inhibiting fluid. The present study should indicate whether the majority of casing leaks to date occurred prior to the present completion practise being implemented, or is the result of inadequate completions being presently carried out. Such causes as poor casing being initially used, improper surveillance by the operator's field staff, etc.; could be other causes of such leaks.

If this study suggests changes in such completions should be required, a memo recommending proposed Board requirements on the same shall be submitted by the Petroleum Section for Board approval.



H. C. Moster

HCM/evh

Encls.

c.c. - J. D. Russell ✓



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

October 18, 1973



Oil and Natural Gas Conservation Board
310 Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. J. T. Cawley, Chairman


Gentlemen:

Please be advised that Chevron Standard Limited hereby designates the following representative and alternative representatives to the Operating Committee for Virden-Roselea Unit No. 1:

Representative: Mr. L. D. Brown
Box 100
Virden, Manitoba
ROM 2C0

Alternates: Mr. A. Hamberg
Mr. D. R. Henderson
400 Fifth Avenue S.W.
Calgary, Alberta
T2P 0L7

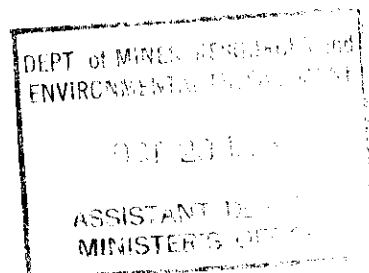
Yours very truly,


J. G. TROWELL
Assistant Manager
Producing Department
Units and Joint Ventures

DRHenderson/lw

cc: All Working Interest Owners
Virden-Roselea Unit No. 1

Copies sent to J. S. Roper



Jas. T. Cawley, P. Eng.
xxxxxxxxxxxx

R3C OP8

April 23, 1973

Mr. R.R. McDaniel
McDaniel Consultants (1965) Ltd.
300 Western Union Building
610 - 3th Avenue S.W.
CALGARY 2, Alberta

Dear Sir:

Re: (1) Virden-Roselea Unit #3 (April 1973)
(2) Submission to Conservation Board (March 1973)

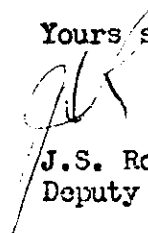
A copy of the progress report, 1972, for the above Unit is being forwarded under separate cover.

It is noted that the operator, Chevron Standard Limited, has requested that the voidage balance of fluids in the areas listed in Section 10 and 15 (see page 4 of the Unit #3 progress report) be excluded from future reports, as, "a voidage balance is being naturally maintained by active water drive."

A copy of the submission to the Conservation Board dated March 6, 1973 is enclosed for your information. An original copy was forwarded to you on March 14, 1973.

Your comments and any recommendations regarding the submission would be appreciated.

Yours sincerely,


J.S. Roper
Deputy Chairman

FSG/evh
Enclosure

March 6, 1973

Virden-Roselea Unit No. 3
Voidage Balance Requirements
Order PM7, Section 2 Clause 6

The Oil and Natural Gas Conservation Board
Room 310
Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. Jas T. Cawley, P. Eng.
Chairman

Gentlemen:

In accordance with the Oil and Natural Gas Conservation Board Order No. PM7, Pressure Maintenance Rule No. 2, Clause 6, Chevron Standard Limited as Unit Operator of Virden-Roselea Unit No. 3, hereby submits that a voidage balance is being naturally maintained by an active water drive, and that artificial maintenance of voidage balance by injection of water is not required in the Submission Area as shown on attached Figure 1 and listed as follows:

Lsd. 2-10-10-26 WPM
Lsd. 5-10-10-26 WPM
Lsd. 6-10-10-26 WPM
Lsd. 7-10-10-26 WPM
Lsd. 10-10-10-26 WPM
Lsd. 11-10-10-26 WPM
Lsd. 12-10-10-26 WPM
Lsd. 9-15-10-26 WPM

The following information is offered in support of this submission:

I. GENERAL

Over the five year period from the initiation of injection in Virden-Roselea Unit No. 3 on January 1, 1967 to December 3, 1971, approximately forty percent of the water required for injection was produced from the Devonian WSW 2-11-10-26 (WPM).

The Devonian formation in the water supply well was abandoned in December 1971 because of irreparable corrosion damage to the casing in the well. An alternate source of injection water from the Mississippian formation was developed utilizing the following three wells:

Chevron S. Virden Province 2-10-10-26
Chevron South Virden 12-10-10-26
Mineraloid Virden 9-15-10-26

Produced Mississippian formation water is presently the only source of injection water with approximately two-thirds of the injection water being supplied by the above three wells.

II. BOTTOM HOLE PRESSURE HISTORY

The Province of Manitoba Department of Mines and Natural Resources Publication #60-5, published in 1963, and entitled "Mississippian Oil Fields of Southwestern Manitoba" by H. R. McCabe records an initial reservoir pressure of 976 psig for the producing formation in the Virden-Roselea area. Drillstem test records for wells drilled in the area indicate formation pressures in the range of 850 to 900 psig. The drillstem test information is not considered reliable and is assumed to indicate lower than true initial reservoir pressure because of probable formation damage and incomplete pressure build-ups. The initial formation pressure recorded by McCabe is considered to be high. For the purpose of this study the original discovery pressure was assumed in the range of 900 to 950 psig.

The results of bottom hole pressure surveys taken in 1969, 1971 and 1972 are shown on Figures 2 and 3. The isobaric maps indicate that the reservoir pressure in the Submission Area is at or near original discovery pressure. Withdrawals from the Submission Area since Unit inception to August 31, 1972, the approximate time of the 1972 pressure survey, amounted to 2,999,982 reservoir barrels whereas injection during the same period amounted to 174,384 reservoir barrels. Therefore, a net voidage of 2,825,598 reservoir barrels has not resulted in a reduction of reservoir pressure.

III. GEOLOGICAL

Oil is produced from seven zones in the Virden-Roselea field. Zones of higher porosity and permeability are generally separated by dense impermeable zones and therefore fluid communication between zones would not be anticipated. However, fluid communication is likely in areas containing vertical fractures. The results of an analysis of vertical fractures as observed in cores is shown on Figure 4. Two or more open vertical fractures were observed in the cores from all cored wells in the Submission Area. No core data is available for the well Mineraloid Virden 9-15-10-26.

The proximity of the aquifer interface in the lowest producing horizon, the cherty zone, is shown on Figure 5. This figure shows the gross pay of the cherty zone above the original oil-water interface at approximately -680 feet subsea. This evidence of the proximity of the aquifer in the cherty zone, vertical fractures and high reservoir pressure in the Submission Areas, indicates it would be reasonable to expect the high producibility and water cuts as shown on Figures 6 and 7.

The well Mineraloid Virden 9-15-10-26 WPM was not cored, therefore, geological information is lacking on this well. However, the producing characteristics of this well are similar to those of other wells in the Submission Area which suggests that the well is subject to the active water drive. In addition, the high withdrawal rate from the 9-15 well has little, if any, effect on the bottom hole pressure at the off-setting suspended well 12-14-10-26.

IV. SUMMARY AND CONCLUSIONS

Chevron Standard Limited hereby submits that fluid withdrawals from the Submission Area are being replaced by an active water drive from the underlying aquifer and, therefore, reservoir voidage need not be replaced by injection of water in this area. The evidence supporting this submission is summarized as follows:

1. The reservoir pressure in the Submission Area is presently at or near original discovery pressure, even though reservoir voidage has exceeded 2.8 million reservoir barrels.
2. All wells in the Submission Area are in good communication with the aquifer because of vertical fractures in the reservoir and the close proximity of the oil-water contact in the cherty zone. All producing wells exhibit high water cuts.
3. The producing capability of most wells in the Submission Area is in excess of 300 barrels of fluid per day with some wells capable of producing as much as 1,480 barrels of fluid per day.

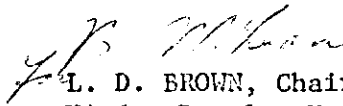
With the concurrence of the Board, Chevron Standard Limited, as Operator of Virden-Roselea Unit No. 3, proposes to report in the annual progress report, the voidage balance of fluids in the Unit area exclusive of the Submission Area. Water and oil production from the Submission Area will not be considered as voidage withdrawals and any water injected will not be credited as voidage replacement. At present, the water injected in the well 6-10-10-26 WPM in the Submission Area is limited to excess water that cannot be injected into other injection wells in the Unit due to pumping equipment limitations and wellhead injection pressure limitations.

A comparison of the present and proposed methods for calculating reservoir voidage, for the calendar year 1972, is shown on Tables I and II attached. It is apparent that sufficient Mississippian water was produced from the Submission Area to adequately supply the voidage requirements for the remainder of the Unit (Table II).

As shown on Figure 7, it is evident that sufficient water for injection requirements is available from the Submission Area. Wells in the Submission Area are capable of producing a minimum of 4,800 barrels of fluid per day at high water cuts. Fluid level measurements on the four wells presently producing from the Submission Area indicates that three of the wells were full while producing. The fourth well, Mineraloid Virden 9-15-10-26 WPM, was approximately one-half full while producing at a rate of 1,400 barrels of fluid per day.

If additional information is required regarding this submission, please contact Mr. E. N. McLean at the above letterhead address. Additional copies of this submission may be obtained from the Information Centre in our Calgary Office.

Yours very truly,


L. D. BROWN, Chairman
Virden-Roselea Unit No. 3
Operating Committee

BNMcLean/lw
Attachments

TABLE I

VIRDEN-ROSELEA UNIT NO. 3

RESERVOIR VOIDAGE RATES - 1972

	<u>First Quarter</u>	<u>Second Quarter</u>	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>Total For Period</u>
Oil Produced (Ebls)	105,920	109,310	111,273	105,135	431,638
Gas Produced (MSCF)	9,533	9,838	10,015	9,462	38,847
Water Produced (Ebls)	498,945	598,716	632,172	562,098	2,291,931
Average Solution GOR	90	90	90	90	90
Formation Volume Factor	1.05	1.05	1.05	1.05	1.05
Voidage Oil (Res. Bbls)	111,216	114,775	116,837	110,392	453,219
Voidage Water (Res. Ebls)	498,945	598,716	632,172	562,098	2,291,931
Total Voidage (Res. Bbls)	610,161	713,491	749,009	672,490	2,745,149
Water Injected (Res. Bbls)	500,064	598,716	632,172	562,098	2,293,050
Net Voidage (Res. Bbls)	110,097	114,775	116,837	110,392	452,100
Net Void. Rate (Res. Bbls/D)	1,223	1,261	1,270	1,200	1,239
Cum. Net Void. (Res. Bbls)	-2,158,314	-2,043,538	-1,926,701	-1,816,309	

Gas Produced = Solution Gas

Pre-Unit Voidage: Oil - 6,226,190
 Water - 10,851,490
 Total - 17,077,680

TABLE II
VIRDEN-ROSELEA UNIT NO. 3
RESERVOIR VOIDAGE RATES - 1972*

	<u>First Quarter</u>	<u>Second Quarter</u>	<u>Third Quarter</u>	<u>Fourth Quarter</u>	<u>Total For Period</u>
Oil Produced (Bbls)	98,166	98,758	100,269	97,035	394,278
Gas Produced (MSCF)	3,835	6,836	9,024	8,738	35,485
Water Produced (Bbls)	306,617	311,170	327,899	315,483	1,261,169
Average Solution GOR	90	90	90	90	90
Formation Volume Factor	1.05	1.05	1.05	1.05	1.05
Voidage Oil (Res. Bbls)	103,074	103,696	105,262	101,939	413,991
Voidage Water (Res. Bbls)	306,617	311,170	327,899	315,483	1,261,169
Total Voidage (Res. Bbls)	409,691	414,866	433,131	417,422	1,675,160
Water Injected (Res. Bbls)	484,342	581,004	613,405	545,950	2,224,701
Net Voidage (Res. Bbls)	-74,651	-166,138	-180,224	-123,526	-549,541
Net Void. Rate (Res. Bbls)	-329	-1,826	-1,959	-1,397	-1,506
Cum. Net Void. (Res. Bbls)	-2,343,061	-2,509,199	-2,689,422	-2,817,949	

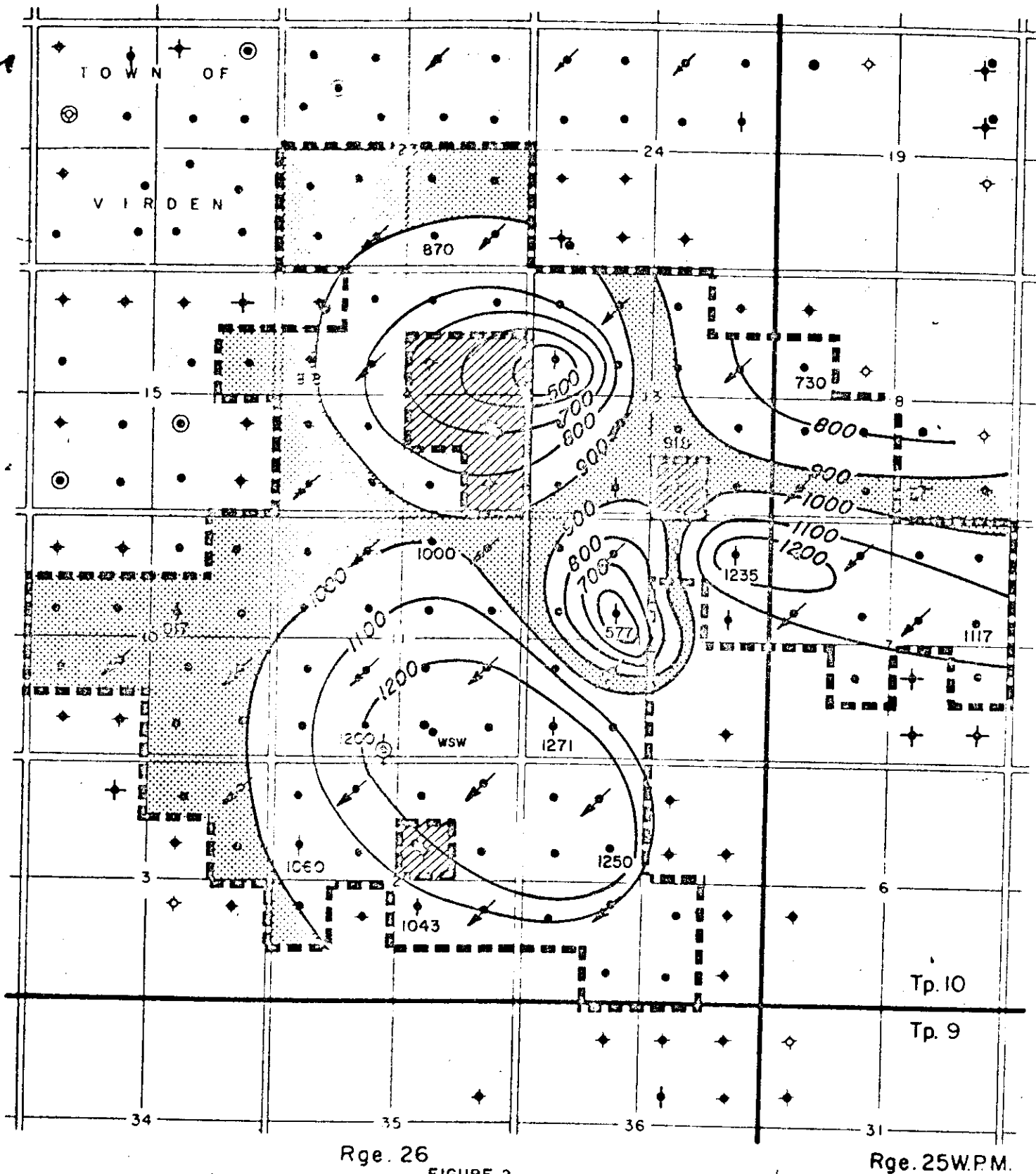
Gas Produced = Solution Gas

Pre-Unit Voidages: Oil - 6,226,190
 Water - 10,851,490

 Total - 17,077,680

*Excluding oil, gas and water produced from and injected to the following Submission Area:

Lsd. 2-10-10-26 WPM
Lsd. 5-10-10-26 WPM
Lsd. 6-10-10-26 WPM
Lsd. 7-10-10-26 WPM
Lsd. 10-10-10-26 WPM
Lsd. 11-10-10-26 WPM
Lsd. 12-10-10-26 WPM
Lsd. 9-15-10-26 WPM



VIRDEN ROSELEA UNIT No. 3

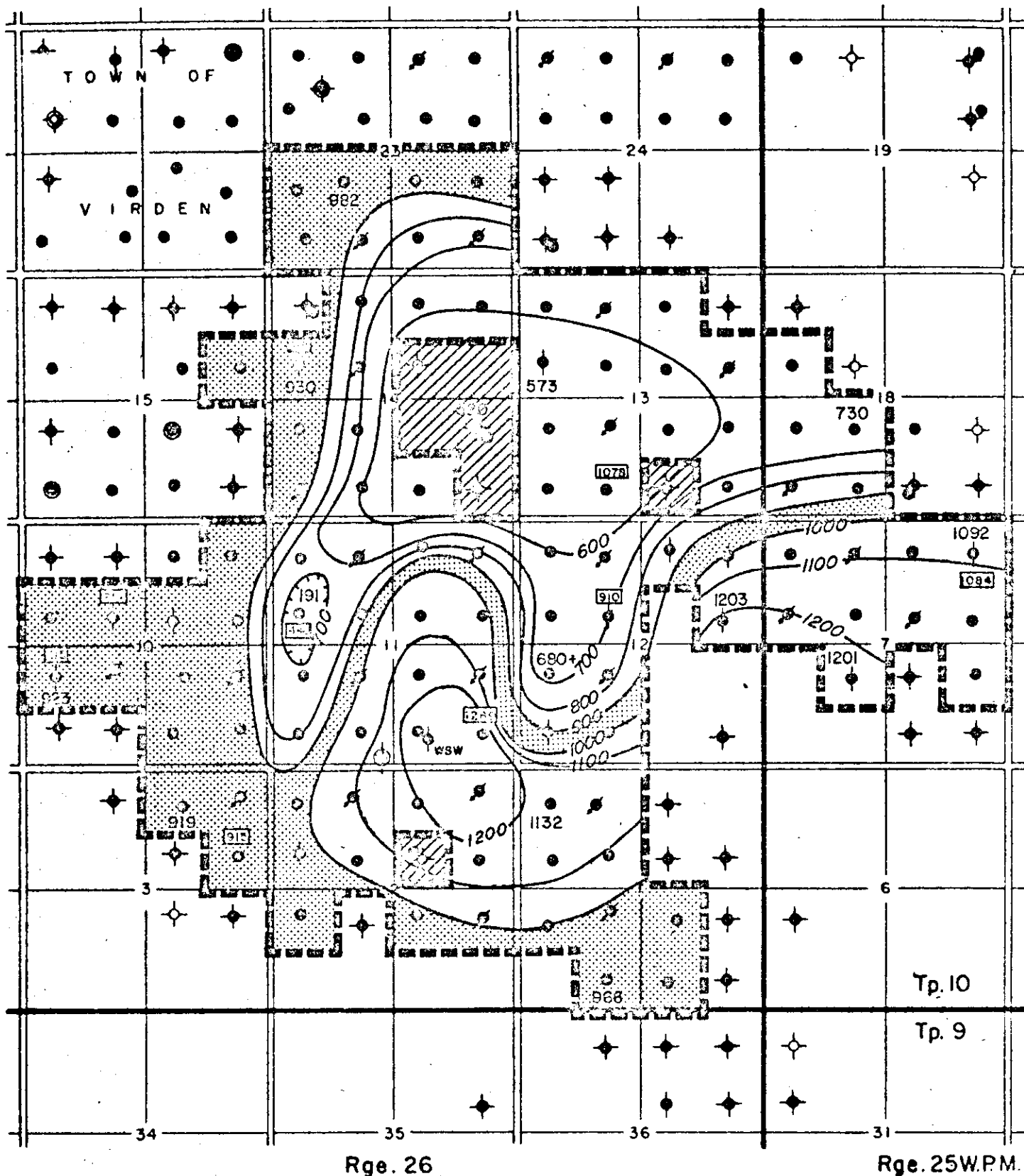
ISOBARIC MAP

BASED ON 1969 BHP SURVEY

LEGEND

AREAS NEAR
DISCOVERY PRESSURE

Scale 1" = 3000'



Rge. 26

FIGURE 3

Rge. 25W.P.M.

VIRDEN ROSELEA UNIT No. 3

LEGEND

ISOBARIC MAP

AREAS NEAR
DISCOVERY PRESSURE

BASED ON 1971 BHP SURVEY
1972 BHP SURVEY SHOWN 913

Scale 1" = 3000'

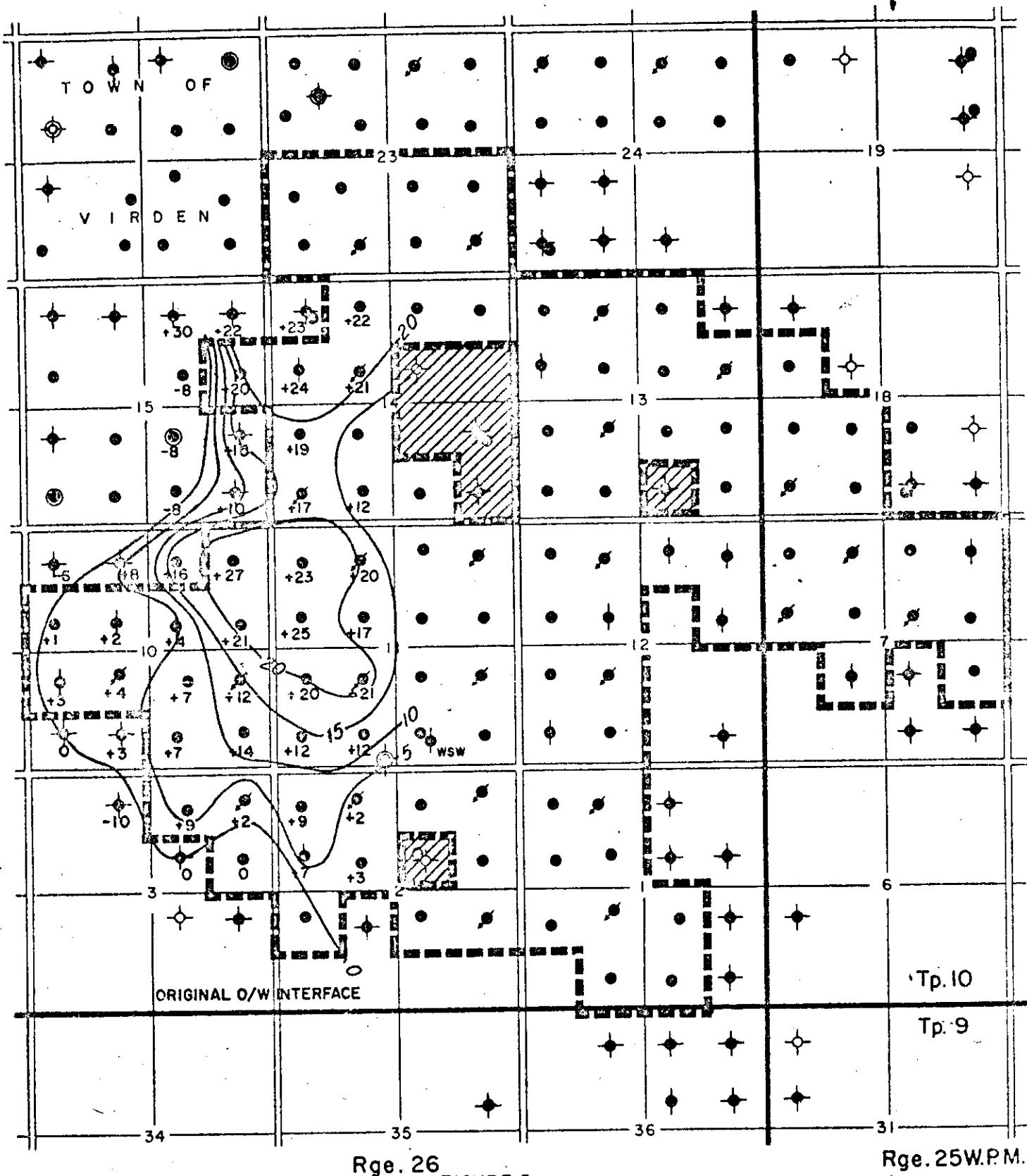
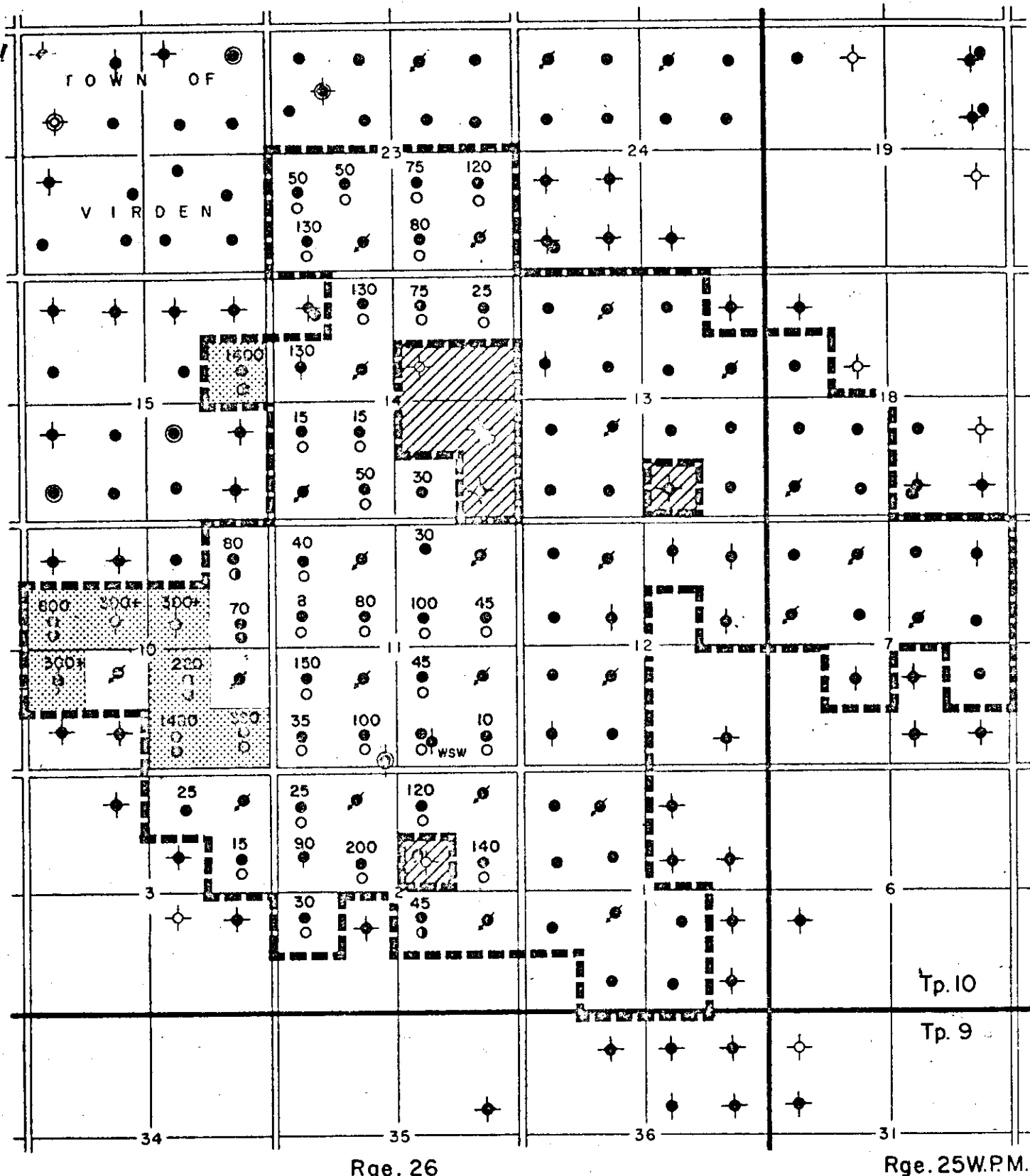


FIGURE 5
 VIRDEN ROSELEA UNIT No. 3
 GROSS PAY OF CHERTY ZONE
 ABOVE
 ORIGINAL OIL/WATER INTERFACE



Rge. 26

FIGURE 7

Rge. 25W.P.M.

VIRDEN ROSELEA UNIT No. 3
WEST HALF AVERAGE
FLUID RATES & LEVELS
AS OF AUGUST, 1972

LEGEND

- CURRENT FLUID PRODUCTION RATE
- WELL PUMPED OFF
- ◐ WELL 1/2 FULL WHILE PRODUCING
- WELL FULL WHILE PRODUCING
- WELLS CAPABLE OF PRODUCTION OVER 300 B.F.P.D.

Scale 1" = 3000'

R3C OP8

May 14, 1973

Mr. R. R. McDaniel,
McDaniel Consultants (1965) Ltd.,
800 Western Union Building,
640 - 8th Avenue S.W.,
Calgary 2, Alta.


Re: Subsurface Pressure Survey
April 9th to April 18th, 1973

Dear Rod:

Enclosed herewith is a copy of the results of a subsurface survey taken in the North Virden Scallion Unit #1 and the Virden-Roselea Units #1, #2 and #3.

Any comments you may have on the above survey or any recommendations you might suggest at this time would be appreciated.

Yours sincerely,


J. S. Roper,
Director of Mines.

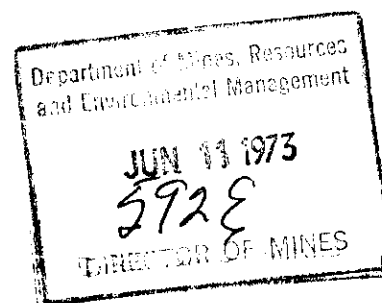
FSG/h



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

May 31, 1973



The Oil and Natural Gas Conservation Board
Department of Mines, Resources and
Environmental Management
Room 310, Legislative Building
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. J. T. Cawley, P. Eng.
Chairman

Copy

Gentlemen:

Chevron Standard Limited, as Unit Operator of Virden-Roselea Unit No. 3, under and pursuant to The Mines Act, Chapter M160, Revised Statutes of Manitoba, 1970 and Amendments thereto, hereby, on behalf of the Working Interest Owners in Virden-Roselea Unit No. 3, and on behalf of Chevron Standard Limited and Mineraloid Limited request the Oil and Natural Gas Conservation Board to hold a hearing to consider for approval the following:

1. Proposal for Unit Enlargement and Expansion of Water Injection System, Virden-Roselea Unit No. 3, pursuant to Section 79 of The Mines Act.
2. Application for a Maximum Permissible Rate of Production for the Enlargement Tracts, pursuant to Section 62 of The Mines Act.
3. Amendment to Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3" pursuant to Part VI, Clause 6.03 (j) of the above "Plan" and also Section 78 (3) of The Mines Act.

In support of this application, Chevron Standard Limited will endeavour to file with the Board, consents to this application signed by at least 75% of the Working Interest Owners in Virden-Roselea Unit No. 3 and consents to the application for enlargement only signed by at least 75% of the owners of the royalty interest and working interest in the enlargement tracts.

An early consideration of our request would be greatly appreciated.

Respectfully submitted,

John D. Brown P. Eng.
for J. D. BROWN, Chairman
Virden-Roselea Unit No. 3
Operating Committee

BNMcLean/lw
Attach.

Proposal for Unit Enlargement of Virden-Roselea Unit No. 3

It is proposed that the following tracts be included in Virden-Roselea Unit No. 3 by means of an enlargement: (Figure 1)

Lsd. 2-18-10-25 WPM

Lsd. 7-18-10-25 WPM

Lsd. 10-2-10 26 WPM

The above tracts adjoin the present Virden-Roselea Unit No. 3 area and have wells situated thereon which are completed in the producing horizon that is a lateral extension of the formation that is unitized in Virden-Roselea Unit No. 3.

Each enlargement tract was considered on an individual well basis as to present worth and possible future worth to the Unit.

The well Mineraloid Virden 10A-2-10-26, during a current six month production period specified as August 1, 1971 to January 31, 1972, produced an average of 25 BOPD at a water cut of 69 percent. This well is an economic producer and should be included in the enlargement.

The wells Chevron East Virden Prov. 2A-18-10-25 and Chevron South Virden Prov. 7-18-10-25 have low producibility and are uneconomic to produce under non-Unit operating conditions. The wells may be economically produced under Unit operation but the primary incentive to include these tracts in the Unit by enlargement is derived from their future worth to the Unit.

It is proposed that, contingent upon enlargement, the well Chevron East Virden Prov. 2A-18-10-25 be converted to an injector by installing two inch cement lined tubing and a two inch cement lined steel injection line from 2A-18 to the well on tract 14-7 (Figure 1). The conversion procedure that was used in previous injection well conversions in the Unit will be followed.

Tract Participation

As a result of theoretical and experimental analyses of the displacement of oil by an injected fluid, it is generally recognized that two distinct bands of saturation move through the reservoir. The first zone or band has low displacing fluid saturations and is termed the "Primary or Stabilized Phase," the second region has a much higher displacing fluid saturation and is termed the "Subordinate Phase."¹

The Virden-Roselea Unit No. 3 waterflood had been in operation for approximately six years at year end 1972. In the Unit areas of high rate and effective injection it would be reasonable to assume that the "stabilized" high response phase is passed and "subordinate" production is now predominant. Conversely, in specific areas of low rate and less effective injection (notably boundary or edge wells) it would be reasonable to assume that "primary" or "stabilized" type response may yet occur. Therefore, to provide an equitable participation basis, the tract factors should reflect only the present worth or demonstrable future worth to the Unit of the proposed enlargement tracts.

In an attempt to recognize the above factors, a tract participation formula was derived by comparing the oil production of the proposed enlargement tracts to the oil production of the Unit over a six month period of August 1, 1971 to January 31, 1972. The enlargement tracts were penalized by an "economic limit" factor of 5 BOPD.

Two major considerations entered into the "economic limit" factor determinations as follows:

1. A Unit well can be produced economically at lower rates than one operating outside the Unit. Non-Unit well expenses usually require over 5 BOPD production for economic operation. Major costs leading to this economic limit are oil and water trucking charges, single well battery operating costs and supplementary fuel requirements.

¹Craig, Forrest F. Jr.: "The Reservoir Engineering Aspects of Waterflooding," Monograph Volume 3, Henry L. Doherty Series, Society of Petroleum Engineers of AIME, 1971 - P. 33.

2. Enlargement tracts may be benefitting from response to injection of Unit wells and should in effect share increased production with offsetting injectors. The original determination of tract factors were based on production by 108 wells. After conversion of 25 wells to injection the remaining 83 wells in effect share their actual production with the wells that were converted to injectors. Enlargement tracts should similarly "share" production (which in part may already be response) with offsetting injectors.

The reduction of the actual current production of the enlargement tracts by the "Economic Limit" factor of 5 BOPD, is therefore an attempt to recognize the more efficient Unit operations and the obligation of the enlargement tracts to share production with offsetting injectors. By this device the relative worth of the enlargement tracts to all Working Interest Owners should be approximated as fairly as possible.

Wells were assigned token participation factors when they produced less than 5 BOPD over the current production period. The tract participation factors were arrived at as follows:

1. Oil production for the current period (C.P.) August 1, 1971 to January 31, 1972 (184 days) was recorded.

Viriden-Roselea Unit No. 3	= 214,948 Bbls.
Mineraloid Viriden 10A-2-10-26	= 4,670 Bbls.
Chevron East Viriden Prov. 2A-18-10-25	= 601 Bbls.
Chevron South Viriden Prov. 7-18-10-25	= 371 Bbls.

2. The economic limit (E.L.) of 5 BOPD (920 Bbls.) was deducted from the enlargement wells current period production and the percentage of total production calculated.

	<u>C.P. Minus E.L.</u>	<u>% of Total</u>
Viriden-Roselea Unit No. 3	214,948	98.28531
Mineraloid Viriden 10A-2-10-26	3,750	1.71469
Chevron East Viriden Prov. 2A-18-10-25	0	0
Chevron South Viriden Prov. 7-18-10-25	0	0

3. Adjust the Unit factor to allow for token participation factors to be assigned to the two tracts under E.L. production. Final adjusted tract participations are:

<u>Tract</u>	<u>Tract Participation</u>
108 Well Unit	98.18531
10-2	1.71469
2-18	.05000
7-18	.05000

The total participation of the three enlargement tracts in the enlarged Unit would be 1.81469 percent. It is proposed that upon these tracts being admitted into Virden-Roselea Unit No. 3 area, the tract participation of all tracts within the Unit area prior to enlargement and after enlargement will remain the same one to the other by multiplying each of the tract participations by the factor $(1.000000 - .0181469)$ or .9818531.

Production, Reserves, Incentives

Assuming no further response from waterflooding, the estimated remaining primary reserves under Unit operations as of December 31, 1972 for the well Mineraloid Virden 10A-2-10-26 is 65,000 bbls. (See Figure 2) as compared to 57,000 bbls. estimated recoverable under single well operations.

Incentive for the Working and Royalty Interest Owners of this enlargement tract to enter the Unit is the allocation of a guaranteed share of proven Unit production for the life of the Unit, an ultimate increase in reserves and the elimination of risk associated with single well operations. Incentive for the Working and Royalty Interest Owners of the Unit to include this tract is the inclusion in the Unit of a proven oil producing well and the improvement of Unit areal sweep efficiency through the potential production of Unit waterflood oil at the enlargement tract. All Working Interest Owners would benefit further in the event of increased waterflood recovery from the enlargement tract.

The wells, Chevron East Virden Prov. 2A-18-10-25 and Chevron South Virden Prov. 7-18-10-25 under non-Unit operation are uneconomic to produce. (See Figures 3 and 4). Incentive for the Working and Royalty Interest Owners of both the Unit and the enlargement tracts is based solely on the demonstrable future worth of the wells under Unit operations. While the tracts could probably be produced economically under Unit operations due to the elimination of trucking charges, the primary incentive is contingent on the conversion of the well on tract 2-18 to water injection.

A comparison of the structural cross sections and core analysis of 2A-18 and 7-18 with offsetting Unit wells indicates that the wells have very similar pay, porosity and permeability profiles. Therefore, low producibility of the wells could be attributable to a lack of reservoir energy. By converting the well 2A-18 to an injector, additional response should be experienced at offsetting Unit producers 15-7 and 3-18 in addition to the proposed enlargement well 7-18. Assuming successful conversion to injector the well on tract 2-18 should accept a minimum of 250 BWPd and with a moderately efficient flood an estimate of waterflood reserves recoverable by the Unit would be 95,000 barrels, with an initial production rate increase of 30 BOPd.

Enlargement Tract Requirements

Upon the proposed enlargement tracts being admitted to the Unit, it is proposed that the Working Interest Owners of these enlargement tracts participate in the investment account established by Part X of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3," as of the effective date of this enlargement.

It is proposed that the Working Interest Owners of all the enlargement tracts be responsible for the cost required to tie-in the wells to Unit facilities, the Owner retaining possession and control of surface fluid handling facilities presently on the well leases, and a cash payment to the joint account representing a proportionate share in Unit capital expenditures since inception plus pre-Unit and inventory costs. In addition to these expenditures the two enlargement tracts being allocated token participation factors will make a cash payment to the joint account representing a contribution towards abandonment costs. The cash sums mentioned above will be due on or before effective date of Unit enlargement.

Application for a Maximum Permissible Rate of Production for Wells on the
Enlargement Tracts

The applicants propose that the same production flexibility that has been permitted for the original Virden-Roselea Unit No. 3 also be provided for the enlarged Unit.

Currently, the production at all the enlargement tracts may be considered to be unrestricted since all the wells on these tracts are producing at capacity. It is the applicants' contention that no reservoir damage has resulted from producing these wells at capacity.

By being included in the waterflood project it is anticipated that the productive capacity of certain of the wells on the enlargement tracts will be significantly increased. There is no reason to believe that reservoir damage, either within the Unit area or outside the Unit area, would result from producing these increased capacity wells at unrestricted rates.

It is the applicants' contention that producing wells on the enlargement tracts, when offset by non-Unit producing wells, should also be allowed to produce at unrestricted rates. There is no reason to believe that non-Unit oil would be produced within the Unit by such a practise since the Unit well capacities would increase only as a direct result of the unitized waterflood and therefore the increased production would be made up of oil from within the Unit area only. There is also no reason to believe that the production at future offsetting non-Unit wells would be affected by the production of the new Unit boundary wells at unrestricted rates.

The applicants respectfully request that, on and after the effective date of the Unit enlargement, the wells on the tracts brought in by the enlargement be excluded from any provisions governing the limitations of oil production.

Amendment to Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3"

The Unit Operator has reviewed the district and administrative overhead charges to the Unit under Part XXVI, Clause 26.07 (k) (iii) (a) of the "Plan" resulting from the proposed addition of three wells to the 108 well Unit. The result of this review is a proposed increase of \$165 per month.

Approval to increase the charges, under the subject clause, by \$165 per month to a new total of \$6,265 per month was obtained at an Operating Committee meeting held on November 22, 1972. It is therefore requested that the "Plan" be amended by replacing the wording in Part XXVI, Clause 26.07 (k) (iii) (a) with the following:

"\$6,265 per month for all producing operations."

Pursuant to Part VI, Clause 6.03 (j) of the "Plan" and Section 78 (3) of The Mines Act, the applicants hereby respectfully request the Board to consider and approve the proposed district and administrative overhead charges and proposed amendment to the "Plan," in conjunction with the proposed Unit enlargement.

*any ... for ...
your pleasure ...
(2)*

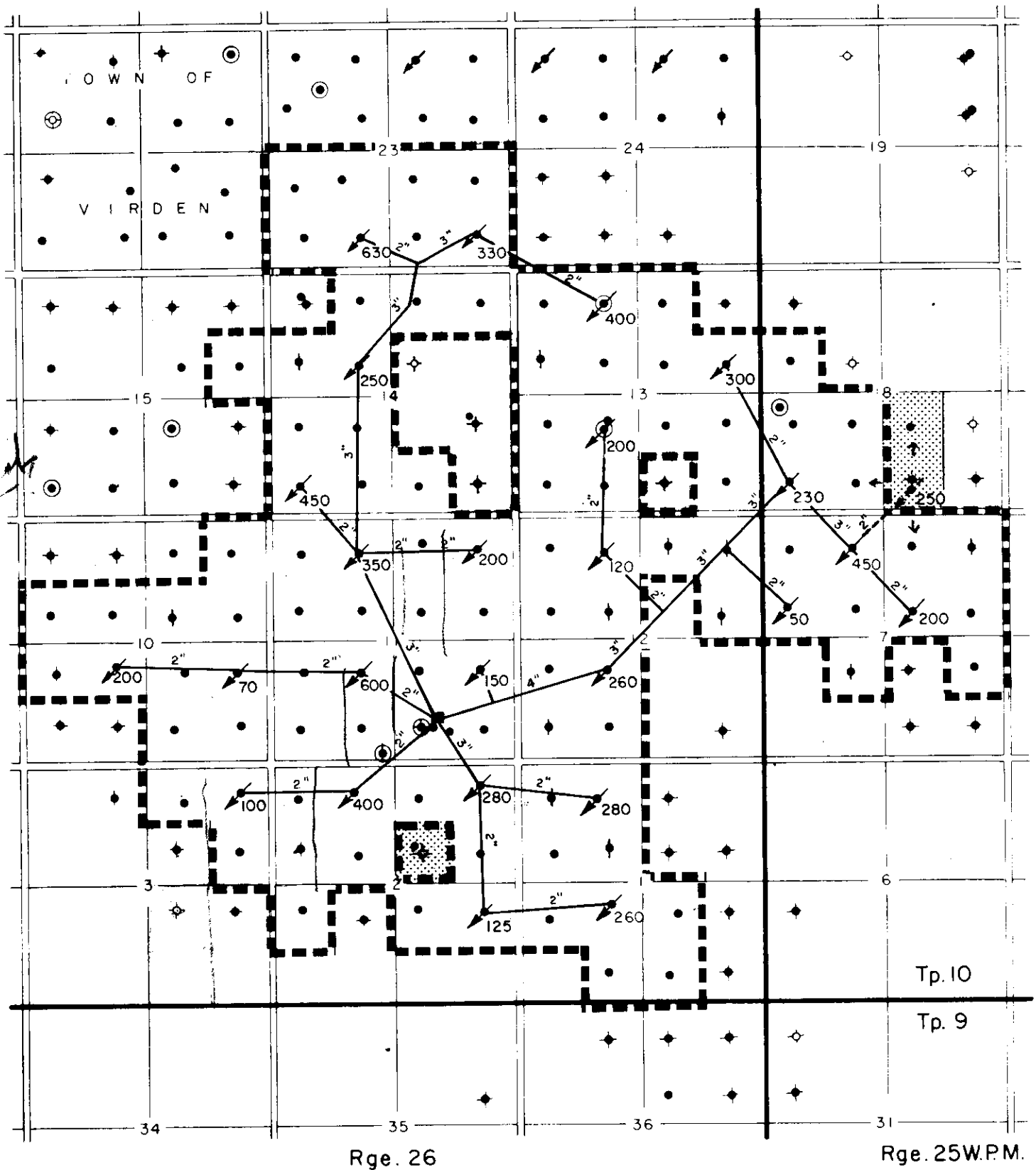


FIGURE 1

VIRDEN ROSELEA UNIT No. 3 AND PROPOSED ENLARGEMENT

Legend Sample

- 200 INJECTION WELL & RATE (1972)
- ⊙ S.W.D. WELL
- 2" INJECTION LINE & SIZE
- INJECTION PLANT
- UNIT BOUNDARY

- PROPOSED ENLARGEMENT TRACTS
- 250 INJECTION WELL, EST. RATE
- 2" PROPOSED INJECTION LINE, SIZE

Scale 1" = 3000'



MINERALOID VIRIDEN 10A-2-10-26WPM

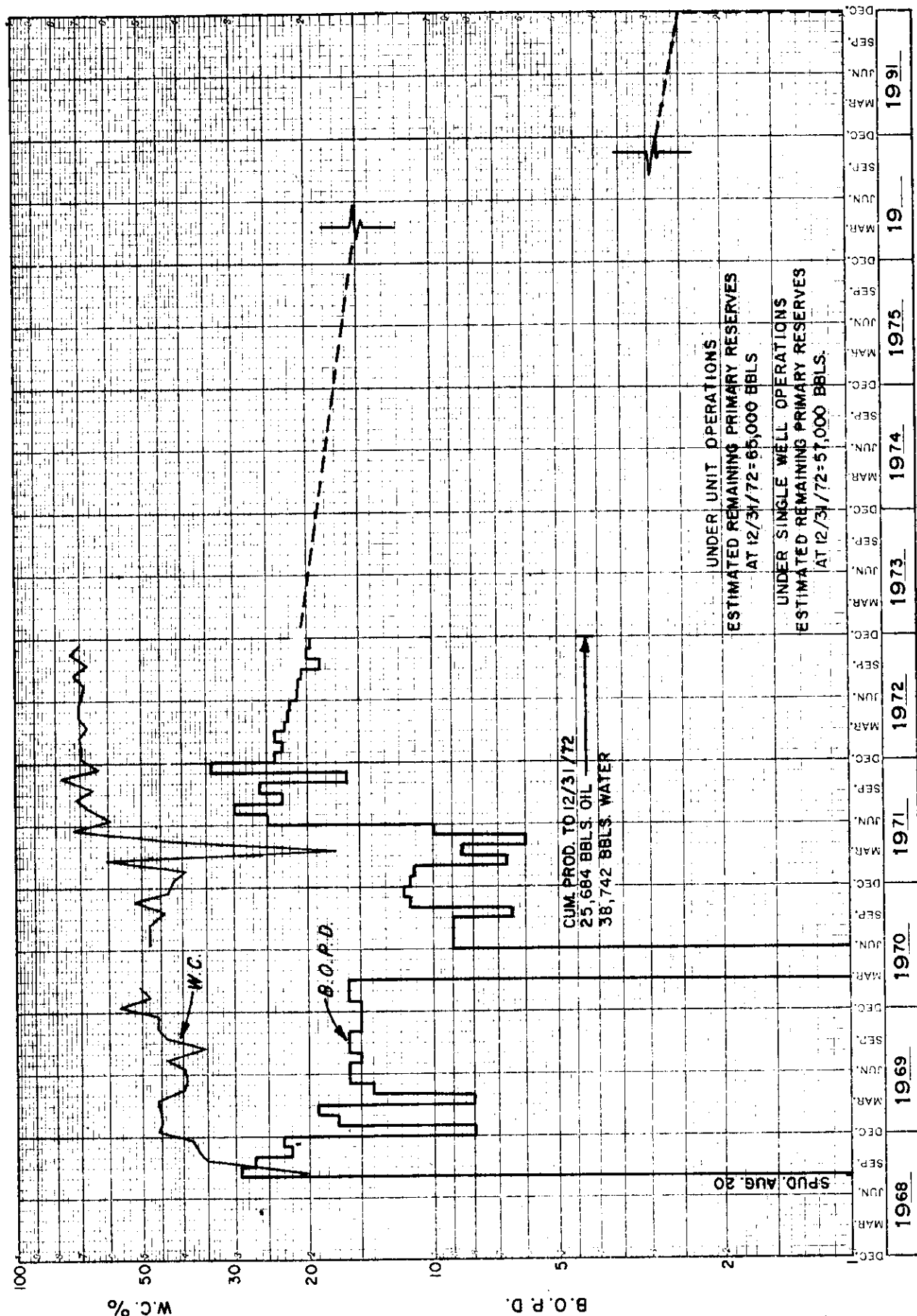


FIGURE 2

CHEVRON EAST VIRDEN PROV. 2A-18-10-25WPM.

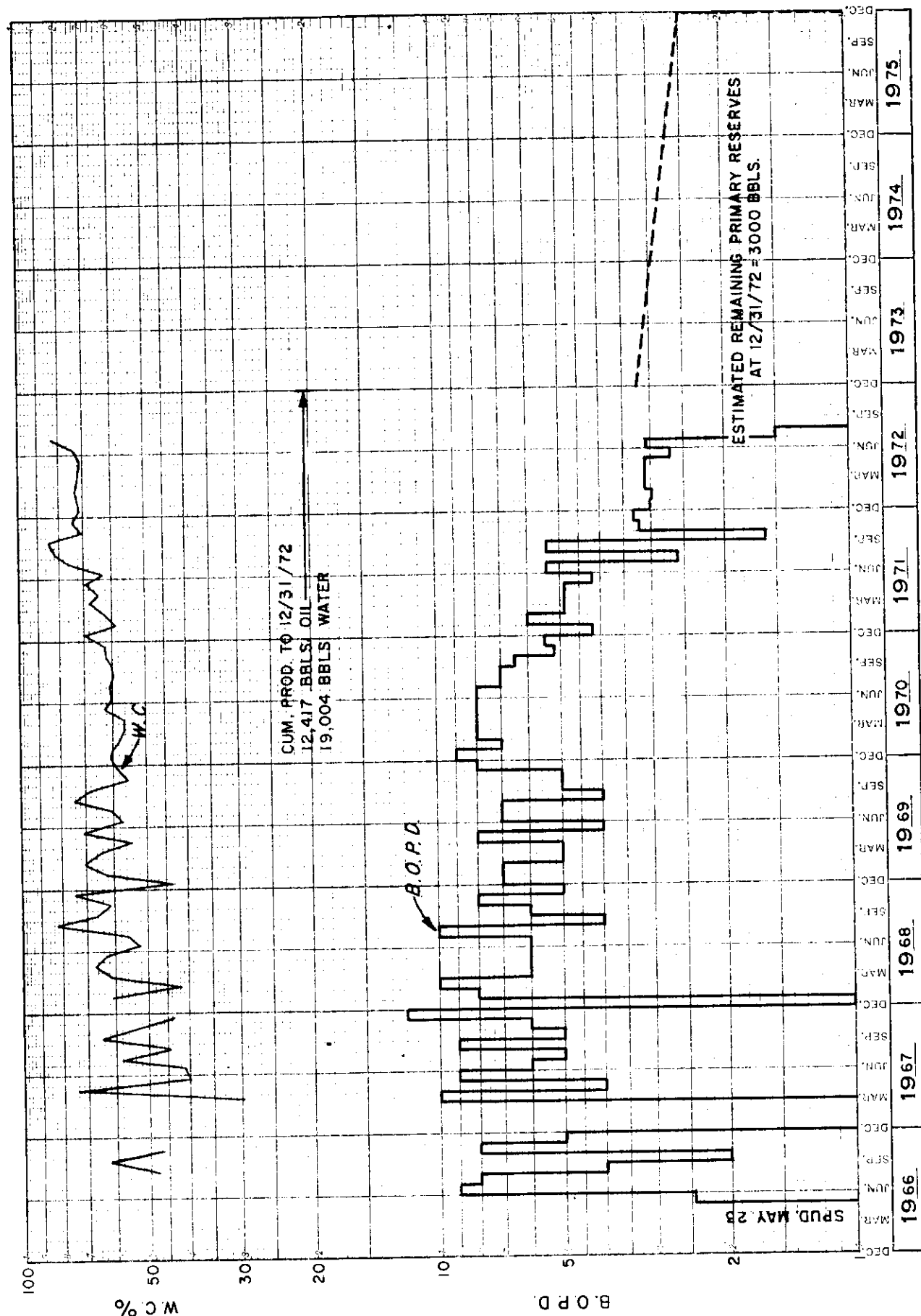


FIGURE 3

CHEVRON SOUTH VIRDEN 7-18-10-25WPM.

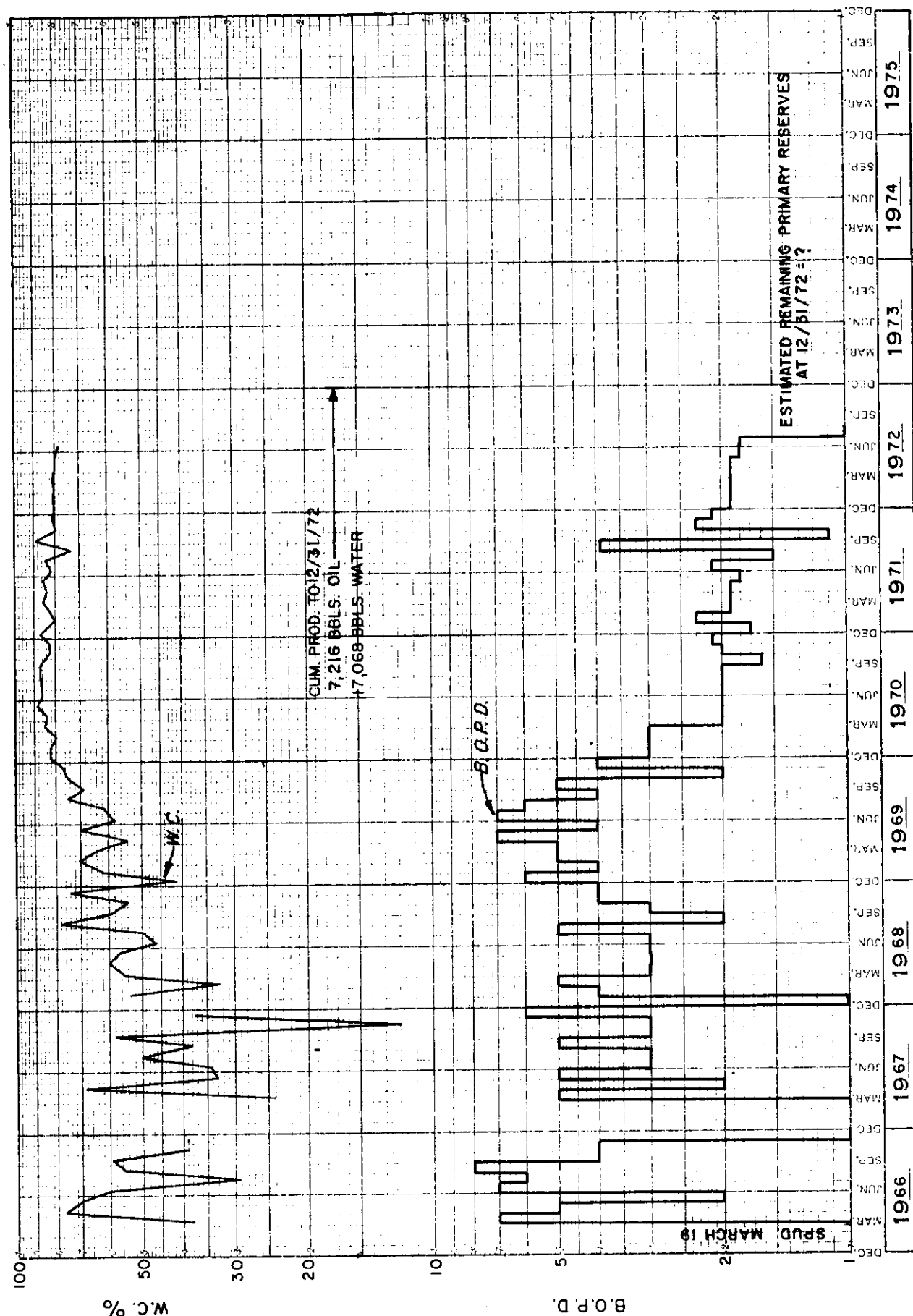


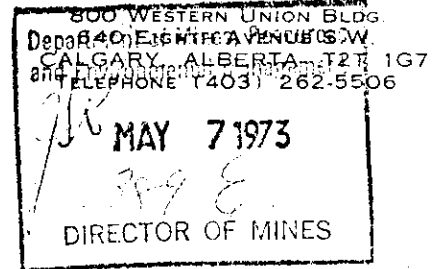
FIGURE 4

333-14-5

MCDANIEL CONSULTANTS (1965) LTD.

Oil and Gas Reservoir Evaluations

R. R. MCDANIEL, P. ENG.
G. C. KNUTSON, P. ENG.
R. E. HUGHES, P. ENG.
W. C. SETH, P. ENG.
F. SCHORNING, P. GEOL.



May 4, 1973

Mr. J.S. Roper, Deputy Chairman,
Oil and Natural Gas Conservation Board,
Room 310, Legislative Building,
Winnipeg, Manitoba.
R3C OP8

Dear Jack:

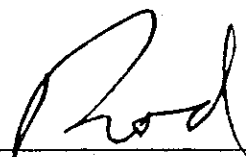
Pursuant to your letter of April 23, 1973, we have reviewed the submission prepared by Chevron Standard Limited on the Virden-Roselea Unit #3 as well as the Annual Progress Report for 1972 on that Unit area.

It is apparent that an active water drive does exist in the downdip westerly edge of this reservoir. As a result the submission to exclude certain areas in Sections 10 and 15 of the Unit area from voidage balance would seem to have reasonable justification. As in the case of a similar application for the North Virden Scallion field we would conclude that should a significant pressure decline become evident water injection could be reinstituted without any significant loss and recovery. As a result we would recommend the approval of their submission in this regard.

Should there be any additional information which we might be of assistance in providing, please do not hesitate to call upon the writer.

Sincerely,

MCDANIEL CONSULTANTS (1965) LTD.



R.R. McDaniel, P. Eng.

RRMcD:nfw

COPY

Jas. T. Cawley, P. Eng.
XXXXXXXXXXXX

R3C OP8

May 11, 1973

Mr. L. D. Brown, Chairman
Virden-Roselea Unit No. 3,
Operating Committee,
Chevron Standard Limited,
100 Fifth Avenue S.W.,
Calgary 1, Alberta.

Re: Virden-Roselea Unit #3
Annual Progress Report

Dear Sir:

Pursuant to your submission of March 6, 1973, relating to the voidage balance requirements of Virden-Roselea Unit No. 3, it is apparent that an active water drive exists in certain areas of Sections 10 and 15 of the Unit area.

The voidage balance of fluids in the submission area, namely: Leds. 2, 5, 6, 7, 10, 11 and 12 of Sec. 10 - Twp. 10 - Rge. 26 WPM and Lsd. 9 of Sec. 15 - Twp. 10 - Rge. 26 WPM, will not be required in future annual progress reports providing there is no change indicated in the active water drive.

Should a significant pressure decline be indicated in any of the submission area wells, then the reporting of voidage balance may be re-instituted.

Yours very truly,

J. S. Roper,
Deputy Chairman.

J.S.R.

INTER - DEPARTMENTAL MEMORANDUM

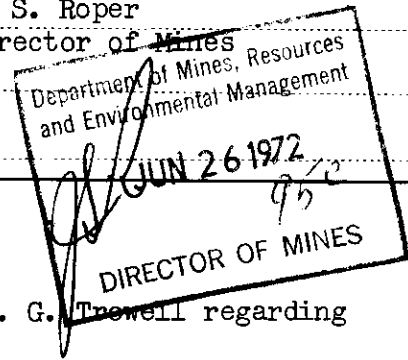


FROM J. S. Gamey
Reservoir Engineer

DATE June 26, 1972

TO J. S. Roper
Director of Mines

SUBJECT THUNDERBIRD PRODUCTION



Friday, June 25/72 - received a phone call from J. G. Trowell regarding May production from Thunderbird 10-15 well.

(I had previously informed Mr. Trowell at the Board hearing of June 21st that Mr. Al Norton was concerned about the high fluid withdrawal from the Unit well on 9-15-10-26, and that he would be contacting Mr. Trowell)

Mr. Trowell reported that -

1. Mr. Norton has not contacted the Chevron office in Calgary.
2. Mr. Trowell does not feel that the high fluid withdrawals are affecting the 10-15 well; water-cut remained the same during April and May.
3. Chevron will watch the production on 10-15 as they definitely do not want to be accused of taking any oil from Thunderbird (Trowell)

J. S. Gamey

*Noted by Mr. Trowell
June 27, 1972*

INTER-DEPARTMENTAL MEMORANDUM

PROVINCE
OF
MANITOBA

DATE June 6, 1972

FROM S. GAMEY
Reservoir EngineerTO J. S. ROPER - Director of Mines
M. J. GOBERT - Sr. Assistant Deputy
Minister
Department of Mines
and Environmental Management

SUBJECT THUNDERBIRD VIRDEN 10-15-10-26

Phone call from Mr. Al Norton - Monday, June 5/72, 2 P.M.

Mr. Al Norton phoned this office stating that he had been unable to contact Mr. Gobert for the purpose of voicing a complaint against Chevron Standard for pumping large volumes of fluid from the well on 9-15-10-26, in the Virden-Roselea Unit No. 3.

The Unit well on 9-15 did not produce in 1971. In March 1972, a Reda pump was installed on 9-15, and the well put back on production.

In Mr. Norton's opinion, the high volume pumping from 9-15 (namely: 34,915 bbls. of water and 1,782 bbls. of oil in April/72) has caused a decrease in the oil production from the offsetting Thunderbird well on 10-15.

Our records indicate that to April/72 the Thunderbird production has shown little variation over the past year. Since the Unit well on 9-15 just resumed production in March, it is likely Mr. Norton is referring to May '72 production which has not been received by us as yet.

There is active water drive in this area. During April/72, Thunderbird's 10-15 well produced 5,098 bbls. of water and 169 bbls. of oil, giving a water-cut of 96% of the fluid produced. The Unit well on 9-15 produced 34,915 bbls. of water and 1,782 bbls. of oil, for a water-cut of 95% of total fluid produced. Under Board Order 42A (filed 1966), the Unit wells are exempt the field allowable of 60 bbls. of clean oil per day.

I told Mr. Norton he should write the Oil and Natural Gas Conservation Board outlining his case. He (Mr. Norton) said he would try and contact Mr. Trowell of Chevron Standard in Calgary, as he would be visiting Calgary enroute back to his home in California.

I will report to you further when we receive the May production reports.

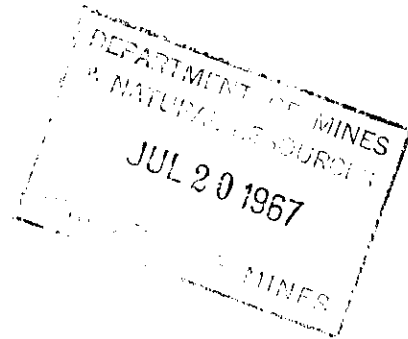
CHEVRON STANDARD LIMITED

MEDICAL ARTS BUILDING, 329A - 6TH AVENUE S.W., CALGARY, ALBERTA.

July 19, 1967

Virden-Roselea Unit No. 3
Chevron et al South Virden
Prov. WSW 2-11-10-26
Our File No. 54,804-C

Mr. J. S. Richards,
Director of Mines,
Department of Mines and Natural
Resources,
901 Norquay Building,
401 York Avenue,
Winnipeg 1, Manitoba.

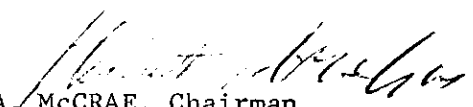


Dear Sir:

Thank you very much for your letter of June 12, 1967 returning the Water Supply Well Agreement for our consideration.

The amendments you proposed are agreeable to Chevron Standard Limited and we have now had the Agreement executed and return three copies of same herewith. It would be much appreciated if you would present same to the Minister of Mines and Natural Resources for execution, returning two copies to us when this has been accomplished.

Yours very truly,


S. A. McCRAE, Chairman,
Virden-Roselea Unit No. 3
Legal Committee.

SAM/ps
Encls. (3)

p. c. to:  Mr. F. S. Gamey,
Reservoir Engineer.

COPY

July 25, 1967.

Mr. J. S. Richards,
Director of Mines.

Mr. M. J. Gobert,
Assistant Deputy Minister.

Virden-Roselea Unit No. 3.

Consent Agreement -
Chevron et al South Virden Prov. WSW 2-11-10-26.

Attached, hereto, 3 copies of the above Agreement, which have been redrafted to incorporate the changes suggested by Mr. D. W. Moylan and the Mines Branch.

The Agreement has been executed by the company.

This Agreement grants the Crown's consent to the use and operation of the subject well as a source of Devonian water for use in the operation of the Virden-Roselea Unit No. 3.

It is recommended that the Agreement be executed by the Minister, on behalf of the Crown. If executed, 2 copies will be returned to the company and one retained for our records.

J. S. Richards.

JSR:db

Encs. 3.

c. c. to: Mr. F. S. Gamey,
Reservoir Engineer.

JUN 6 1967
COPY

June 1, 1967.

Mr. J. S. Richards,
Director of Mines,
Mines Branch,
901 Norquay Building.

Mr. D. W. Moylan,
Departmental Solicitor,
Department of Attorney-General,
167 Legislative Building.

Water Supply Well Agreement -

Virden-Roselea Unit No. 3.

Attached, hereto, copy of the above
Consent Agreement, submitted by Chevron Standard Limited, for
execution by the Minister of Mines and Natural Resources.

As Chevron is operating the well, in
respect of which the Agreement is written, on behalf of the Unit,
I would suggest that Clause 7 should limit any assignment to a
succeeding operator. Part VII of Manitoba Regulation 102/66 (Unitiza-
tion Order No. 5) provides for the selection of a Successor Unit
Operator.

Your opinion, of this suggestion and
the rest of the Agreement, would be appreciated.

JSK:db

J. S. Richards.

c. c. to: Mr. F. S. Ganey,
Reservoir Engineer.



CHEVRON STANDARD LIMITED

MEDICAL ARTS BUILDING, 329A - 6TH AVENUE S.W., CALGARY, ALBERTA.

December 5, 1966

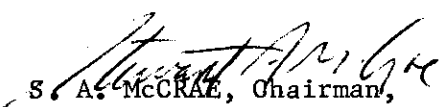
Virden-Roselea Unit No. 3
Our File No. 54,804

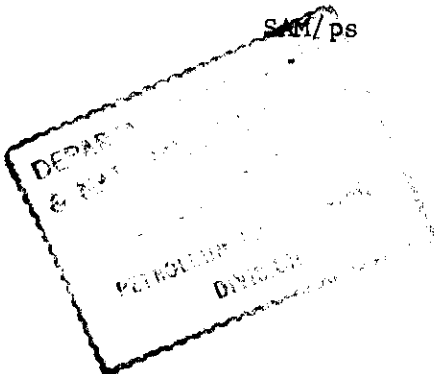
Mr. M. J. Gobert,
Assistant Deputy Minister,
Department of Mines and Natural Resources,
Province of Manitoba,
Norquay Building,
Winnipeg 1, Manitoba.

Dear Sir:

We acknowledge with thanks receipt of your letter of November 23, 1966 enclosing four certified copies of Unitization Order No. 5.

Yours very truly,


S. A. McCRAE, Chairman,
Virden-Roselea Unit No. 3
Legal Committee.



54,804



CHEVRON STANDARD LIMITED

MEDICAL ARTS BUILDING, 329A - 6TH AVENUE S.W., CALGARY, ALBERTA.

May 30, 1967

Virden-Roselea Unit No. 3
Chevron et al South Virden
Prov. WSW 2-11-10-26
Our File No. 54,804-B

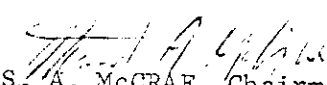
Mr. M. J. Gobert,
Assistant Deputy Minister,
Department of Mines and Natural Resources,
Province of Manitoba,
Norquay Building,
Winnipeg 1, Manitoba.

Dear Sir:

Enclosed herewith please find three copies of a Consent Agreement for consideration by the Minister, Department of Mines and Natural Resources, Province of Manitoba, relative to our use of Devonian water from the above-mentioned well. The enclosed Agreement was prepared at the request of Mr. Lindsey Brown of our Virden office and I understand from him that you had requested that we submit an Agreement for your consideration.

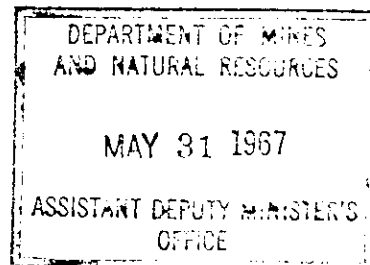
We would be pleased if you would review the enclosure and if same is acceptable to you, arrange for execution by the Minister, and if you will then return all copies to this office we will arrange for the execution thereof by representatives of Chevron Standard Limited and return a fully signed copy to you.

Yours very truly,


S. A. McCRAE, Chairman,
Virden-Roselea Unit No. 3
Legal Committee.

SAM/ps
Encl.

p. c. to: Mr. F. S. Gamey,
Reservoir Engineer.

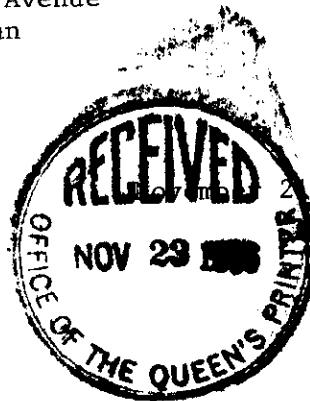




THE BRITISH AMERICAN OIL COMPANY LIMITED

PRODUCERS — REFINERS — MARKETERS

Financial Building, 8th Floor
Scarth Street and 13th Avenue
Winnipeg, Saskatchewan



1966

Mr. R. S. Evans
Queen's Printer
Province of Manitoba
Winnipeg, Manitoba

Dear Sir:

Re: Manitoba Regulation 102/66
Virden Roselea Unit No. 3

Please arrange to forward twelve (12) copies of The Manitoba Gazette for November 12, 1966, as soon as possible.

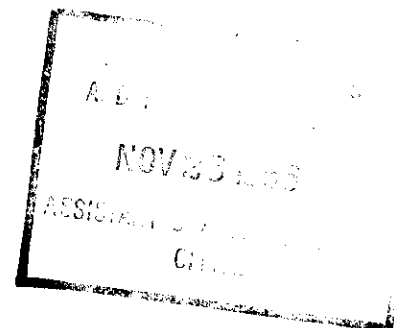
Yours very truly,

THE BRITISH AMERICAN OIL COMPANY LIMITED

L. W. Powell
REGINA ZONE PRODUCTION MANAGER

(Nov 24)

*Mr. Gohert
Would you please
supply the above regulation.
I have your
S.P. office
for H.*



IMPERIAL OIL LIMITED



PRODUCING DEPARTMENT
WESTERN REGIONAL OFFICES

JOHN S. POYEN
REGIONAL OPERATIONS MANAGER

W. B. DINGLE
ASST. REGIONAL OPERATIONS MANAGER
PRODUCTION

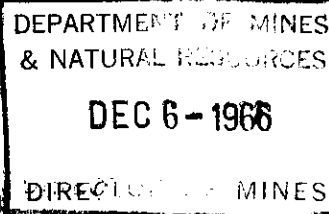
K. F. HUFF
ASST. REGIONAL OPERATIONS MANAGER
EXPLORATION

500 SIXTH AVENUE SOUTH WEST, CALGARY, ALBERTA

December 5, 1966

No: Uc-373

Department of Mines and Natural Resources
The Oil and Natural Gas Conservation Board
901 Norquay Building
401 York Avenue
Winnipeg 1, Manitoba



Gentlemen:

Manitoba Gazette
Virden-Roselea Unit No. 3
Our Reference: MU 2.1

Could you please arrange to forward to our office seven (7) copies of the Manitoba Gazette issued on November 12, 1966, wherein the Plan of Unit Operation for the Virden-Roselea Unit No. 3 was printed.

Please forward the invoice to our company for these Gazettes and we shall arrange for payment. The material should be forwarded to:

Imperial Oil Limited
500 Sixth Avenue S. W.
Calgary, Alberta

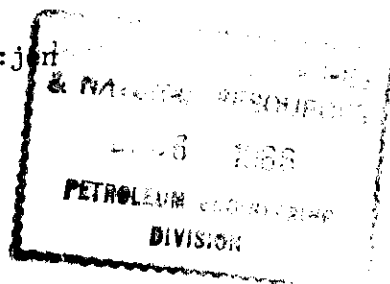
Attention: Mr. G. E. Andrews

Yours very truly,

R. G. LILL, Manager
Contracts and Unitization Department

By: E. C. Musgreave
E. C. Musgreave

ECM:jeh



COPY

August 2, 1966.

Chevron Standard Limited,
Medical Arts Building,
329A - 6 Avenue, S. W.,
Calgary,
Alberta.

Attention Mr. S. A. McCree, Chairman,
Legal Committee,
Virden-Roselea Unit No. 3.

Re Proposed Plan
Virden-Roselea Unit No. 3
Your File: 5A.804.

Dear Sir:

Subject to the conditions outlined in your letter of July 27, 1966, the method proposed for the eventual inclusion of Chevron South Virden Prov. S&D 3-11-10-26 in Virden-Roselea Unit No. 3 appears to be reasonable.

When the hearing is re-convened, you might wish to advise the Board of your proposal and of the charges which would be made during the interim period.

Yours very truly,


J. S. Richards,
Deputy Chairman.

MJG:db

c. c. to: Mr. Stuart Anderson,
Chairman.

Mr. M. J. Gobert,
Member.

> Mr. F. S. Gamey,
Reservoir Engineer.

CHEVRON STANDARD LIMITED

MEDICAL ARTS BUILDING, 329A - 6TH AVENUE S.W., CALGARY, ALBERTA DEPARTMENT OF MINES

& NATURAL RESOURCES

July 27, 1966

JUL 28 1966

DIRECTOR OF MINES

Proposed Plan
Virden-Roselea Unit No. 3
File: 54,804

Mr. M. J. Gobert
Assistant Deputy Minister of Mines
and Natural Resources
Department of Mines and Natural Resources
Norquay Building
WINNIPEG 1, Manitoba

Dear Sir:

As you are aware the Chevron South Virden Prov. SWD 3-11-10-26 Salt Water Disposal Well, situated on Lot. 3, of Sec. 11, in Twp. 10, Rge. 26, WPM, although not listed in Part XXI of the proposed "Plan for Unit Operation Governing the Unitized Management Operation and Further Development of Virden-Roselea Unit No. 3" is intended to be used in unit operations. As you are further aware, copies of the "Plan for Unit Operation" with this omission were forwarded to the Working Interest Owners and Royalty Owners, along with Consent Forms for their approval, before this omission was brought to our attention.

We feel that inasmuch as this well will be used by the Unit that it should become a Unit Well as soon as possible. We would not, however, like to see a delay in the final approval of the Plan over this matter and accordingly we would suggest that we continue taking Consent Forms to the "Plan for Unit Operation" in its present form with the final Hearing to be held as soon as the required number of Consents have been secured in accordance with our original intention. We would further suggest that after the "Plan for Unit Operation" is finally approved by the Board, we could then ask for an amendment thereto in accordance with Section 20.06 of the Plan to include the above mentioned well as a Unit Well. It is our understanding that any amendment pursuant to Section 20.06 of the Plan can, subject to the approval of the Board, be obtained with the consent of at least 75% of the Working Interest Owners and that inasmuch as the Royalty Owners are only indirectly concerned with this aspect of the unitization, that such course of proceedings would be proper.

We would be glad if you would review this matter and advise if this procedure is satisfactory to the Board and if our

Mr. M. J. Gobert

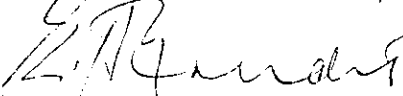
- 2 -

July 27, 1966

suggestion is agreeable to you, we will then review the matter with the other Working Interest Owners at our Organizational Meeting. In the event that this well is used for unit operations prior to it becoming a Unit Well, we do not anticipate any difficulties in arriving at an agreeable charge for same with the Working Interest Owners pending its inclusion in the Unit.

If there is any further information you require on this matter, please do not hesitate to let us know.

Yours very truly,


S.A. McCrae, Chairman
Legal Committee
Virden-Roselea Unit No. 3

EHG:fc

p. c. to: > Mr. F. S. Gamey,
Reservoir Engineer.

cc: Mr. J. S. Richards
Director of Mines

Mr. Stuart Anderson
Chairman

June 21, 1966.

DEPARTMENT OF MINES
JUN 21 1966
DIRECTOR OF MINES

Mr. C. C. Brown, Chairman, Board,
Virgil-Moseley Unit, Inc.,
Operating Committee,
Cavendish Mining, Limited,
Medical Arts Building,
200 - 11th Avenue, S.E.,
Atlanta, Georgia.

Dear Mr. Brown:

Re: Virgil-Moseley Unit, Inc.

Reference is made to the hearing held on the 10th of June, 1966, at Atlanta, Georgia, relative to the untimeliness of the filing of the petition for reorganization under Chapter 11 of the Federal Bankruptcy Code, and the fact that the petition was filed on or before the date of the hearing.

The petition for reorganization of the Virgil-Moseley Unit, Inc., was filed on the 10th of June, 1966, and the petition was filed on or before the date of the hearing.

The petition for reorganization of the Virgil-Moseley Unit, Inc., was filed on the 10th of June, 1966, and the petition was filed on or before the date of the hearing.

Sincerely,

W. H. R. R. R.

W. H. R. R. R.
W. H. R. R. R.
W. H. R. R. R.
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W. H. R. R. R.

W. H. R. R. R.

June 17, 1966

Mr. G.D.Haight,
Division Engineer,
Imperial Oil Limited,
1825 McIntyre Street,
Regina, Saskatchewan.

Dear Mr. Haight:

Mr. F.L. Gagey will be pleased to send you
two copies of the transcript of the Virden-Roselea
Unit No.3 hearing held in Virden, June 16, 1966,
as soon as it is available.

Yours very truly,



H.J. Gobert
Assistant Deputy Minister

MJC/js



IMPERIAL OIL LIMITED

1825 McINTYRE STREET, REGINA, SASKATCHEWAN, CANADA

PRODUCING DEPARTMENT - REGINA DIVISION

R. E. FLANDERS
DIVISION PRODUCTION MANAGER

June 15, 1966

E. 549

File: 04.341

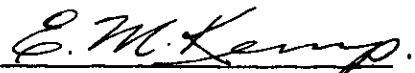
Department of Mines and
Natural Resources
Province of Manitoba
WINNIPEG 1, Manitoba

Attention: Mr. M.J. Gobert

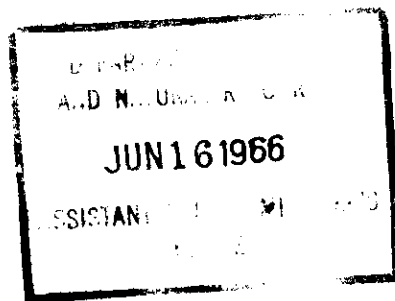
Dear Sirs:

Would you please send us two copies of the
transcript of the Virden-Roselea Unit No. 3 hearing
held in Virden June 16, 1966.

Yours very truly,


G.L. Haight
Division Engineer

/lpm
Day (2)



1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Lichtenthaler and Whistler (1973).

Dr. J. H. Moore, Chairman,
Hudson-Rosedale Unit No. 3,
New York Committee,
American Association of Unitarians,
Riverside Park Building,
100 West Avenue, New York,
New York, Agents.

1962 - Released - Children - Youngest - Only - 100%

1000

It is up to everyone in the group to make sure that the materials are properly organized and that the program is as similar to the program for the other units as possible. The materials should be prepared in a way that is easy to use and that is easy to understand.

I hereby certify that the foregoing is a true and correct copy of the original as the same appears in the files of the Department of the Interior, Bureau of Land Management, and is so certified by the Commissioner of the General Land Office.

FOUR FOUR EIGHT Y.

[illegible]

1. *Chlorophyll a* (Chl *a*)

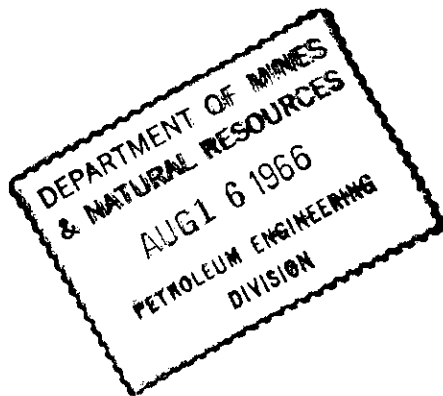
c.c. Mr. Stuart Anderson
Mr. J.C. Richards
Mr. F.L. Conney

[illegible]

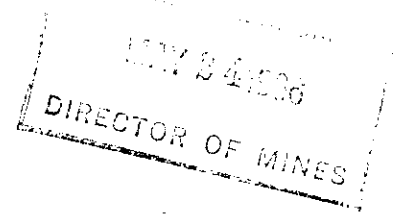


CHEVRON STANDARD LIMITED

MEDICAL ARTS BUILDING, 3200 AVENUE S.W., CALGARY, ALBERTA.



May 19, 1966




Virden-Roselea Unit No. 3
Our File No. 54,804

Mr. M. J. Gobert,
Assistant Deputy Minister,
Department of Mines and
Natural Resources,
Winnipeg 1, Manitoba.

Dear Sir:

As discussed we now enclose three copies of an attachment listing the changes in the Plan for Unit Operation, Virden-Roselea No. 3 from that used in Virden-Roselea No. 2.

Yours very truly,

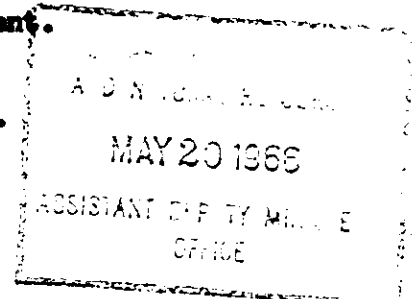

S. A. McCRAE, Chairman,
Virden-Roselea Unit No. 3
Legal Committee.

SAM/ps
Encl.

Orig. copy on: Virden-Roselea No. 3. - with attachment.

p. c. on: Virden-Roselea No. 2. - with attachment.

p. c. to: Mr. F. S. Gasey,
Reservoir Engineer. - with attachment.



DIFFERENCES BETWEEN VIRDEN-ROSELEA UNIT NO. 2
AND VIRDEN-ROSELEA UNIT NO. 3 AGREEMENTS.

1. PART I, Page 3: No. 3 contains definition of "a Stock Tank Barrel", and "Tract Participation" has been changed to "Interim Tract Participation" and "Final Tract Participation".
2. PART III, Page 8: No. 3 has been changed to reflect "Interim" and "Final" Tract Participations.
3. PART V, Page 18: Item 5.05 of No. 3 makes voting interest equal to Participating Interest based on Final Tract Participation.
4. PART VI, Page 20: In No. 3 Voting and Quorum based on Final Tract Participation.
5. PART VII, Page 24: In No. 3, Item 7.04, after word "respect" in the 5th line the word "to" has been changed to "of".
6. PART VIII, Page 27: In No. 3, Item 8.02 bases charges to Common Account on either "Interim" or "Final" Tract Participations, whichever are in effect at the time same are paid. Operating Committee to determine "capital items". Item 8.09 of No. 3 provides for Pre-unit Expense to be based on Final Tract Participation.
7. PART XII, Page 43: In No. 3, the 11th line of Item 12.02 after "Unit Operator" the following "with the approval of the Operating Committee" has been added.
8. PART XVI, Page 48: In No. 3 the words "or release" have been deleted from the 1st line of Item 16.07.
9. PART XVII, Page 50: In No. 3, after the word "decide" in the 2nd line of Item 17.03 the word "permanently" has been added.
10. PART XX, Page 56: In No. 3 Item 20.01 provides for termination of Plan based on Final Tract Participation. Item 20.06 provides for application for rehearing by Working Interest Owners based on Final Tract Participation.
11. PART XXVI, Page 76: In No. 3 Item 26.07 (k) (iii) (a) the amount changed to \$6,100.00 per month from \$2,550.00 per month.

May 18, 1966

Mr. A.H. McDaniel,
President,
McDaniel Consultants (1965) Ltd.,
305 Sunford Bldg.,
608 - 7th St. S.W.,
Calgary, Alberta.

Dear Mr. McDaniel:

We expect that an application for Virden-Roselea No.3 will be received early next week. The hearing will be in Virden on Thursday June 16, 1966.


For your consideration in the meantime, have enclosed:

1. A draft copy of the Plan.
2. Waterflood evaluation prepared
Virden-Roselea Unit No.3 - dated
February 1966 (This is our only copy).
3. Final Tract participation factors.
4. Proposal for Pressure Maintenance by
waterflooding.
5. Proposed waterflood installation costs.

You might take particular note of the change in the basis for participation.

Did your firm prepare the House Mountain high pressure plan? If so would appreciate a copy since we will hear an application for a small 8 well high pressure flood on June 6, 1966.

Best regards,


A.C. Gobert
Assistant Deputy Minister

WJG/js
Encl.

c.c. Mr. Stuart Anderson
Mr. J.S. Richards
Mr. F.S. Gamey