HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

June 23, 1983

The Oil and Natural Gas Conservation Board
989 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Dr. Ian Haugh
Deputy Chairman

Dear Sir:

RE: Application to Expand Pressure Maintenance of the Waskada Lower Amaranth Pool

The following submission is Omega Hydrocarbons Ltd.'s formal application to expand pressure maintenance of the Waskada Lower Amaranth Pool by a combination of water and gas injection. While we have attempted to cover in this application all the critical features of our proposal we would be happy to supply any other additional information that the Board may require in order to make its decision.

PRIMARY CONSIDERATIONS

The proposed scheme has been developed with due consideration of the following objectives:

1) Maximize oil recovery. Injection of water or gas will reverse the trend of declining reservoir pressure.

2) Maximize energy conservation. Reservoir energy will be maximized by repressuring the pool and thereby minimizing the production of excess solution gas. Gas re-injection will conserve that resource for its possible future use.

3) Minimize environmental impact. The proposed Waskada LPG Recovery Plant will incorporate stock tank vapour recovery and approval of this pressure maintenance scheme will allow Omega to re-injection a majority of the solution gas that is currently being flared.

4) Maximize flexibility. In order, to meet the above stated objectives; to accommodate other future development in the area; and, to balance produced to injected volumes of water and gas it is imperative to allow for a flexibility of design in order that injection water can be substituted for gas and vice versa.

SUPPORTING FACTORS

1) Oil production rates from the portion of the Lower Amaranth Pool under primary depletion continue to decline and the producing gas-oil ratio currently averages approximately twice the solution gas-oil ratio. Both of these factors are consistent with the recent pressures surveyed within the pilot water flood area indicating the need for pressure maintenance as soon as possible.

2) The pilot waterflood of the Lower Amaranth has been on injection since February 25, 1983. Early indications of improved oil production suggest that this scheme will be successful. Water production has increased but still remains below the field average and therefore is of no immediate concern. While produced gas-oil ratios have not yet declined this is anticipated to occur within the next few months.

3) A portion of the Lower Amaranth Pool has recently been modelled using a three dimensional black oil computer simulator, BLAKO to determine the relative merits of three depletion mechanisms. Primary depletion, water flooding and gas flooding were modelled indicating, for the study area, respective oil recoveries of 12.2%, 28.4% and 22.3%. Noteworthy is that both secondary recovery schemes roughly doubled oil recovery and that the gas flood study did not incorporate a gas blow down phase. It is expected in the gas flood area during a blow down phase that oil recoveries would be improved from the 22.3% figure and also that the incremented recovery of LPG liquids by the recycling of lean gas, which has not been quantified here should offset the apparent difference in oil recovery between water flooding and gas flooding.

PROPOSED SCHEME

It is proposed that as much of the area indicated within the heavy dotted line on Figure 1 that can be drilled, completed and unitized by the fall of 1983 be included in this approval.

With adequate provisions for substitution of injection fluids Omega requests approval to inject water in the following Lower Amaranth locations:

WATER INJECTION WELLS

1) 15-31-1-25 WPM (Not yet drilled)
2) 13-31-1-25 WPM
3) 7-31-1-25 WPM (Not yet completed in the Lower Amaranth)
4) 5-31-1-25 WPM
5) 15-30-1-25 WPM
6) 13-30-1-25 WPM
7) 5-30-1-25 WPM

8) 15-25-1-26 WPM
9) 13-25-1-26 WPM
10) 7-25-1-26 WPM (Currently approved as a pilot injection well)
11) 5-25-1-26 WPM (Currently approved as a pilot injection well)
12) 15-24-1-26 WPM (Currently approved as a pilot injection well)
13) 13-24-1-26 WPM (Currently approved as a pilot injection well)
14) 15-23-1-26 WPM
15) 16-22-1-26 WPM
16) 5-26-1-26 WPM
17) 7-26-1-26 WPM
18) 13-26-1-26 WPM
19) 5-27-1-26 WPM
20) 7-27-1-26 WPM
21) 13-27-1-26 WPM (Not yet completed in the Lower Amaranth)
22) 15-27-1-26 WPM

and to inject gas in the following Lower Amaranth locations:

GAS INJECTION WELLS

1) 16-11-1-26 WPM
2) 5-13-1-26 WPM
3) 7-13-1-26 WPM
4) 13-13-1-26 WPM
5) 15-13-1-26 WPM
6) 15-14-1-26 WPM
7) 7-23-1-26 WPM (Not yet completed in the Lower Amaranth)
8) 5-24-1-26 WPM (Not yet completed in the Lower Amaranth)
9) 7-24-1-26 WPM

At this point, our production/injection forecasts indicate that after roughly two years of gas injection Well 7-24 would be converted from gas injection to water injection due to a shortage of injection gas and that roughly six months later 7-23 would be converted. The balance of the gas injection wells would remain on gas injection at least for the seven year forecasted period.

Because of the difficulties in attempting to balance produced gas volumes to injected gas volumes it will generally be attempted to keep available lean gas volumes slightly greater than the required injection volumes and that excess gas be flared rather than overinjected into the reservoir.

MEASUREMENT, MONITORING AND CONTROL

Oil, water and gas produced will continue to be measured at test satellites and prorated to the battery as per our current practice.

Injection water and injection gas will be measured for each individual well; in most cases within the satellite buildings on each lease.

Injection pressures will be routinely monitored and recorded by pressure guages installed with the injection meters. It is proposed

that static reservoir pressures be monitored by implementing a program of rotating injection well pressure fall off tests. This type of program would supply accurate static pressure data for the whole pool under pressure maintenance without the economic burden of lost production. Surveying injection wells is considered superior also in that it should be more accurate than acoustic well sounder tests on producers and does not necessitate pulling bottom hole pump and rods.

Injection volumes will be targetted based upon voidage calculations routinely done on a pattern-by-pattern basis. For the purpose of these voidage calculations the injection patterns illustrated on Figure 2 will be used. Calculations done in the model study and the experience of the pilot waterflood indicated that there should be no problem in achieving sufficient injectivity to meet voidage replacement requirements, however, maximum injection wellhead pressures will be limited to 10,000 kPa for water injection wells and 17,000 kPa for gas injection wells.

PRODUCTION/INJECTION FORECASTS

The Production/Injection Forecast detailed on Table 1 represents Omega's best estimate at this time for the first seven years of the project. The forecast has been generated based upon the CMG Model Study with adjustments for eliminating the development drilling effects contained in the Study. The projections of the Study were extrapolated to the project area using a type-curve approach and net porosity-foot multiples.

In order to check the validity of this extrapolation a check was done against the May, 1983 production from those Lower Amaranth wells already on production in that month. In the month of May, Lower Amaranth wells in the project area produced 11,289.9 m^3/oil, 9,979.8 m^3 water and 1,153.9 km^3 gas. When the proposed injection locations are eliminated from the totals the volumes are 9.620.0 m^3 oil, 8,559.5 m^3 water and 968.2 km^3 gas. On the basis of porosity-footage approximately 70% of the project area was on production in May; 30% having yet to be drilled or recompleted for. Adjusting for this the projected volumes are, for one month, 13,724 m^3 oil, 12,211.2 m^3 water and 1,381.3 km^3 gas. These volumes compare favourably to the forecasted volumes as follows:

	Initial Production based on May/83 Figures	Initial Production based on CMG Study
Oil (BOPD)	2785	2769
Water (BWPD)	2478	2315
Gas (MMCFD)	1.58	1.26

You will note that produced lean gas (ie. after LPG recovery and compression) is 27% less than the produced raw gas, accounting for

surface loss and shrinkage. You will also note that due to difficulties in matching produced gas volumes to injected volumes there is a projected need to flare gas in order to prevent over injection of gas and any resulting channelling problems.

Produced volumes from non-unit wells directly impact on the proposed scheme in the availability of injection water and gas. It should be noted that these volumes are only very roughly forecasted in large measure due to the unpredictability of these volumes. This is the single biggest reason for Omega's request for a large degree of flexibility in the Pressure Maintenance Order that may result from this application.

UNITIZATION

It is expected that the majority of the required drilling and recompleting of Lower Amaranth wells in the project area will be completed by the end of June. Efforts will begin immediately in July to form the Unit(s) required to implement this plan. This unitization effort will impact on this application only insofar as certain well or wells may have to be culled from the approval (for addition at some later time) if they remain undrilled or if efforts to include them in the Unit(s) are unsuccessful.

SUMMARY

There is every indication of an immediate need for full scale pressure maintenance of the Lower Amaranth Pool. Lean processed gas is expected to be available for reinjection by the end of November or the beginning of December. Water injection facilities are virtually in place now. Unitization efforts are on going and are expected to be completed in September. Approval of this basic pressure maintenance plan will allow a smooth transition to a full scale project and will accomplish all the stated objectives.

Enclosed, in support of this application is a copy of the CMG report, Waskada Model Study - Lower Amaranth Pool, dated May, 1983.

Please direct any comments or questions to the undersigned or to Mr. George Patey, Vice-President of Production (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse
Petroleum Engineer

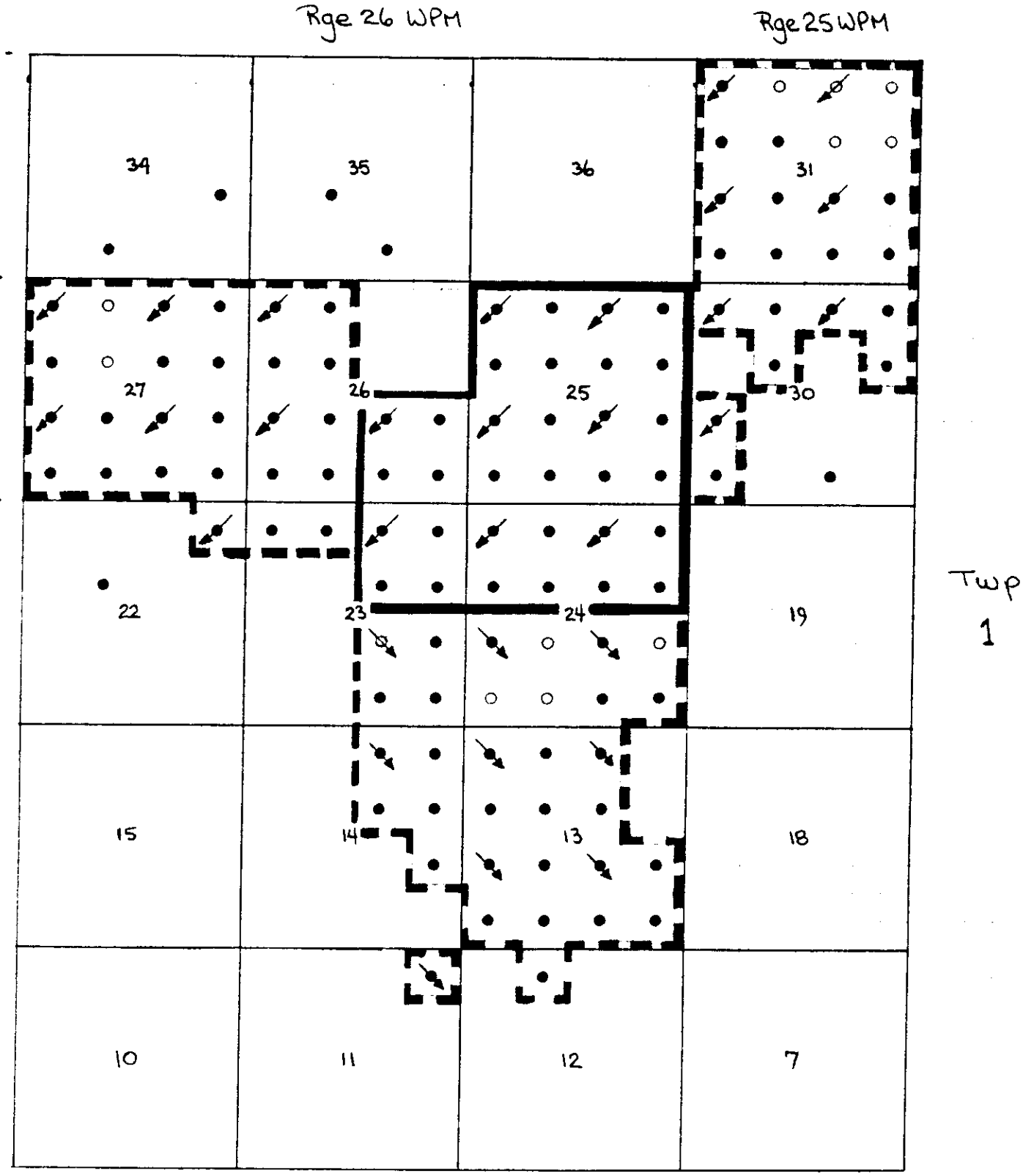
EW/sp

cc: B. Dubrieul, Petroleum Branch
G. Patey
J. Hall

FIGURE 1

GAS INJECTION

WATER INJECTION

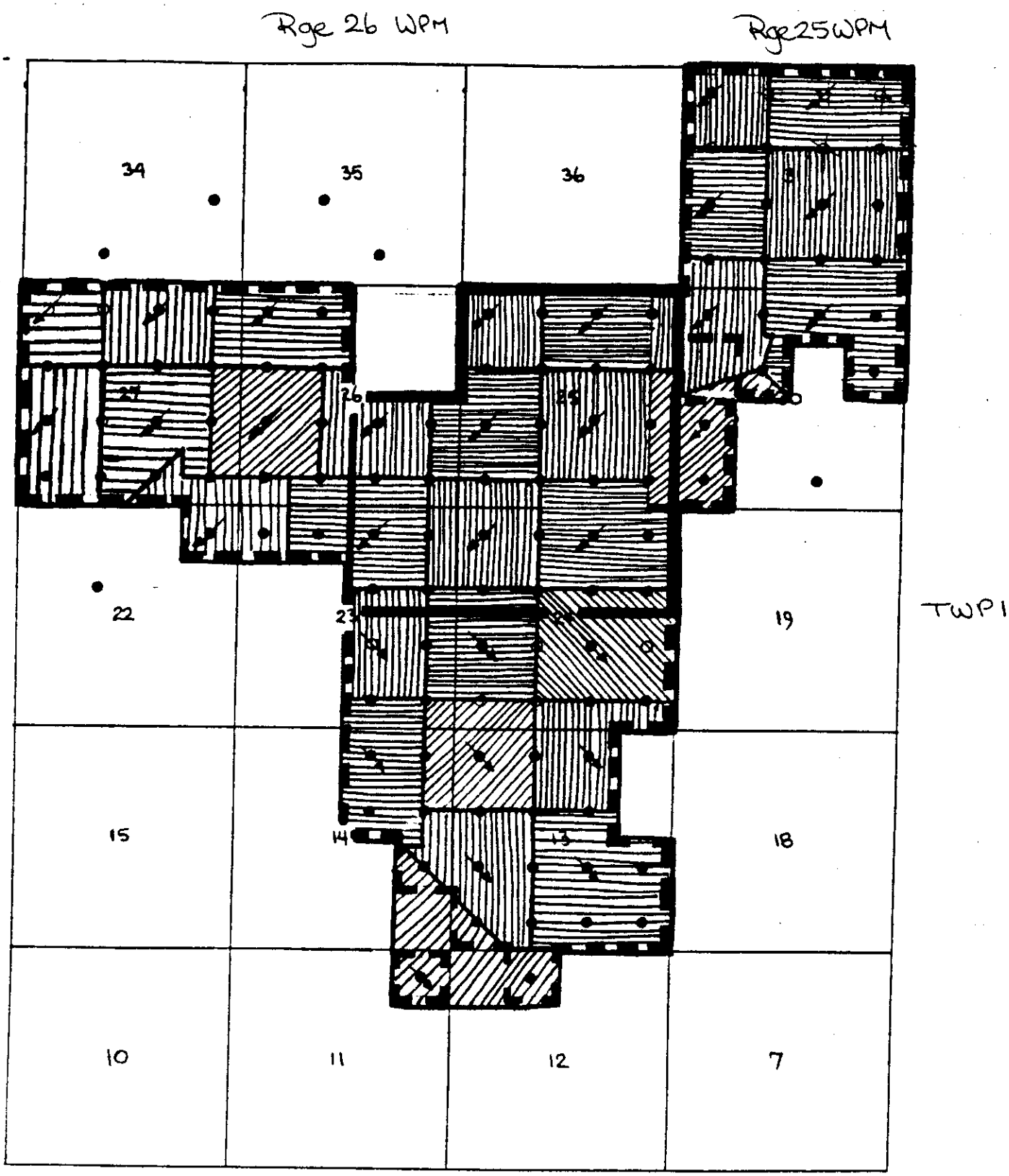


Present Waskada Lower Amaranth Unit No. 1

Proposed Unit(s) Outline

June 22/83

FIGURE 2



June 22/83

TABLE 1
PRODUCTION/INJECTION FORECAST
WASKADA PRESSURE MAINTENANCE PROJECT

TIME PERIOD (YRS)	PRD'D UNIT OIL (BOPD)	PRD'D UNIT WATER (BWPD)	OTHER PRD'D WATER (BWPD)	INJ'D UNIT WATER (BWPD)	MAKE UP WATER REQ'D (BWPD)	PRD'D UNIT RAW GAS (MMCFD)	OTHER PRD'D RAW GAS (MMCFD)	TOTAL LEAN GAS (MMCFD)	INJ'D UNIT RAW GAS (MMCFD)	FLARED LEAN GAS (MMCFD)
0-0.5	2769	2315	837	6088	2936	1.26	0.50	1.29	0.71	0.58
0.5-1.0	2905	2505	797	4684	1381	1.35	0.60	1.42	0.94	0.48
1.0-1.5	3031	2727	780	4243	736	1.59	0.71	1.68	1.31	0.37
1.5-2.0	2927	2852	689	4261	720	2.05	0.82	2.09	1.86	0.23
2.0-2.5	2934	2978	643	4368	747	2.65	0.85	2.56	2.75	<0.19> Convert 7-2
2.5-3.0	2935	3154	522	4767	1091	3.45	0.79	3.09	3.52	<0.43> Convert 7-2
3.0-3.5	2895	3457	481	5162	1224	4.09	0.76	3.54	2.83	0.71
3.5-4.0	2787	3618	419	5291	1254	4.52	0.69	3.80	3.25	0.55
4.0-4.5	2714	3747	356	5443	1340	4.91	0.61	4.02	3.75	0.27
4.5-5.0	2569	3870	290	5571	1411	5.09	0.51	4.09	4.00	0.09
5.0-5.5	2421	4109	268	5697	1319	5.59	0.48	4.43	4.38	0.05
5.5-6.0	2285	4169	230	5718	1319	5.59	0.42	4.39	4.48	<0.09>
6.0-6.5	2114	4268	214	5790	1309	4.97	0.40	3.92	3.54	0.38
6.5-7.0	1961	4379	199	5867	1289	4.42	0.38	3.50	2.80	0.70

June 24/83

HYDROCARBONS Ltd.
TELEPHONE (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

August 8, 1983

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

Attn: Mr. Marc Eliesen
Chairman

Dear Sir:

Re: Expansion of Waskada Pressure Maintenance
Lower Amaranth Pool

In reply to your letter of July 12 and in further support of our application of June 23 we offer the following point by point discussion:

1) Inclusion of non-operated offsetting tracts

On August 4, Omega convened a meeting with all the neighbour operators to discuss the subject application to expand pressure maintenance at Waskada. We briefly summarized the findings from model study, presented data showing the progress of the pilot waterflood to June 30, 1983 and outlined our intentions with respect to our expansion program. The stated objective of the meeting was to gain their support and co-operation in our efforts. Our data and reasoning was presented to encourage them to undertake their own efforts to install pressure maintenance on their properties.

We stated that we have the majority of the physical facilities already in place to expand our flood and for expediency, would prefer to proceed as we have planned. We have offered to co-operate with them; whenever possible, in such areas as sale of high pressure water and water disposal capabilities. We have opened the door for their specific proposals in these areas.

In general, our presentation was favorably received and we believe a sense of co-operation was developed. We have offered to share data and to co-operate with facilities and left them to decide what to do with their own producing properties.

2/.....

2) Undrilled Omega Operated Tracts

In general, Omega feels that the proposed expansion will not be the end of pressure maintenance expansion for the Lower Amaranth pool. More wells will be drilled on the edges of the pool and whether they are Omega operated or not; they likely will be incorporated in the pressure maintenance scheme.

In keeping with this reasoning, the proposed expansion should not be viewed as a situation where anything that is not included now will never be pressure maintained.

Assuming that we agree on this principle we can address ourselves to the specific well locations you mentioned in your July 12 letter:

a) 10-30-1-25 WPM - A program has been prepared and we have already drilled this location.
b) 12-30-1-25 WPM - Reviewing the relative merits of recompletion versus re-drilling. Re-drilling looks favourable.
c) 9-13-1-26 WPM and 16-13-1-26 WPM - Our mapping indicates that these locations are very poor Lower Amaranth prospects. We have no plans to drill these wells at present.
d) 13-12-1-26 WPM - Production results from both 16-11 and 14-12-1-26 WPM have been disappointing. Therefore 13-12 is not expected to be an economic candidate for drilling.

3) Pressure Measurements

Omega to survey the pressures at 14 of wells that are not to be converted to injection at the time that they are converted to supply a base line pressure survey. Surveying wells as they are converted would be least expensive and would offer direct comparisons. The following is the list of wells we would suggest to survey:

1)	13-24-1-26 WPM	8)	5-30-1-25 WPM
2)	7-27-1-26 WPM	9)	7-24-1-26 WPM
3)	13-26-1-26 WPM	10)	7-23-1-26 WPM
4)	16-22-1-26 WPM	11)	15-14-1-26 WPM
5)	13-31-1-25 WPM	12)	15-13-1-26 WPM
6)	5-31-1-25 WPM	13)	5-13-1-26 WPM
7)	15-30-1-25 WPM	14)	16-11-1-26 WPM

4) Accepting Other Operators' Produced Water

At our operators' meeting of August 4 we stated that Omega could entertain specific proposals to dispose of produced water from other operators. To date no such requests have been made.

In consideration of any such proposals due consideration must be given to:
a) Water quality and compatibility with existing produced water in our system.

3/.....

b) Omega's ability to handle this water; e.g. without approval to expand the waterflood we have enough problems disposing of our own water.
c) Suitable formula for cost sharing.

If these hurdles can be passed Omega has no problem with the principle of accepting other operators' produced water and in fact would prefer not to have to re-activate the 11-29 source well.

5) Pilot Waterflood

As detailed in our letter of August 2nd where we submitted pattern-by-pattern voidage calculations and graphical presentation of the production data we believe our early results from the pilot are very encouraging.

In addition to this production data we will be forwarding very soon our report on the analysis of the recent injection well pressure leak off tests done on the four pilot water injection wells. The extrapolated p* from all the tests were all very close to 700 psig bottom hole and it is anticipated that the analysis will yield $\bar{p}$ (average pressure) of several hundred pounds more.

6) Waterflood Recovery versus Gasflood Recovery

While Omega feels comfortable with the recent model study's predictions of ultimate recovery for primary and waterflood we have suggested that the present model study understates the recovery for gas flood. The difficulty with this, as you have suggested, is how to quantify the possible upside potential of gas flooding.

We are suggesting that upside potential of gas flooding is a result of three factors.

a) Conservation of the gas for possible future use.
b) Additional oil recovery derived from future depletion of the gas bubble.
c) Additional LPG production that will result from the stripping of the uncovered oil by the recycled lean gas.

On these first two points it is very difficult to forecast their effects because they are solely based upon the possibility of a future gas market. Our reservoir engineering consultant has suggested that theoretically there is no impediment to following a gas flood with water to displace the gas bubble and to further enhance the oil recovery. Considering the great expense of computer modelling and the fact that the accuracy of our prediction is greatly dependent on what assumptions we make about the later life of gas flooding, we believe that after we monitor the early results of gas flooding on the project area we will be better able to make the later life assumptions. Omega would also like to know the answer to this question but until we have a clearer indication of what gas marketting strategies are appropriate, it does not appear to be a worthwhile effort.

4/.....

Omega intends on doing a compositional model study to determine the magnitude of the LPG stripping effect. We have not yet run it for a number of reasons:

a) Before initiating a new reservoir study, we wished to confirm the area that would be gas flooded so that we could model that area.
b) We hoped to improve on our initial model study by including some history matching of the early gas flood period.
c) We also hoped that by deferring this study we may be able to have a better indication of future gas markets and therefore incorporate a gas bubble depletion phase in the study.

Omega would be monitoring the LPG content of the gas produced from the gas flood area which further help to refine the future model study. We have reason to believe that in one to four years after initiating gas flooding that we will be faced with some gas plant limitations and may need to make significant capacity improvements. Due to the dollar magnitude of these decisions we would like to make the compositional model study as accurate as possible and to defer its implementation until we have a better indication of the need for future gas plant modifications. In other words; if this work is done now, it would most certainly be outdated when we needed to make these gas plant decisions and we would simply have to re-do it or review it.

7) Changing from gas to Water Injection

As we have indicated in our application there is a possibility for the need to change some wells from gas injection to water injection after approximately two years of gas flooding. We basically agree with the recommendation of the model study that additional model studies are necessary but because we feel we can benefit from deferring this additional modelling as discussed under point no. 6 and because we do not anticipate such a change before 2 years we prefer to conduct additional model studies when we are better informed.

It is not our intention to suggest the Board approve at this time any specific future modifications to our initial program, but to identify the possibility of these development and to provide in the resulting Pressure Maintenance Order for procedures for making required modifications in injection fluids after appropriate supporting information is supplied. Based on the experience of Dr. Flores these types of changes are feasible and potentially beneficial.

8) Quantitative Analysis of Gravity Effects

Your request more simply stated is for a field wide model study. In initial commissioning the model study that was presented with our application, we did consider this and subsequently decided against it. We were quoted an estimate to do such a study at a quarter of a million dollars. At this cost we were still faced with the inherent limitations of modelling an oil pool while it is still being developed; that is by the time the study is completed

it is out of date. Development assumptions are critical and because of the magnitude of the model each additional case run is very expensive. Not only would a study like this be expensive and likely inappropriate at this stage it would postpone any decision about pressure maintenance probably close to a year. The far less comprehensive study that we have already done took 6 months.

What appears to be at issue here is containment of injected gas. It is appropriate to re-iterate that the gas flood area is on a 9 spot pattern no different than the water flood. It is designed to pressure up the pool and prevent free gas evolution near the producing wells. The flood pattern will be essentially an areal sweep of the pool not a vertical displacement process. The layered nature of the reservoir dictates this approach and we remain confident that gas migration up dip will not be a problem particularly with the small angle of dip we have seen or experienced.

9) Maximum Allowable Injection Wellhead Pressures

Injection pressures in excess of fracture pressure are to be avoided and therefore because of the differences in hydrostatic head, the maximum wellhead pressure for a water injection well is correspondly less than that for a gas injection well.

10) Zone Definition

Zones A, B, C and D are defined in the well Omega Waskada 3-31-1-25 as follows:

Zone A	898.6 - 902.9	Metres	drilled	depth	
Zone B	902.9 - 907.3	"	"	"	
Zone C	907.3 - 912.3	"	"	"	
Zone D	912.3 - 920.2	"	"	"	(Top Mississippian)

These zones are correlatable through the study area on the gamma-ray log. They correspond to zones of sand development in a general sense but only Zone 'C' is a consistently developed sand. The C and D zones can be correlated throughout the entire S.W. Manitoba area but the 'A' and 'B' zones are subject to rapid changes in shale content and have a more local distribution.

11) Extrapolation of Model Study to Field

This approximation was done in three steps:

a) Extract the raw production/injection data versus time from the model study for each of the three depletion cases. By interpolation determine the production/injection values at convenient time step points (i.e. every 6 months) with time =0 set at day 1219 of the model study the day of the start of injection and the first round of development wells come on.

b) Determine the sum of the net active well porosity-footage for each time point of the data so that the model data could be adjusted to negate the effects of the sequential development used in the model. For example in year one of the developed prediction (i.e. day 1219 to day 1584 of the model study)

there was a total of 6062 porosity-feet of active wells; starting at the beginning of year two to the end there were 9898 porosity-feet of active wells. By dividing the model prediction by total active porosity feet the model was normalized for a constant active porosity-footage.

c) The area of the pressure maintenance scheme was divided, on a pattern basis, into gas flood area, water flood area and potentially converted areas. For each area the porosity-footages were added and then the sums were multiplied by the normalized predictions developed in step (b). Some simplifying assumptions were made on converted patterns and the individual predictions were added to yield a total field prediction.

While we recognize this technique is somewhat simplified we feel comfortable with the end product as our current best estimate.

12) Geological Variations

The study area was selected to some extent on the basis that it is close to average for most field parameters. Zonation and stratification varies only slightly over the field. Porosity thickness varies across the field more on a local than regional basis. Water saturations tend to be higher in the west and lower in the central and southern portions of the field than in the study area. The effect of these variations are not known but should have little effect on the ratios of primary to secondary recovery.

13) Model Boundary Conditions

As shown in Table A-12 of the model study edge wells were included in the model as fractional wells consistent with the approach of no flow across the boundaries of a potentially larger flood area.

14) History Matching

CMG represents a group of reservoir engineers experienced with computer simulations which will freely admit that simulation models for all their sophistication are not always able to resolve all production anomalies.

While there still was some discrepancies between the predicted and the actual data the overall correlation was good. Fine tuning the existing model study while it may improve the decimal accuracy of the study will under no circumstances, alter the main recommendation of the study which was to start pressure maintenance as soon as possible.

Further model studies will be undertaken as the need arises. We have already identified work that will be undertaken later that would be done when more history is available to match to.

15) Corrosion Control

Cathodic protection is currently being installed on all wells tied into the gathering system. The anode beds will protect not only the wells themselves

but also their connecting pipelines.

Corrosion coupons are being monitored and chemical programs monitored and adapted as required.

16) Production Allowables

It would be our intent to apply for exemption from production allowables for wells within the pressure maintenance scheme. As you know production allowables for wells in the program area but outside the existing pilot waterflood pattern are not generally curtailed by allowable limits. Their ability to produce is lower than the allowable limit and therefore if that situation should change through implementation of pressure maintenance, we would feel that allowable restrictions would be inappropriate.

SUMMARY

We hope that this letter adequately addresses your concerns. As you know we are anxious to begin injecting water particularly, because we once again are well limited on our water disposal system and are growing concerned about the amount of water being injected into the Mississippian wells at 6-30 and 1-30-1-25 WPM.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse for

George E. Patey
V.P. Production

GEP/WEW/ms

cc: T. J. Hall
E. Wyse
B. Dubreuil, Petroleum Branch - Manitoba

December 17, 1984

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Communication Testing - Waskada Lower Amaranth and Mississippian Reservoirs

Your letter of December 4, 1984 outlining the progress of your program of pressure testing to define the extent of communication between the Lower Amaranth and Mississippian reservoirs in Waskada is acknowledged.

We request that you continue to provide the Board with progress reports in this matter as additional data becomes available. In addition, specific well operations arising from this program should be submitted to the Petroleum Branch for prior approval.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/lk

c.c. Marc Eliesen
J. F. Redgwell

b.c. Petroleum Branch

November 21, 1984

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey
Vice President, Production

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Board Order No. PM 42

Enclosed herewith is a copy of Board Order No. PM 42 authorizing pressure maintenance operations in the proposed Waskada Unit No. 5. Your attention is specifically directed to subclause 3(1) under which you are required to submit reservoir pressure survey results to the Board prior to commencement of injection. You will also be aware that Board approval of the Unit Agreement will be required before injection is initiated.

In previous letters (August 28, 1984 and October 11, 1984) you advised that an extensive program of geological and reservoir engineering studies was being prepared and that initial steps had been taken on a program of reservoir fluid studies. The Board would appreciate receiving from you a status report on both these programs.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

Enclosure

cc: Marc Eliesen
J. F. Redgwell

bc: Petroleum Branch
LRD/IH/bb

Bob
file

MANITOBA

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

November 6, 1984

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Injection Pattern - Waskada Lower Amaranth A Pool

It has been brought to the Board's attention that Omega plans a possible change in the configuration of injection patterns in the Northeast part of the subject Pool (Sections 7, 8 and 9-2-25 WPM).

In the interests of maximizing areal sweep through standardization of the injection pattern and in view of the probability that future drilling will make this part of the Pool contiguous with the central developed area, you are advised that the Board does not favour a change in injection pattern for this area.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/lk

c.c. Marc Eliesen
J. F. Redgwell
Petroleum Branch

NOV 6 1984

Change of Injection Pattern (Sect 7, 8 & 9 - 2-25)

Omega point 1 "Unlikely that area would ever be connected to main developed area."

- note drilling is already taking place on the SE 1/4 of Section 5-2-25 (only 3/4 of a mile from Section 8.)

- also drilling is proceeding in the NE 1/4 - 1-2-26 about a mile from the ~~prop~~ subject development

Conclude that it is quite likely that the subject development will be connected to the main developed area (either through NE 1/4 - 5 or NW 1/4 of Sect. 6 and SW 1/4 sect 7 - 2-25 or both

Omega point 2 Change of pattern would eliminate offset operators ~~any~~ objections and speed up water flooding (prevent pressure from dropping below the bubble point

True. Only non-Omega areas offsetting injectors (N 1/2 - 5 - 2-25) are undeveloped at this time

Omega point 3. would not eliminate other operators from joining unit at a future date

True but Omega's track record would indicate they'd rather not have any outside wells. Suggest that if outside wells are not

party to the original unit, they are not likely to be included in the future. Other operator's development's are to small and scattered to form an effective Unit. Inclusion of other W.I.O. at this time might be the first step towards field wide unitization.

OMEGA
HYDROCARBONS LTD.

1500 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 26, 1984

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

Attention: Mr. L. R. Dubreuil
Chief Petroleum Engineer

Dear Bob:

RE: Injection Pattern
Sections 7, 8 and 9 Twp 2 Rge 25 WPM

Omega Hydrocarbons whishes to pursue the changing of the injection pattern in the above area of the Waskada field. We requrest your approval to change the injection pattern to wells in Lsd. 2, 4, 10 and 12 based on the following information.

1) This area of the field is isolated from the main developed area by the town of Waskada. It is very unlikely this area would ever by connected and the changing of the pattern would therefore not effect the efficiency of the flood.

2) The Waskada area is extremely sensative to a sharp drop in productivity once pressure drop below the bubble point. It is therefore imperative that water flood be initiated as soon as possible and by changing to this proposed pattern we will virtually eliminate any possible intervention from outside operators and would speed up the process of water flooding hopefully being able to flood this area before pressures drop below the bubble point.

3) This injection pattern will not eliminate outside operators from joining into our unit at a future date and would certainly uncomplicate possible problems with forming a unit at this time.

..../2

We therefore request your re-consideration in changing the injection pattern. We would greatly appreciate an early answer to this proposal as we plan to be pipelining in this area in the next few weeks and must know which well to install the internally coated pipeline.

Yours truly,

OMEGA HYDROCARBONS LTD.

G. E. Patey
V. P. Production

GP/cw

PS 1-25

MANITOBA

Inter-Departmental Memo

Date OCTOBER 23, 1984

To The Oil and Natural Gas Conservation Board

Marc Eliesen - Chairman
Dr. I. Haugh - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Expansion of Pressure Maintenance Operations

Proposed Waskada Unit No. 5
Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., in its letter of April 13, 1984, has applied for approval to conduct waterflood operations in a portion of the subject Pool. To facilitate processing of the application, the Board sent Omega deficiency letters, dated April 27, 1984 and September 10, 1984 to which Omega responded in its letters of August 28, 1984 and October 11, 1984. Notice of the application was published in the Manitoba Gazette (Sept. 29, 1984) and the Melita New Era (Sept. 27, 1984). No objections to the application have been received.

Recommendation:

It is recommended that the application be approved and that Board Order No. PM 42 (draft attached) be issued.

It is also recommended that the Board, in its cover letter to the Order, acknowledge Omega's commitment to obtain PVT data from the northwest part of the Pool and to perform reservoir model studies and request that the Board be kept informed of developments in these areas by way of regular status reports. In light of future additional water supply requirements in the Field, it is suggested Omega be also advised to inform the Water Resources Branch of their plans for future water supply (i.e. - additional Swan River water supply wells).

Discussion:

As discussed in previous memos, production performance of wells in the subject Pool indicate that primary reserves are quite limited and that pressure maintenance through water injection adds significantly to ultimate recoverable reserves.

The proposed scheme,while not contiguous with existing waterfloods utilizes the same injection pattern which will allow for orderly future development between the existing and proposed waterflood areas.

One concern that has been expressed is the possible shortage of water supply if water injection operations expand quickly. In the past, the lack of water supply has resulted in deteriorating waterflood performance in certain areas.

....2

Omega has indicated that the capability of current supply wells is about 600 m^3/d, while current requirements are in the range of 100 m^3/d. However, by late 1985, it will be necessary to develop 900 m^3/d of additional supply capacity. It is likely that this supply requirement will be met by completing additional wells in the Swan River Formation. It is anticipated that this Formation can supply adequate quantities of water.

The Swan River aquifer in the Waskada area is somewhat brackish but is potentially useful for watering livestock (etc.). Due to this potential alternate use, it is recommended that Omega be asked to make the Water Resources Branch aware of its supply requirements.

In its responses to the Board's deficiency letters, Omega has committed to developing a more meaningful reservoir model as well as obtaining additional PVT data. To ensure there commitments are pursued, it is suggested that periodic (say quarterly) status reports be required. These could be included as part of the regular monthly progress reports.

The attached draft Board Order No. PM 42 contains equivalent provisions to previous pressure maintenance orders for the subject Pool.

As noted in Omega's October 11, 1984 memo, the Unit Agreement for the proposed Waskada Unit No. 5 has not been completely executed. Water injection cannot be commenced until the Unit Agreement has been executed by all involved parties and the Board has approved the agreement.

[illegible]

H. Clare Moster

LRD/HCM/lk

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 11, 1984

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

Attention: Dr. Ian Haugh

Dear Sir:

Re: Expansion of Pressure Maintenance Operations
Waskada Lower Amaranth A Pool
Proposed Waskada Unit No. 5

In response to your letter of September 10, we offer the following additional comments:

1. Water Supply

At the present time Omega operates 2 Waskada water source wells with a combined deliverability of about 600 m^3/d. These wells presently are hardly being used with the total 11-30 battery water almost equalling the water injection requirements.

Based on the very rough projections shown on Appendix A, it is not anticipated that there should be any water shortages until after there is some significant additional water injection added to what is already either on or planned for the immediate future. The maximum anticipated source water requirements is expected to be approximately 1500 m^3/d, or roughly 900 m^3/d over our present requirements.

2. Reservoir Fluid Studies

Steps have been taken to collect the necessary oil and gas samples in order to do a recombined PVT analysis of the heavier Lower Amaranth reservoir fluid in the NW portion of the field. Results will be forwarded as they become available.

Ian Haugh's office-17Oct84
cc: H. C. Moster

3. Surface Facilities Schematic

Enclosed is a surface facility schematic. Appropriate flowline licenses will be submitted as soon as possible. Extensive flowline development has been undertaken before, during and after the drafting of the new regulations and therefore further dialogue will be required to determine the magnitude of application required.

This hopefully addresses all remaining points and will result in the issuance of the necessary P.M. Order for the subject Unit No. 5. Waskada Unit No. 5 Unit Agreement has to date been signed by all but one party and therefore we are hopeful that it may receive it's unanimous approval soon.

Yours truly,

OMEGA HYDROCARBONS LTD.

T.J. Hall, President

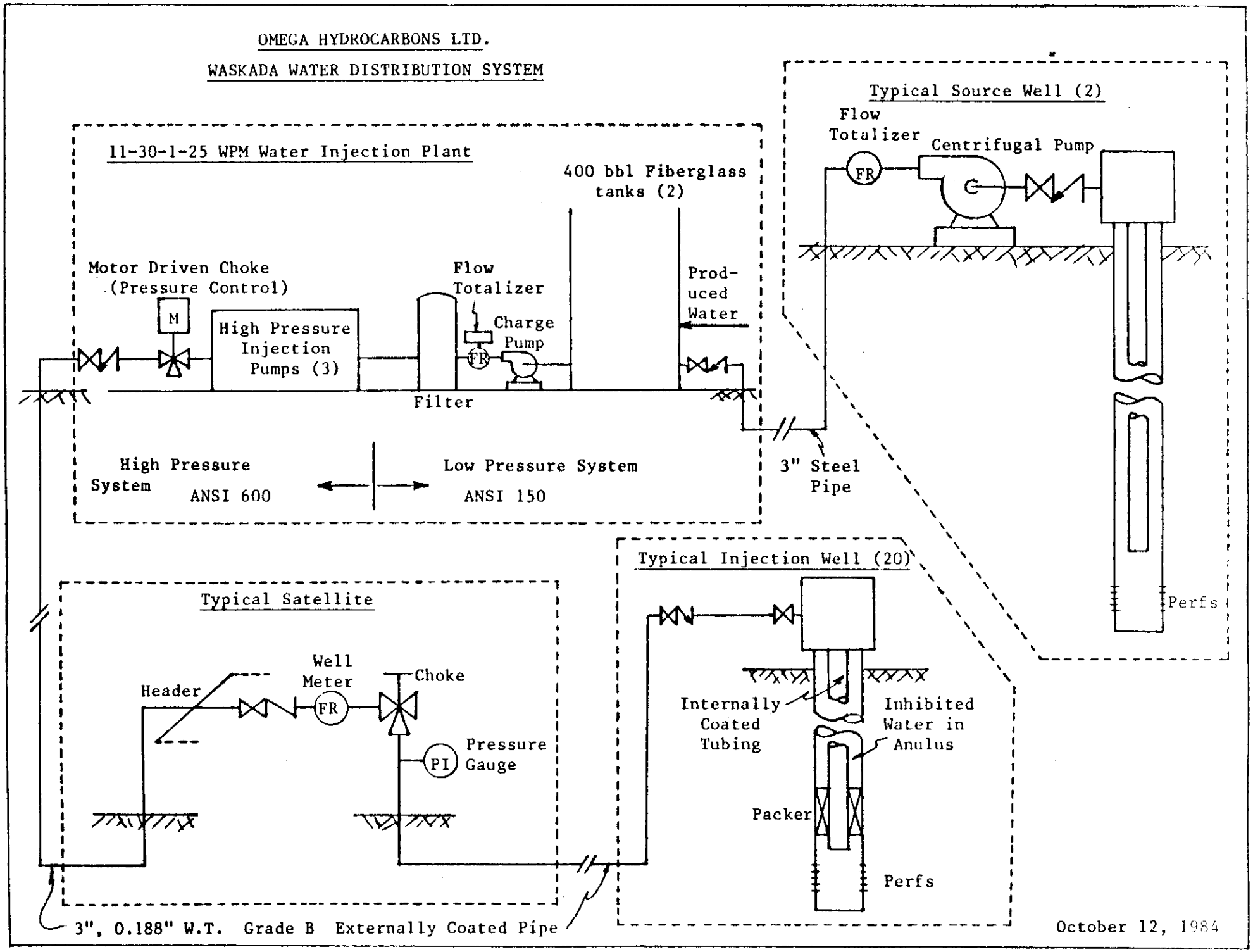
TJH/sk
Encl.
cc. M. Mawdsley
E. Wyse
G.E. Patey

APPENDIX A

ANTICIPATED WATER REQUIREMENTS FOR
OMEGA HYDROCARBON'S WASKADA OPERATION

October 10, 1984

MONTH	PRODUCTION (m^3/d)	INJECTION (m^3/d)	DISPOSAL (m^3/d)	SOURCE (m^3/d)
Sept./84	1000	1100		100
Oct.	1100	1100		-
Nov.	1300	1100	200	-
Dec.	1400	1500		100
Jan./85	1600	1900		300
Feb.	1800	2000		200
Mar.	1900	2100		200
Apr.	2000	2100		100
May	2100	2500		400
June	2200	2600		400
July	2200	3100		900
Aug.	2200	3300		1100
Sept.	2300	3400		1100
Oct.	2300	3500		1200
Nov.	2300	3500		1200
Dec.	2300	3600		1300
Jan./86	2300	3800		1500
Feb.	2300	3800		1500
Mar.	2300	3800		1500
Apr.	2300	3700		1400
May	2300	3700		1400
June	2300	3600		1300
July	2300	3600		1300
Aug.	2300	3500		1200


OMEGA HYDROCARBONS LTD.
WASKADA WATER DISTRIBUTION SYSTEM
11-30-1-25 WPM Water Injection Plant
Motor Driven Choke
(Pressure Control)
M
High Pressure
Injection
Pumps (3)
Flow
Totalizer
FR
Charge
Pump
Filter
400 bbl Fiberglass
tanks (2)
Prod-
uced
Water
High Pressure
System
ANSI 600
Low Pressure System
ANSI 150
3" Steel
Pipe
Typical Source Well (2)
Flow
Totalizer
FR
Centrifugal Pump
Perfs
Typical Injection Well (20)
Internally
Coated
Tubing
Inhibited
Water in
Anulus
Packer
Perfs
Typical Satellite
Header
Well
Meter
FR
Choke
PI
Pressure
Gauge
3", 0.188" W.T. Grade B Externally Coated Pipe
October 12, 1984

Docket 12215
Motorways (1980) Ltd.,
Winnipeg, Manitoba.

Application for extension of Public Service Vehicle Certificate for the following:

Intra-provincial:

Transportation of general freight from Brandon and Winnipeg to and from Virden, Manitoba and district, and vice versa.

Extra-provincial:

1. Transportation of general freight from Virden and district to and from the Manitoba/Ontario border for furtherance to points in Ontario as authorized, and vice versa.

2. Transportation of general freight from Virden and district to and from the Manitoba/International boundary for furtherance to points in the United States of America as authorized, and vice versa.

Docket 12216
Lang Cattle Co. Ltd.,
Swift Current, Saskatchewan.

Application for extension of Public Service Vehicle Certificate for the transportation of livestock from various points in the Province of Manitoba, excluding Brandon, Virden and Melita, to the Manitoba/Ontario border for furtherance to various points in the Province of Ontario as authorized.

Docket 12196
Southeast Transfer Ltd.,
Steinbach, Manitoba.

Application for extension of Public Service Vehicle Certificate for the transportation of lumber (dimensional stock) and composition sheathing, from various points in the United States of America to Winnipeg, Manitoba.

Docket 12214
Southeast Transfer Ltd.,
Steinbach, Manitoba.

Application for extension of Public Service Vehicle Certificate for the transportation of lumber (dimensional stock) and composition sheathing from various points in the Provinces of Alberta and Saskatchewan to Winnipeg, Manitoba.

This is a proposed Joint Hearing application to be heard by representatives of the Motor Transport Boards of Manitoba, Saskatchewan and Alberta in Winnipeg, Manitoba at a date, time and place to be determined at a later date.

Docket 12210
TNT Canada Inc.,
Mississauga, Ontario.

Application for change of name and transfer of the Public Service Vehicle Certificate presently held in the Province of Manitoba by Wesbell Transport Ltd./Ltee to TNT Canada Inc., Mississauga, Ontario, pursuant to Articles of Amalgamation, the Province of Ontario, dated June 30, 1984.

Anyone wishing to make representation or oppose the granting of the above applications must file such notice with the Secretary of the Board, 200-301 Weston Street, Winnipeg, Manitoba, either by mail or personal filing, prior to 4:30 P.M., Monday, October 15, 1984. Notices received after this date will not be accepted.

Subsequent to the above date the applications will be scheduled for Public Hearing and the applicants and anyone who opposed will be notified as to the date, time and place of the Hearing.

L. G. OLIJNEK,
Secretary,
—39 THE MOTOR TRANSPORT BOARD.

UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd. has made application under The Mines Act to conduct a waterflood project in the Lower Amaranth Formation in that portion of the Waskada Field described as follows:

Lsd's 13, 14, 15, and 16 of Section 35-1-26 (WPM)

S½ of Section 2-2-26 (WPM)

Lsd's 9, 10, 11 and 12 of Section 2-2-26 (WPM)

It is proposed to convert the following wells to water injection:

Omega Waskada 13-35-1-26 (WPM)
Omega Waskada 15-35-1-26 (WPM)
Omega Chevron Waskada 5-2-2-26 (WPM)
Omega Waskada 7-2-2-26 (WPM)

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

Copies of the application may be obtained from Omega Hydrocarbons Ltd., 630-330 Fifth Avenue S.W., Calgary, Alberta, T2P 0L4.

THE OIL AND NATURAL GAS CONSERVATION BOARD
IAN HAUGH,
Deputy Chairman.

Dated: September 12, 1984.
—39

NOTICE

L. & S. CARPET CARE wish to announce their new rates for your fall cleaning needs. All carpet cleaning is 16c sq. ft. Upholstry cleaning may vary—average chesterfield and chair $40.00, average car $40.00. No mileage charge on most jobs. Lorne and Shirley Percival, Deloraine, 747-2767. 5-2c

---

NOTICE UNDER THE MINES ACT
Waskada Oil Field

Omega Hydrocarbons Ltd. has made application under The Mines Act to conduct a waterflood project in the Lower Amaranth Formation in that portion of the Waskada Field described as follows:

Lsd's 13, 14, 15, and 16 of Section 35-1-26 (WPM)
S½ of Section 2-2-26 (WPM)
Lsd's 9, 10, 11 and 12 of Section 2-2-26 (WPM)

It is proposed to convert the following wells to water injection:

Omega Waskada 13-35-1-26 (WPM)
Omega Waskada 15-35-1-26 (WPM)
Omega Chevron Waskada 5-2-2-26 (WPM)
Omega Waskada 7-2-2-26 (WPM)

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

Copies of the application may be obtained from Omega Hydrocarbons Ltd., 630-330 Fifth Avenue S.W., Calgary, Alberta, T2P 0L4.

—Yours Sincerely
The Oil and Natural Gas Conservation Board
Ian Haugh
Deputy Chairman
Dated: September 12th, 1984
6-1c

MISCELLANEOUS

MISCELLANEOUS OR APPROPRIATE—Eric Jordan "Have Texture Will Travel". Average livingroom and two bedroom ceilings $339.00, furniture can be left in the room. No mileage charge. Sparkles included. 528-3246.

FOR SALE—Pesticide Container Crusher, powered by 8 h.p. gas motors, will compact 20 litre metal pesticide containers while forcing out pesticide residue or other liquid. Submit bids to M.A.U.M. 201-377 Henderson Highway, Winnipeg, Manitoba. R2K 2H2.

NOTICE OF TENDER—1976 White Freightliner Cabover tractor. 290 Cummins, 15 spd., radio. Can be seen at General Truck Sales in Winnipeg. Submit tenders for above to Box 33, Haywood, Man., R0G 0W0 by September 28, 1984. Highest or any tender not necessarily accepted.

FOR SALE—Four growthy purebred Charolais heifers, two polled, one scured and one horned, bred to son of world show champion "Wildor Raven". Will deliver. Garth Jackson, White Pearl Charolais, Inglis, Manitoba. 204-564-2330.

MISCELLANEOUS—Yarn By Mail—Icelandic wools, Buffalo wool, Irish wool, Lambsglow (2 and 3 ply, 100 per cent wool, machine washable); Mohair and other fashion wools. September and October only 10 per cent off our regular discount prices. Lilian Olafsson Assoc., Box 264, Station "A" Winnipeg, R3K 2A1. Phone 204-888-4278.

MISCELLANEOUS—STORE FIXTURE CATALOGUE AVAILABLE free to stores or individuals that may be opening

MISCELLANEOUS

FOR SALE—BALL JACKETS—$16.00 Up. Buy direct from the factory and save! Peter Upton Jacket Works. Call toll free 1-(800)-661-6461 for your free catalogue.

BUILDING SUPPLIES—FOR SALE: 3"x14"x40ft. fir planks at $1.75 lin. ft.; 12"x12"x16ft. fir timbers at $3.00 lin. ft.; 4"x4" up to 10 ft. long spruce at $0.35 lin. ft.; 1 1/8"x6" tongue and groove sheeting at $0.08 lin. ft.; good selection of new and used steel. Springfield Salvage, Springfield Rd. 1 mile east of Lagimodiere Blvd. Ph. 224-4184.

EMPLOYMENT OPPORTUNITY—"Agricultural Work Training Opportunities Abroad. Must have two years practical experience, be single. European, Australian, New Zealand host families. Write to International Agricultural Exchange Association, 1211-11th Ave. SW, Calgary, Alberta, T3C 0M5".

FOR SALE—Curry Bros. Ltd. Fall Clearance Sale. Special prices on Harley Davidson Golf Cars 1977-1978, reconditioned. Behleyn Bins built and delivered. Call 242-2397 or 242-2646, Manitou.

BUSINESS OPPORTUNITY—Family Tax Planning. Learn Loopholes to decrease taxes. Free Brochure. U & R Tax Schools, 207-1345 Pembina Highway, Winnipeg, Man. R3T 2B6.

HORSE SALE—South-western Manitoba draft horse sale Wednesday, October 10th 1 p.m. in Agricultural Barns, Virden. 80 fillies, 8 mares, 45 colts. Information—Marg Brown, Kenton. 838-2089.

WINDOWS AND DOORS—Canada's finest quality and

MISCELLANEOUS

FOR SALE—Attractive, busy Motor Inn, Western Manitoba. All departments doing well. Sales $950,000. Ideal for aggressive couple or partnership. Owner has other interests. Box 1152, Roblin.

HELP WANTED—Shop foreman required for IHC Dealership in southern Manitoba. Duties include supervising approx. seven persons in shop and set-up area. Supervisory experience in IHC shop an asset. Other management experience will be considered. We offer negotiable salary, comprehensive health and sickness plan. Phone or send resume to G. Sterling Truck and Implements Ltd., Box 89, Pilot Mound, Man. R0G 1P0. Att: Glen Sterling, 204-825-2183 or evenings 204-825-2827. All enquiries held in strict confidence.

FOR SALE—160 acres, 70 cultivated, log home, buildings, fenced, North of Winnipegosis. Some machinery, creek. $24,900.00. Cattle, hay can purchase separately. Box 808, The Pas, Manitoba.

In Memoriam

MOORE—In loving memory of my husband and father, Everette, who passed away October 4th, 1978.

However long our lives may last
Whatever lands we view
Whatever joy or grief be ours
We will always remember you.
—Edna and Family

COOPER—In loving memory of Mrs. Frank Cooper.

Beyond Life's Gateway

There's an open gate at the end of the road
Through which each must go alone,
And there in a light we cannot

MANITOBA

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

NOTICE UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd. has made application under The Mines Act to conduct a waterflood project in the Lower Amaranth Formation in that portion of the Waskada Field described as follows:

Lsd's 13, 14, 15, and 16 of Section 35-1-26 (WPM)

S½ of Section 2-2-26 (WPM)

Lsd's 9, 10, 11 and 12 of Section 2-2-26 (WPM)

It is proposed to convert the following wells to water injection:

Omega Waskada 13-35-1-26 (WPM)

Omega Waskada 15-35-1-26 (WPM)

Omega Chevron Waskada 5-2-2-26 (WPM)

Omega Waskada 7-2-2-26 (WPM)

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

Copies of the application may be obtained from Omega Hydrocarbons Ltd., 630 - 330 Fifth Avenue S.W., Calgary, Alberta, T2P OL4.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

DATED: September 12th, 1984

MANITOBA

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

September 10, 1984

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Expansion of Pressure Maintenance Operations - Waskada Lower Amaranth A Pool

Your letter of August 28, 1984 regarding expansion of pressure maintenance operations in the subject Pool is acknowledged.

Your commitment to undertake suitable reservoir engineering model studies to support your waterflood application is noted. It is the Board's opinion that such studies should incorporate, to the degree practicable, observed waterflood performance specifically from the area of the original waterflood pilot.

In addition to the above, a number of issues were raised in our letter of April 27, 1984 which have not been addressed in your letter. These are outlined below.

1. Water Supply

Data from the area of the original pilot indicates waterflood performance is quite sensitive to the level of withdrawal replacement. While the available water supply has been expanded by activation of a second water supply well, it is noted that some areas are not achieving voidage replacement on a monthly basis. Please provide a brief discussion of your anticipated water injection requirements (total project including the subject expansion) and your estimated water supply for the next two years.

....2

2. Reservoir Fluid Studies

Please indicate the status of your reservoir fluid sampling program for the area (as discussed in item #2 of our April 27, 1984 letter).

3. Please provide appropriate schematics of surface facilities associated with the project (refer Item #5 of our April 27, 1984 letter). Please note that pursuant to Section 58 of The Petroleum Drilling and Production Regulations, 1984, it is necessary to apply for a flow line licence prior to putting a line in operation. A sample application form is attached.

4. In addition to the above specific items, you are referred to Section 126 of The Petroleum Drilling and Production Regulations 1984 which outlines submission requirements for an application of this type. The information submitted should conform to these requirements. Based on your commitment to conduct appropriate reservoir model studies, the Board will continue processing of your application (advertisement for objections, etc.). However, final approval of the project will be withheld pending your response to the items discussed in this letter.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/lk

b.c. Petroleum Branch

PS-1-25

MANITOBA
Inter-Departmental Memo

Date September 10, 1984

To The Oil and Natural Gas Conservation Board

Marc Eliesen - Chairman
Dr. I. Haugh - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Expansion of Pressure Maintenance Operations

Proposed Waskada Unit No. 5
Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd. has submitted a response to the Board's deficiency letter of April 27, 1984 regarding the subject application to expand pressure maintenance operations.

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Melita New Era and be sent to all working interest owners within one kilometre of the project area.

It is also recommended that the attached deficiency letter be sent to Omega and that final approval of the project be delayed until an appropriate response has been received.

Discussion:

As noted in the Branch's memo of April 27, 1984, primary production performance in this and other parts of the subject Pool suggests that primary recovery is very limited. Also, severe and rapid pressure declines have been observed in the Pool. These factors both point to the need for and timeliness of pressure maintenance operations.

Performance of the original pilot water injection area indicates that waterflood recovery will greatly exceed primary recovery.

In view of the above, it is in the interest of maximizing recovery from the Pool to proceed with pressure maintenance operations as soon as possible.

The Board's letter of April 27, 1984 requested Omega's comments on a number of specific concerns and pointed out that the application was deficient in many areas. In response to this letter, Omega has made a commitment to undertake reservoir model studies and has proposed a pre-injection pressure survey. The other concerns

....2

raised and data requested have not been addressed. Although many of the items not provided will not have a direct bearing on the proposed disposition of the application, such information is necessary to ensure a complete and informative application.

In view of the need for prompt action regarding pressure maintenance operations, it is recommended that the advertisement procedure be initiated at this time. Advertisement in the Manitoba Gazette and the Melita New Era as well as notification of offsetting working interest owners is recommended (see Attachment No. 1 for involved parties).

Final approval of the application should be withheld however, until the deficiencies have been satisified.

H. Clare Moster

LRD/lk

ATTACHMENT NO. 1

Working Interest Owners
Within One Kilometre of
Proposed Waterflood Scheme

Working Interest Owner	Area
Sasko Oil and Gas	NW¼-1-2-26
Chevron Canada Resources Ltd.	SW¼-2-2-26
Rex Petroleum Ltd.	N½-2-2-26
Voyager Petroleum Ltd.	SE¼-10-2-26
Samedan Oil of Canada Inc.	Section 11-2-26

MANITOBA

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

NOTICE UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd. has made application under The Mines Act to conduct a waterflood project in the Lower Amaranth Formation in that portion of the Waskada Field described as follows:

Lsd's 13, 14, 15 and 16 of Section 35-1-26 (WPM)

S½ of Section 2-2-26 (WPM)

Lsd's 9, 10, 11 and 12 of Section 2-2-26 (WPM)

It is proposed to convert the following wells to water injection:

Omega Waskada 13-35-1-26 (WPM)

Omega Waskada 15-35-1-26 (WPM)

Omega Chevron Waskada 5-2-2-26 (WPM)

Omega Waskada 7-2-2-26 (WPM)

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

Copies of the application may be obtained from Omega Hydrocarbons Ltd., 630, 330 - 5th Avenue S.W., Calgary, Alberta T2P 0L4.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

DATED: September , 1984

Ian Haugh
Deputy Chairman

October 5, 1984

Omega Hydrocarbons Ltd.
Sun Life Plaza
Ste. 1300 - 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey
Vice President, Production

Dear George:

Re: Injection Pattern
Sections 7, 8 & 9, Township 2, Range 25 (WPM)

Your letter of September 26, 1984 relating to a possible future water injection project in Sections 7, 8 and 9 -2-25 (WPM) is acknowledged.

While we concur that the area may not be continuous in the near future with other water flood projects, there appears to be no technical reason why the injection locations should be modified and future developments could foreseably make this development contiguous with the rest of the pool. We are also of the opinion that use of the already established pattern could possible facilitate inclusion of non-Omega operated lands into a Unit and lead to a more efficient and effective ultimate development of the pool.

For the reasons stated above, we suggest that injection locations in the subject area should reflect the pattern you have established in other parts of the Field.

Yours sincerely,

Original Signed By
L. R. DUBREUIL

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch

LRD/sb

bc: The Oil & Natural Gas
Conservation Board (Dr. I. Haugh)

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630-330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

September 26, 1984

Manitoba Dept. of Energy
and Mines
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. Bob Dubrieul

Dear Sir:

Re: Future Waterflood Injection Pattern
Sections 7, 8 and 9-2-~~3~~5 WPM

Please be advised that Omega Hydrocarbons Ltd. is in the process of installing oil flowlines and future water injection lines in the above area. The decision on the configuration of the potential waterflood pattern in this area is now being made with the inclusion of internal plastic coating of what is expected to be water injection lines for Lsd's 2, 4, 10 and 12.

This particular area is not now and likely never will be contiguous to existing waterflood operations on the pattern of Lsd's 5, 7, 13 and 15 because of the separation caused by the Town of Waskada. It is for that reason that we do not feel compelled to stick with this pattern. The Lsd 2, 4, 10 and 12 pattern maximizes Omega's producing-to-injecting well ratio and does not adversely affect anyone.

The purpose of this letter is to go on record as choosing that injection pattern for this area even in advance of a pressure maintenance application in order that future plans of adjacent operators do not conflict.

Yours truly,

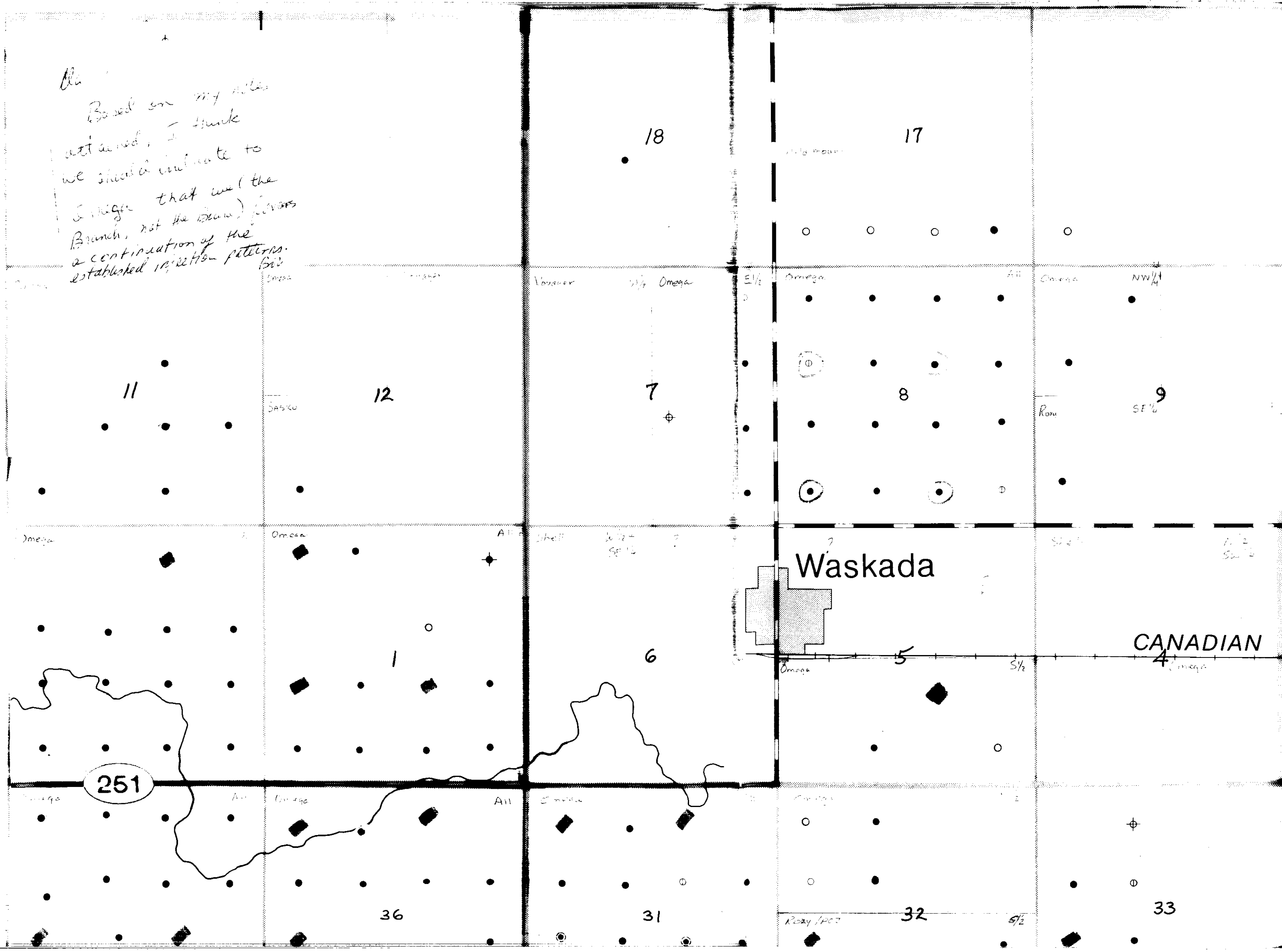
OMEGA HYDROCARBONS LTD.

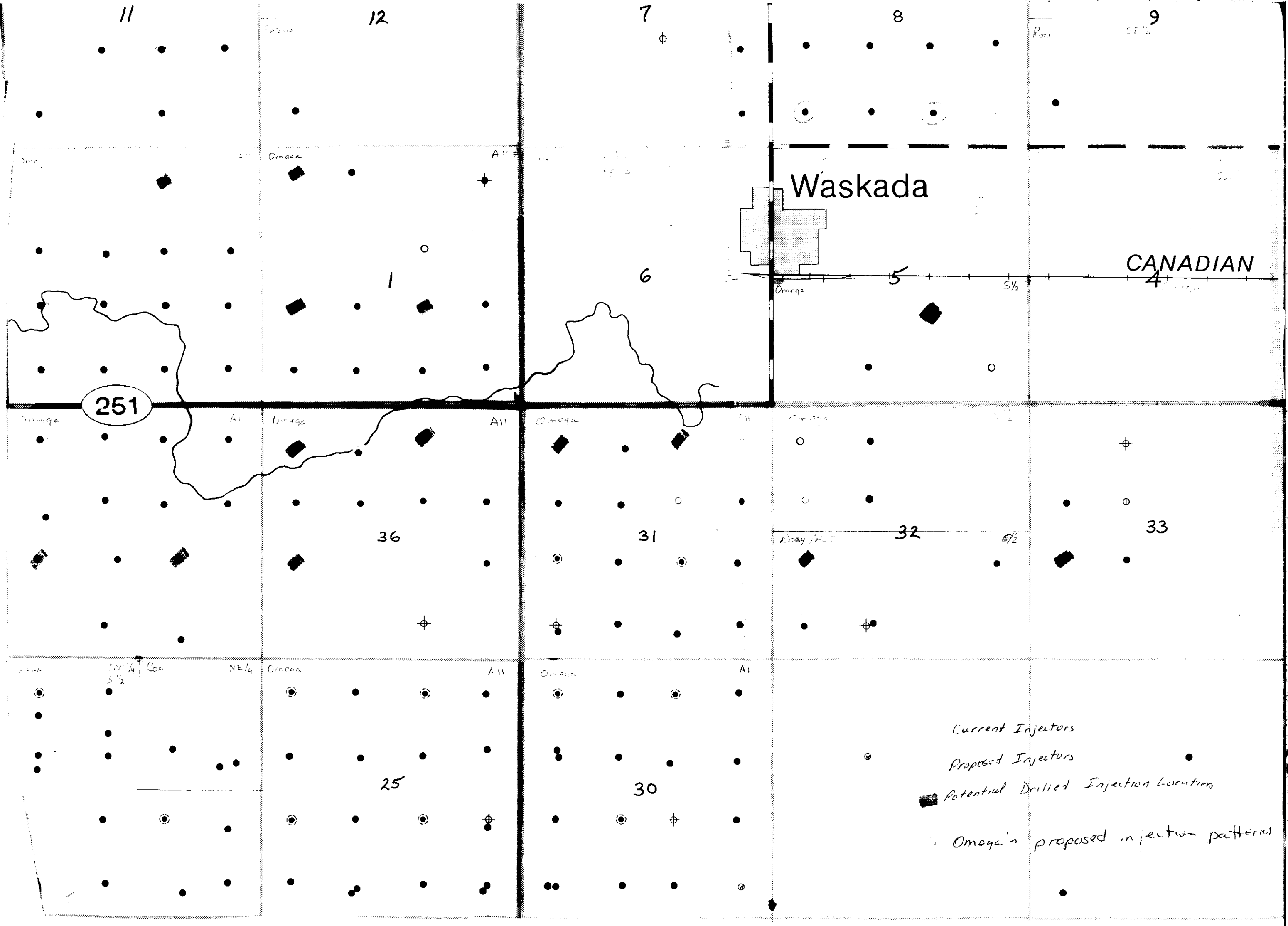
G.E. Patey
V.P. Production

c.c. W.E. Wyse

WEW/tt

Based on my notes
attached, I think
we should evaluate to
include that we (the
Branch, not the Board) focus
a continuation of the
established injection patterns.
Bill




11
12
7
8
9
Waskada
CANADIAN
1
6
5
4
251
36
31
32
33
25
30
Current Injectors
Proposed Injectors
Potential Drilled Injection Location
Omega's proposed injection pattern

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

September 26, 1984

Manitoba Department of Energy and Mines
Eaton Place
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. Bob Dubrieul

Dear Sir:

RE: Future Waterflood Injection Pattern
Sections 17, 18 and 20-1-25 WPM

Please be advised that Omega Hydrocarbons Ltd. is in the process of installing oil flowlines and future water injection lines in the above area. The decision on the configuration of the potential waterflood pattern in this area is now being made with the inclusion of internal plastic coating of what is expected to be water injection lines for Lsd's 5, 7, 13 and 15.

Because this particular area may one day be contiguous to other Lower Amaranth waterfloods on this already established pattern it seems prudent to remain on this pattern.

The purpose of this letter is to go on record as choosing that injection pattern for this area even in advance of a pressure maintenance application in order that future plans of adjacent operators do not conflict.

Yours truly,

OMEGA HYDROCARBONS LTD.

G. E. Patey
V. P. Production

cc: Ed Wyse

UNIT: 5

OMEGA HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

August 28, 1984

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

Attention: Dr. Ian Haugh

Dear Sir:

Re: Waskada Unit No.5
Expansion of Pressure Maintenance Operations

Further to our application of April 13th to initiate a waterflood pressure maintenance program in the proposed Waskada Unit No. 5 area and in response to your letter of April 27th we offer the following:

1) Omega is currently drawing up specifications and AFE's for an extensive program of geological and reservoir engineering studies in the Waskada field. In so far as the intended studies extend beyond the immediate requirements for Unit No. 5 and require partner approval it is anticipated that this work; to be done by consultants, will not be actually commissioned until sometime in September.

   This letter however will serve as Omega's firm commitment to undertaken suitable reservoir engineering model studies to support our application to waterflood the Unit No. 5 area.

2) The Pre-injection Pressure Survey is proposed to include two wells: 7-2-2-26 WPM and 15-35-1-26 WPM. These two wells will be surveyed with bottom hole pressure gauges at the time of their conversion to water injection.

.../2

Ian Haugh's office-06Sep84
pc: H. C. Moster

It is our hope that this commitment for engineering work will be sufficient to allow the Board to approve this application in order that water injection may be started before this winter.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. W.E. Wyse

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

April 27, 1984

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey

Dear Sirs:

Re: Waskada Lower Amaranth A Pool - Expansion of Pressure Maintenance Operations - Proposed Waskada Unit No. 5

Your letter of April 13, 1984 requesting approval to initiate water injection operations in the area of the proposed Waskada Unit No. 5 is acknowledged. Attached for your information and use is a copy of Section 126 of the final draft of the Petroleum Drilling and Production Regulations, 1984 pertaining to submission requirements for an application of this nature. As this regulation is expected to be in effect in the very near future, and as it reflects current Board policy, your application should conform to these requirements.

Further to the above, we specifically request your comments or further information regarding the following:

1. Water Supply - Recent production and injection data indicates that produced water supply is being completely utilized for injection in the currently approved Units. Further, it is noted that in the most recent two or three months, reservoir voidage has not been replaced in the area of the original pilot waterflood and that injection operations have not yet commenced in the recently approved Waskada Unit No. 3. As a reliable source of supply is a prerequisite for successful expansion of the waterflood scheme, your comments are requested on

   (a) The proposed volumes of water injection for both Waskada Unit No. 3 and the proposed Waskada Unit No. 5.

   (b) The anticipated supply water deliverability from the existing Swan River water supply well (Omega Waskada Prov. WSW 11-29-1-25 (WPM)).

....2

(c) Plans to supplement existing water supply including the number and location of any additional supply wells.

2. Reservoir Fluid Study - Data obtained from crude oil samples taken from wells in the area of the proposed expansion indicate that the oil density in this area is significantly higher than in the central part of the Pool. Inasmuch as PVT properties form part of the basic input to a reservoir model study, the Board feels it is necessary to quantify these parameters in this area which apparently has different fluid characteristics from the rest of the pool. Consequently, you are requested to submit your plans to obtain a reservoir fluid sample from a well in this area for use in a comprehensive PVT study.

3. Reservoir Model Studies - Reservoir model studies submitted in support of the first major expansion of pressure maintenance operations in the Pool were based primarily on interpreted well data and reflected only a very rudimentary history match. In that more than one year of production, injection and pressure information from the pilot waterflood is now available, the existing model prediction should be compared to this history as a means of evaluating the predictions. Before extrapolating the model's prediction to the proposed expansion area, adjustments to the model prediction reflecting PVT properties and if necessary history matching are likely to be necessary.

   While we share your previously stated view that such "fine tuning" is not likely to change the conclusions from the study (i.e. - to proceed with waterflooding), we are of the opinion that a properly calibrated model study can be a valuable tool in assessing the performance of the pressure maintenance program.

   Consequently, we request that you provide a comparison of predicted to actual data for the area of the pilot waterflood. Also, we request that you provide appropriate graphs representing the model's prediction of oil, gas and water rates, adjusted for differing PVT properties and, if necessary, observed history, for the proposed expansion area.

4. Pre-injection Pressure Survey - We request that you provide specifics of your plans to determine the reservoir pressure level in the proposed waterflood expansion areas.

5. Surface facilities - We request that you provide appropriate schematics indicating the lay out of surface facilities including water supply and injection lines and any additional plant facilities. Also, the proposed method of production treating and testing should be indicated (i.e. will the current method of satellites for field testing with group treating at the 11-30 battery be used or is an alternate installation planned).

....3

The Board recognizes that some of the information requested herein may require a considerable amount of time to provide. Consequently, the Board is prepared to consider approval of your application prior to obtain PVT data and the graphical predictions of oil, gas and water rates for the proposed expansion area on the understanding that these data will be provided prior to initiation of injection.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/lk/rm

bc: Marc Eliesen
J. F. Redgwell
Petroleum Branch

→ Bob

PS-1-25

MANITOBA
Inter-Departmental Memo

Date April 27, 1984

To The Oil and Natural Gas Conservation Board

Marc Eliesen - Chairman
Dr. I. Haugh - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Waskada Lower Amaranth A Pool - Expansion of Pressure Maintenance Operations - Proposed Waskada Unit No. 5

First | Fold

Omega Hydrocarbons Ltd., by its letter dated April 13, 1984 has made application to expand its pressure maintenance operations in the subject pool by instituting a nine-spot waterflood in the area shown on Figure 1.

Recommendations:

It is recommended that the attached letter, requesting additional information and comments, be sent to Omega.

Discussion:

Omega Hydrocarbons Ltd. has applied for approval of an expansion of its pressure maintenance operations in the subject pool to encompass additional waterflood areas in the north part of Section 35-1-26 (WPM) and the south part of Section 2-2-26 (WPM) (see Figure No. 1). This part of the pool has been successfully developed in the Lower Amaranth primarily over the last 9 months. No Mississippian potential has been indicated in the area of the proposed enlargement although successful Mississippian completions have been made to the immediate south and to the west.

Omega's application contains little new or discriptive information and relies solely on data presented in support of its previous application to expand pressure maintenance operations in the areas of the Waskada Lower Amaranth Unit No. 1, the Waskada Units No. 2 and 3 and the proposed Waskada Unit No. 4. This material included a model study of a portion of the subject pool in which production and recovery predictions were made for primary depletion, waterflooding and gas flooding.

Production history for wells in the proposed project is very limited but suggests a severe productivity decline, similar to wells in the original pilot waterflood area. Based on this, primary recovery is probably quite limited and the need for pressure maintenance quite apparent.

While the need for pressure maintenance in this area is evident, the Branch has several concerns and questions regarding Omega's proposal.

....2

1. Water Supply - Figure No. 3 is a plot of water production and water injection for Omega's wells. Also shown for reference is a plot of total Waskada Field water production. From this graph, it is evident that water supply for the existing water injectors is limited. Further, it is noted that voidage has not been replaced in a number of injection patterns during the last 2 or 3 months and that water injectors in the proposed Waskada Unit No. 3 have not yet been put on injection. While Omega apparently plans to reactivate the water supply well (Omega Waskada Prov. WSW 11-29-1-25 (WPM), there is no data indicating whether this will provide sufficient supply. Omega should be required to present its plans and options regarding provision of a reliable and adequate source of supply water to support its current and planned operations (I believe Omega has discussed with the Board the possibility of converting the 6-30 well for water supply).

2. Reservoir Fluid Properties - Crude oil sampling by Omega, the Branch and other operators indicate crude density to be substantially higher in the area of the proposed project when compared to other parts of the pool. This implies that reservoir fluid property data obtained in other parts of the pool may not be representative for this area. Data of this kind is necessary for use in reservoir model studies and monitoring reservoir performance (e.g. producing GOR vs solution GOR etc.). For these reasons the Branch feels it is necessary for a comprehensive PVT analysis to be conducted on a representative fluid sample from this area.

3. Model Studies - Previously submitted model studies were based almost entirely on well data. However, it is common practice in developing models of this type to utilize observed pressure and production history to calibrate the model (i.e. history match). While only very limited history was available for the original study, there is now more than one year of waterflood performance in the original pilot waterflood area available. In addition, as discussed above, fluid property data representative of the proposed project area probably differs from that utilized in the model. The effect of these factors is to cause doubt as to the applicability of the previous model predictions to the project area. While it is extremely unlikely that revisions of this sort will change the conclusions derived from the study, they will provide a more useful tool with which to guage performance. In that our concern is more in assuring that adequate standards are present to guage performance, we would be prepared to recommend approval of the application on the understanding that this data be submitted prior to initiation of injection.

....3

4. Pre-Injection Pressure Level Determination - As in previous applications of this nature, a determination of pre- flood pressure conditions should be undertaken. Omega has not provided any details of its intentions to perform such a survey.

5. Surface Facilities - Omega has provided no skematics of the surface facilities associated with the proposed project.

6. Other Concerns - A number of lesser concerns and deficiencies should be addressed in Omega's application. Attached is a copy of Section 126 of the final draft of the Petroleum Drilling and Production Regulations, 1984 pertaining to enhanced recovery applications. A number of the points which should be addressed specifically are marked with an asterisk (*).

In that the application is incomplete and deficient in many aspects,advertisement for objections should be delayed until Omega has provided the above mentioned comments and data (except as herein noted).

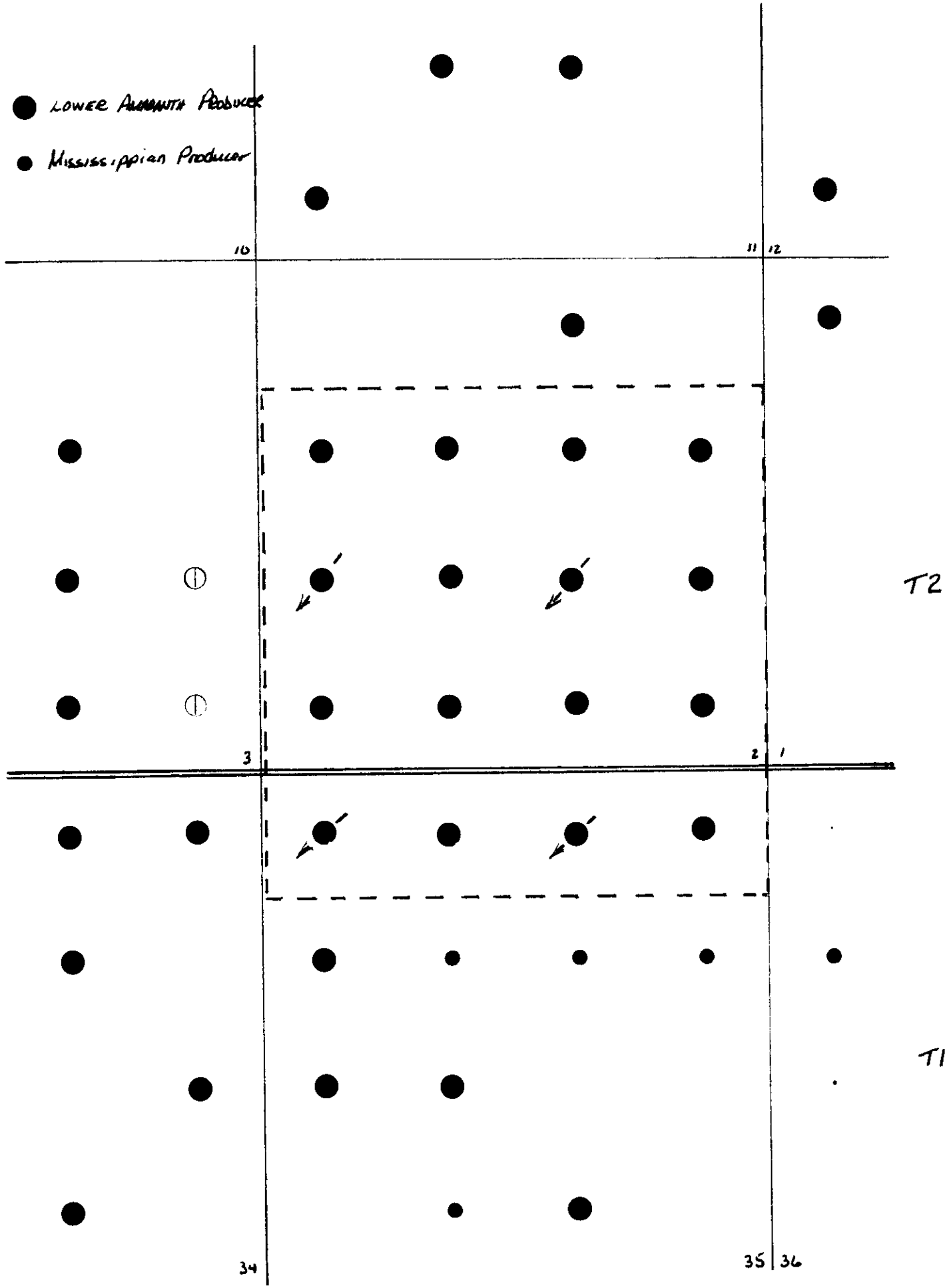
A deficiency letter outlining the Branch's concerns is attached.

Original Signed by H. C. Moster

H. Clare Moster

LRD/lk

FIGURE No. 1



R 26 WPM

FIG. NO. 2
WELL PERFORMANCE
AREA OF PROPOSED PROJECT

——— 15-2-2-26
- - - - 13-35-1-26
..... 12-2-2-26

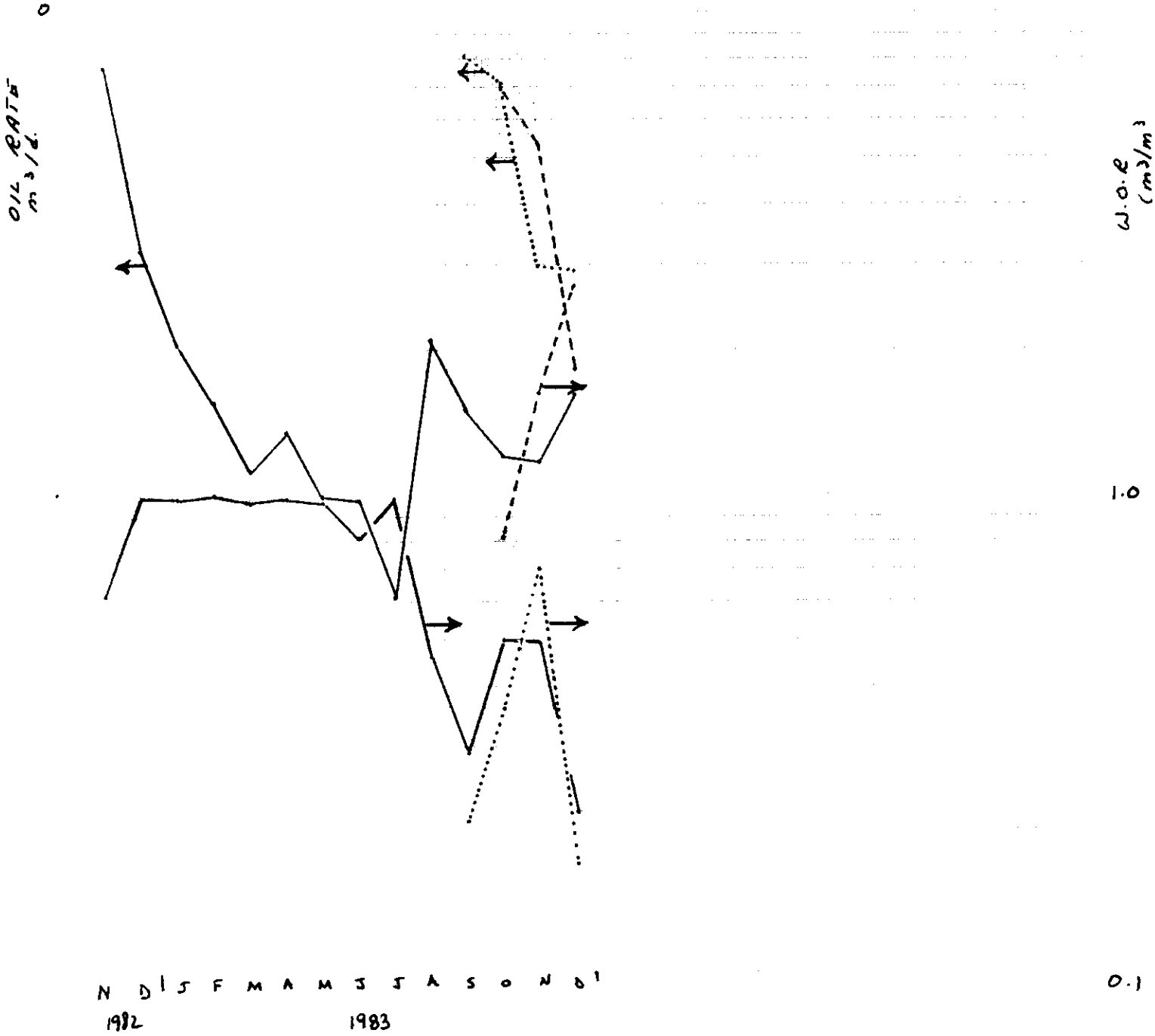
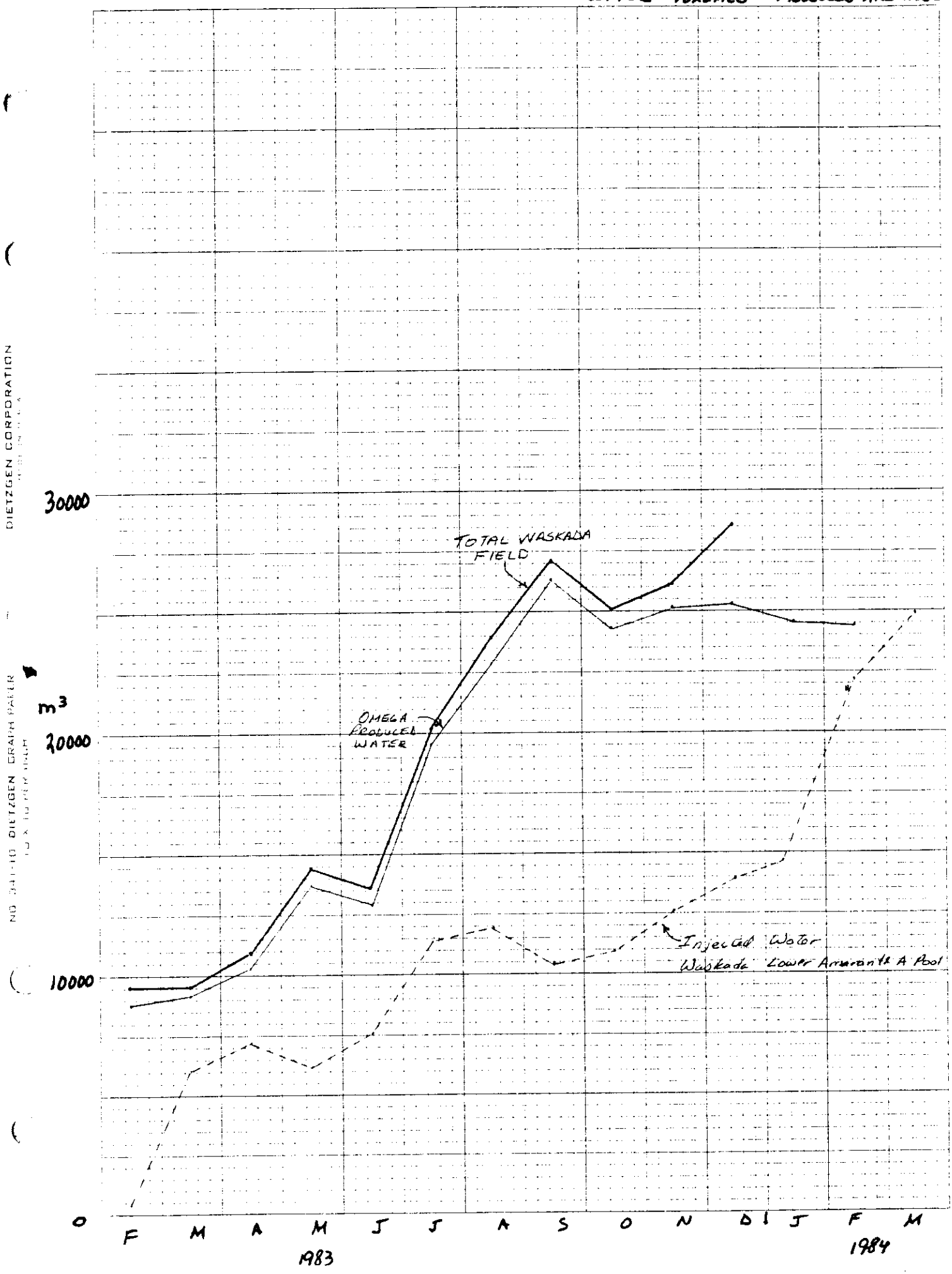


FIG NO 3

WATER VOLUMES - PRODUCED AND INJECTED



(f) a description of the corrosion mitigation features of the flow line;

(g) details of any additional devices to be installed on the flow line to minimize the volume of fluid spilled in the event of a line break;

(h) results of the hydrostatic test required pursuant to subsection 58(2);

(i) a statement indicating that the necessary surface rights have been properly obtained; and

(j) any additional information that the director may require.

Enhanced Recovery Operations

126. An application, pursuant to section 64, for approval of a scheme to enhance recovery of oil or gas shall be made to the board and shall be accompanied by the following

(a) maps showing

(i) the scheme area,

(ii) the mineral rights owners, lessees and surface owners within and adjoining the scheme area,

(iii) the status and zone of completion of each well within and adjoining the scheme area,

(iv) the interpreted pool boundaries, and

(v) pore volume and permeability capacity for each pool included in the scheme;

(b) if a scheme involves injection of water or other corrosive fluids, a schematic wellbore cross section showing the method of completion of the injection wells;

(c) if the scheme involves injection of fresh water, proof that licensing requirements under The Water Rights Act have been satisfied;

* (d) proof that the surface owners in the scheme area have been notified of the operator's intentions;

* (e) a diagram of the configuration of surface facilities, including wellhead piping, location of injection pumps and compressors, type and rated working pressure of all piping and equipment downstream of any injection pump or compressor,

(f) details of

(i) the proposed methods of controlling corrosion in the wellbores, flow lines and surface facilities,

(ii) the source and conditioning of the injection fluid and evidence of its compatability with rock and water of the formation into which it is to be injected,

(iii) the proposed treatment program for the injected water, and

(iv) the proposed method of measuring the quantity of the injected fluid,

* (g) a tabulation of the results of reservoir studies showing

(i) the original oil and gas in place in the scheme area,

(ii) the recovery predicted under the existing producing mechanism and under the proposed scheme,

(iii) the injection wells, injection rates and well head pressures,

(iv) future production rates, gas-oil and water-oil ratios and water-gas ratios under the existing and proposed depletion mechanisms;

(v) details of reservoir fluid properties such as oil formation volume factor, solution gas-oil ratio, oil viscosity and gas formation volume factor,

(vi) details of the recovery predictions including the areal and vertical sweep efficiencies, displacement efficiencies and economic limits and stratification model used, if applicable,

(vii) measured or estimated reservoir pressure data for the scheme area, and

(viii) in the case of a gas cycling scheme, the economic and technical data to substantiate the proposed rate of cycling;

(h) details of

(i) the date of commencement of injection and the date after which the proposed level of replacement of reservoir withdrawals on a monthly basis will be achieved,

(ii) the safeguards to prevent channelling and to maximize the sweep efficiencies, and

(iii) the reservoir pressure at which the scheme will be conducted; and

(i) any other information that the board may require.

Common Flow Lines

127. An application, pursuant to section 65, for approval of the use of common flow lines shall be made to the director and include

(a) names and locations of all well to be included in the proposed use of common flow lines;

(b) reasons justifying the proposed use of common flow lines;

(c) present layout of production facilities, including flow lines and batteries;

(d) proposed layout of production facilities, including flowlines and batteries;

(e) proposed production measurement methods and frequency of testing each well;

(f) data to indicate the production history of each well;

(g) the proposed features of the flow line designed to minimize the volume of a spill in the event of a line break;

OMEGA HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

April 13, 1984

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

THE OIL AND NATURAL GAS
CONSERVATION BOARD
WINNIPEG, MANITOBA
APR 17 1984
RECEIVED

ATTENTION: Dr. Ian Haugh
Deputy Chairman

Dear Sir:

Re: Proposed Waskada Unit No. 5
Application to Waterflood

Discussions between Working Interest Owners commenced in February, 1984 and have recently culminated with a tentative agreement on Tract Participation for the proposed Waskada Unit No. 5. The Unit Agreement has been drawn up and sent to all Royalty and Working Interest Owners to ratify.

The subject Unit consists of 16 tracts including Lower Amaranth wells at 13, 14, 15 & 16-35-1-26 WPM and 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12-2-26 WPM. The intention of the owners in forming this Unit is to commence waterflood operations in the area as soon as possible with water injection wells located at 13-35 & 15-35-1-26 WPM and 5-2 and 7-2-2-26 WPM. Due consideration will be given to either Unit expansion or further unitization to expand the waterflood upon completion of contiguous pool development.

Please consider this letter as our application for approval of this waterflood project which is actually an expansion of our existing waterflood operations albiet not directly connected at this time.

In so far as this proposal is actually an extension of our existing waterflood of the Lower Amaranth all previously submitted support documents and data used for our application(s) to waterflood Waskada Lower Amaranth Unit No. 1 and Waskada Unit No. 2 and 3 are relevant and have not been duplicated here. The previous studies

.../2

p.c. - H. Clare Moster
April 18, 1984 - IH/ra

and the performance of the existing flood combined with the primary depletion performance of the proposed Unit wells seem to be sufficient to support this application, however we are certainly willing to supply any additional information that the Board may require in its consideration of this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse

Ed Wyse for
G.E. Patey
V.P. Production

WEW/tt

COPY

March 7, 1984

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey
Vice President, Production

Dear Sirs:

Re: Tracer Program Requirements - Board Order No. PM 40

This will acknowledge receipt of your letter of February 28th, and confirmation of your acceptance of conditions relating to the above requirements.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

for Ian Haugh
Deputy Chairman

IH/ra

bc: Petroleum Branch

OMEGA HYDROCARBONS Ltd.
TELEPHONE (403) 261-0743 530 - 330 FIFTH AVENUE S.W. CALGARY ALBERTA T2P 0L4

February 28, 1984

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

Attention: Dr. Ian Haugh

Dear Sir:

Re: Tracer Program Requirements
Board Order No. PM 40

As requested in your February 16th letter Omega Hydrocarbons Ltd. hereby agrees to the following program:

1) Monthly, for a period of no less than 4 months, the following wells are to be shut in for a period of 72 hours and daily bottom hole pressures calculated from acoustic well sounder measurements:

   a) 8-24-1-26 WPM - MC3a
   b) 8A-24-1-26 WPM - LAm
   c) 3A-25-1-26 WPM - MC3a
   d) 11-26-1-26 WPM - LAm
   e) 11A-26-1-26 WPM - MC3a
   f) 5A-26-1-26 WPM - MC3a
   g) 1-25-1-26 WPM - MC3a
   h) 1A-25-1-26 WPM - LAm

2) Quarterly, for one year, bottom hole pressure gauge readings will be taken at two of the following three suspended wells:

   a) 1A-27-1-26 WPM - MC3a
   b) 2A-27-1-26 WPM - MC3a
   c) 9A-27-1-26 WPM - MC3b

p.c. - H. Clare Moster
March 7, 1984 - ra

.../2

3) By September 1st, 1984 , Omega will submit a comprehensive engineering review of all of the above pressure data collected. This review will draw whatever conclusions can be made and will indicate whether the need for further pressure monitoring is indicated.

4) Production surveillance of Mississippian production will be summarized and reported coincidental to the annual pressure maintenance program report specified in Clause 9 of Board Order No. PM 40. The said report is to be filed with The Petroleum Branch within 60 days of the end of each calendar year.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. Ed Wyse
B. Wilcox
M. Mawdsley

EW/tt

COPY

February 20, 1984

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey
Vice President, Production

Dear Sirs:

Re: Board Order No. PM 41
Waskada Lower Amaranth A Pool

Enclosed is Board Order No. PM 41 relating to pressure maintenance operations in the proposed Waskada Unit No. 4. Your attention is directed to those conditions in the Order related to pre-injection requirements, specifically subclauses 2(1) and 2(3), and clause 4, and you are asked to note that Board approval of the unitization agreement for the proposed Unit is required prior to the initiation of injection. It will be necessary also for Omega to apply for an exemption from certain provisions of The Pipe Line Act with relation to the injection lines associated with the Waskada Unit No. 4. A copy of submission requirements for an application for such exemption is enclosed.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

Enclosures

LRD/MCM/IH/ra

bc: Petroleum Branch

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

February 16, 1984

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Tracer Program Requirements - Board Order No. PM 40

Further to your letter of February 2, 1984 and your recent discussions with the Petroleum Branch, both regarding the tracer program required pursuant to Board Order No. PM 40, the Board is prepared to approve your alternate monitoring scheme subject to the following conditions:

1. The wells Omega Waskada 1-25-1-26 (WPM) and Omega Waskada 1-25LAm-1-26 (WPM) be added to the list of wells in which monthly static fluid level determinations are to be made.

2. Omega submit, not later than September 1, 1984, a comprehensive engineering review of the proposed pressure monitoring program. This review should include conclusions drawn from the data collected and should indicate whether or not additional pressure monitoring is required.

3. A summary of the results of production surveillance programs be included in the annual summary reports required pursuant to clause 9 of Board Order No. PM 40.

Please confirm in writing your acceptance of these conditions.

Yours sincerely,

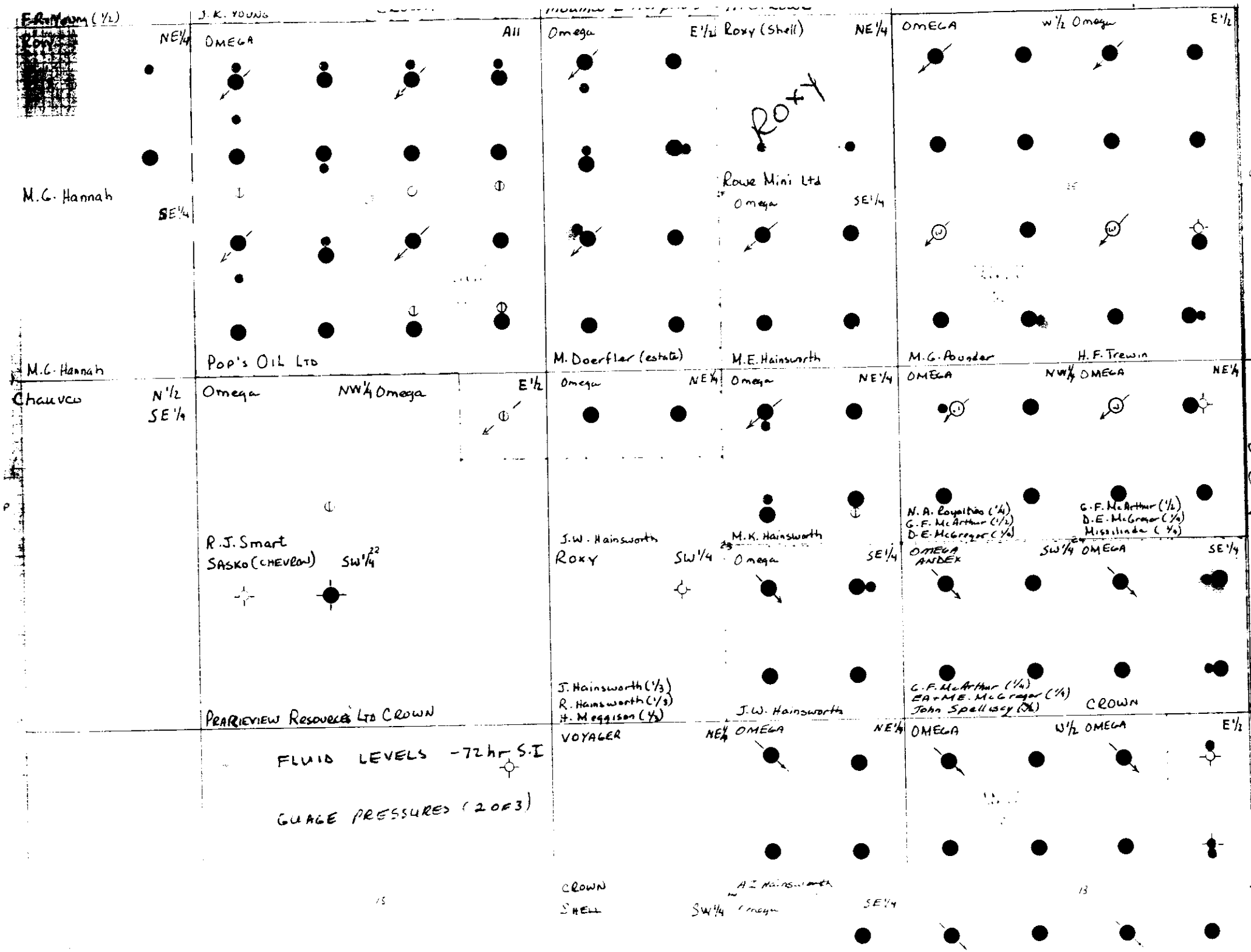
THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/MCM/lk

b.c. Petroleum Branch


F.R. Mann (1/2)
Roxy
J. K. YOUNG
NE1/4
OMEGA
All
Omega
E1/2 Roxy (Shell)
NE1/4
OMEGA
W1/2 Omega
E1/2
M.G. Hannah
SE1/4
Rowe Mini Ltd
Omega
SE1/4
M.G. Hannah
POP'S OIL LTD
M. Doerfler (estate)
M.E. Hainsworth
M.G. Pounder
H.F. Trewin
Chauvco
N1/2
SE1/4
Omega
NW1/4 Omega
E1/2
Omega
NE1/4
Omega
NE1/4
OMEGA
NW1/4 OMEGA
NE1/4
R.J. Smart
SASKO (CHEVRON)
SW1/4
J.W. Hainsworth
ROXY
SW1/4
M.K. Hainsworth
Omega
SE1/4
N.A. Royalties (1/4)
G.F. McArthur (1/2)
D.E. McGregor (1/4)
OMEGA ANDEX
G.F. McArthur (1/2)
D.E. McGregor (1/4)
Missolinda (1/4)
SW1/4 OMEGA
SE1/4
PRAIRIEVIEW RESOURCES LTD CROWN
J. Hainsworth (1/3)
R. Hainsworth (1/3)
H. Meggison (1/3)
J.W. Hainsworth
G.F. McArthur (1/4)
EA+ME. McGregor (1/4)
John Spellacy (1/2)
CROWN
VOYAGER
NE1/4 OMEGA
NE1/4
OMEGA
W1/2 OMEGA
E1/2
FLUID LEVELS -72 hr S.I
GUAGE PRESSURES (2 OF 3)
CROWN
SHELL
SW1/4
A.I. Hainsworth
Omega
SE1/4
TUNDRA

* B/F

February 15, 1984

Newscope Resources Limited
1600, 700 - 9th Avenue S.W.
Calgary, Alberta
T2P 3V4

Attention: Mr. R. D. Weir
Vice President - Operations

Dear Sirs:

Re: Waskada Lower Amaranth A Pool

This will acknowledge receipt of your letter of January 23, 1984 regarding Newscope's plans for evaluating pressure maintenance in the Waskada Lower Amaranth A Pool.

The Board considers it more critical at this stage to determine reservoir pressure in an area which has experienced substantial withdrawals as opposed to an area (e.g. Lsd 14 of Section 7-1-25 WPM) where pressure conditions approaching initial conditions may be expected. This priority in monitoring pressures will more definitively indicate the need for pressure maintenance. Further, it is suggested that a comprehensive pressure survey program be coordinated by Newscope and Chevron, the major producers in this area of the Pool.

Your letter of January 30, 1984 regarding the overproduction status of Newscope's wells is also acknowledged. The Board notes your proposal to forward specific plans following your current review of production and prior to March 1st, 1984.

*

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/HCM/IH/ra

bc: Petroleum Branch

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

February 2, 1984

THE OIL AND NATURAL GAS
CONSERVATION BOARD
WINNIPEG, MANITOBA
FEB 3 1984
RECEIVED

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

Attention: Dr. Ian Haugh

Dear Sir:

Re: Waskada Tracer Program
PM Order No. 40

Since the draft stage of PM Order No. 40 which approved the expansion of Omega's Waskada waterflood we have been investigating the "state of the art" of tracers. Our investigation has determined the following:

1) Injection tracers have been infrequently done and although some studies are public most studies are not.

2) We have learned of three other tracer programs:

   a) An extensive chemical and radioactive tracer study of Western Decalta's in Turner Valley on a complex carbonate pool under waterflood;

   b) A radioactive tracer study done by BP on a heavy oil steam flood project in the Wain-Wright area;

   c) A study done by Amoco on its miscible flood project at South Swan Hills.

   Personnel at Western Decalta and BP were questioned regarding their projects which are quite recent.

.../2

p.c. - H. Clare Moster
February 8, 1984 - IH/ra

3) These tracers are commonly placed as a slug and measured by relatively sophisticated analysis. Sampling programs are expensive and difficult to design to insure a successful study. It appears that there is a significant likelihood of not getting samples at the proper time to measure the passing of the slug. This is the main problem in tracer studies and renders work of this type a hit or miss affair.

In light of these findings we respectively request that the subject tracer study be replaced by a program of diligent production surveillance augmented by additional pressure survey work to determine whether Lower Amaranth/ Mission Canyon communication is indeed a problem. While these results may not be as definitive as a successful tracer study at least we can be sure of learning something from these efforts.

No doubt we can rely on our offsetting operators to closely monitor their production closely and we will do the same. In addition we specifically proposed the following pressure surveillance program:

Monthly, for a period of no less than 4 months, we would shut in the following wells for a period of 72 hours and determine daily by fluid level the bottom hole pressure at:

1) 8-24-1-26 WPM - MC3a
2) 8A-24-1-26 WPM - LAm
3) 3A-25-1-26 WPM - MC3a
4) 11-26-1-26 WPM - LAm
5) 11A-26-1-26 WPM - MC3a
6) 5A-26-1-26 WPM - MC3a

In addition to these tests we would undertake quarterly, for one year, bottom hole pressure gauge readings at two of the following three suspended MC3a wells: 1A-27, 2A-27 or 9A-27-1-26 WPM. Only two are proposed because we are contemplating a fracture treatment of one, as yet undetermined well.

We feel these efforts will sufficiently address the problem and invite your comments.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. E. Wyse
J. Hall

GEP/tt

January 31, 1984

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

Attention: Mr. D. N. Schierman, P. Eng.,

Dear Doug:

Re: Waskada Field Reservoir Data

Further to our discussions, enclosed are copies of the reservoir information you requested. Included are:

1. Progress Reports for November and December 1983
2. Pressure Surveys on Lower Amaranth Wells
3. Board Order No. 70A (Allowable Exemption)
4. Board Order No. PM40 (Pressure Maintenance)
5. Water Compatibility Study
6. PVT Study - 8-26-1-26 WPM
7. Special Core Analysis Study 16-22-1-26 and 3-25MC3a-1-26

Also enclosed is an invoice in the amount of $65.00 (260 copies at $0.25 per copy). Should you require any further information, please contact the undersigned.

Yours sincerely,

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch

LRD/sb
Encls.

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

January 25, 1984

Petroleum Branch
Department of Energy & Mines
975 Century Street
Winnipeg, Manitoba
R3H 0W4

DEPARTMENT OF ENERGY AND MINES
JAN 27 1984
PETROLEUM BRANCH

Attention: Mr. Bob Dubreuil

Dear Sir:

Re: Waskada Tracer Program
PM Order No. 40 — Required under Clause 6

This is to confirm your telephone conversation with our Mr. Ed Wyse on January 24th.

Immediately after we became aware that a tracer program would be required at Waskada we began to investigate the various tracer methods as well as to determine which injection wells would offer the best information as tracer candidates.

Early investigations suggested a radioactive slug of tritium offered the most advantages with a comprehensive program of water sampling and analysis at offsetting producing wells. The cost to implement the program for two injection wells was estimated at $30,000.

Two operators who have undertaken similar programs were contacted and although their comments supported this choice of program it was noted that there was sufficient differences between their situations and ours to cast doubt on the validity of these comparisons. In addition one operator had very disappointing results because of an improperly designed sampling program.

In light of this information and the relatively high cost of the proposed program the AFE has not been approved by Omega management pending the results of a more thorough investigation of other possible tracer programs.

.../2

XC's IH (JAN 30/84)

This investigation is ongoing and to date has not uncovered any previously unidentified tracer studies. Whether this is a result of their non-existence or the result of data inaccessibility is not yet known.

In summary, Omega is attempting to obtain maximum assurance that our proposed tracer program is appropriate for the Waskada circumstance. As an improperly conceived scheme would be costly and possibly uninformative we are proceeding with caution. I trust we have sufficiently addressed your concern over the delay and will continue to keep you informed on this situation.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. Ed Wyse
Jack Hall

GEP/tt

Forwarded to IH with "draft" Order on Jan. 11th

PS 1 25

MANITOBA

Inter-Departmental Memo

Date January 9, 1984

To The Oil and Natural Gas Conservation Board

Marc Eliesen, Chairman
Dr. I. Haugh, Deputy Chairman
J. F. Redgwell, Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Pressure Maintenance by Gas Injection

Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., in its letter of June 23, 1983 made application to expand pressure maintenance operations in the Waskada Lower Amaranth A Pool. The proposal involved expansion of the existing water injection system to the West (Waskada Unit No. 2) and to the East (proposed Waskada Unit No. 3) and implementation of a gas injection scheme in the southern part of the pool (proposed Waskada Unit No. 4). Upon publication of a Notice (Sept. 21 , 1983), the Board received an intervention from Chevron Canada Resources Limited. Chevron's intervention indicated concern regarding the effect of gas injection on offset wells, operated by Chevron, and regarding the effectiveness of gas injection in improving recovery. With Chevron's concurrence, Omega requested that the Board hold the gas flood aspects of its application in abeyance while completing processing of the waterflood portion. As a result, the waterflood portion of Omega's application was approved and Board Order No. PM 40 issued. In the interim, discussions between Chevron and Omega have led to a modification in Omega's application resulting in postponement of gas injection into two wells which had been of greatest concern to Chevron (Omega Waskada Prov. 16-11-1-26 and Omega Waskada 7-13-1-26). As a result, Chevron has withdrawn its intervention, and Omega has requested that its application be reativated in an amended form.

Recommendation:

It is recommended that the amended application be approved and that Board Order No. PM 41 (draft attached) be issued.

Discussion:

Figure 1 is a map of the proposed gas flood area showing the proposed locations of gas injection (original application). Also shown is the location of offset operators' holdings in the area. The proposal is a southern extension of the northern 9-spot waterflood pattern. Gas injection was proposed over water injection in this area for a number of reasons (listed below).

....2

1. The proposed gas flood area has somewhat lower reservoir permeability than the waterflood areas to the north. Due to the much higher mobility of gas, Omega feels that injectivity constraints would be lessened by utilization of gas in this area.

2. Construction of its liquids recovery plant in the Waskada Field provided Omega with a source of sweet dry gas for injection. As the alternative to injection would be flaring, Omega contends that injection followed by reproduction at a later date would increase overall resource recovery.

3. Engineering studies conducted by Omega would indicate gas flood and waterflood to have essentially equivalent recovery efficiency in the Waskada Lower Amaranth A Pool.

Figure No. 2 is a Map showing average permeability from core analysis for a number of wells in the pool. While there are significant variations over short distances, in general the permeabilities for the gas flood area are lower than for the waterflood area to the north. As gas has a much lower viscosity than oil, its mobility (of which injectivity is a function) is much higher than that of water for a given permeability (mobility = k/u where k = permeability and u = viscosity). Stated another way, equivalent injectivity can be obtained using gas with a much lower permeability than with water.

Another consideration regarding gas flooding is that the low density gas, which is being injected down dip may tend to move up dip causing rapid gas breakthrough at a number of wells. Although not impossible, the very small structural dip of the Lower Amaranth A Pool makes up dip gas movement unlikely.

Omega's liquids recovery plant will go onstream in January 1984. While the recovered liquids (propane, butane, etc.) can be readily marketed, the dry gas can not. The proposal to use gas for injection would serve as a storage project and would make the gas available for possible future use.

The gas to oil mobility ratio is much higher than the water to oil mobility ratio. This means that rate of gas movement in the reservoir will exceed that of water and result in earlier breakthrough of the injected fluid at the producing well. In a totally immiscible system, this would result in gas flooding having a lower ultimate recovery than waterflooding. However, when vaporization of liquids by the gas moving through the reservoir is considered, it is not unlikely that gas flood recovery could equal or exceed that of waterflooding.

Based on the above discussions, the proposed gas flood appears logical and the proposed area appears optimum. It should be recognized however, that while waterflooding is somewhat of a "tried and true" secondary recovery agent, gas flooding is much less common and due to the mobility factor, much more difficult to predict performance.

....3

Chevron's intervention is primarily concerned with premature breakthrough of gas in its offsetting wells. While this is of some concern in most pressure maintenance projects, due to the mobility factor it is more of a concern here. The agreement to postpone gas injection in the two injectors closest to Chevron's land (16-11 and 7-13) should ensure that Chevron's interests are preserved. It is Omega's intention to apply for approval of injection in these two wells as soon as positive indications are received from initial performance.

While there is a potential for detrimental effects in offsetting wells, there is also potential for positive effects. It is noted that initiation of pressure maintenance operations by offset operator's would tend to minimize the effects of Omega's project on such operators (as a result of reduced pressure gradients).

The attached draft pressure maintenance order is quite similar in format to the recently issued Board Order No. PM 40. Included are provisions requiring annual pressure surveys, incorporation of a tracer program, monthly and annual progress reports and immediate notification of the Board should breakthrough occur. Also incorporated in the draft is flexibility for the Board to approve additional injectors, to suspend gas injection and to provide for water injection without issuing of a new PM Order.

Original Signed by H. C. Moster

H. Clare Moster

LRD/lk

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

January 25, 1984

Petroleum Branch
Department of Energy & Mines
975 Century Street
Winnipeg, Manitoba
R3H 0W4

DEPARTMENT OF ENERGY AND MINES
JAN 27 1984
PETROLEUM BRANCH

Attention: Mr. Bob Dubreuil

Dear Sir:

Re: Waskada Tracer Program
PM Order No. 40 — Required under Clause 6

This is to confirm your telephone conversation with our Mr. Ed Wyse on January 24th.

Immediately after we became aware that a tracer program would be required at Waskada we began to investigate the various tracer methods as well as to determine which injection wells would offer the best information as tracer candidates.

Early investigations suggested a radioactive slug of tritium offered the most advantages with a comprehensive program of water sampling and analysis at offsetting producing wells. The cost to implement the program for two injection wells was estimated at $30,000.

Two operators who have undertaken similar programs were contacted and although their comments supported this choice of program it was noted that there was sufficient differences between their situations and ours to cast doubt on the validity of these comparisons. In addition one operator had very disappointing results because of an improperly designed sampling program.

In light of this information and the relatively high cost of the proposed program the AFE has not been approved by Omega management pending the results of a more thorough investigation of other possible tracer programs.

xc's IH (JAN 30/84)

.../2

This investigation is ongoing and to date has not uncovered any previously unidentified tracer studies. Whether this is a result of their non-existence or the result of data inaccessibility is not yet known.

In summary, Omega is attempting to obtain maximum assurance that our proposed tracer program is appropriate for the Waskada circumstance. As an improperly conceived scheme would be costly and possibly uninformative we are proceeding with caution. I trust we have sufficiently addressed your concern over the delay and will continue to keep you informed on this situation.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. Ed Wyse
Jack Hall

GEP/tt

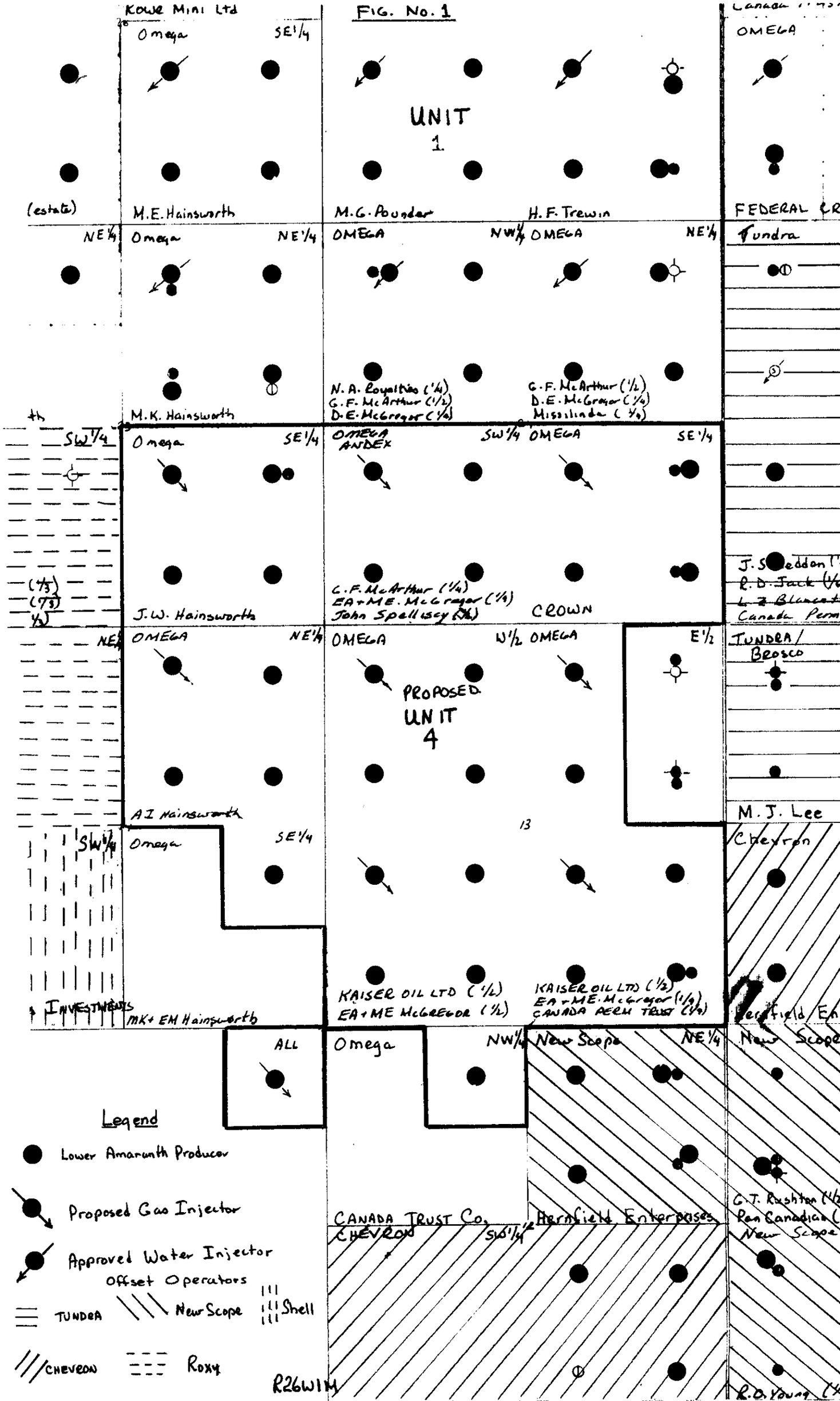


FIG. No. 1
Kowe Mini Ltd
Omega
SE1/4
UNIT
1
OMEGA
(estate)
M.E. Hainsworth
M.G. Pounder
H.F. Trewin
FEDERAL
NE1/4
Omega
NE1/4
OMEGA
NW1/4
OMEGA
NE1/4
Tundra
N.A. Royalties (1/4)
G.F. McArthur (1/2)
D.E. McGregor (1/4)
G.F. McArthur (1/2)
D.E. McGregor (1/4)
Missilinda (1/4)
M.K. Hainsworth
SW1/4
Omega
SE1/4
OMEGA
ANDEX
SW1/4
OMEGA
SE1/4
J.W. Hainsworth
C.F. McArthur (1/4)
EA+ME. McGregor (1/4)
John Spellicy (1/4)
CROWN
NE1/4
OMEGA
NE1/4
OMEGA
W1/2
OMEGA
E1/2
TUNDRA/
BROSCO
PROPOSED
UNIT
4
A.I. Hainsworth
M.J. Lee
13
SW1/4
Omega
SE1/4
Chevron
KAISER OIL LTD (1/2)
EA+ME McGREGOR (1/2)
KAISER OIL LTD (1/2)
EA+ME. McGregor (1/4)
CANADA AGRI TRUST (1/4)
INVESTMENTS
MK+EM Hainsworth
ALL
Omega
NW1/4
New Scope
NE1/4
New Scope
Legend
Lower Amaranth Producer
Proposed Gas Injector
Approved Water Injector
Offset Operators
TUNDRA
New Scope
Shell
CHEVRON
Roxy
CANADA TRUST Co.
CHEVRON
SW1/4
Hernfield Enterprises
R26W1M

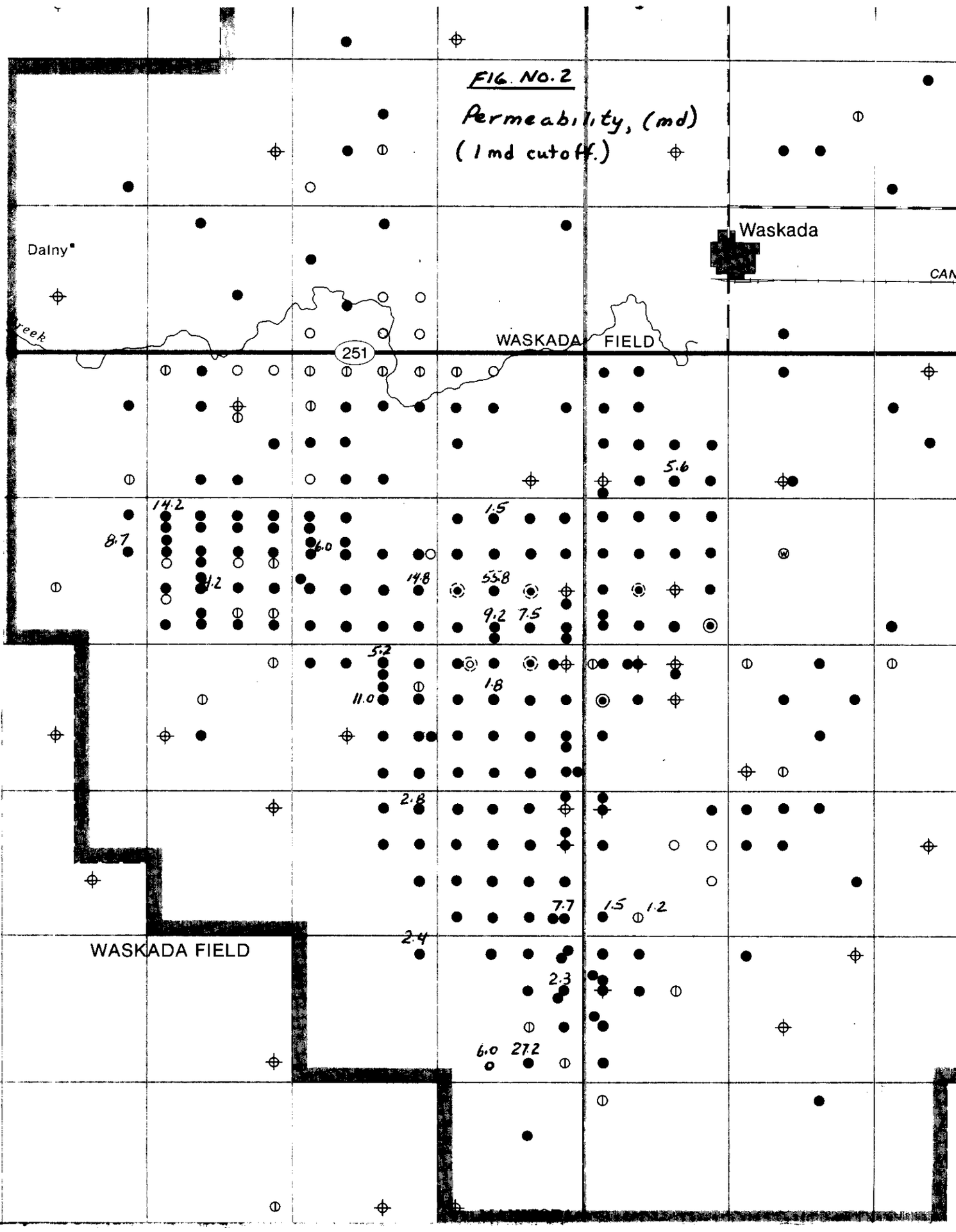


FIG. NO. 2
Permeability, (md)
(1 md cutoff.)
Waskada
Dalny
CAN
Creek
251
WASKADA FIELD
WASKADA FIELD
14.2
8.7
6.0
1.2
14.8
55.8
9.2
7.5
1.5
5.6
5.2
11.0
1.8
2.8
7.7
1.5
1.2
2.4
2.3
6.0
27.2

→ Bob
cont. processing/gasflood applns

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

January 3, 1984

DEPARTMENT OF ENERGY AND MINES
JAN 4 1984
PETROLEUM BRANCH

Chevron Canada Resources Limited
500 - Fifth Avenue S.W.
Calgary, Alberta
T2P OL7

Attention: Mr. R. A. Pashelka

Dear Sirs:

Re: Pressure Maintenance Operations in the Waskada Lower Amaranth A Pool

The Board acknowledges receipt of your letter of December 20, 1983, and notes that Chevron Canada Resources Limited is prepared to withdraw its intervention in the matter of an application by Omega Hydrocarbons Ltd. on the understanding that Omega withdraws its proposal to inject gas into the wells at 16-11 and 7-13-1-26 WPM.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

IH/ra

cc: Marc Eliesen, Chairman
J. F. Redgwell, Member

bc: H. Clare Moster

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

1983-12-20

Waskada Lower Amaranth "A" Pool

The Oil and Natural Gas Conservation
Board,
Province of Manitoba,
989 Century Street,
Winnipeg, Manitoba.
R3H 0W4

Attention: Mr. Ian Haugh

Dear Sirs:

Further to our intervention dated October 4, 1983 Chevron Canada Resources Limited wishes to advise the Board that on the understanding that Omega Hydrocarbons Ltd. withdraws its proposal to inject gas into the wells at 16-11 and 7-13, Chevron Canada Resources Limited is prepared to withdraw its intervention in the matter of an application by Omega to expand its pressure maintenance operations in the Waskada Lower Amaranth "A" Pool.

Yours very truly,

R. A. PASHELKA

RAP/ps

cc: Omega Hydrocarbons Ltd.
630 - 333 Fifth Avenue S.W.,
Calgary, Alberta.
T2P 0L4

→ Bob

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

December 14, 1983

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Pressure Maintenance Expansion - Waskada Lower Amaranth A Pool

Your letter of December 8, 1983 requesting that portions of your application of June 23, 1983 relating to gas flooding in the subject pool be reactivated is acknowledged. You are advised that final processing of your application cannot proceed until the intervention filed by Chevron Canada Resources Limited is withdrawn or a hearing held.

In addition, you are reminded that, prior to commencement of injection, you are required to obtain Board approval of the Unit Agreement covering the proposed Waskada Unit No. 4.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

LRD/lk

b.c. Marc Eliesen
J. F. Redgwell
Petroleum Branch

HYDROCARBONS Ltd.
TELEPHONE (403) 261-0743
630-330 FIFTH AVENUE S.W. CALGARY, ALBERTA T2P 0L4

December 8, 1983

The Oil and Natural Gas
Conservation Board
939 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Dr. Ian Haugh,
Deputy Chairman

Dear Sir:

Re: Expansion of Waskada Pressure Maintenance
Operations - Lower Amaranth Pool

In our October 6th letter Omega Hydrocarbons Ltd. requested that the Board consider granting us approval for only the waterflood areas of our June 23rd application and hold in abeyance the gas flood portion of that application pending an acceptable solution to the Chevron intervention against it.

Now that the waterflood has been aproved with the issuance of PM Order No. 40 and we have had an opportunity to discuss our differences on the gas flood with Chevron we respectfully request that our gas flood application be reactivated in a reduced form to comply with the interim solution to Omega - Chevron impass.

In our June 23rd application we requested approval to inject gas at nine locations: 16-11, 5-13, 7-13, 13-13, 15-13, 15-14, 7-23, 5-24 and 7-24-1-26 WPM. Through meetings between Omega and Chevron; Chevron has agreed to remove their intervention against our application if we remove wells 16-11 and 7-13-1-16 WPM from that application. We therefore request that our application be so revised.

Through of a copy of this letter sent to Chevron we are confirming our compliance with our verbal agreement and we expect that Chevron will remove their intervention forth with.

.../2

It is Omega's intention to implement pressure maintenance by gas or water injection at 16-11 and 7-13 at such time as appropriate approvals can be granted. Although, of course, we prefer to be able to inject gas one fluid or the other will be used and we fully intend to pursue a solution to the present impass regarding these two wells.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
V.P. Production

c.c. Petroleum Branch, Clare Moster
Chevron Canada, C.B. Holmlund

GEP/tt

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

December 6, 1983

Chevron Canada Resources Limited
500 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L7

Attention: Mr. R. A. Pashekla

Dear Sirs:

Re: Pressure Maintenance Operations
Waskada Lower Amaranth A Pool

You are hereby advised that Board Order No. PM 40 authorizing waterflood pressure maintenance operations in a portion of the Waskada Lower Amaranth A Pool has been filed as Manitoba Regulation No. 250/83.

At this time, the Board wishes to point out that the initial performance of the pilot waterflood project in the Waskada Lower Amaranth Unit No. 1 has been very positive in comparison to performance prior to initiation of water injection, and compared to current performance of non-waterflooded areas. Further, pre-injection pressure data indicates a rapid pressure decline to levels below the bubble point under primary depletion. Consequently, it appears, at the present time, that pressure maintenance may be required to achieve maximum recovery in the Waskada Lower Amaranth A Pool.

Inasmuch as Chevron Canada Resources Limited operates a number of wells which are completed in and are producing from the Waskada Lower Amaranth A Pool, you are hereby requested to submit to the Board, prior to March 1, 1984, a preliminary review of the need for and feasibility of enhanced recovery operations in the lands operated by Chevron Canada Resources Limited in the Waskada Lower Amaranth A Pool. Your review should include the results of a reservoir pressure survey designed to evaluate the general level of pressure in your portions of the Pool.

....2

Please direct all questions and inquiries in this regard to the Petroleum Branch (Ph.: (204) 944-6574).

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

LRD/lk

b.c. Petroleum Branch

December 5, 1983

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey
Vice President, Production

Dear Sirs:

Re: Board Order No. PM 40 -
Waskada Lower Amaranth A Pool

Enclosed is Board Order No. PM 40 relating to pressure maintenance operations in the Waskada Lower Amaranth Unit No. 1 and proposed Waskada Units No. 2 and 3. The Board wishes to draw your attention specifically to the following points:

(a) Board approval of the unitisation agreements for the proposed Waskada Units 2 and 3 is required prior to initiation of injection in these Units.

(b) Clause No. 6 of Order No. PM 40 requires that within 30 days of the effective date of the Order, Omega submit to the Petroleum Branch a comprehensive program for incorporating tracer material in the injected water.

(c) It will be necessary for Omega to apply for an exemption from provisions of The Pipe Line Act relating to obtaining a construction permit and an operating licence for those parts of Omega's injection system not covered in a previous exemption dated January 25, 1983. A copy of submission requirements for an application for such an exemption is enclosed.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

LRD/IH/ra

Ian Haugh
Deputy Chairman

bc: Petroleum Branch

November 4, 1983

Voyager Petroleums Ltd.
2700 Bow Valley Square 2
205 - 5th Avenue S.W.
Calgary, Alberta
T2P 2V7

Attention: Mr. J. W. McIntosh,
Reservoir Engineer

Dear Sirs:

Enclosed is one copy of the application material submitted by Omega Hydrocarbons Ltd. in support of its application to expand pressure maintenance operations in the Waskada Field. Please note that the period for filing interventions or objections with respect to this application expired on October 20, 1983.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LRD/lk

b.c. Petroleum Branch

VOYAGER PETROLEUMS LTD.
2700 BOW VALLEY SQUARE 2 205 5TH AVENUE S.W., CALGARY, ALBERTA, CANADA T2P 2V7 / (403) 298-0100

October 27, 1983

Petroleum Branch
Department of Energy and Mines
975 Century Street
Winnipeg, Manitoba
R3H 0W4

Dear Sir

Could you please send Voyager Petroleums Ltd. a copy of the application submitted by Omega Hydrocarbons for approval to expand the pressure maintenance operation in the Lower Amaranth A Pool in the Waskada field. Please send the application to the attention of the undersigned. Thank you.

Yours very truly

J.W. McIntosh
Reservoir Engineer

JWM/eb

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

October 26, 1983

DEPARTMENT OF ENERGY AND MINES
OCT 31 1983
PETROLEUM BRANCH

Tundra Oil and Gas
300 Assiniboine Avenue
Winnipeg, Manitoba
R3C 0X6

Attention: Mr. D. P. Barchyn

Dear Sirs:

Re: Waskada Lower Amaranth A Pool -
Expanded Pressure Maintenance Operations

We are in receipt of your letter of October 6, 1983 regarding the application by Omega Hydrocarbons Ltd. to expand pressure maintenance operations in the Waskada Lower Amaranth A Pool.

Your concerns regarding the potential for communication between the Lower Amaranth and Mississippian Formations are shared by the Board. The Board is currently considering a number of proposals to monitor the occurrence of such communication and will, in all likelihood, incorporate a monitoring program as a condition of any approval of the application.

With respect to overproduction of wells in the area, the Board has taken steps to ensure compliance with the regulations under The Mines Act.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

LED/BCM/IH/ts

bc: Mark Ellison
J. F. Radgwell
Petroleum Branch

MANITOBA

Inter-Departmental Memo

PS 1 25

Date October 25, 1983

To The Oil and Natural Gas Conservation Board

Marc Eliesen - Chairman
Dr. I. Haugh - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Expansion of Pressure Maintenance Operations - Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., (Omega) in its application dated June 23, 1983 has applied for approval to expand waterflood operations and initiate gas flood operations in the Waskada Lower Amaranth A pool.

A copy of the original application plus subsequent correspondence is attached (ATTACHMENT No. 4).

Recommendations:

It is recommended that:

1. The waterflood portions of the subject application be approved subject to the terms and conditions of Board Order No. PM 40 - draft copy attached.

2. The gas flood portions of the subject application be held until further notice from Omega.

Discussion:

1. The Application

In its application of June 23, 1983, Omega applied for approval of pressure maintenance operations as follows:

a. Expansion of the existing nine spot pilot waterflood in the Waskada Lower Amaranth Unit No. 1 and in the proposed Waskada Unit No. 2 and Waskada Unit No. 3.

b. Institution of a dry gas injection scheme in the proposed Waskada Unit No. 3.

Figure 1 attached illustrates the extent of the proposed expansion and the location of proposed and present injectors.

Implementation of Omega's entire proposal would result in most of the subject pool being subject to waterflood.

In its application, Omega indicated its perception of the need for expanded pressure maintenance to ensure maximization of oil recovery in the pool. As has been documented with respect to pilot waterflood operations previously approved, the pressure and production rate decline experienced in the Waskada Lower Amaranth A Pool under primary depletion is very severe and suggests a low primary recovery factor. In contrast to this, early performance of the pilot waterflood project in the Waskada Lower Amaranth Unit No. 1 illustrates stable or increasing rates and also reflects positive trends in terms of gas-oil ratios and reservoir pressure with only limited incidence of water breakthrough. Figures 2 and 3 illustrate some aspects of this performance. From these observations, Omega has concluded that waterflooding in the subject pool will have a significant positive impact on ultimate recovery.

In its application, Omega contends that the proposed gas flood operation in the southern portion of the pool would increase ultimate recovery in a manner similar to the waterflood and also, provide a means of storage of the dry gas stream from Omega's liquids recovery plant currently under construction.

In support of its application, Omega submitted the results of a computer model study performed by the Computer Modelling Group of Calgary. This study indicates an ultimate recovery of 28.4% of original oil in place (OOIP) for waterflood and 22.3% of OOIP for gas flood. In addition, it is observed that gas flood recoveries may approach those for waterflood if the vaporization of reservoir fluids by the dry gas injection (not included in the "black oil" simulator) is considered.

After analysis of the subject application, the Petroleum Branch had a number of areas of concern or clarification. These questions were included in the Board's letter to Omega dated July 12, 1983. Omega's response of August 8, 1983 has provided answers to most of the Branch's concerns although, technical analysis of the gas injection scheme continues to be somewhat vague.

2. Publication of Notice

As a result of Omega's letter of July 12, 1983, the Petroleum Branch, being reasonably satisfied as to the applications completeness, recommended to the Board that the application be advertised for objections. Notice of the application was published in the Manitoba Gazette (October 1, 1983), the Melita New Era (October 6, 1983), the Deloraine Times and Star (October 5, 1983) and sent to all offsetting working interest owners and all royalty owners in the area of the scheme. Figure 4 is a copy of the above mentioned notice, and Table 1 is a listing of Royalty and Working Interest Owners to which the notice was sent.

3. Interventions and Objections

Following publication of the notice, interventions or objections were received from Chevron Canada Resources Limited (Chevron), Roxy Petroleum Ltd. (Roxy), and Tundra Oil and Gas (Tundra). Copies of these interventions are included as Attachments 1, 2 and 3 respectively. Each will be discussed separately.

4. Intervention by Chevron

Chevron's intervention was based on its concerns that "proposed gas injection will have a detrimental effect on Cehvron's adjoining wells" and "the effectiveness of gas injection in improving oil recovery". Chevron's concerns were based on results of Omega's model studies which indicated that gas injection results in high GOR's in a short period of time and its concern that mobility ratio considerations would suggest that the predicted gas flood recovery factor to be overly optimistic.

In its intervention, Chevron did not indicate any concerns with the waterflood portions of the application.

Subsequent to the intervention, Omega has requested that the Board hold the gas flood portions of its application while proceeding with the waterflood aspects. Further to this, we understand that negotiations have been initiated between Omega and Chevron with the possible result of inclusion of some Chevron acreage in the proposed gas flood area.

5. Intervention by Roxy

Roxy's intervention was based on its concern that in areas where communication existed between the Mississippian and the Lower Amaranth, injection operations in the Lower Amaranth could adversely effect any Mississippian production in the area.

The question of such communication has been a concern throughout the development of the pool. While there is evidence in certain locations that such communication does not exist (pressure monitoring of one zone while the other is alternately produced and shut in) there is also evidence to suggest that communication is a problem (analysis of fracture treatments and individual well production histories). Based on these observations, it appears that Roxy's concerns appear justified.

To monitor the occurrence of such communication, Roxy proposes a three point monitoring program which involves a) inclusion of a chemical tracer in the injection water (with monitoring for the tracer in the produced Mississippian water), b) periodic monitoring of reservoir pressure in the Mississippian to monitor changes, and c) qualitative analysis of Mississippian water production history.

While all three points would be effective to some extent, the Branch feels that points a) and b) would be somewhat redundant and further that injection of a tracer on a continuous basis would

be more definitive and would result in less lost production than periodic pressure surveys. Monitoring of water production history is a reasonable requirement and should be instituted.

Roxy also comments about GOR restrictions in the gas flood area and continuous monitoring of production history for waterflood operations.

Inasmuch as the gas flood proposal is currently being held, Roxy's concern in this regard is noted for consideration upon reactivation of this aspect of the application.

With respect to monitoring of waterflood operations, the terms and conditions of draft Board Order No. PM 40 adequately provide for such monitoring.

6. Intervention by Tundra

In its intervention, Tundra also expresses concerns about inter-reservoir communication. The above comments with respect to Roxy's intervention would also apply to Tundra's concerns.

Tundra also expresses concern regarding overproduction of wells by Omega, particularly those offsetting Tundra land. Further, it is suggested that should Omega apply for further relief from allowable production within the waterflood area, Tundra would intervene before the Board.

With respect to overproduction in a primary depletion area, particularly offsetting non-Omega operated lands, the Branch is in full agreement with Tundra's comments and has drafted (previously forwarded) correspondence for the Board to Omega in this regard.

With respect to a waterflood project such as the subject application, we maintain that if production of wells at the project boundaries is restricted that oil will flow off the waterflood area to the primary area. This contention is illustrated by a review of hypothetical pressure gradients shown on Figure 5.

In summary, the concerns of Tundra where valid are being addressed by proposed monitoring programs and by the Board's correspondence to Omega regarding overproduction.

7. Board Order No. PM 40

Attached is a draft of Board Order No. PM 40 covering pressure maintenance operations in Waskada Lower Amaranth Unit No. 1, proposed Waskada Unit No. 2 and proposed Waskada Unit No. 3. It is noted that Section 74(2) of The Mines Act requires approval of the above Unit agreements by the Board prior to commencement of Unit operations. Consequently, it is suggested that Order PM No. 40 not be issued until the Board has approved the necessary Unit agreements.

The following is a list of some of the significant aspects of the Order with a brief explanation of the intent of each clause:

Pressure Maintenance Rules

1. "and other such wells in the Unit area as the Board may approve" this provides for additions to the pressure maintenance scheme at the Board's discretion without amending of the PM order. Order No. PM 39 contains a similar provision.

3(a) Requires reservoir pressure determination prior to injection to establish base line conditions from which to evaluate flood response.

3(b) Requires periodic pressure surveys to assist in evaluating performance of the scheme.

7~~6~~. Requires monthly reports of the progress of the pressure maintenance scheme including individual well production or injection rates, gas and water-oil ratios.

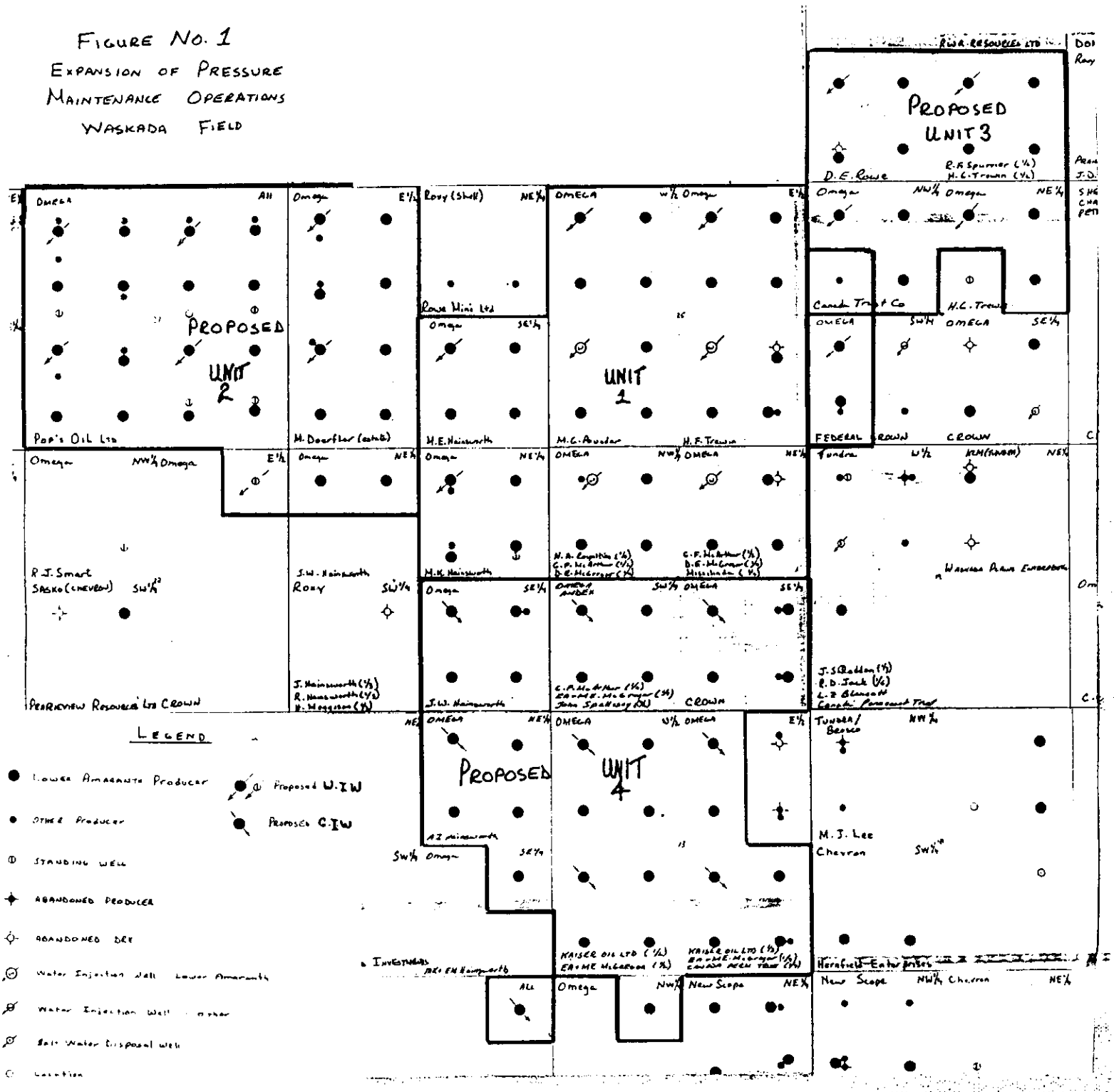
5. Provides for a program of injection of a chemical tracer with the injection water and monitoring of water production in the Mississippian to evaluate possible communication between the Lower Amaranth and the Mississippian.

Original Signed by H. C. Moster

H. Clare Moster

FIGURE NO. 1

EXPANSION OF PRESSURE MAINTENANCE OPERATIONS WASKADA FIELD



WASKADA LOWER AMARANTH UNIT No 1

FIG No. 2 PRODUCTION RATE vs TIME by INJECTION PATERN

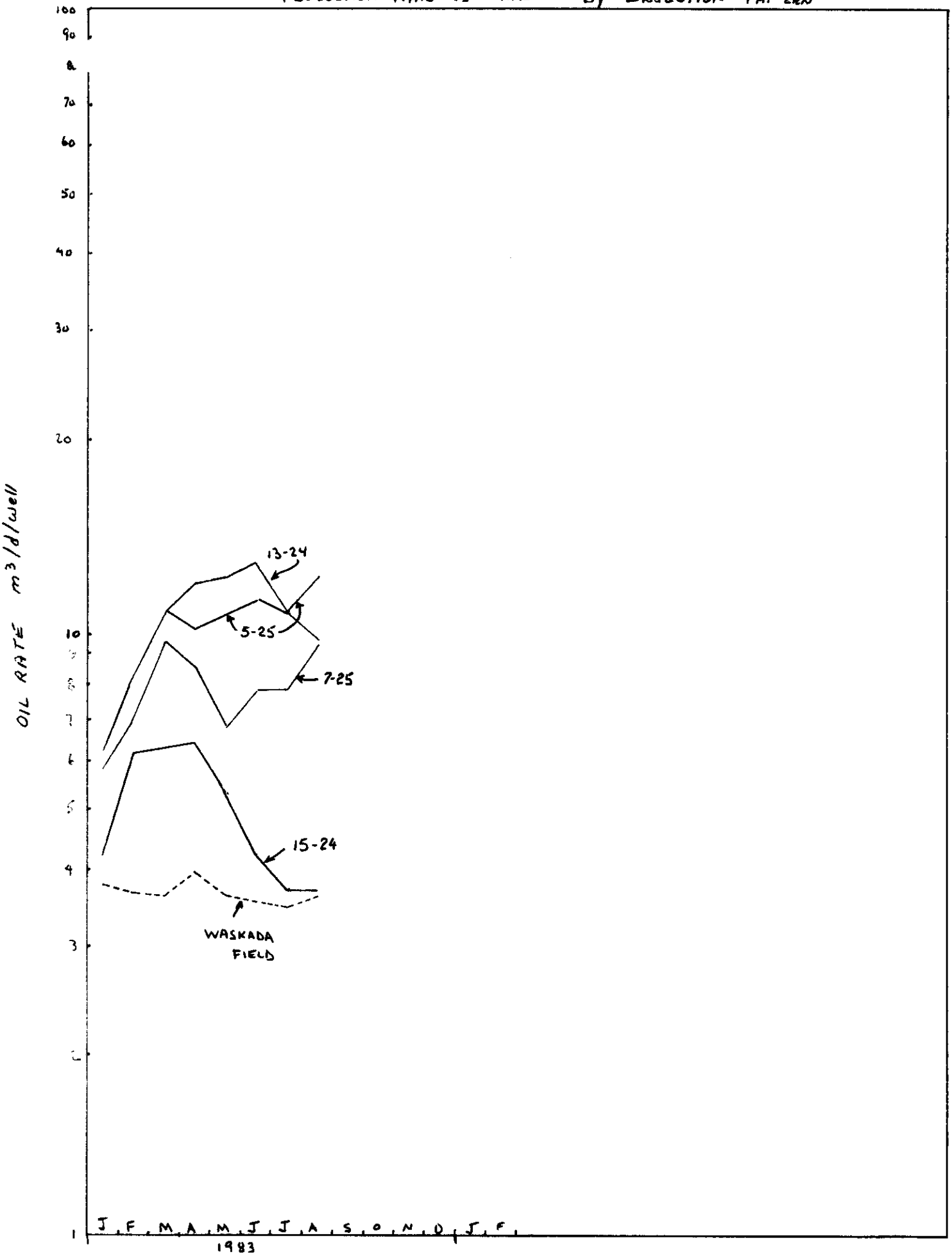


FIGURE No. 3

WASKADA LOWER AMARANTH UNIT No. 1
GOR vs Time by Injection Pattern

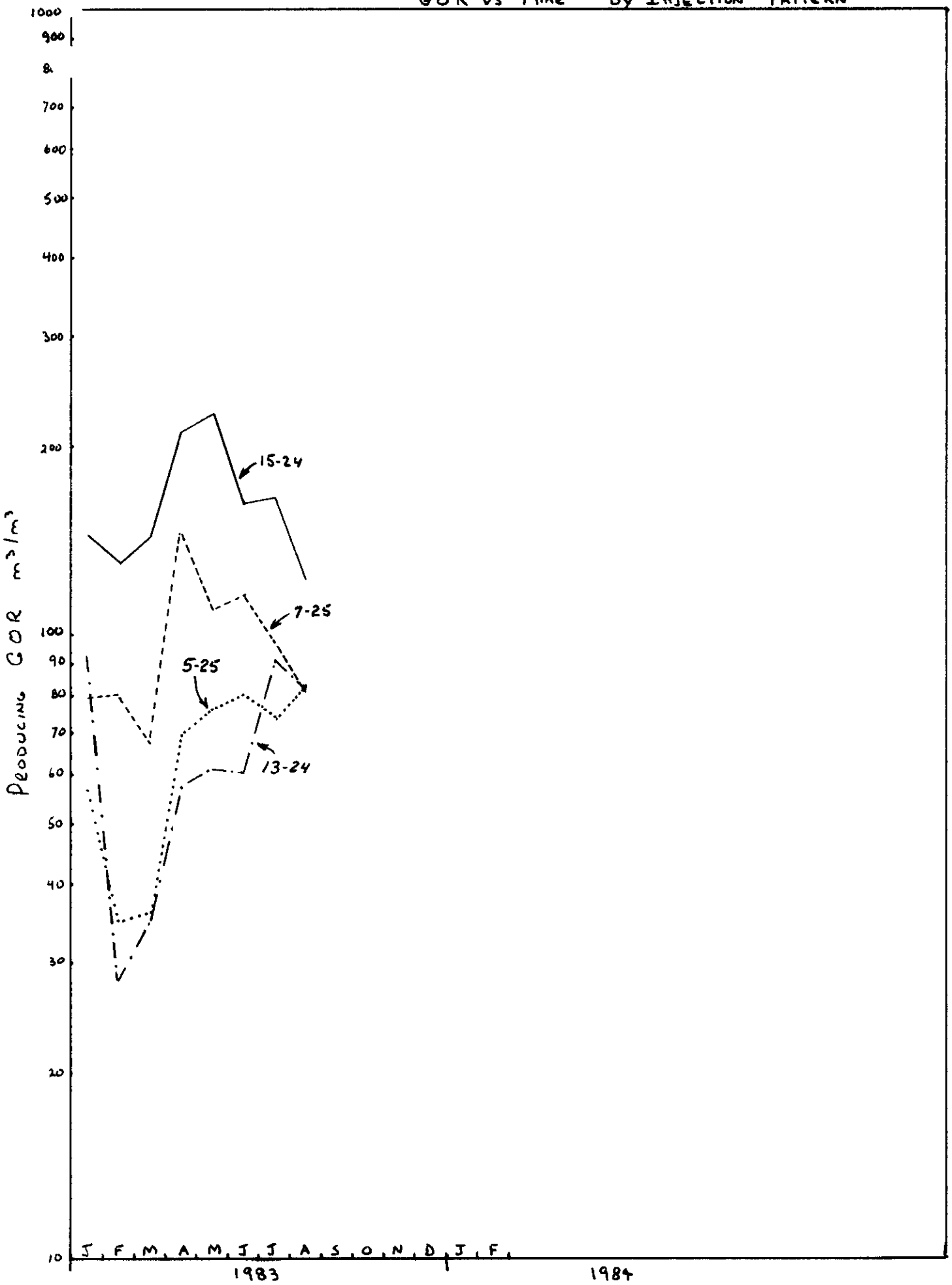


FIGURE No 5 - HYPOTHETICAL PRESSURE GRADIENTS

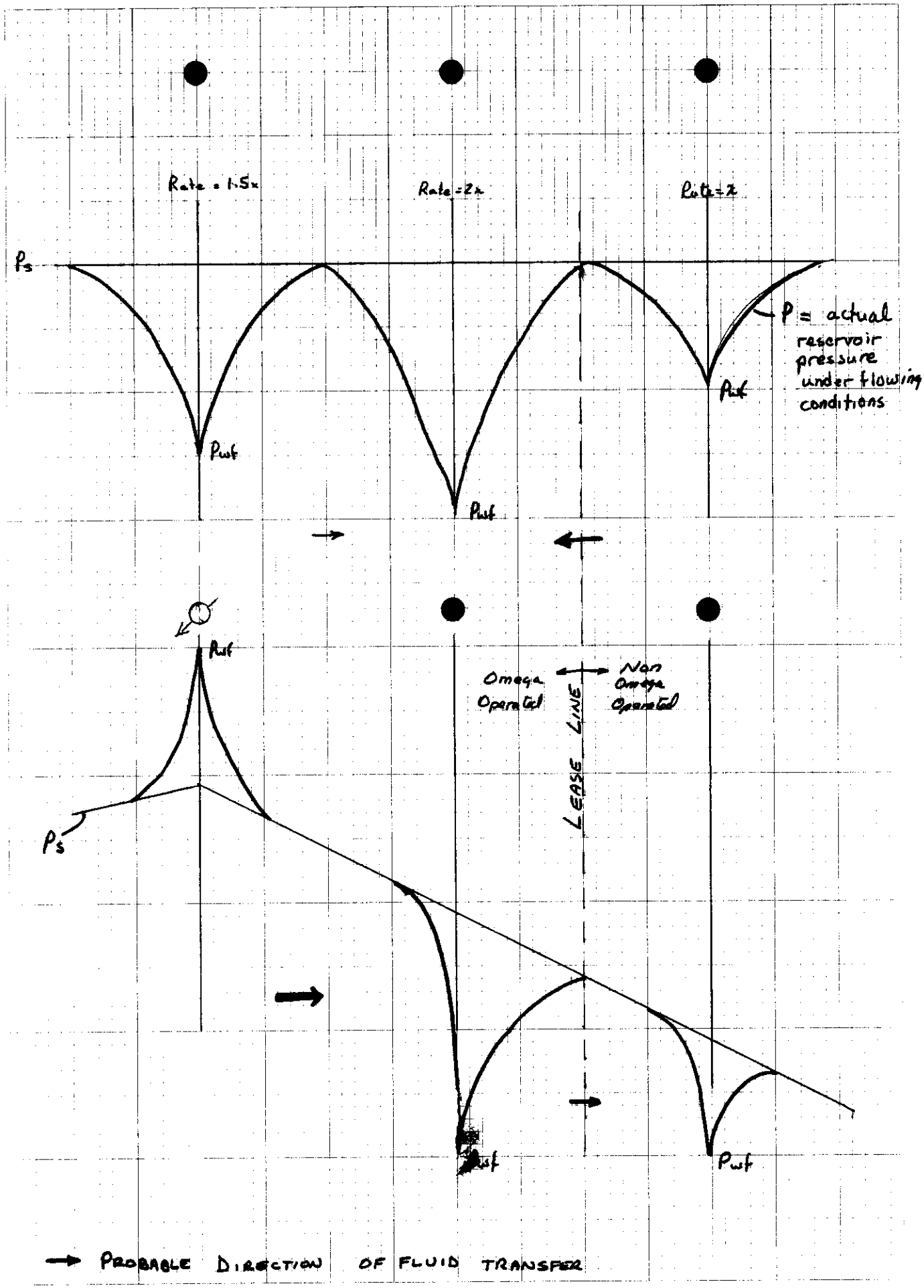


TABLE No. 1 - Page 1

~~Attachment No. 1~~

Royalty Owners In Proposed Pressure Maintenance Expansion Area

Canada Permanent Trust
311 - 6th Avenue S.W.
Calgary, Alberta
T2P 0R6

Energy Mines and Resources
580 Booth St.
Ottawa, Ontario
K1A 0E4

Canada Trust Co.
505 - 3rd St. S.W.
Calgary, Alberta
T2P 3E6

H. G. Trewin
Box 175
Waskada, Man.
R0M 2E0

D. E. Rowe
Waskada,
Man.
R0M 2E0

R. F. Spurrier
5915 Meghan Way
Sacramento, California 95842
U.S.A.

Kaiser Oil Ltd.
P. O. Box 6800
Station "D"
800 - 6th Avenue S.W.
Calgary, Alberta
T2P 0N1

J. W. Hainsworth
Waskada
Man.
R0M 2E0

J. Doerfler (executor of estate of M. Doerfler)
Waskada,
Man.
R0M 2E0

Pop's Oil Ltd.
Box 104
Deloraine, Man.
R0M 0M0

S. R. Young
1898 Skylark Place
Victoria, B. C.
V8N 2X1

Table No 1 - Page 2

~~Attachment No. 2~~

Working Interest Owners

Within ½ mile of Proposed Pressure Maintenance Expansion

Chevron Canada Resources Ltd.
Box 100,
Virden, Man.
R0M 2C0

New Scope Resources Ltd.
10 Donald St.
Winnipeg, Man.
R3C 1L5

Tundra Oil and Gas
300 Assiniboine Ave.
Winnipeg, Man.
R3C 0X6

Shell Canada Resources Ltd.
Box 100
Calgary, Alberta
T2P 2H5

Chauvco Resources Ltd.
Ste. 775, 606 - 4th St. S.W.
Calgary, Alberta
T2P 1T1

Petrostar
1530 - 311 - 6th Ave. S.W.
Calgary, Alberta
T2P 0R6

Roxy Petroleum Ltd.
2000, 540 - 5th Avenue S.W.
Calgary, Alberta
T2P 0M2

Voyager Petroleums Ltd.
600 Bow Valley Square 2
205 - 5th Ave. S.W.
Calgary, Alberta
T2P 2V7

Sasko Oil and Gas Limited
330 - 5th Ave. S.W.
Calgary, Alberta
T2P 0L4

Andex Oil Company
1501 - 500 - 4th Ave. S.W.
Calgary, Alberta
T2P 2V6

K-Tel Petroleum Ltd.
1670 Inkster Blvd.
Winnipeg, Man.
R2X 2W8

October 24, 1983

Roxy Petroleum Ltd.
2000 - 540 - 5th Avenue S.W.
Calgary, Alberta
T2P 0M2

Attention: Mr. V. G. Johnson
Vice-President Production

Dear Mr. Johnson:

Re: Waskada Lower Amaranth A Pool -
Expanded Pressure Maintenance Operations

Your letter of October 18, 1983 containing certain recommendations for consideration with respect to an application by Omega Hydrocarbons Ltd. to expand pressure maintenance operations in the Waskada Lower Amaranth A Pool is hereby acknowledged.

Your concerns regarding the potential communication between the Lower Amaranth and Mississippian Formations are shared by the Board. Your suggested monitoring program appears to have merit and consideration will be given to your proposal in further processing of the application.

With respect to your concerns regarding the gas injection portions of the application, you are hereby informed that Omega has requested that this portion of the application be held in abeyance until further notice. Consequently, your concerns in this respect will be held until this portion of the application is re-activated.

With respect to requirements for continuous monitoring of production history, the current Board Order No. PM39, which provides for pressure maintenance operations in the Waskada Lower Amaranth Unit No. 1, contains adequate provisions in this regard and the Board fully intends to in-

corporate similar provisions in any future pressure maintenance orders.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

LRD/IH/sb
bcc: - Petroleum Branch

cc: Marc Eliesen, Chairman
J. F. Redgwell, Member

October 24, 1983

Chevron Canada Resources Limited
500 - Fifth Avenue S.W.
Calgary, Alberta
T2P OL7

Attention: Mr. R. A. Pashelka

Dear Sirs:

Re: Expansion of Pressure Maintenance Operations - Waskada Field

With reference to Chevron's intervention in the application by Omega Hydrocarbons Ltd. dated June 23, 1983, to expand pressure maintenance operations in the Waskada Field, Omega has subsequently requested that the Board process only those portions of the application relating to waterflood operations and hold in abeyance that portion of the application relating to gas flood. Inasmuch as your intervention is concerned only with the gas flood portion of the application, the Board will accordingly hold your concerns until such time as Omega may wish to reactivate the gas flood proposal.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

LRD/IH/ra

bc: Marc Eliesen
J. F. Redgwell

Petroleum Branch

roxy PETROLEUM LTD.
2000, 540 - 5TH AVENUE SOUTH WEST CALGARY, ALBERTA, CANADA T2P 0M2 PHONE 1-403-269-7751

October 18, 1983

The Oil & Natural Gas Conservation Board
989 Century St.
WINNIPEG, Manitoba
R3H 0W4

Attention: Ian Haugh
Deputy Chairman

Dear Sir:

Re: Waskada Oil Pool
Waskada Pressure Maintenance Operations
Lower Amaranth A Pool

With respect to the submission of Omega Hydrocarbons Ltd. dated June 23, 1983 for an expansion of the Lower Amaranth A pool waterflood pressure maintenance operations, Roxy Petroleum submits the following recommendations for your consideration:

1. It is the opinion of Roxy Petroleum that segregation between the Lower Amaranth and Mississippian reservoirs may not be absolute due to either communication created by fracture stimulation or natural reservoir communication. It is strongly recommended that consideration be given to implementing a reservoir monitoring program to determine the degree of reservoir segregation of injected fluids. With the large number of twin Mississippian/Spearfish wells such a program could be easily maintained by:
   a) Injection of tracer materials at injection wells and sampling and monitoring of Mississippian production.
   b) Regular periodic pressure surveys of Mississippian producers to monitor changes in reservoir pressure.
   c) Qualitative analysis of Mississippian water production history

2. The Lower Amaranth A reservoir is very heterogeneous vertically and Omega indicated at their meeting of August, 1983 that the reservoir may be heterogeneous to a large degree areally with permeability lenses deteriorating or improving. It is our opinion that there will be a high probability of channelling of injection fluids, (particularly of gas injection), along higher permeability lenses in certain injection patterns.

.../2

Roxy would request that the Board give consideration to outlining a GOR limit above which the gas injection volumes are reviewed and modified as necessary. Similarily it is requested that your approval for waterflood operations be qualified to provide continuous monitoring of production history and revision of approvals to prevent reservoir damage.

Roxy Petroleum is of the opinion that the above and particularly a program to monitor injection fluids would be a positive enhancement for both the Mississippian and Lower Amaranth reservoir management. Our Company, as operator of a joint venture, has drilled a number of Mississippian prospects adjacent to the proposed waterflood units and is evaluating further Lower Amaranth and Mississippian locations. I would be please to meet with yourself or your staff to discuss our proposals at any time of your convenience.

Yours truly,

V. G. Johnson
Vice President Production

VGJ/kw

cc: H. C. Moster, P. Eng.
Director, Petroleum Branch

Omega Hydrocarbons
Attn: George Patey

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

October 14, 1983

Omega Hydrocarbons Ltd.
630 - 330 Fifth Avenue S.W.
Calgary, Alberta
T2P OL4

Attention: Mr. George Patey,
Vice President, Production.

Dear Sirs:

Re: Expansion of Pressure Maintenance Operations - Waskada Lower Amaranth A Pool

This will acknowledge receipt of your letter of October 6, 1983, in which you request that the Board consider granting approval for only the waterflood areas of your application, and to hold in abeyance approval of the gas flood portion.

Objections to your application may be filed with the Board up to October 20, 1983, after which date the Board will advise on the status of your amended application.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Ian Haugh
Deputy Chairman

cc: Marc Eliesen, Chairman
J. F. Redgwell, Member

IH/ra

bc: Petroleum Branch

300 ASSINIBOINE AVENUE / WINNIPEG / MANITOBA / CANADA / R3C 0X6

The Oil and Natural Gas
Conservation Board
989 Century Street
Winnipeg, Manitoba
R3H OW4

October 6, 1983

ATTN: DR. IAN HAUGH
DEPUTY CHAIRMAN

Dear Sir:

RE: APPLICATION TO EXPAND PRESSURE MAINTENANCE OF THE WASKADA LOWER AMARANTH POOL

Having received notice of the formal application by Omega Hydrocarbons Ltd.("Omega") to expand the pressure maintenance scheme at Waskada and having reviewed the application material, Tundra Oil and Gas, KLM Ventures and Corvair Oils Ltd. as offsetting operators wish to express to the Board some concerns over possible effects which the proposed scheme may have on our operations. Our concerns fall into two general areas:

(a) The potential deleterious effects of the proposed scheme on our offsetting Mississippian production, and

(b) Potential loss of recoverable reserves and inequitable drainage patterns resulting from excessive daily production rates in unit wells offsetting our lands.

IMPACT ON MISSISSIPPIAN PRODUCTION

Regarding our first concern, we have long suspected that the fracture treatments applied to wells perforated in the Lower Amaranth often established direct communication with the underlying Mississippian reservoirs. Our experience at 13-19-1-25 (Misssisippian producer) where water cuts were directly affected by water production from the 13-19 LAM well and at 12-18-1-25 where production and water cuts were virtually unaffected by a recompletion from the Mississippian to the Lower Amaranth tends to support this suspicion.

../2

Please Address Correspondence To:
BAINBRIDGE INVESTMENTS LIMITED TUNDRA TRADING LIMITED WESTMEAD LIMITED
TELEPHONE (204) 949-1195

The Board's attention is also drawn to several wells within the proposed unit expansion namely, 4-30LAM-1-25, 15-30-1-25 and 1-25LAM-1-26 which have shown excessively high water cuts in recent months. Given the structural position of these wells, it would be difficult to explain this in terms of edge or bottom water encroachment. However, all of these wells are in the vicinity of the 6-30-1-25 Mississippian water injector and it may be possible that these wells are seeing breakthrough of water injected into the Mississippian. If this is the case, it would be logical to expect that the effects of injection into the Lower Amaranth may affect Mississippian producers in the vicinity. The proposed scheme could, therefore, result in the injection of water into the Mississippian reservoirs in a very haphazard and unpredictable manner.

To accurately delineate the channels of communication within and between the Lower Amaranth and Mississippian reservoirs in the Waskada Field would be an expensive and technically difficult, if not impossible, task. However, we do feel that enough evidence exists to strongly suspect that complex communication paths do exist and there is a possibility that water injection in the Lower Amaranth may adversely affect Mississippian production in the vicinity.

EXCESSIVE PRODUCTION RATES

Our second area of concern is daily production allowables. Omega has stated that they intend to apply for exemption from production allowables for wells within the pressure maintenance scheme. We would like to draw the Board's attention to the well 1-24LAM-1-26 which was recently drilled by Omega and incidently, is offset from the centre of the LSD towards our land in Section 19-1-25. June production figures indicate an average production rate of 27 m3/D (170 BOPD) over 16 days. If this is what Omega deems to be an appropriate production rate when production allowables of 7.9 m3/D (50 BOPD) are in effect, we dread to think of the production rates we might see if they were granted an exemption! This well offsets 4-19-1-25 which is an undrilled spacing unit having both Lower Amaranth and

Mississippian potential which we intend to drill before year end. We feel that excessive production rates of this type in offsetting spacing units pose a serious threat to our ability to economically and efficiently produce our reserves, both Lower Amaranth and Mississippian. Exemption from allowables for wells offsetting non-unit lands would result in inequitable drainage patterns along the unit boundaries and, with reference to our earlier comments regarding possible communication between Mississippian and Lower Amaranth reservoirs, potential for pre-mature water coning problems in Mississippian reservoirs offsetting the unit.

CONCLUSION

Having reviewed the engineering reports supporting Omega's application, we appreciate the need to implement this scheme as soon as possible and do not wish to force this application through a lengthy public hearing process. Our purpose is to make the Board aware of our concerns and potential problems which may arise from this scheme. If the proposed scheme should adversely affect our Mississippian production in Section 19-1-25, we would then ask the Board to assess liability with reference to the comments made in this letter.

Regarding production allowables, it is our understanding that this matter is not under consideration in the present application but would be dealt with under a separate application. Our position is that current maximum permissable rates should be maintained and enforced on all wells within the proposed unit which directly offset non-unit lands. Should Omega apply for exemption from allowables for all wells within the proposed scheme, we intend to intervene before the Board with this position.

../4

We appreciate the opportunity to review and comment on Omega's application to the Board. If the Board should require clarification of any of the points discussed above, please feel free to contact us.

Dan Barchyn
Exploration Manager
Tundra Oil and Gas

Ken Lee
KLM Ventures Ltd.

John Mitchell
Corvair Oil Ltd.

DPB/eb

cc Mr. Jack Hall
Omega Hydrocarbons Ltd.

HYDROCARBONS Ltd.
TELEPHONE (403) 261-0743

October 6, 1983

The Oil and Natural Gas Conservation Board
939 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Dr. Ian Haugh
Deputy Chairman

Dear Sir:

RE: Expansion of Waskada Pressure Maintenance Operations - Lower Amaranth Pool

In light of recent developments affecting the gas injection portion of our June 23 application, Omega Hydrocarbons Ltd. respectfully requests that the Board consider granting us approval for only the waterflood areas for which there appears to be no problem. The gas flood portion of our application could be held in abeyance until an acceptable solution is found to appease the neighbouring operators.

By the time you receive this letter you should have received copies of the Unit Agreements for the proposed Waskada Units No. 2 and 3. The waterflood area for which we are applying is slightly reduced from that originally described in our June application and is the same area as the combined areas of the unflooded areas of the Waskada Lower Amaranth Unit No. 1 and the proposed Waskada Units No. 2 and 3.

The new water injection locations included in this area are:

1) 5-30-1-25 WPM
2) 13-30-1-25 WPM
3) 15-30-1-25 WPM
4) 5-31-1-25 WPM
5) 7-31-1-25 WPM
6) 16-22-1-26 WPM
7) 15-23-1-26 WPM
8) 13-25-1-26 WPM
9) 15-25-1-26 WPM
10) 5-26-1-26 WPM
11) 7-26-1-26 WPM
12) 13-26-1-26 WPM
13) 5-27-1-26 WPM
14) 7-27-1-26 WPM
15) 13-27-1-26 WPM
16) 15-27-1-26 WPM

We hope that there is no impediment to this request and that approval can be granted expediently.

Yours truly,

OMEGA HYDROCARBONS LTD.

George Patey
Vice-President Production

GP/sp

cc: E. Wyse
J. Hall

x.c. - H. Clare Moster
October 11, 1983 - IH/ra

→ Bob

October 6, 1983

Chevron Canada Resources Limited
500 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L7

Attention: Mr. R. A. Pashelka

Dear Sirs:

Re: Expansion of Pressure Maintenance Operations - Waskada Lower Amaranth A Pool

Your letter of October 4, 1983 and copy of Chevron's formal intervention in the subject application is hereby acknowledged. You will be kept apprised of the Board's intentions with regard to the subject application.

Yours sincerely,

THE OIL AND NATURAL GAS CONSERVATION BOARD

Ian Haugh
Deputy Chairman

LRD/lk

b.c. Petroleum Branch

Melita New Era Oct 6, 1983

Classifieds

• PROPERTY

FOR SALE

—Large Lot
—100 x 250
—Level
—Ideal Located
—In Town of Melita

• • • •

—Trailer
—12'x50'
—Attached Shed
—Oil Heat

• • •

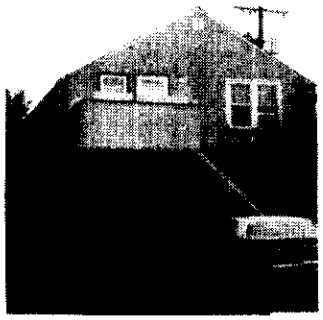
Mobile Home

—Located in Pierson, 3 lots included.

• • •

—Trailer Located, Pierson
—3 lots with Trailer
—Free Standing Antenna
—Treilye Stove, Air Condition
—2 Additions on Trailer

• • •



—1 Upstairs
—2 Bedroom Home
—Location on Large Lot, 100'x508'
—With Shop and Garage Rear

• • • •

—1 Storey
—2 Bedroom
—Close to Downtown

• • • •

—2 Bedroom
—Central Air Condition
—Attached Garage

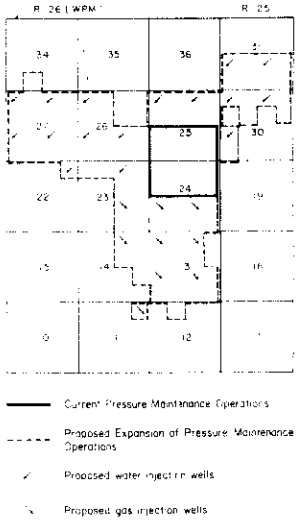
• • • •

For More Information Contact

• NOTICE

The Oil and Natural Conservation Board
NOTICE
Under the Mines Act
Waskada Oil Field

Omega Hydrocarbons Ltd. has made application under The Mines Act for approval to expand its pressure maintenance operations in the Waskada Lower Amaranth A Pool. The area of the proposed expansion and the area of existing pressure maintenance operations are outlined on the following plan.



The plan also indicates the locations of wells proposed to be converted for the injection of either produced water or natural gas.

If no valid objection or intervention in writing is received by the Board at 989 Century Street, Winnipeg, Manitoba R3H 0W4, within 14 days of the publication of this notice, the Board may approve the application.

Copies of the application may be obtained or examined by interested parties at the Petroleum Branch, Department of Energy and Mines, 975 Century Street, Winnipeg, Manitoba R3H 0W4.

Dated September 21, 1983.

—Ian Haugh
Deputy Chairman
The Oil and Natural Gas Conservation Board

• TENDERS

FOR SALE BY TENDER— The Antler River School Division No. 43 invites tenders for the sale of one used piano. Can be seen at the Melita School.

Highest or any tender not necessarily accepted.

Tenders to be sealed and marked (Tender) and must be submitted to the Division Office on or before 4:00 p.m., on October 10th, 1983.

Tenders to be submitted to:
I. W. Vickers
Secretary-Treasurer
Antler River School Division No. 43
P.O. Box 370
Melita, Manitoba
R0M 1L0

7-2c

Canadian Radio-television and Telecommunications Commission

Conseil de la radiodiffusion et des télécommunications canadiennes

notice : public hearing

The CRTC will hold a public hearing beginning on 14 Nov., 1983, at the Chateau Lacombe, 101st St., at Bellamy Hill, Edmonton, Alta., to consider the following: **Westman Media Co-operative Ltd.** Melita, Man.; Application (832010300) by Westman Media Co-operative Ltd., 909-24th St., Brandon, Man., R7B 1Y5, to renew the licence for the broadcasting receiving undertaking serving Melita, expiring 31 Jan., 1984. The application may be examined at: Town Offices, Main St., Melita.

Intervention: Any person wishing to intervene must submit a written intervention to the Secretary General of the Commission (C.R.T.C., Ottawa, Ont., K1A 0N2). A true copy of the intervention must also be served upon the applicant, on or before the deadline date indicated below and a proof of such service must be included with the original document addressed to the Secretary General. An intervention shall contain a clear and concise statement of the relevant facts and the grounds upon which the intervener's support for, opposition to or proposed modification of an application is

Animals, plants & man

by Keith Levenick & Robb McNabb

A number of people have called up worried about the rapid loss of the needles on their pine trees in the last week or two. Reg Curle the Provincial Horticulturist from Winnipeg has been getting the same type of call from all over the province. No it's not an epidemic - it's something that occurs every year. If you look closely you will usually see that the new needles from this year's growth are on the tree. It is the old needles that have fallen and they normally do this gradually every year. However this year due to the long hot dry summer these trees are suffering from drought and the old needles have all dropped off quite rapidly.

If you can do it a good heavy watering this week should help prevent browning off next spring. Pyramidal cedars are another evergreen that should have a good watering not to prevent damage next spring.

Feed alternatives, feeding system and management of replacement heifers are the major topics on Dairy Day planned for Wednesday, October 12 at the Agricultural Extension centre in Brandon.

The Program co-sponsored by Manitoba Agriculture and the Keystone Holstein Club will begin with registration at 10:00 a.m.

The morning speaker will be Provincial Nutritionist Bill Steeds. Steeds will talk about dealing with feed problems and developing lower cost dairy rations through the use of such alternative protein sources as distillers grain or the use of alternative forages like sudan grass. Steeds will also comment on how best to include straw in a dairy ration.

Two Brandon area producers will be a part of the afternoon program. Herman VandenHam will provide a look at a modern efficient feeding system and describe its operation. Garry Donohoe will discuss the things he has learned over the years about raising replacement heifers.

Also included in the afternoon program will be Provincial Dairy Specialist Allan Steinke who will deal with various systems for raising dairy heifers. Steinke will provide an insight into the heifers requirements from the day she is born to the day she becomes a part of the milking herd.

Dand news

by KAE MORE

Clint and Dorothy Whetter recently spent a weekend visiting Perry and Dorothy Whetter at Dauphin. They also visited Robert and Ellen Stevenson of Kenton last Saturday.

Reporters for the month of October are Gail Cassils, Mary Teetaert and Meredith

ATTACHMENT No. 1

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

1983-10-04

In the Matter of an Application
Made by Omega Hydrocarbons Ltd.
to Expand its Pressure Maintenance
Operations in the Waskada Lower
Amaranth "A" Pool
Our File No. 59,195

Mr. Ian Hough,
Deputy Chairman,
The Oil and Natural Gas Conservation Board,
939 Century Street,
Winnipeg, Manitoba.
R3H 0W4

Dear Sir:

I enclose a copy of Chevron Canada Resources Limited's formal Intervention in the above.

Yours very truly,

R. A. PASHEKLA

RAP/ps
Encl.

cc: Omega Hydrocarbons Ltd.,
630 One Calgary Place,
330 Fifth Avenue S.W.,
Calgary, Alberta.
T2P 0L4

x.c. - H. Clare Moster
October 5, 1983 - IH/ra

THE OIL AND NATURAL GAS CONSERVATION BOARD
WASKADA OIL FIELD

IN THE MATTER OF THE MINES ACT AND THE
REGULATIONS MADE THEREUNDER

and

IN THE MATTER OF AN APPLICATION MADE BY
OMEGA HYDROCARBONS LTD. TO EXPAND ITS
PRESSURE MAINTENANCE OPERATIONS IN THE
WASKADA LOWER AMARANTH A POOL

INTERVENTION OF
CHEVRON CANADA RESOURCES LIMITED

OCTOBER 1983

THE OIL AND NATURAL GAS CONSERVATION BOARD
WASKADA OIL FIELD

IN THE MATTER OF THE MINES ACT AND THE
REGULATIONS MADE THEREUNDER

and

IN THE MATTER OF AN APPLICATION MADE BY
OMEGA HYDROCARBONS LTD. TO EXPAND ITS
PRESSURE MAINTENANCE OPERATIONS IN THE
WASKADA LOWER AMARANTH A POOL

INTERVENTION OF CHEVRON CANADA RESOURCES LIMITED

1. Chevron Canada Resources Limited (Chevron), a body corporate registered to do business in the Province of Manitoba, is actively engaged in the production of petroleum substances in the said Province and in particular in the Waskada Oil Field and, as such, has considerable interest, vested and otherwise, in the Application by Omega Hydrocarbons Ltd. in its locations of injection wells in the Waskada Oil Field.

2. Technical Basis for Chevron's Intervention to Omega's Waskada Pressure Maintenance Application:

   Chevron Canada Resources Limited is concerned about the effects of gas injection in Omega Hydrocarbons Ltd.'s proposed Waskada Lower Amaranth "A" Pool Pressure Maintenance Scheme:

   a. Chevron Canada Resources Limited is concerned that the proposed gas injection will have a detrimental effect on Chevron's adjoining wells. The model study commissioned by Omega shows that the producers' offsetting gas injection wells will have very high GORs. Omega has not presented any

information to show that a similar occurrence will not occur at the second line offset producers, which are not part of the proposed project. Will these allowables be penalized?

b. Chevron Canada Resources Limited is also concerned about the effectiveness of gas injection in improving oil recovery from the Lower Amaranth "A" Pool. The model Study indicates that after ten years oil recovery from gas injection is about the same as oil recovery from water injection. Given that the gas/oil mobility ratio is much less favourable than the water/oil mobility ratio, these results seem questionable if not unreasonable. The unfavourable gas/oil mobility ratio suggests that early gas breakthrough could occur and oil recovery from gas injection would be much less than predicted.

3. All communications relative to this Intervention should be directed to:

Mr. Richard A. Pashelka,
Chevron Canada Resources Limited,
500 Fifth Avenue S.W.,
Calgary, Alberta.
T2P 0L7

ALL OF WHICH IS RESPECTFULLY SUBMITTED.

DATED at the City of Calgary, in the Province of Alberta this 4th day of October, A.D. 1983.

CHEVRON CANADA RESOURCES LIMITED

By: _____
R. A. PASHELKA, Its Counsel

way Traffic Board, Room 200-301 Weston Street, Winnipeg, Manitoba, R3E 3H4. Phone: 786-6708.

W. SIMPKIN,
Secretary,
—40 THE HIGHWAY TRAFFIC BOARD.

UNDER THE MINES ACT

LANDS OPEN TO PROSPECTING AND STAKING FOR QUARRY MINERALS

In accordance with Section 53 of Manitoba Regulation 226/76 under "The Mines Act"; being Chapter M160 of the Continuing Consolidation of the Statutes of Manitoba, the following listed quarry mineral dispositions are declared open to prospecting and staking at 12 o'clock noon, on the 12th day of October, 1983.

DISPOSITIONS

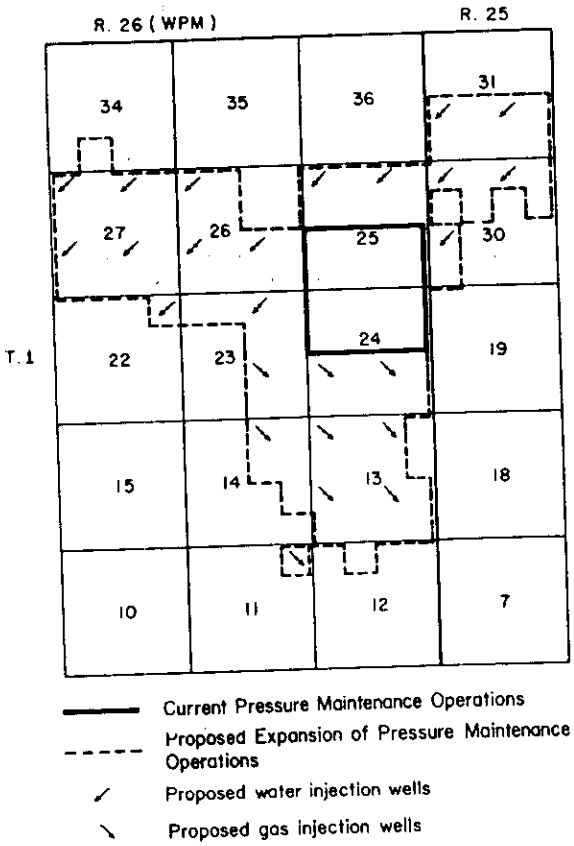
Quarry Mineral Lease Nos.	Location
QL-208	N½ LS. 16 Sec. 18, S½ LS. 1 Sec. 19-32-11, W
QL-321	E½ LS. 13, W½ LS. 14, Sec. 17-16-18, W
QL-459	Portion of Unsurveyed Twp. 28-4, E
QL-460	Portion of Unsurveyed Twp. 28-4, E
QL-463	SE¼ Sec. 30-35-23, W
QL-464	All of Fractional Sec. 11-27-22, W

Exploration Permit No.	Location
QP-38	LS.s. 1 & 8 Sec. 23, N½'s LS.s. 5 & 6, All LS.s. 12 & 13 Sec. 24-11-9, E

Dated at Winnipeg, Manitoba, this 19th day of September, 1983.

B. E. SIAS,
Chief Mining Recorder,
Mineral Resources Division,
—40 Department of Energy and Mines.

WASKADA OIL FIELD



Omega Hydrocarbons Ltd. has made application under The Mines Act for approval to expand its pressure maintenance operations in the Waskada Lower Amaranth A Pool. The area of the proposed expansion and the area of existing pressure maintenance operations are outlined on the following plan.

◀

The plan also indicates the locations of wells proposed to be converted for the injection of either produced water or natural gas.

If no valid objection or intervention in writing is received by the Board at 989 Century Street, Winnipeg, Manitoba, R3H 0W4, within 14 days of the publication of this notice, the Board may approve the application.

Copies of the application may be obtained or examined by interested parties at the Petroleum Branch, Department of Energy and Mines, 975 Century Street, Winnipeg, Manitoba, R3H 0W4.

Dated September 21, 1983.

IAN HAUGH,
Deputy Chairman,
The Oil and Natural Gas
—40 Conservation Board.

PU

UNDE

RURAL MU
SALE OF LAN

By virtue of a warrant issued by in the Province of Manitoba, unde ipality, to me directed, and bearing to levy on the several parcels of lan of taxes due thereon with costs, I do and costs are sooner paid, I will on in the Village of Binscarth, in the afternoon, proceed to sell by publi

Further take notice that the Vi to the amount due thereon for arrea even though a greater sum than the on the said lands.

Descripti

Lot 10, Block 7, Plan 241 .....
Part of Rd or Street lying immedia
NE 10-19-28W .....

Given under my hand and seal 1983.

9610—40

RURAL M
SALE OF LA

By virtue of a warrant issued the Province of Manitoba, under to me directed, and bearing date on the several parcels of land he taxes due thereon with costs, I d been in arrears for a period of one which they were imposed; and (sooner paid, I will on the 8th day o Office, in the Village of Neepawa sell by public auction the said lar

Note: It is Councils intention the lands indicated below.

Descript

CT #D174501, Roll #87700, NE 20

Dated at the Town of Neepaw ber, 1983.

9611—40

RURAL M
SALE OF L

By virtue of a warrant issued the Province of Manitoba, under to me directed, and bearing date the several parcels of land herei due thereon with costs, I do here arrears for a period of one year they were imposed; and (b) the paid, I will on the 4th day of N

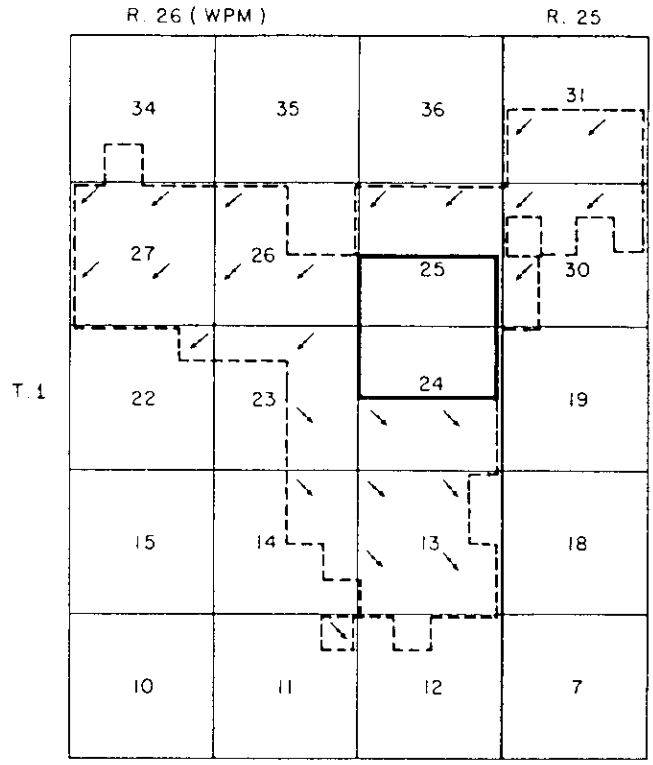
MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd. has made application under The Mines Act for approval to expand its pressure maintenance operations in the Waskada Lower Amaranth A Pool. The area of the proposed expansion and the area of existing pressure maintenance operations are outlined on the following plan.



Current Pressure Maintenance Operations

Proposed Expansion of Pressure Maintenance Operations

Proposed water injection wells

Proposed gas injection wells

The plan also indicates the locations of wells proposed to be converted for the injection of either produced water or natural gas.

If no valid objection or intervention in writing is received by the Board at 989 Century Street, Winnipeg, Manitoba R3H 0W4, within 14 days of the publication of this notice, the Board may approve the application.

Copies of the application may be obtained or examined by interested parties at the Petroleum Branch, Department of Energy and Mines, 975 Century Street, Winnipeg, Manitoba R3H 0W4.

Dated: September 21, 1983

Ian Haugh
Deputy Chairman
The Oil and Natural Gas
Conservation Board

Attachment No. 1

Royalty Owners In Proposed Pressure Maintenance Expansion Area

Canada Permanent Trust
311 - 6th Avenue S.W.
Calgary, Alberta
T2P 0R6

Energy Mines and Resources
580 Booth St.
Ottawa, Ontario
K1A 0E4

Canada Trust Co.
505 - 3rd St. S.W.
Calgary, Alberta
T2P 3E6

H. G. Trewin
Box 175
Waskada, Man.
R0M 2E0

D. E. Rowe
Waskada,
Man.
R0M 2E0

R. F. Spurrier
5915 Meghan Way
Sacramento, California 95842
U.S.A.

Kaiser Oil Ltd.
P. O. Box 6800
Station "D"
800 - 6th Avenue S.W.
Calgary, Alberta
T2P 0N1

J. W. Hainsworth
Waskada
Man.
R0M 2E0

J. Doerfler (executor of estate of M. Doerfler)
Waskada,
Man.
R0M 2E0

Pop's Oil Ltd.
Box 104
Deloraine, Man.
R0M 0M0

S. R. Young
1898 Skylark Place
Victoria, B. C.
V8N 2X1

Attachment No. 2

Working Interest Owners

Within ½ mile of Proposed Pressure Maintenance Expansion

Chevron Canada Resources Ltd.
Box 100,
Virden, Man.
R0M 2C0

New Scope Resources Ltd.
10 Donald St.
Winnipeg, Man.
R3C 1L5

Tundra Oil and Gas
300 Assiniboine Ave.
Winnipeg, Man.
R3C 0X6

Shell Canada Resources Ltd.
Box 100
Calgary, Alberta
T2P 2H5

Chauvco Resources Ltd.
Ste. 775, 606 - 4th St. S.W.
Calgary, Alberta
T2P 1T1

Petrostar
1530 - 311 - 6th Ave. S.W.
Calgary, Alberta
T2P 0R6

Roxy Petroleum Ltd.
2000, 540 - 5th Avenue S.W.
Calgary, Alberta
T2P 0M2

Voyager Petroleums Ltd.
600 Bow Valley Square 2
205 - 5th Ave. S.W.
Calgary, Alberta
T2P 2V7

Sasko Oil and Gas Limited
330 - 5th Ave. S.W.
Calgary, Alberta
T2P 0L4

Andex Oil Company
1501 - 500 - 4th Ave. S.W.
Calgary, Alberta
T2P 2V6

K-Tel Petroleum Ltd.
1670 Inkster Blvd.
Winnipeg, Man.
R2X 2W8

Sent Sept-22/83 LB

MANITOBA

Inter-Departmental Memo

Date: September 20, 1983

To: The Oil & Natural Gas Conservation Board

Marc Eliesen, Chairman
Dr. I. Haugh, Deputy Chairman
J. F. Redgwell, Member

From: H. Clare Moster
Director
Petroleum Branch

Telephone:

Subject: Expansion of Pressure Maintenance Operations - Waskada Field

Omega Hydrocarbons Ltd, in its letter dated June 23, 1983, has applied for approval to expand pilot pressure maintenance operations in the Waskada Field. In subsequent letters dated August 8, 1983 and September 9, 1983, Omega has provided additional information regarding its application that had been requested by the Board.

Recommendation:

It is recommended that the attached notice be published in the Manitoba Gazette and the Melita New Era. Further, it is recommended that the notice be sent to all royalty owners within the proposed expansion and all working interest owners within one half mile of the proposed expansion.

Discussion:

In response to the Board's letter of August 30, 1983, Omega, in its letter of September 9, 1983 has provided lists of working interest and royalty owners within one half mile of the proposed expansion and 10 copies of the complete submission.

As the offsetting royalty owners are relatively unaffected by the proposal and as publication in the local press as well as the Manitoba Gazette is required, it is recommended to send the notice only to royalty owners within, and working interest owners within one half mile of the proposed expansion. These parties are listed on Attachments 1 and 2 respectively.

Original signed by H. C. Moster

H. Clare Moster

LAD/HCM/eb
Att:

HYDROCARBONS Ltd.
TELEPHONE (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

September 9, 1983

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

Attention: Dr. Ian Haugh
Deputy Chairman

Dear Sir:

RE: Expansion of Waskada Pressure Maintenance Operations - Lower Amaranth Pool

In response to your August 30 letter please find enclosed the following:

1) Ten copies of the CMG Study.
2) Ten copies of our application including our original June 23 letter and the subsequent August 8 addendum.
3) A comprehensive list of all royalty and working interest owners within the proposed unit areas.
4) A list of working and royalty interest owners in lands adjacent to the program area. This list has been compiled to the best of our ability; it is not complete and we cannot guarantee its accuracy because we do not have access to all that information.

Will note that we have changed slightly the tracts that we now propose to unitize and I will list those changes below. As we stated earlier the possibility of this occurring existed because of the uncertainty in which wells would be drilled and completed in the Lower Amaranth soon enough to be uncorporated in their respective units. The changes listed result in deleting from our pressure maintenance application wells 13-31-1-25 WPM and 15-31-1-25 WPM from the proposed list of water injectors. The neighbouring wells have not yet been drilled.

The changes to the proposed unit outline presented in our June 23 letter are:

1) 3-34-1-26 WPM has been added to Waskada Unit No. 2.

2) The N/2 of Section 31-1-25 WPM has been deleted from Waskada Unit No. 3.

3) No changes have been made to Waskada Unit No. 4.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse
Petroleum Engineer

EW/sp

cc: Sharon Van Middlesworth
Jack Hall
George Patey

WASKADA, MANITOBA

Land Description	P&NG Lessor	P&NG Lessee
SE¼ 7-1-25-WPM	59643 Minerals Ltd.	Chevron Canada Resources Limited
NW¼ 18-1-25-WPM	Melvin James Lee	Tundra Trading Ltd. & Westmead Ltd.
SW¼ 18-1-25-WPM	Hernefield Enterprises Ltd.	Chevron Canada Resources Limited
NE¼ 19-1-25-WPM	Canada Permanent Trust (1/6) Tundra Trading Ltd. (5/6)	Unknown
NW¼ 19-1-25-WPM	As above	Unknown
SW¼ 19-1-25-WPM	Unknown	Unknown
N½ 20-1-25-WPM	Charles C. McGregor	Omega Hydrocarbons Ltd.
NW¼ 29-1-25-WPM	Unknown	Unknown
SW¼ 29-1-25-WPM	Unknown	Unknown
SE¼ 30-1-25-WPM	Dept. of Energy & Mines	Omega Hydrocarbons Ltd.
NE¼ 31-1-25-WPM	Smart Oils Ltd. & R. W. R. Resources Ltd.	Omega Hydrocarbons Ltd.
NW¼ 32-1-25-WPM (½ int)	As above	Omega Hydrocarbons Ltd.
NW¼ 32-1-25-WPM (½ int)	Dome Petroleum Limited	Omega Hydrocarbons Ltd.
SW¼ 32-1-25-WPM	Unknown	Unknown
SW¼ 5-2-25-WPM (111 acres)	Sheryl E. A. Smart	Omega Hydrocarbons Ltd.
SE¼ 6-2-25-WPM	Unknown	Unknown
SW¼ 6-2-25-WPM	Unknown	Unknown
Sec. 11-1-26-WPM	Dept. of Energy & Mines	Francana Oil & Gas Ltd. Petroventures Resources Ltd. Page Petroleum Ltd.
NE¼ 12-1-26-WPM	Hernefield Enterprises Ltd.	New Scope Resources Ltd.

WASKADA, MANITOBA

Land Description	P&NG Lessor	P&NG Lessee
NW¼ 12-1-26-WPM	Canada Trust Company	Omega Hydrocarbons Ltd.
NW¼ 14-1-26-WPM	Unknown	Unknown
SW¼ 14-1-26-WPM	First Farland Investments Ltd.	Shell Canada Resources Ltd.
E½ 22-1-26-WPM	Dept. of Energy and Mines	Omega Hydrocarbons Ltd.
NW¼ 22-1-26-WPM	Robert J. Smart	Omega Hydrocarbons Ltd.
SW¼ 22-1-26-WPM	Prairieview Resources Ltd.	Century Exploration Company
SW¼ 23-1-26-WPM	Joyce Hainsworth (1/3) Roland Hainsworth (1/3) Heather Meggison (1/3)	Roxy Petroleum Ltd.
NE¼ 26-1-26-WPM	Rowe Mini Ltd.	Shell Canada Resources Ltd.
NE¼ 28-1-26-WPM	Murray G. Hannah	Chauvco Resources Ltd. ?
SE¼ 28-1-26-WPM	As above	As above
NE¼ 33-1-26-WPM	Pop's Oil Ltd.	Chevron Canada Resources Ltd.
SE¼ 33-1-26-WPM (½ int)	Ovey Seymour Young	Chevron Canada Resources Ltd.
SE¼ 33-1-26-WPM (½ int)	Frank Ross Young	Chevron Canada Resources Ltd.
N½ 34-1-26-WPM	Frank Ross Young	Chevron Canada Resources Ltd.
SE¼ 34-1-26-WPM	Dept. of Energy & Mines	Omega Hydrocarbons Ltd.
SE¼ 35-1-26-WPM	Howard George Rowe	Omega Hydrocarbons Ltd.
SW¼ 35-1-26-WPM	Moamco Enterprises Ltd.	Omega Hydrocarbons Ltd.
E½ 36-1-26-WPM (1/3 int)	William L. McKinney	Omega Hydrocarbons Ltd.
E½ 36-1-26-WPM (1/3 int)	James A. McKinney	Omega Hydrocarbons Ltd.
E½ 36-1-26-WPM (1/3 int)	Dorothy E. Young	Omega Hydrocarbons Ltd.
W½ 36-1-26-WPM	H. Glover Lee	Omega Hydrocarbons Ltd.
SE¼ 1-2-26-WPM	Unknown	Unknown

UNIT # 2

Tract Number	Land Description	Owner	Royalty Interests
1	Lsd. 16-22-1-26 WPM	Department of Energy & Mines	100%
2	Lsd. 13-23-1-26 WPM	John Wilfred Hainsworth	100%
3	Lsd. 14-23-1-26 WPM	John Wilfred Hainsworth	100%
4	Lsd. 3-26-1-26 WPM	Mary Doerfler (John Doerfler acts as Committee of her Estate)	100%
5	Lsd. 4-26-1-26 WPM	As above	100%
6	Lsd. 1-27-1-26 WPM	Pop's Oil Ltd.	100%
7	Lsd. 2-27-1-26 WPM	Pop's Oil Ltd.	100%
8	Lsd. 3-27-1-26 WPM	Pop's Oil Ltd.	100%
9	Lsd. 4-27-1-26 WPM	Pop's Oil Ltd.	100%
10	Lsd. 5-27-1-26 WPM	Pop's Oil Ltd.	100%
11	Lsd. 6-27-1-26 WPM	Pop's Oil Ltd.	100%
12	Lsd. 7-27-1-26 WPM	Pop's Oil Ltd.	100%
13	Lsd. 8-27-1-26 WPM	Pop's Oil Ltd.	100%
14	Lsd. 5-26-1-26 WPM	Mary Doerfler (John Doerfler acts as Committee of her Estate)	100%
15	Lsd. 6-26-1-26 WPM	As above	100%
16	Ltd. 11-26-1-26 WPM	As above	100%
17	Lsd. 12-26-1-26 WPM	As above	100%
18	Lsd. 9-27-1-26 WPM	Pop's Oil Ltd.	100%
19	Lsd. 10-27-1-26 WPM	Pop's Oil Ltd.	100%
20	Lsd. 11-27-1-26 WPM	Pop's Oil Ltd.	100%
21	Lsd. 12-27-1-26 WPM	Pop's Oil Ltd.	100%
22	Lsd. 13-27-1-26 WPM	Pop's Oil Ltd.	100%

Tract Number	Land Description	Owner	Royalty Interests
23	Lsd. 14-27-1-26 WPM	Pop's Oil Ltd.	100%
24	Lsd. 15-27-1-26 WPM	Pop's Oil Ltd.	100%
25	Lsd. 16-27-1-26 WPM	Pop's Oil Ltd.	100%
26	Lsd. 13-26-1-26 WPM	Mary Doerfler (John Doerfler acts as Committee for her Estate)	100%
27	Lsd. 14-26-1-26 WPM	As above	100%
28	Lsd. 3-34-1-26 WPM	Seymer Ross Young	100%

NOTES:

(1) Tracts 1 through 28 inclusive have 100% Working Interest owned by Omega Hydrocarbons Ltd.

(2) Tract 28: GORR to Chevron Canada Resources Limited of:
on oil: 1/150 (min 5% - max 15%),
on gas: 15% (min. 10¢/mcf)

UNIT # 3

Tract Number	Land Description	Owner	Royalty Interests
1	Lsd. 4-30-1-25 WPM (down to and including the Lodgepole formation)	Department of Energy, Mines and Resources	100%
2	Lsd. 5-30-1-25 WPM (down to and including the Lodgepole formation)	As above	100%
3	Lsd. 11-30-1-25 WPM	Canada Trust Company	100%
4	Lsd. 9-30-1-25 WPM	Howard Gordon Trewin	100%
5	Lsd. 16-30-1-25 WPM	Howard Gordon Trewin	100%
6	Lsd. 15-30-1-25 WPM	Howard Gordon Trewin	100%
7	Lsd. 14-30-1-25 WPM	Canada Trust Company	100%
8	Lsd. 13-30-1-25 WPM	Canada Trust Company	100%
9	Lsd. 4-31-1-25 WPM	Dale Edward Rowe	100%
10	Lsd. 3-31-1-25 WPM	Dale Edward Rowe	100%
11	Lsd. 2-31-1-25 WPM	Ralph F. Spurrier (50% int) Howard Gordon Trewin (50% int)	
12	Lsd. 1-31-1-25 WPM	As above	
13	Lsd. 8-31-1-25 WPM	As above	
14	Lsd. 7-31-1-25 WPM	As above	
15	Lsd. 6-31-1-25 WPM	Dale Edward Rowe	100%
16	Lsd. 5-31-1-25 WPM	Dale Edward Rowe	100%
17	Lsd. 12-31-1-25 WPM	Dale Edward Rowe	100%
18	Lsd. 11-31-1-25 WPM	Dale Edward Rowe	100%
19	Lsd. 13-31-1-25 WPM	Dale Edward Rowe	100%

Delete from Unit will be added later.

NOTES: (1) Tracts 1 through 19 inclusive have 100% Working Interest owned by Omega Hydrocarbons Ltd.

(2) Tracts 1 and 2: GORR's to:

PanCanadian	5%	(Reduced)	2.5%
QueWest	5.5%	(Reduced)	2.75%
Triton	2%	(Reduced)	1%

(3) Tracts 3, 7 & 8: GORR's to:

QueWest	5.5%	(Reduced)	2.75%
Triton	2%	(Reduced)	1%

UNIT # 4

Tract Number	Land Description	Owner	Royalty Interests
1	Lsd. 14-12-1-26 WPM	Canada Trust Company	100%
2	Lsd. 16-11-1-26 WPM	Dept. of Energy & Mines	100%
3	Lsd. 4-13-1-26 WPM	See Group A below	
4	Lsd. 3-13-1-26 WPM	See Group A below	
5	Lsd. 2-13-1-26 WPM	See Group B below	
6	Lsd. 1-13-1-26 WPM	See Group B below	
7	Lsd. 8-13-1-26 WPM	See Group B below	
8	Lsd. 7-13-1-26 WPM	See Group B below	
9	Lsd. 6-13-1-26 WPM	See Group A below	
10	Lsd. 5-13-1-26 WPM	See Group A below	
11	Lsd. 8-14-1-26 WPM	See Group C below	
12	Lsd. 10-14-1-26 WPM	Arthur Irwin Hainsworth	100%
13	Lsd. 9-14-1-26 WPM	Arthur Irwin Hainsworth	100%
14	Lsd. 12-13-1-26 WPM	See Group A below	
15	Lsd. 11-13-1-26 WPM	See Group A below	
16	Lsd. 10-13-1-26 WPM	See Group B below	
17	Lsd. 15-13-1-26 WPM	See Group B below	
18	Lsd. 14-13-1-26 WPM	See Group A below	
19	Lsd. 13-13-1-26 WPM	See Group A below	
20	Lsd. 16-14-1-26 WPM	Arthur Irwin Hainsworth	100%
21	Lsd. 15-14-1-26 WPM	Arthur Irwin Hainsworth	100%
22	Lsd. 2-23-1-26 WPM	John Wilfred Hainsworth	100%
23	Lsd. 1-23-1-26 WPM	John Wilfred Hainsworth	100%
24	Lsd. 4-24-1-26 WPM	See Group D below	
25	Lsd. 3-24-1-26 WPM	See Group D below	
26	Lsd. 2-24-1-26 WPM	Dept. of Energy & Mines	100%

UNIT # 4 (Cont'd)

Tract Number	Land Description	Owner	Royalty Interests
27	Lsd. 1-24-1-26 WPM	Dept. of Energy & Mines	100%
28	Lsd. 8-24-1-26 WPM	Dept. of Energy & Mines	100%
29	Lsd. 7-24-1-26 WPM	Dept. of Energy & Mines	100%
30	Lsd. 6-24-1-26 WPM	See Group D below	
31	Lsd. 5-24-1-26 WPM	See Group D below	
32	Lsd. 8-23-1-26 WPM	John Wilfred Hainsworth	100%
33	Lsd. 7-23-1-26 WPM	John Wilfred Hainsworth	100%

NOTES:

(1) Tracts 1, 3 through 23 inclusive, 26 through 29 inclusive, 32 & 33 have 100% Working Interest owned by Omega Hydrocarbons Ltd.

(2) Tract 2 has 83.334% Working Interest owned by Omega Hydrocarbons Ltd. and 16.666% Working Interest owned by K-Tel Petroleum Ltd.

(3) Tracts 24, 25, 30 & 31 have 75% Working Interest owned by Omega Hydrocarbons Ltd. and 25% Working Interest owned by Andex Oil Co. Ltd.

(4) Group A Royalty Owners: Kaiser Oil Ltd. - 50%,
E. A. & M.E. McGregor - 50%

(5) Group B Royalty Owners: Kaiser Oil Ltd. - 50%
E. A. & M.E. McGregor - 25%
Canada Permanent Trust Company - 25%

(6) Group C Royalty Owners: Jointly owned by M. K. Hainsworth and E. M. Hainsworth

(7) Group D Royalty Owners: George Franklin McArthur - 25%
E. A. & M. E. McGregor - 25%
John Spelliscy - 50%

(8) GORR to Marvin D. Allison of 3% of OHL's interest on Group A lands.

(9) GORR to Marvin D. Allison of 3% of OHL's interest on Group B lands.

(10) GORR to Marvin D. Allison of 3% of OHL's interest on Group D lands.

(11) GORR to Francana, Page & Petroventures of OHL's 83.334% interest of: on oil: 1/150 (min 5% - max 15%), on gas: 15% with regards to Tract 2

(12) Tracts 26, 27, 28 & 29 GORR's to: Reston Resources - 3% and Gulch Resources - 3%

August 30, 1983

Omega Hydrocarbons Ltd.
630, 330 - 5th Avenue S.W.
Calgary, Alberta
T2P OL4

Attention: Mr. George E. Patey
V.P. Production

Dear Sirs:

Re: Expansion of Waskada Pressure Maintenance Operations
Lower Amaranth Pool

Receipt of your letter of August 8, 1983 is acknowledged.

Processing of your application continues including the information supplied with your letters dated August 19th (pressure fall-off tests) and August 22nd (pilot waterflood progress reports).

Pursuant to subsection 62(18) of The Mines Act, the Board will be giving notice of Omega's application to interested parties. To assist us in this matter, please provide the Board with the names and addresses of all working interest owners and royalty interest owners in and adjoining all tracts covered by the proposed expanded operations. The Board will also require additional copies of Omega's complete application, including the CMG report and your August 8th letter, sufficient to provide copies to each working interest owner who requires further information on Omega's application.

On receipt of the requested information and copies, the Board will then send out the required notice. Response to the notice will determine the necessity for a public hearing.

You will be advised if additional information is required.

Yours sincerely

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
IAN HAUGH

Ian Haugh
Deputy Chairman

HCM/IH/ra
bc: Petroleum Branch
Marc Eliesen
J. F. Redgwell

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743 630 - 330 FIFTH AVENUE S.W. CALGARY, ALBERTA T2P 0L4

August 25, 1983

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

Attention: Mr. Marc Eliesen
Chairman

Dear Sir:

RE: Board Order No. PM 39 -
Waskada Lower Amaranth Unit No. 1

Omega is now in the process of applying for a widespread expansion of its pressure maintenance in the Waskada Lower Amaranth Pool. In anticipation of possible delays in Omega acquiring the necessary approvals to inject fluids in wells outside the existing Waskada Lower Amaranth Unit No. 1 boundaries, we wish to request approval to add two water injection wells to the pilot area.

Board Order No. PM 39 states in Pressure Maintenance Rules, Section 1, Subsection (1):

"Water shall be injected to the Lower Amaranth Formation of Jurassic Age through the wells:

Omega Waskada WIW 13-24LAm-1-26 (WPM)
Omega Waskada WIM 14-24-1-26 (WPM)
Omega Waskada WIM 5-25-1-26 (WPM)
Omega Waskada WIM 7-25-1-26 (WPM)

and such other wells in the Unit Area as the Board may approve."

It is under the provisions of this rule that we request permission to inject water into wells Omega Waskada 15-25-1-26 (WPM) and Omega Waskada 15-23-1-26 (WPM).

The additional two injectors are requested due to our excellent production response within the present pilot area and the fact at the higher production rates we are having difficulty replacing voidage.

x.c. - H. Clare Moster
August 31, 1983 - IH/ra

Without additional injectors we are concerned that the present four injectors will not be adequate to replace voidage and this could eventually cause loss of productivity if the formation pressure dropped to below the bubble point.

It would seem that Board Order No. PM 39 provides for the addition of water injection wells within the Unit without any additional formal orders or hearings. In requesting approval for only 15-25 and 15-23 we have avoided any direct effects on other operators' oil wells. We would greatly appreciate your early attention to our request.

Yours truly,

OMEGA HYDROCARBONS LTD.

George Patey
Vice-President Production

GP/cw

cc: Mr. Clare Moster,
Petrleum Branch
J. Hall
E. Wyse

HYDROCARBONS Ltd.
TELEPHONE (403) 261 0743 630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

August 8, 1983

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

Attn: Mr. Marc Eliesen
Chairman

Dear Sir:

Re: Expansion of Waskada Pressure Maintenance
Lower Amaranth Pool

In reply to your letter of July 12 and in further support of our application of June 23 we offer the following point by point discussion:

1) Inclusion of non-operated offsetting tracts

On August 4, Omega convened a meeting with all the neighbour operators to discuss the subject application to expand pressure maintenance at Waskada. We briefly summarized the findings from model study, presented data showing the progress of the pilot waterflood to June 30, 1983 and outlined our intentions with respect to our expansion program. The stated objective of the meeting was to gain their support and co-operation in our efforts. Our data and reasoning was presented to encourage them to undertake their own efforts to install pressure maintenance on their properties.

We stated that we have the majority of the physical facilities already in place to expand our flood and for expediency, would prefer to proceed as we have planned. We have offered to co-operate with them; whenever possible, in such areas as sale of high pressure water and water disposal capabilities. We have opened the door for their specific proposals in these areas.

In general, our presentation was favorably received and we believe a sense of co-operation was developed. We have offered to share data and to co-operate with facilities and left them to decide what to do with their own producing properties.

2/.....

2) Undrilled Omega Operated Tracts

In general, Omega feels that the proposed expansion will not be the end of pressure maintenance expansion for the Lower Amaranth pool. More wells will be drilled on the edges of the pool and whether they are Omega operated or not; they likely will be incorporated in the pressure maintenance scheme.

In keeping with this reasoning, the proposed expansion should not be viewed as a situation where anything that is not included now will never be pressure maintained.

Assuming that we agree on this principle we can address ourselves to the specific well locations you mentioned in your July 12 letter:

a) 10-30-1-25 WPM - A program has been prepared and we have already drilled this location.
b) 12-30-1-25 WPM - Reviewing the relative merits of recompletion versus re-drilling. Re-drilling looks favourable.
c) 9-13-1-26 WPM and 16-13-1-26 WPM - Our mapping indicates that these locations are very poor Lower Amaranth prospects. We have no plans to drill these wells at present.
d) 13-12-1-26 WPM - Production results from both 16-11 and 14-12-1-26 WPM have been disappointing. Therefore 13-12 is not expected to be an economic candidate for drilling.

3) Pressure Measurements

Omega to survey the pressures at 14 of wells that are not to be converted to injection at the time that they are converted to supply a base line pressure survey. Surveying wells as they are converted would be least expensive and would offer direct comparisons. The following is the list of wells we would suggest to survey:

1)	13-24-1-26 WPM	8)	5-30-1-25 WPM
2)	7-27-1-26 WPM	9)	7-24-1-26 WPM
3)	13-26-1-26 WPM	10)	7-23-1-26 WPM
4)	16-22-1-26 WPM	11)	15-14-1-26 WPM
5)	13-31-1-25 WPM	12)	15-13-1-26 WPM
6)	5-31-1-25 WPM	13)	5-13-1-26 WPM
7)	15-30-1-25 WPM	14)	16-11-1-26 WPM

4) Accepting Other Operators' Produced Water

At our operators' meeting of August 4 we stated that Omega could entertain specific proposals to dispose of produced water from other operators. To date no such requests have been made.

In consideration of any such proposals due consideration must be given to:
a) Water quality and compatibility with existing produced water in our system.

3/.....

b) Omega's ability to handle this water; e.g. without approval to expand the waterflood we have enough problems disposing of our own water.
c) Suitable formula for cost sharing.

If these hurdles can be passed Omega has no problem with the principle of accepting other operators' produced water and in fact would prefer not to have to re-activate the 11-29 source well.

5) Pilot Waterflood

As detailed in our letter of August 2nd where we submitted pattern-by-pattern voidage calculations and graphical presentation of the production data we believe our early results from the pilot are very encouraging.

In addition to this production data we will be forwarding very soon our report on the analysis of the recent injection well pressure leak off tests done on the four pilot water injection wells. The extrapolated p* from all the tests were all very close to 700 psig bottom hole and it is anticipated that the analysis will yield $\bar{p}$ (average pressure) of several hundred pounds more.

6) Waterflood Recovery versus Gasflood Recovery

While Omega feels comfortable with the recent model study's predictions of ultimate recovery for primary and waterflood we have suggested that the present model study understates the recovery for gas flood. The difficulty with this, as you have suggested, is how to quantify the possible upside potential of gas flooding.

We are suggesting that upside potential of gas flooding is a result of three factors.

a) Conservation of the gas for possible future use.
b) Additional oil recovery derived from future depletion of the gas bubble.
c) Additional LPG production that will result from the stripping of the uncovered oil by the recycled lean gas.

On these first two points it is very difficult to forecast their effects because they are solely based upon the possibility of a future gas market. Our reservoir engineering consultant has suggested that theoretically there is no impediment to following a gas flood with water to displace the gas bubble and to further enhance the oil recovery. Considering the great expense of computer modelling and the fact that the accuracy of our prediction is greatly dependent on what assumptions we make about the later life of gas flooding, we believe that after we monitor the early results of gas flooding on the project area we will be better able to make the later life assumptions. Omega would also like to know the answer to this question but until we have a clearer indication of what gas marketting strategies are appropriate, it does not appear to be a worthwhile effort.

4/.....

Omega intends on doing a compositional model study to determine the magnitude of the LPG stripping effect. We have not yet run it for a number of reasons:

a) Before initiating a new reservoir study, we wished to confirm the area that would be gas flooded so that we could model that area.
b) We hoped to improve on our initial model study by including some history matching of the early gas flood period.
c) We also hoped that by deferring this study we may be able to have a better indication of future gas markets and therefore incorporate a gas bubble depletion phase in the study.

Omega would be monitoring the LPG content of the gas produced from the gas flood area which further help to refine the future model study. We have reason to believe that in one to four years after initiating gas flooding that we will be faced with some gas plant limitations and may need to make significant capacity improvements. Due to the dollar magnitude of these decisions we would like to make the compositional model study as accurate as possible and to defer its implementation until we have a better indication of the need for future gas plant modifications. In other words; if this work is done now, it would most certainly be outdated when we needed to make these gas plant decisions and we would simply have to re-do it or review it.

7) Changing from gas to Water Injection

As we have indicated in our application there is a possibility for the need to change some wells from gas injection to water injection after approximately two years of gas flooding. We basically agree with the recommendation of the model study that additional model studies are necessary but because we feel we can benefit from deferring this additional modelling as discussed under point no. 6 and because we do not anticipate such a change before 2 years we prefer to conduct additional model studies when we are better informed.

It is not our intention to suggest the Board approve at this time any specific future modifications to our initial program, but to identify the possibility of these development and to provide in the resulting Pressure Maintenance Order for procedures for making required modifications in injection fluids after appropriate supporting information is supplied. Based on the experience of Dr. Flores these types of changes are feasible and potentially beneficial.

8) Quantitative Analysis of Gravity Effects

Your request more simply stated is for a field wide model study. In initial commissioning the model study that was presented with our application, we did consider this and subsequently decided against it. We were quoted an estimate to do such a study at a quarter of a million dollars. At this cost we were still faced with the inherent limitations of modelling an oil pool while it is still being developed; that is by the time the study is completed

it is out of date. Development assumptions are critical and because of the magnitude of the model each additional case run is very expensive. Not only would a study like this be expensive and likely inappropriate at this stage it would postpone any decision about pressure maintenance probably close to a year. The far less comprehensive study that we have already done took 6 months.

What appears to be at issue here is containment of injected gas. It is appropriate to re-iterate that the gas flood area is on a 9 spot pattern no different than the water flood. It is designed to pressure up the pool and prevent free gas evolution near the producing wells. The flood pattern will be essentially an areal sweep of the pool not a vertical displacement process. The layered nature of the reservoir dictates this approach and we remain confident that gas migration up dip will not be a problem particularly with the small angle of dip we have seen or experienced.

9) Maximum Allowable Injection Wellhead Pressures

Injection pressures in excess of fracture pressure are to be avoided and therefore because of the differences in hydrostatic head, the maximum wellhead pressure for a water injection well is correspondly less than that for a gas injection well.

10) Zone Definition

Zones A, B, C and D are defined in the well Omega Waskada 3-31-1-25 as follows:

Zone A	898.6 - 902.9	Metres	drilled	depth	
Zone B	902.9 - 907.3	"	"	"	
Zone C	907.3 - 912.3	"	"	"	
Zone D	912.3 - 920.2	"	"	"	(Top Mississippian)

These zones are correlatable through the study area on the gamma-ray log. They correspond to zones of sand development in a general sense but only Zone 'C' is a consistently developed sand. The C and D zones can be correlated throughout the entire S.W. Manitoba area but the 'A' and 'B' zones are subject to rapid changes in shale content and have a more local distribution.

11) Extrapolation of Model Study to Field

This approximation was done in three steps:

a) Extract the raw production/injection data versus time from the model study for each of the three depletion cases. By interpolation determine the production/injection values at convenient time step points (i.e. every 6 months) with time =0 set at day 1219 of the model study the day of the start of injection and the first round of development wells come on.

b) Determine the sum of the net active well porosity-footage for each time point of the data so that the model data could be adjusted to negate the effects of the sequential development used in the model. For example in year one of the developed prediction (i.e. day 1219 to day 1584 of the model study)

there was a total of 6062 porosity-feet of active wells; starting at the beginning of year two to the end there were 9898 porosity-feet of active wells. By dividing the model prediction by total active porosity feet the model was normalized for a constant active porosity-footage.

c) The area of the pressure maintenance scheme was divided, on a pattern basis, into gas flood area, water flood area and potentially converted areas. For each area the porosity-footages were added and then the sums were multiplied by the normalized predictions developed in step (b). Some simplifying assumptions were made on converted patterns and the individual predictions were added to yield a total field prediction.

While we recognize this technique is somewhat simplified we feel comfortable with the end product as our current best estimate.

12) Geological Variations

The study area was selected to some extent on the basis that it is close to average for most field parameters. Zonation and stratification varies only slightly over the field. Porosity thickness varies across the field more on a local than regional basis. Water saturations tend to be higher in the west and lower in the central and southern portions of the field than in the study area. The effect of these variations are not known but should have little effect on the ratios of primary to secondary recovery.

13) Model Boundary Conditions

As shown in Table A-12 of the model study edge wells were included in the model as fractional wells consistent with the approach of no flow across the boundaries of a potentially larger flood area.

14) History Matching

CMG represents a group of reservoir engineers experienced with computer simulations which will freely admit that simulation models for all their sophistication are not always able to resolve all production anomalies.

While there still was some discrepancies between the predicted and the actual data the overall correlation was good. Fine tuning the existing model study while it may improve the decimal accuracy of the study will under no circumstances, alter the main recommendation of the study which was to start pressure maintenance as soon as possible.

Further model studies will be undertaken as the need arises. We have already identified work that will be undertaken later that would be done when more history is available to match to.

15) Corrosion Control

Cathodic protection is currently being installed on all wells tied into the gathering system. The anode beds will protect not only the wells themselves

but also their connecting pipelines.

Corrosion coupons are being monitored and chemical programs monitored and adapted as required.

16) Production Allowables

It would be our intent to apply for exemption from production allowables for wells within the pressure maintenance scheme. As you know production allowables for wells in the program area but outside the existing pilot waterflood pattern are not generally curtailed by allowable limits. Their ability to produce is lower than the allowable limit and therefore if that situation should change through implementation of pressure maintenance, we would feel that allowable restrictions would be inappropriate.

SUMMARY

We hope that this letter adequately addresses your concerns. As you know we are anxious to begin injecting water particularly, because we once again are well limited on our water disposal system and are growing concerned about the amount of water being injected into the Mississippian wells at 6-30 and 1-30-1-25 WPM.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse for

George E. Patey
V.P. Production

GEP/WEW/ms

cc: T. J. Hall
E. Wyse
B. Dubreuil, Petroleum Branch - Manitoba

MANITOBA
DEPARTMENT OF ENERGY AND MINES

THE OIL AND NATURAL GAS CONSERVATION BOARD
309 LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

JUL 12 1983

Omega Hydrocarbons Ltd.
630 - 330 - 5th Ave. S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. Ed Wyse

Dear Sir:

Re: Expansion of Waskada Pressure Maintenance Operations

Your application for expansion of the pressure maintenance scheme in the subject pool has been reviewed in some detail. While the Board is in general agreement that some form of pressure maintenance is probably required in the Waskada Lower Amaranth A Pool, we have a number of questions and comments with respect to the application. These are indicated below:

1) Figure 1 to this letter shows the current status of non-confidential wells which have produced oil from the Lower Amaranth A Pool. Also shown to illustrate the amount of development are all locations, wells being completed and confidential wells. Included on the Figure is an indication of working interests in the area immediately offsetting the proposed Unit expansion. It is noted that although Omega does have the dominant position in the pool, there are several other operators having land in critical areas. Notable among these is the NE¼ of Section 26-1-26 (WPM) (operated by Roxy Petroleum Ltd.) which contains a first line offset to existing water injection (i.e.: Roxy et al Waskada 9-26-1-26 (WPM)) and which would be surrounded on three sides by Unit lands under the proposed expansion. Another area of concern is the area to the south and east of the proposed Unit, operated by New Scope and Chevron, which has been successfully developed in the Lower Amaranth. In summary, the Board is concerned that inclusion of offsetting tracts operated by working interest owners other than Omega has not been given due consideration. Although it is understandable that Omega may wish to maintain a "competitive advantage" over the other operators, it is, in the opinion of the Board, more important that all working interests cooperate to ensure maximum ultimate recovery from the pool. Omega, as the major operator in the area has, in the Board's opinion, the responsibility of initiating discussions with the other parties involved. It is recognized that inclusion of other working interests will extend, to some degree, the Unit negotiation

process and consequently, we request Omega take immediate action to initiate appropriate discussions.

2) Further with respect to the proposed Unit enlargement, it would appear that development and inclusion of certain tracts (notably Lsd's 10 and 12 of Section 30-1-25 (WPM), Lsd's 9 and 16 of Section 13-1-26 (WPM) and Lsd. 13 of Section 12-1-26 (WPM) would result in more complete and regular patterns. We are particularly concerned with respect to Lsd. 12 of Section 30-1-25 (WPM) as your proposal would result in injectors directly north and south with no withdrawal point to minimize oil trapping. Also inclusion of Lsd. 13 of Section 12-1-26 (WPM) would eliminate the need for the off pattern injector in Lsd. 16 of Section 11-1-26 (WPM).

3) The trend of declining reservoir pressure was well documented in the current pilot waterflood area. Does Omega have any actual data to quantify the degree of pressure depletion in any other parts of the proposed expansion? Further to this, what are Omega's specific plans to obtain reservoir pressure data prior to expansion of the flood area?

4) Table 1 of your application indicates substantial amounts of make-up water will be required. Has any consideration been given to providing these make-up volumes by accepting produced water from other operators in the area as opposed to reactivation of a supply well?

5) With respect to the pilot waterflood, what specific positive signs have been noted to date? Review of your production data through May 1983 indicates no general oil rate response and with some indication of water breakthrough at 1-25 and at 12-24.

6) The computer model study indicates that gas flood recovery is some 6 percentage points less than waterflood recovery. In your application you imply that when liquid recovery through recycling of lean gas is taken into account, the recoveries are equivalent. What, if any, calculations have been made to quantify the effect of liquids recovery on the gas flood recovery prediction?

7) Your proposal indicates the likelihood of changing from gas to water as an injection fluid at specific wells during the course of the project. Have the possible detrimental or beneficial effects of this been considered (e.g.: relative permeability induced injectivity problems, trapped saturations etc.)? We note that Recommendation No. 4 on Page 3 of the computer model study suggests additional model studies would be necessary to assess the effects of a change in injection fluid.

8) A quantitative analysis of the gravity related effects of injecting gas downdip of water injection is requested.

9) What are the reasons (corrosion related?) for the difference in maximum allowable wellhead pressures between gas and water injection?

10) Please provide a definition of the zones A B C and D used in your model study.

11) Please elaborate on the method of extrapolating model projections to the model area providing a specific example.

12) How does zonation, stratification, porosity thickness and saturations compare from the study area to the proposed project area? What are the probable effects of any variations noted on the model study results?

13) What boundary conditions were imposed on the model (e.g.: no flow, calculated influx or eflux, etc.)?

14) In spite of a comment in the model study that a good history match was obtained, review of Table B-2 of the study indicates substantial discrepancies between calculated and observed data. Has any further work been done to improve the history match, and therefore reliability of the model, using more recent field observed data?

15) What are the corrosion mitigation features of the project, particularly with respect to expansion of the test cathodic protection system described in correspondence relating to the pilot waterflood?

16) Do you intend to make application for exemption from production allowables for the area of the expanded project?

While the list of comments and questions is quite lengthy, it is felt that all of the above points must be addressed in a more complete manner to allow a complete evaluation of your application. Consequently, we will hold your application pending receipt of your response to this letter.

With respect to another related matter, the Board notes with concern that a number of wells within the pilot waterflood area are producing at rates greatly in excess of the production allowable, even though demonstration of compliance with the qualifying terms of Board Order No. 69A with respect to pressure levels and voidage replacement has not been provided. Consequently, you are requested to either demonstrate such qualification at your earliest convenience or alternatively, to restrict production to allowable levels.

Yours sincerely,

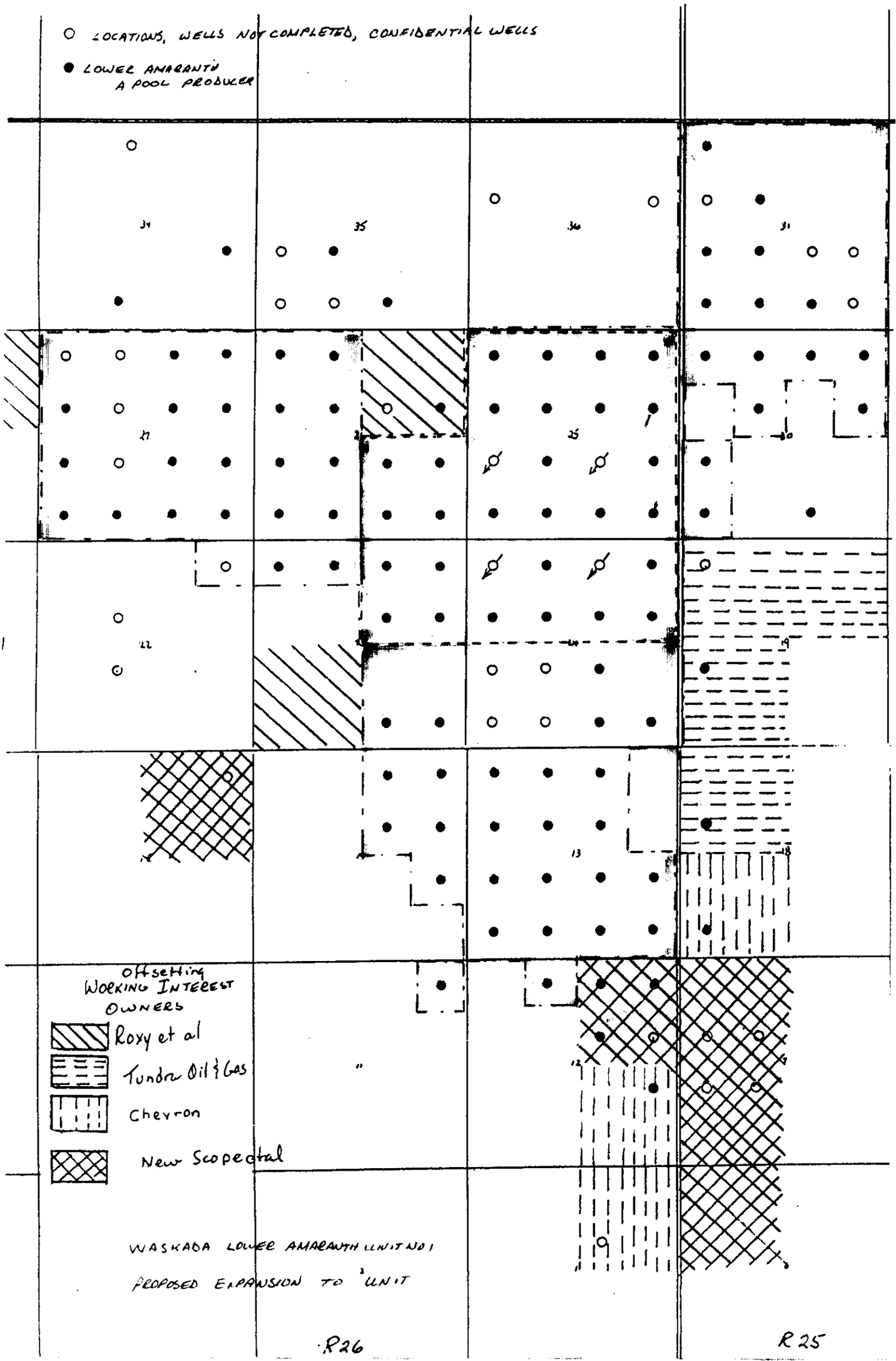
Marc Eliesen

Marc Eliesen
Chairman

cc: - Ian, Haugh, Deputy Chairman
- J. F. Redgwell, Member
- Petroleum Branch

LRD/HCM/sb

FIGURE NO. 1


○ LOCATIONS, WELLS NOT COMPLETED, CONFIDENTIAL WELLS
● LOWER AMARANTH A POOL PRODUCER
34
35
36
31
27
25
22
13
12
Offsetting Working Interest Owners
Roxy et al
Tundra Oil & Gas
Chevron
New Scopectal
WASKADA LOWER AMARANTH UNIT NO 1
PROPOSED EXPANSION TO UNIT
R26
R25

June 30, 1983

Ocean Hydrocarbons Ltd.
630 - 330 - 5th Avenue S.W.
Calgary, Alberta
T2P 0L4

Attention: Ed Wyss,
Petroleum Engineer

Dear Sir:

Re: Application to Expand Pressure Maintenance of the Westaskiwin Lower Mannville A Pool

The Board acknowledges receipt of your application dated June 23, 1983 to expand pressure maintenance of the Westaskiwin Lower Mannville A Pool by a combination of water and gas injection.

Your application is being reviewed and you will be notified in due course of its status.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

Hans Hinsen
Chairman

HCH/lk

c.c. Dr. I. Waugh, Deputy Chairman
J. F. Hedgcoll, Member

b.c. Petroleum Branch

DATE: July 8, 1983

MANITOBA

TO: Marc Eliesen
Deputy Minister
Dept. of Energy & Mines
309 Legislative Bldg.

FROM: H. Clare Moster

Dept.:

Branch: Petroleum

Address:

Telephone:

- ( ) Take action
- ( ) Circulate
- ( ) Per your request
- ( ) See me re attached
- ( ) Call me on this matter
- ( ) For your information
- ( ) Investigate and report
- ( ) Supply data for my reply
- (X) For your revision or approval
- ( ) Reply direct with copy to me
- ( ) Return with comments or recommendations
- ( ) Draft reply for signature of:

COMMENTS:

Deficiency letter to Omega with respect to Omega's application to expand their waterflood/gas flood project at Waskada.

PS-f-182 (Transmittal/Route Slip)

HYDROCARBONS Ltd.
TELEPHONE: (403) 261-0743
630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

June 23, 1983

The Oil and Natural Gas Conservation Board
989 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Dr. Ian Haugh
Deputy Chairman

Dear Sir:

RE: Application to Expand Pressure Maintenance of the Waskada Lower Amaranth Pool

The following submission is Omega Hydrocarbons Ltd.'s formal application to expand pressure maintenance of the Waskada Lower Amaranth Pool by a combination of water and gas injection. While we have attempted to cover in this application all the critical features of our proposal we would be happy to supply any other additional information that the Board may require in order to make its decision.

PRIMARY CONSIDERATIONS

The proposed scheme has been developed with due consideration of the following objectives:

1) Maximize oil recovery. Injection of water or gas will reverse the trend of declining reservoir pressure.

2) Maximize energy conservation. Reservoir energy will be maximized by repressuring the pool and thereby minimizing the production of excess solution gas. Gas re-injection will conserve that resource for its possible future use.

3) Minimize environmental impact. The proposed Waskada LPG Recovery Plant will incorporate stock tank vapour recovery and approval of this pressure maintenance scheme will allow Omega to re-injection a majority of the solution gas that is currently being flared.

4) Maximize flexibility. In order, to meet the above stated objectives; to accommodate other future development in the area; and, to balance produced to injected volumes of water and gas it is imperative to allow for a flexibility of design in order that injection water can be substituted for gas and vice versa.

SUPPORTING FACTORS

1) Oil production rates from the portion of the Lower Amaranth Pool under primary depletion continue to decline and the producing gas-oil ratio currently averages approximately twice the solution gas-oil ratio. Both of these factors are consistent with the recent pressures surveyed within the pilot water flood area indicating the need for pressure maintenance as soon as possible.

2) The pilot waterflood of the Lower Amaranth has been on injection since February 25, 1983. Early indications of improved oil production suggest that this scheme will be successful. Water production has increased but still remains below the field average and therefore is of no immediate concern. While produced gas-oil ratios have not yet declined this is anticipated to occur within the next few months.

3) A portion of the Lower Amaranth Pool has recently been modelled using a three dimensional black oil computer simulator, BLAKO to determine the relative merits of three depletion mechanisms. Primary depletion, water flooding and gas flooding were modelled indicating, for the study area, respective oil recoveries of 12.2%, 28.4% and 22.3%. Noteworthy is that both secondary recovery schemes roughly doubled oil recovery and that the gas flood study did not incorporate a gas blow down phase. It is expected in the gas flood area during a blow down phase that oil recoveries would be improved from the 22.3% figure and also that the incremented recovery of LPG liquids by the recycling of lean gas, which has not been quantified here should offset the apparent difference in oil recovery between water flooding and gas flooding.

PROPOSED SCHEME

It is proposed that as much of the area indicated within the heavy dotted line on Figure 1 that can be drilled, completed and unitized by the fall of 1983 be included in this approval.

With adequate provisions for substitution of injection fluids Omega requests approval to inject water in the following Lower Amaranth locations:

WATER INJECTION WELLS

1) 15-31-1-25 WPM (Not yet drilled)
2) 13-31-1-25 WPM
3) 7-31-1-25 WPM (Not yet completed in the Lower Amaranth)
4) 5-31-1-25 WPM
5) 15-30-1-25 WPM
6) 13-30-1-25 WPM
7) 5-30-1-25 WPM

8) 15-25-1-26 WPM
9) 13-25-1-26 WPM
10) 7-25-1-26 WPM (Currently approved as a pilot injection well)
11) 5-25-1-26 WPM (Currently approved as a pilot injection well)
12) 15-24-1-26 WPM (Currently approved as a pilot injection well)
13) 13-24-1-26 WPM (Currently approved as a pilot injection well)
14) 15-23-1-26 WPM
15) 16-22-1-26 WPM
16) 5-26-1-26 WPM
17) 7-26-1-26 WPM
18) 13-26-1-26 WPM
19) 5-27-1-26 WPM
20) 7-27-1-26 WPM
21) 13-27-1-26 WPM (Not yet completed in the Lower Amaranth)
22) 15-27-1-26 WPM

and to inject gas in the following Lower Amaranth locations:

GAS INJECTION WELLS

1) 16-11-1-26 WPM
2) 5-13-1-26 WPM
3) 7-13-1-26 WPM
4) 13-13-1-26 WPM
5) 15-13-1-26 WPM
6) 15-14-1-26 WPM
7) 7-23-1-26 WPM (Not yet completed in the Lower Amaranth)
8) 5-24-1-26 WPM (Not yet completed in the Lower Amaranth)
9) 7-24-1-26 WPM

At this point, our production/injection forecasts indicate that after roughly two years of gas injection Well 7-24 would be converted from gas injection to water injection due to a shortage of injection gas and that roughly six months later 7-23 would be converted. The balance of the gas injection wells would remain on gas injection at least for the seven year forecasted period.

Because of the difficulties in attempting to balance produced gas volumes to injected gas volumes it will generally be attempted to keep available lean gas volumes slightly greater than the required injection volumes and that excess gas be flared rather than overinjected into the reservoir.

MEASUREMENT, MONITORING AND CONTROL

Oil, water and gas produced will continue to be measured at test satellites and prorated to the battery as per our current practice.

Injection water and injection gas will be measured for each individual well; in most cases within the satellite buildings on each lease.

Injection pressures will be routinely monitored and recorded by pressure guages installed with the injection meters. It is proposed

that static reservoir pressures be monitored by implementing a program of rotating injection well pressure fall off tests. This type of program would supply accurate static pressure data for the whole pool under pressure maintenance without the economic burden of lost production. Surveying injection wells is considered superior also in that it should be more accurate than acoustic well sounder tests on producers and does not necessitate pulling bottom hole pump and rods.

Injection volumes will be targetted based upon voidage calculations routinely done on a pattern-by-pattern basis. For the purpose of these voidage calculations the injection patterns illustrated on Figure 2 will be used. Calculations done in the model study and the experience of the pilot waterflood indicated that there should be no problem in achieving sufficient injectivity to meet voidage replacement requirements, however, maximum injection wellhead pressures will be limited to 10,000 kPa for water injection wells and 17,000 kPa for gas injection wells.

PRODUCTION/INJECTION FORECASTS

The Production/Injection Forecast detailed on Table 1 represents Omega's best estimate at this time for the first seven years of the project. The forecast has been generated based upon the CMG Model Study with adjustments for eliminating the development drilling effects contained in the Study. The projections of the Study were extrapolated to the project area using a type-curve approach and net porosity-foot multiples.

In order to check the validity of this extrapolation a check was done against the May, 1983 production from those Lower Amaranth wells already on production in that month. In the month of May, Lower Amaranth wells in the project area produced 11,289.9 m^3/oil, 9,979.8 m^3 water and 1,153.9 km^3 gas. When the proposed injection locations are eliminated from the totals the volumes are 9.620.0 m^3 oil, 8,559.5 m^3 water and 968.2 km^3 gas. On the basis of porosity-footage approximately 70% of the project area was on production in May; 30% having yet to be drilled or recompleted for. Adjusting for this the projected volumes are, for one month, 13,724 m^3 oil, 12,211.2 m^3 water and 1,381.3 km^3 gas. These volumes compare favourably to the forecasted volumes as follows:

	Initial Production based on May/83 Figures	Initial Production based on CMG Study
Oil (BOPD)	2785	2769
Water (BWPD)	2478	2315
Gas (MMCFD)	1.58	1.26

You will note that produced lean gas (ie. after LPG recovery and compression) is 27% less than the produced raw gas, accounting for

surface loss and shrinkage. You will also note that due to difficulties in matching produced gas volumes to injected volumes there is a projected need to flare gas in order to prevent over injection of gas and any resulting channelling problems.

Produced volumes from non-unit wells directly impact on the proposed scheme in the availability of injection water and gas. It should be noted that these volumes are only very roughly forecasted in large measure due to the unpredictability of these volumes. This is the single biggest reason for Omega's request for a large degree of flexibility in the Pressure Maintenance Order that may result from this application.

UNITIZATION

It is expected that the majority of the required drilling and recompleting of Lower Amaranth wells in the project area will be completed by the end of June. Efforts will begin immediately in July to form the Unit(s) required to implement this plan. This unitization effort will impact on this application only insofar as certain well or wells may have to be culled from the approval (for addition at some later time) if they remain undrilled or if efforts to include them in the Unit(s) are unsuccessful.

SUMMARY

There is every indication of an immediate need for full scale pressure maintenance of the Lower Amaranth Pool. Lean processed gas is expected to be available for reinjection by the end of November or the beginning of December. Water injection facilities are virtually in place now. Unitization efforts are on going and are expected to be completed in September. Approval of this basic pressure maintenance plan will allow a smooth transition to a full scale project and will accomplish all the stated objectives.

Enclosed, in support of this application is a copy of the CMG report, Waskada Model Study - Lower Amaranth Pool, dated May, 1983.

Please direct any comments or questions to the undersigned or to Mr. George Patey, Vice-President of Production (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

Ed Wyse
Petroleum Engineer

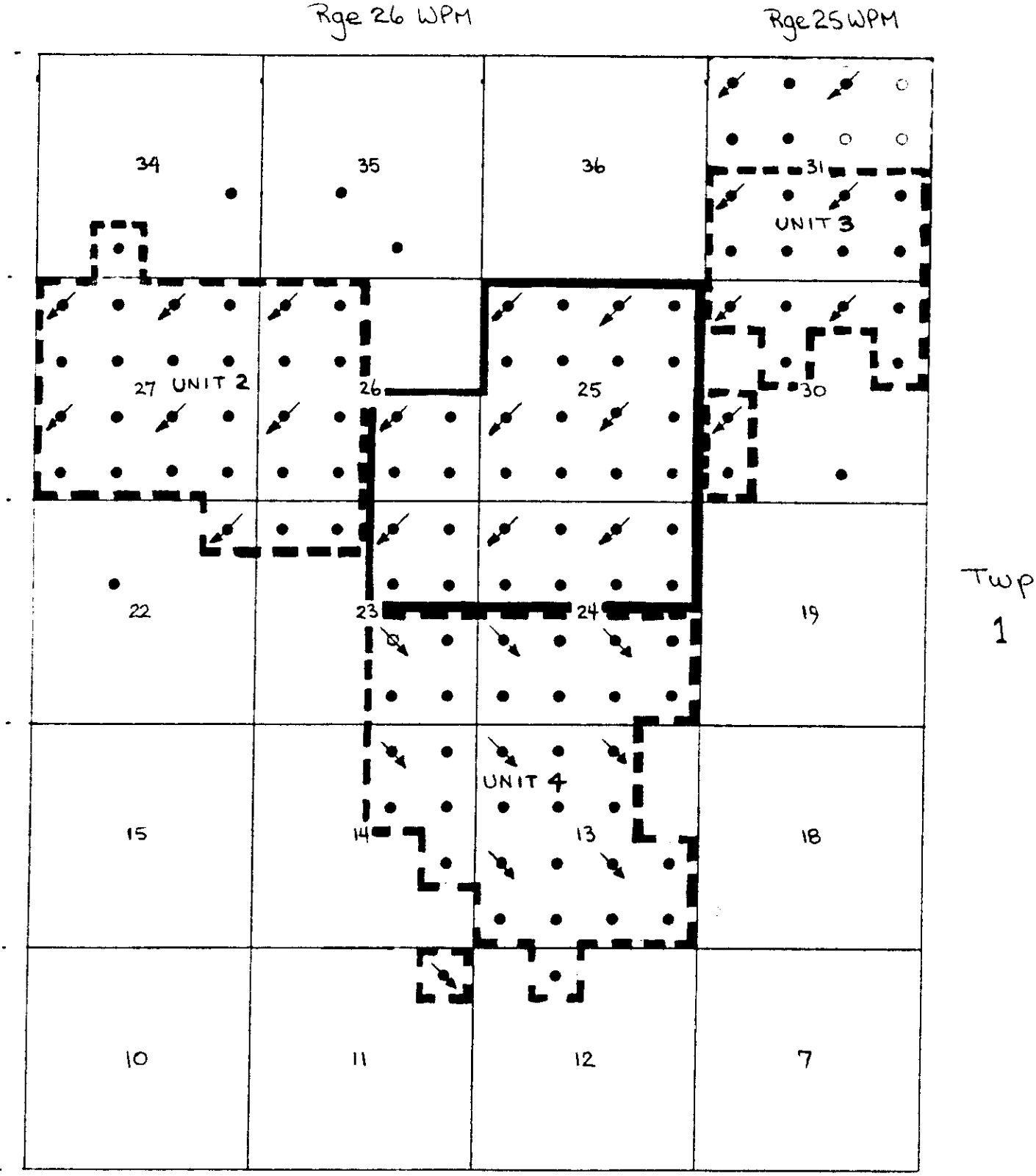
EW/sp

cc: B. Dubrieul, Petroleum Branch
G. Patey
J. Hall

FIGURE 1

GAS INJECTION

WATER INJECTION

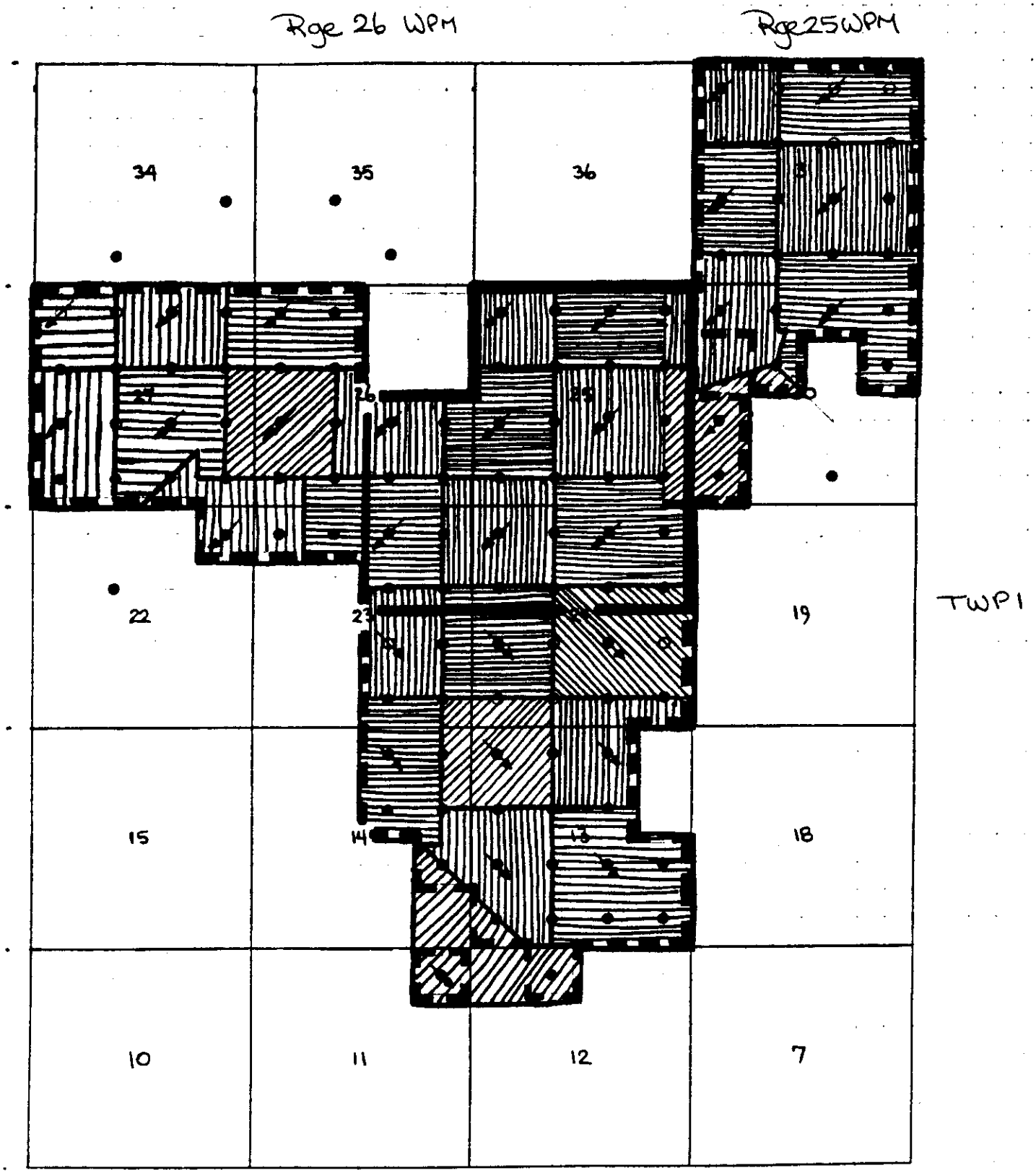


Present Waskada Lower Amaranth Unit No. 1

Proposed Unit(s) Outline

June 22/83
revised Sep 8/83

FIGURE 2



June 22/83

TABLE 1
PRODUCTION/INJECTION FORECAST
WASKADA PRESSURE MAINTENANCE PROJECT

TIME PERIOD (YRS)	PRD'D UNIT OIL (BOPD)	PRD'D UNIT WATER (BWPD)	OTHER PRD'D WATER (BWPD)	INJ'D UNIT WATER (BWPD)	MAKE UP WATER REQ'D (BWPD)	PRD'D UNIT RAW GAS (MMCFD)	OTHER PRD'D RAW GAS (MMCFD)	TOTAL LEAN GAS (MMCFD)	INJ'D UNIT RAW GAS (MMCFD)	FLARED LEAN GAS (MMCFD)
0-0.5	2769	2315	837	6088	2936	1.26	0.50	1.29	0.71	0.58
0.5-1.0	2905	2505	797	4684	1381	1.35	0.60	1.42	0.94	0.48
1.0-1.5	3031	2727	780	4243	736	1.59	0.71	1.68	1.31	0.37
1.5-2.0	2927	2852	689	4261	720	2.05	0.82	2.09	1.86	0.23
2.0-2.5	2934	2978	643	4368	747	2.65	0.85	2.56	2.75	<0.19> Convert 7-24
2.5-3.0	2935	3154	522	4767	1091	3.45	0.79	3.09	3.52	<0.43> Convert 7-23
3.0-3.5	2895	3457	481	5162	1224	4.09	0.76	3.54	2.83	0.71
3.5-4.0	2787	3618	419	5291	1254	4.52	0.69	3.80	3.25	0.55
4.0-4.5	2714	3747	356	5443	1340	4.91	0.61	4.02	3.75	0.27
4.5-5.0	2569	3870	290	5571	1411	5.09	0.51	4.09	4.00	0.09
5.0-5.5	2421	4109	268	5697	1319	5.59	0.48	4.43	4.38	0.05
5.5-6.0	2285	4169	230	5718	1319	5.59	0.42	4.39	4.48	<0.09>
6.0-6.5	2114	4268	214	5790	1309	4.97	0.40	3.92	3.54	0.38
6.5-7.0	1961	4379	199	5867	1289	4.42	0.38	3.50	2.80	0.70

June 24/83

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

October 30, 1985

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Pressure Maintenance Operations
Waskada Lower Amaranth A Pool

Enclosed is Board Order No. PM 45 authorizing water injection operations in the following Units:

Waskada Lower Amaranth Unit No. 1
Waskada Unit No. 2
Waskada Unit No. 3
Waskada Unit No. 4
Waskada Unit No. 5
Waskada Unit No. 8

This Order provides approval of your recent applications for pressure maintenance operations in Waskada Unit No. 8, conversion of the four remaining gas injectors in Waskada Unit No. 4 to water injection and conversion of two producing wells in Waskada Unit No. 4 to water injection.

Further to the Board's letter of October 17, 1985 requesting alternatives to flaring the produced gas, please note that the subject approval of conversion from gas to water injection in Waskada Unit No. 4 is contingent upon your timely response to that letter (i.e. prior to December 1, 1985).

....2

Further, please note that subclause 1(4) of Board Order No. PM 45 stipulates that "the completion of the wells referred to in subclause (1) will be as prescribed by the Director of the Petroleum Branch". You are consequently required to submit completed applications for each well to be converted (using form MG 416) for approval of the proposed recompletion program, prior to conversion of the wells to injection.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang,
Chairman

LRD/lk

c.c. Petroleum Branch

PS-I-25

Manitoba

Memorandum

Date: October 25, 1985

To: The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
J.F. Redgwell - Member

From: H. Clare Moster
Director, Petroleum Branch

Telephone:

Subject: Board Order No. PM45 - Waskada Lower Amaranth A Pool

First | Fold

Attached and recommended for approval is Board Order No. PM45 authorizing pressure maintenance by water injection in the following Units in the Waskada Field:

Waskada Lower Amaranth Unit No. 1
Waskada Unit No. 2
Waskada Unit No. 3
Waskada Unit No. 4
Waskada Unit No. 5
Waskada Unit No. 8

This Order replaces Board Order Nos. PM40, PM41 and PM42 all of which are rescinded by Board Order No. PM45 and encompasses all pressure maintenance activities conducted by Omega Hydrocarbons Ltd. in the Waskada Lower Amaranth A Pool. The Order also approves the conversion of four (4) gas injection wells in Waskada Unit 4 to water injection.

The terms and conditions of the Order are operationally identical to those included in the Orders being rescinded.

Original Signed By
L. R. [illegible]

for H. Clare Moster

Manitoba

Clare one small typo on first page BD

Action / Route Slip

Date: October 16, 1985

To: G. Yost, Director
Legal Translation Services
6th Floor, 177 Lombard Ave.

From: H. Clare Moster
Director, Petroleum Branch
555 - 330 Graham Ave.

Telephone: 945-6573

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

Comments: Re: Oil and Gas Board Order PM 45

Further to my memo to you dated October 10, 1985 attached is the final draft of the subject Order for translation.

Please call Linda (@ 6577) when ready to be picked up by courier.

MCL 1298 PS 1-132

PS-1-25

MANITOBA
Inter-Departmental Memo

Date October 10, 1985

To G. Yost, Director
Legal Translation Services
6th Floor, 177 Lombard Avenue

From H. Clare Moster
Director, Petroleum Branch
Dept. of Energy & Mines
555 - 330 Graham Avenue

Telephone

Subject OIL AND GAS BOARD ORDER PM 45

First Fold

Attached is a copy of a draft Order No. PM 45 for The Oil and Natural Gas Conservation Board.

Please have the order translated into French and returned to this office at your earliest convenience.

This first draft of this order was initially passed by the Board on October 3, 1985 but we have subsequently been informed by Deputy Legislative Counsel that such orders need be prepared in both languages and simultaneously passed and filed as regulations. Therefore, there is an urgency to have the translation completed as quickly as possible. Please call this office (Linda @ 6577) when translation completed so we can arrange for courier pick-up and delivery.

Original Signed by H. C. Moster

H. Clare Moster

HCM/lk

Manitoba

RUSH/URGENT

Action / Route Slip

Date: OCTOBER 10, 1985

To: CLARE MOSTER

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

OCT 10 1985

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

Comments: Per our discussion, please have the attached Oil & Natural Gas Conservation Board No. PM 45 translated and re-submitted at your earliest convenience.

Thank you.

Barb Z.

MG 1298 PS I 182

Manitoba

Memorandum

Date
October 7, 1985

To
R. B. Chenier, Deputy Miniser,
Energy and Mines,
309 Legislative Building.

From
Andrew C. Balkaran, Q.C.,
Deputy Legislative Counsel,
116 Legislative Building.

Telephone
3986

Subject OIL & NATURAL GAS CONSERVATION BOARD NO. PM 45

The attached regulation has not been filed as it has to be translated and filed in both languages. If you have any questions, please give me a call.

A. C. Balkaran.

DEPARTMENT OF ENERGY AND MINES
Deputy Minister's Office
OCT 8 1985

ca

Enclosure

First | Fold

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 8, 1985

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

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 41 be amended to include two(2) additional injection wells. Since, the gasflood in Waskada Unit No. 4 has recently been terminated it is now our desire to complete the injection patterns which were previously opposed by Chevron Canada Resources Limited in October, 1983. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained in PM Order No. 41, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega Waskada Prov. 16-11-1-26 WPM
Omega Waskada 7-13-1-26 WPM

As operator of both the existing pressure maintenance scheme and the proposed expansion area we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing scheme.

Corrosion prevention methods within the waterflood expansion area will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned, to combat bacterial corrosion which has been an ongoing problem in Waskada.

.../2

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging 900 m^3/d while the two (2) existing source water wells are capable of producing an additional 500 m^3/d of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed expansion area. Since, Omega plans to continue expanding the waterflood into other areas of the Lower Amaranth pool one additional Blairmore source water well is scheduled to be drilled later this year. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Expansion Area
2) Lessee Map of the Expansion Area
3) Well Status Summary
4) Schematic Diagram of the Water Injection System
5) Notification of Surface Owners

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

R.A. Beamish/for

G.E. Patey
Vice President - Production

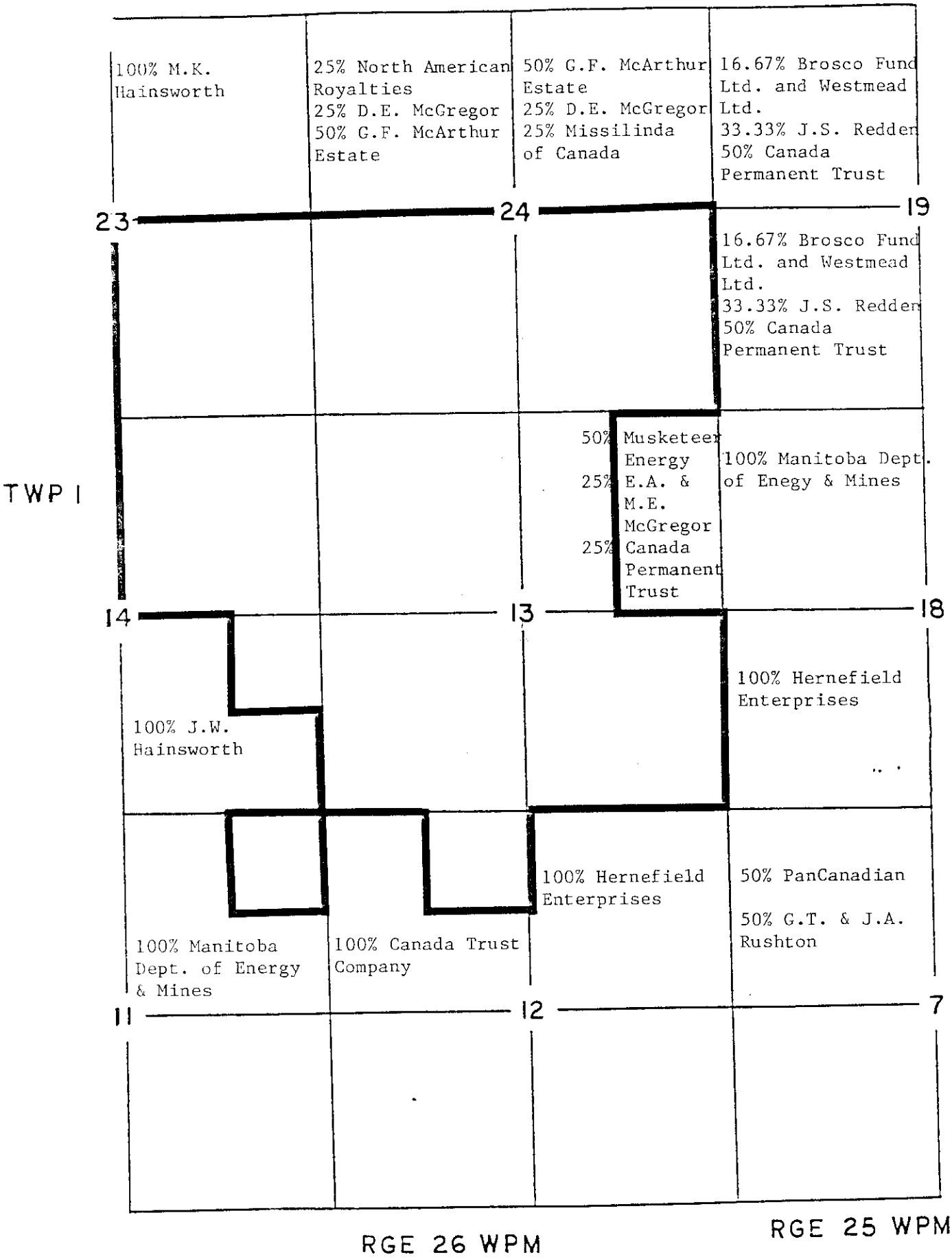
GEP:vb

Encl.

c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Gasflood Approvals File

Lessor Map In and Adjoining
Waskada Unit No. 4

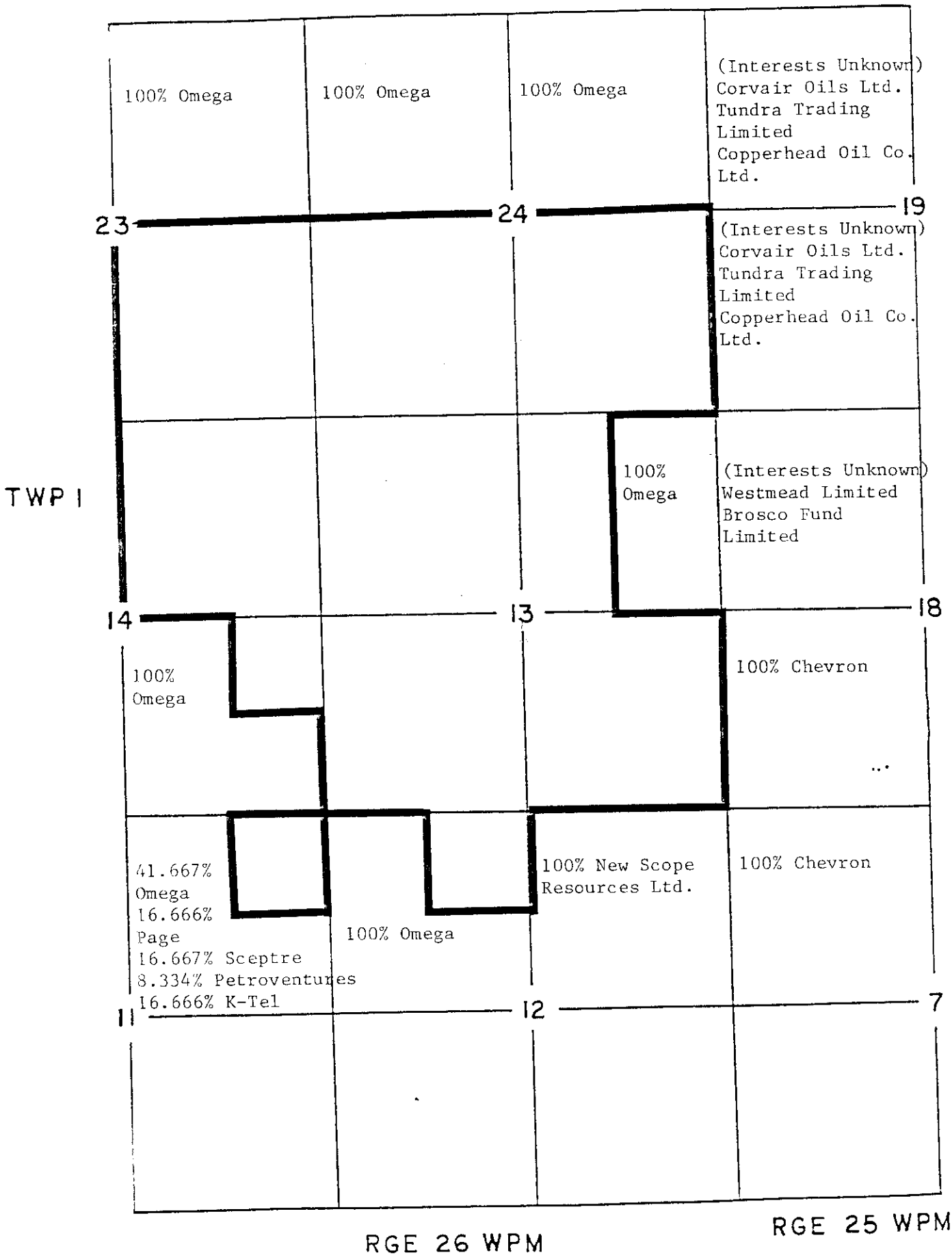
Attachment 1



Waskada Unit No. 4

Lessee Map In and Adjoining
Waskada Unit No. 4

Attachment 2



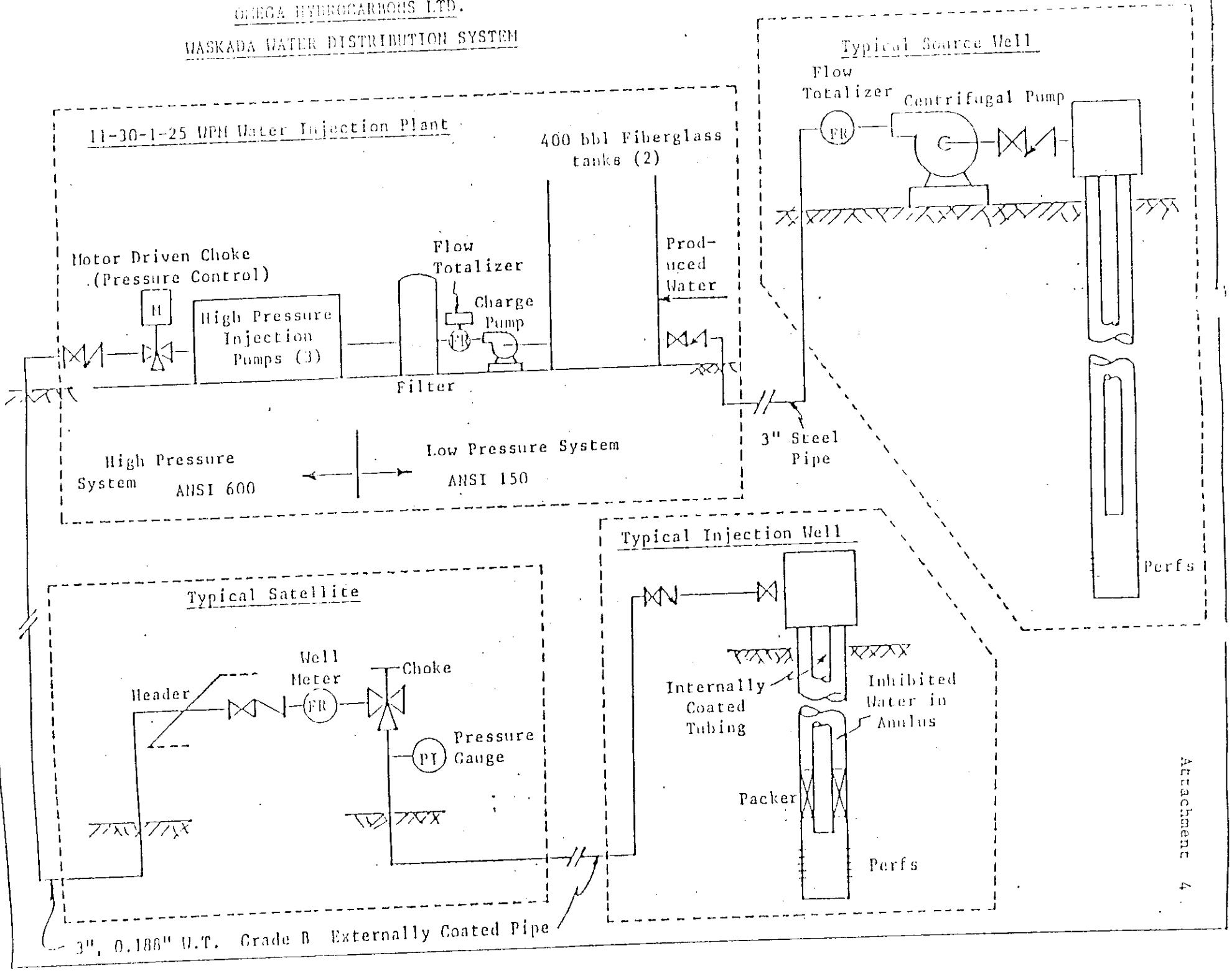
Well Status Summary
For Wells In and Adjoining
Waskada Unit No. 4

Well		Completed Zone	Status
13-7-1-25	WPM	Upper Alida	Producing Oilwell
13A-7-1-25	WPM	Lower Amaranth	Producing Oilwell
4-18-1-25	WPM	Lower Amaranth	Producing Oilwell
5-18-1-25	WPM	Lower Amaranth	Producing Oilwell
12-18-1-25	WPM	Lower Amaranth	Producing Oilwell
13-18-1-25	WPM	Tilston	Producing Oilwell
4-19-1-25	WPM	Lower Amaranth	Producing Oilwell
5-19-1-25	WPM	Lower Amaranth	Producing Oilwell
16-11-1-26	WPM	Lower Amaranth	Producing Oilwell
10-12-1-26	WPM	Lower Amaranth	Producing Oilwell
14-12-1-26	WPM	Lower Amaranth	Producing Oilwell
15-12-1-26	WPM	Lower Amaranth	Producing Oilwell
16-12-1-26	WPM	Lower Amaranth	Producing Oilwell
1-13-1-26	WPM	Lower Amaranth	Producing Oilwell
1A-13-1-26	WPM	Lower Alida	Producing Oilwell
2-13-1-26	WPM	Lower Amaranth	Producing Oilwell
3-13-1-26	WPM	Lower Amaranth	Producing Oilwell
4-13-1-26	WPM	Lower Amaranth	Producing Oilwell
5-13-1-26	WPM	Lower Amaranth	*Gas Injector
6-13-1-26	WPM	Lower Amaranth	Producing Oilwell
7-13-1-26	WPM	Lower Amaranth	Producing OIlwell
8-13-1-26	WPM	Lower Amaranth	Producing Oilwell
9-13-1-26	WPM	Tilston	Producing Oilwell
10-13-1-26	WPM	Lower Amaranth	Producing Oilwell
11-13-1-26	WPM	Lower Amaranth	Producing Oilwell
12-13-1-26	WPM	Lower Amaranth	Producing Oilwell
13-13-1-26	WPM	Lower Amaranth	*Gas Injector
14-13-1-26	WPM	Lower Amaranth	Producing Oilwell
15-13-1-26	WPM	Lower Amaranth	*Gas Injector
16-13-1-26	WPM	Tilston	Producing Oilwell
8-14-1-26	WPM	Lower Amaranth	Producing Oilwell
9-14-1-26	WPM	Lower Amaranth	Producing Oilwell
10-14-1-26	WPM	Lower Amaranth	Producing Oilwell
15-14-1-26	WPM	Lower Amaranth	*Gas Injector
16-14-1-26	WPM	Lower Amaranth	Producing Oilwell
1-23-1-26	WPM	Lower Amaranth	Producing Oilwell
2-23-1-26	WPM	Lower Amaranth	Producing Oilwell
6-23-1-26	WPM	N/A	Abandoned Well
6A-23-1-26	WPM	N/A	Abandoned Well
7-23-1-26	WPM	Lower Amaranth	Water Injector
8-23-1-26	WPM	Lower Alida	Producing Oilwell
8A-23-1-26	WPM	Lower Amaranth	Producing Oilwell
1-24-1-26	WPM	Lower Alida	Producing Oilwell
1A-24-1-26	WPM	Lower Amaranth	Producing Oilwell
2-24-1-26	WPM	Lower Amaranth	Producing Oilwell
3-24-1-26	WPM	Lower Amaranth	Producing Oilwell
4-24-1-26	WPM	Lower Amaranth	Producing Oilwell
5-24-1-26	WPM	Lower Amaranth	Water Injector
6-24-1-26	WPM	Lower Amaranth	Producing Oilwell
7-24-1-26	WPM	Lower Amaranth	Water Injector
8-24-1-26	WPM	Lower Alida	Producing Oilwell
8A-24-1-26	WPM	Lower Amaranth	Producing Oilwell

*Application has been submitted to convert to water injection.

OMEGA HYDROCARBONS LTD.

MASKADA WATER DISTRIBUTION SYSTEM



Attachment 4

Attachment 5

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 7, 1985

Surface Owner's
(addressee list attached)

Dear Sir/Madam:

Re: Waskada Unit No. 4
Proposed Waterflood Expansion

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to commence pressure maintenance operations at wells 16-11 and 7-13-1-26 WPM. The proposed project involves the injection of produced water into the previously mentioned wells to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be made based on the results of this project.

If you have any comments or concerns related to the proposed project, please contact either myself or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

R.A. Beamish, P. Eng.
Manager - Engineering

RAB:vb

c.c. Waskada Unit No. 4 File
Land Dept.

Surface Owners
Addressee List

William Lloyd McKinney
Box 70
Waskada, Manitoba
ROM 2E0

Edmond & Mary McGregor
Box 164
Waskada, Manitoba
ROM 2E0

PS-1-25

MANITOBA
Inter-Departmental Memo

Date August 9, 1985

To The Oil and Natural Gas Conservation Board

Charles Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Expansion of Pressure Maintenance Operations

Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons has made application for approval to conduct pressure maintenance operations by waterflooding in the area of the proposed Waskada Unit No. 8.

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Melita New Era and forwarded to working interest owners adjacent to the project (see Table No. 1 for list). A proposed Notice is attached.

If no objections or interventions are received to the notice, it is recommended that the application be approved and that Board Order No. PM 45 be issued authorizing pressure maintenance operations. A draft copy of the proposed Board Order is attached. It is proposed that the Board Order be written to authorize all unitized waterflood operations operated by Omega in the Waskada Lower Amaranth A Pool. This will result in administrative simplicity.

Discussion:

Omega Hydrocarbons Ltd. has developed an area on the northeast edge of the Waskada Lower Amaranth A Pool. Although this area, (see Figure No. 1) is slightly remote from the remaining developed part of the pool, its production characteristics appear somewhat similar to the area of the original pilot waterflood (Waskada Lower Amaranth Unit No. 1). This performance is characterized by high initial oil rates, low water production and a relatively rapid production decline. Calculations based on this type of performance indicate an ultimate primary recovery factor of less than 5%. By contrast, waterflood operations in the pilot area have shown very positive oil rate response with a minimum of water production. It is anticipated that ultimate recovery in this area will approach 25% of the original oil-in-place. Current recovery in the pilot area is about 7% of the original oil-in-place, and production parameters continue to be favourable.

....2

Because of similarity with the pilot area, it is expected that waterflood operations in the area of the proposed Waskada Unit No. 8 will result in a substantial increase in ultimate recovery for this area. Omega plans to continue use of the previously established inverted nine spot injection pattern and conduct all pressure maintenance operations in the same manner as previously approved waterflood projects. On this basis, in the absence of objections or interventions, approval of the application will be recommended.

Attachment No. 2 to Omega's application indicates offsetting working interest owners. However, the listed interests are the original lessees and do not reflect various farmout agreements by which other parties have obtained an interest. Although our information is not complete, some of these interests have been identified through well licensing. Table No. 1 is a composite list of known working interests in the area.

Clause 126(d) of The Petroleum Drilling and Production Regulations, 1984 requires that the operator of a proposed pressure maintenance scheme submit proof that the surface owners in the project area be notified of the operator's plans. Omega has not submitted such proof of notification. Attached is a proposed letter from the Board indicating that the project will not be approved until proof of notification has been received.

Board Order No. PM 40 authorizes waterflood operation in Waskada Lower Amaranth Unit No. 1, Waskada Unit No. 2 and Waskada Unit No. 3. Board Order No. PM 42 authorizes waterflood operations in Waskada Unit No. 5. Both Orders contain essentially identical provisions governing operations and data submission. It is proposed, for administrative simplicity to combine the above two Orders and provide for operations in the area of the subject application. This proposal reflects the fact that the waterflood operation in Waskada is operationally one large project even though revenue distribution is governed by separate Unit Agreements.

H. Clare Moster

LRD/lk

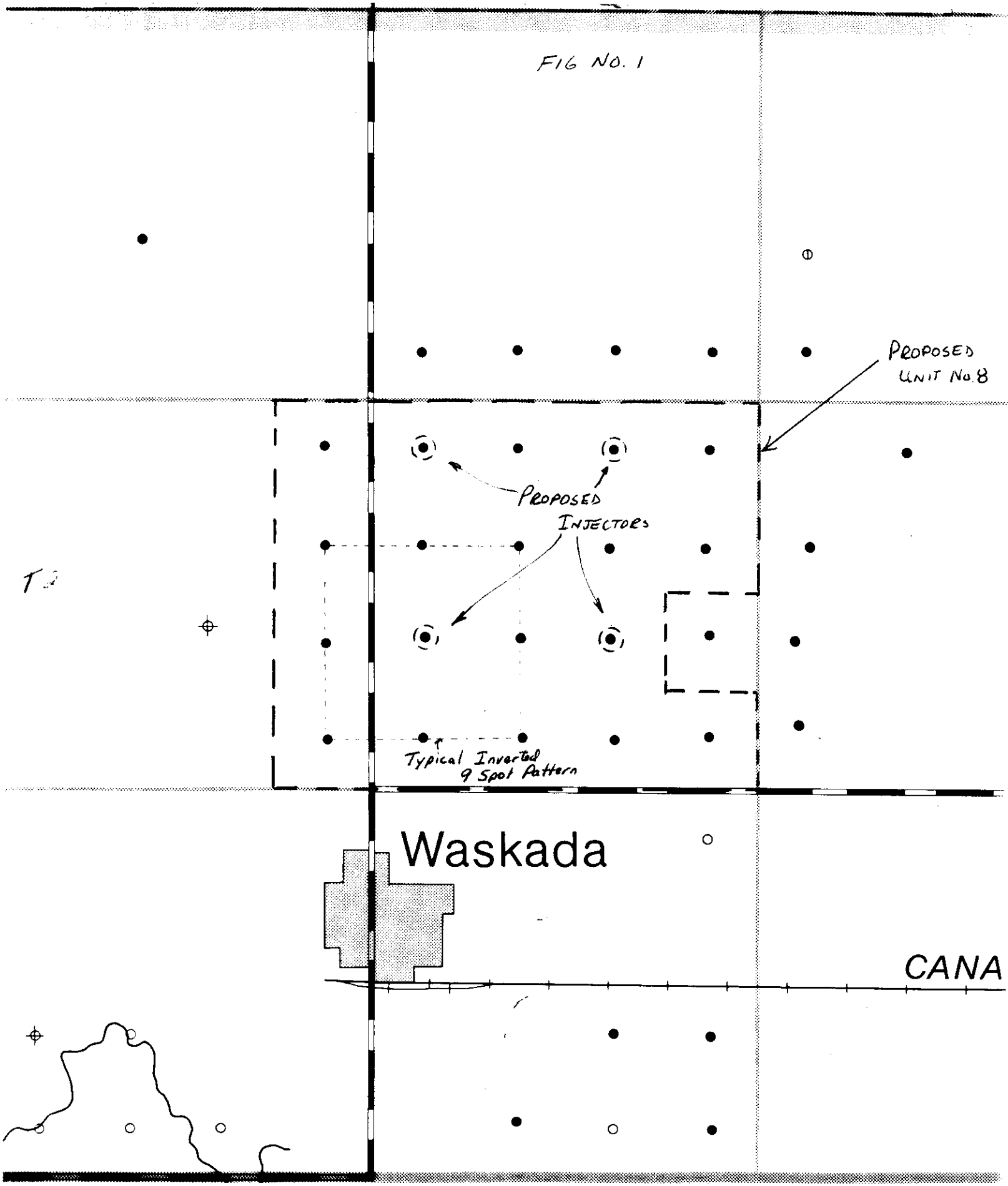
TABLE 1

WORKING INTEREST OWNERS

OFFSETTING PROJECT AREA

Working Interest Owner	Area
Shell Canada Resources Ltd.	S 1/2-17-2-25 SW 1/4-16-2-25 NW 1/4-4-2-25
Great Basins Petroleums Ltd.	NE 1/4-5-2-25 SW 1/4-9-2-25
Petro Star Petroleums Ltd.	NW 1/4-4-2-25
Wildmount Resources Ltd.	Lsd 1, 2, 3, & 4-17-2-25 Lsd 4 & 5-16-2-25
Andex Oil Co. Ltd.	Lsd 16-5-2-25 Lsd 4 & 5-9-2-25 Lsd 5, 13 & 15-4-2-25
United Canso Oil & Gas Ltd.	SW 1/4-16-2-25

FIG NO. 1



P-25 WPM

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 8, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 5-8-2-25 (WPM)
Omega Waskada 7-8-2-25 (WPM)
Omega Waskada 13-8-2-25 (WPM)
Omega Waskada 15-8-2-25 (WPM)

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

Dated at Winnipeg, this day
of August, 1985.

C. Kang, Chairman
The Oil and Natural Gas
Conservation Board

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 6, 1985

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

Attention: Mr. W. McDonald
Deputy Chairman

Dear Sir,

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No.40 be amended to include the area contained inside the newly formed Waskada Unit No. 8. The new Unit consists of 19 tracts and contains Lower Amaranth wells 1-7, 8-7, 9-7, 16-7, 1-8, 2-8, 3-8, 4-8, 5-8, 6-8, 7-8, 9-8, 10-8, 11-8, 12-8, 13-8, 14-8, 15-8 and 16-8-2-25 WPM. The Unit agreement has been signed by all parties involved and is currently awaiting Manitoba Government approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained in PM Order No. 40, Omega Hydrocarbons Ltd. also requests permission to inject water into wells;

Omega Waskada 5-8-2-25 WPM
Omega Waskada 7-8-2-25 WPM
Omega Waskada 13-8-2-25WPM
Omega Waskada 15-8-2-25WPM

coincident with the effective date of the new Unit.

As operator of both the newly formed Unit and the existing pressure maintenance scheme we intend to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing scheme.

Corrosion prevention methods within Waskada Unit No. 8 will include cathodic protection, internally coated flowlines and well treatments. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned, to combat bacterial corrosion which has been an ongoing problem in Waskada.

...../2

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $900m^3/d$ while the two (2) existing source water wells are capable of producing an additional $500m^3/d$ of water. Since these water volumes will be insufficient to handle the injection requirements once injection begins at the new Unit, Omega intends to increase the source water capacity. Work is currently underway to convert wells 1A-27, 2A-27 and 9A-27-1-26 WPM into Blairmore source water wells. A high pressure injection pump and filter system capable of handling an additional $700m^3/d$ of water will be installed at satellite 7-27-1-26 WPM. Although, the new source water wells will mainly supply injection water to Sections 26 and 27-1-26 WPM plans are to construct the tie-in in such a way that they can also supplement other injection wells within the system. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

Omega Hydrocarbons Ltd. is in the process of completing an updated reservoir model study as well as a PVT study in Township 2 Range 26 WPM. The reservoir model study was initiated in February, 1985 and should be completed by August 31, 1985. An inverted nine spot pattern surrounding injection well 13A-24-1-26 WPM was chosen as the model study area based on the length of production history. To date the reservoir model has been successfully history matched and the final predictions are currently being run. In an attempt to predict waterflood performance in all the various areas of the Lower Amaranth pool three separate prediction cases will be run. The different cases were chosen to represent areas of average permeability, low permeability and differing oil properties. The basic assumptions used in each of the cases are as follows:

Case 1 (Average permeability)	- existing PVT properties; field average Ø/k relationship; history matched water saturations, transmisibilities and relative permeability curves.
Case 2 (Low permeability)	- existing PVT properties; a Ø/k relationship from well 16-18-1-25 WPM; water saturations determined by capillary pressure curves; history matched relative permeability curves.
Case 3 (Modified PVT data)	- same as Case 1 except that the oil density and viscosity have been increased to reflect the oil properties observed in the NW portion of the pool. This prediction will be delayed until the results of the PVT study are known.

Oil recovery rate versus time plots obtained from these waterflood predictions, along with individual pattern oil in place values will be used to generate field scale predictions. The waterflood predictions for the areas contained within PM Order No. 40 will be submitted as soon as they become available.

...../3

Funds for additional PVT study work have been approved, however, based on a review of the existing production wells in Township 2 Range 26 WPM it was decided that bottom hole sampling would be delayed until the start of the 1985 drilling program. Surface oil samples are currently being taken at five newly drilled wells (15-3, 16-3, 4-4, 5-4 and 12-4-2-26 WPM). From the analysis of these surface samples a well will be selected for bottomhole sampling. A final PVT study report is anticipated by September, 1985.

In further support of this submission please find attached the following infomation:

1) Lessor Map of the New Unit Area
2) Lessee Map of the New Unit Area
3) Well Status Summary
4) Schematic Diagram of the Proposed Water Injection System

Should you have any comments or questions related to the submission, please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

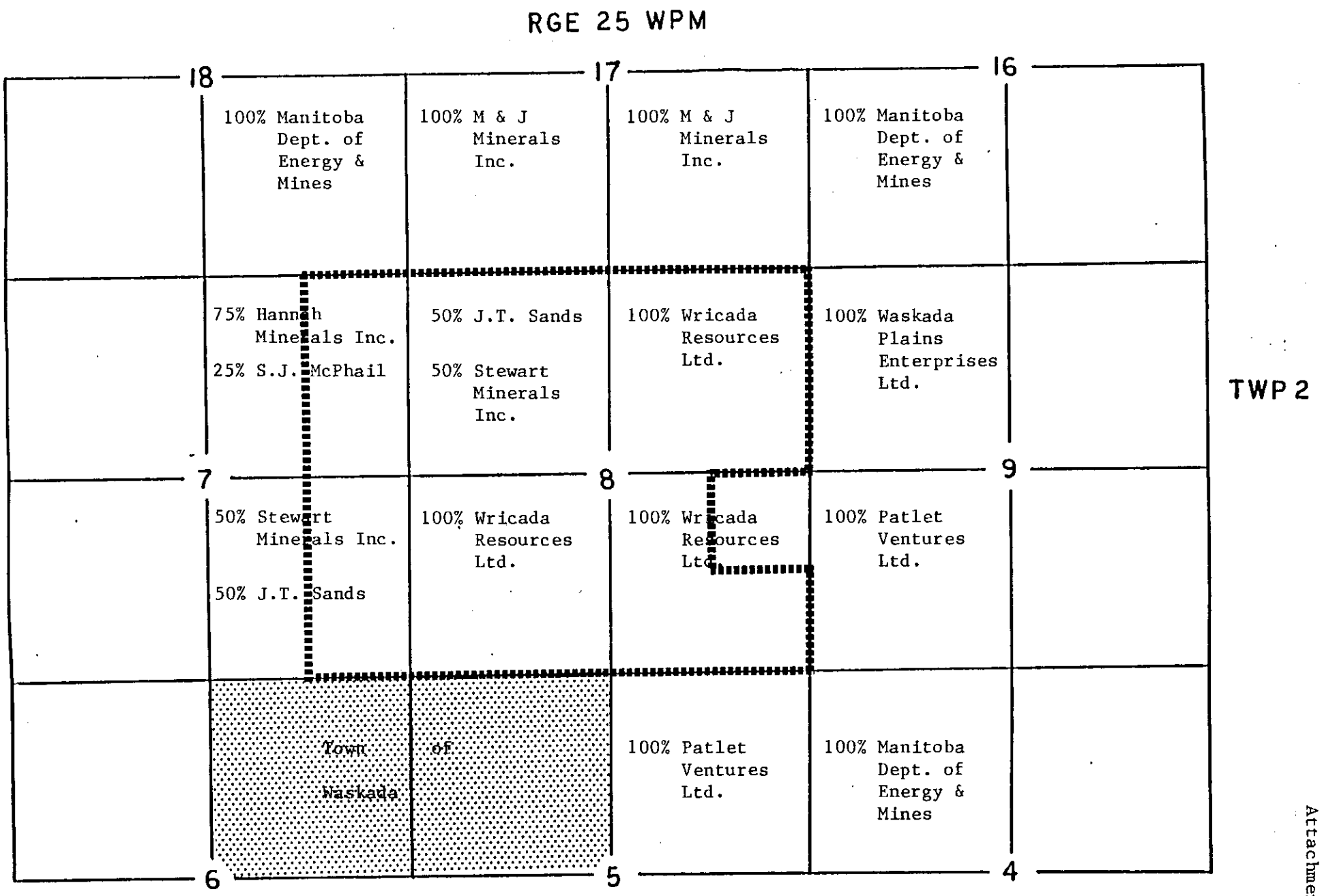
Yours truly,
OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President - Production

GEP:ad
Encls.
c.c. R. Dubreuil - Man.Pet.Branch ✓
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map In and Adjoining

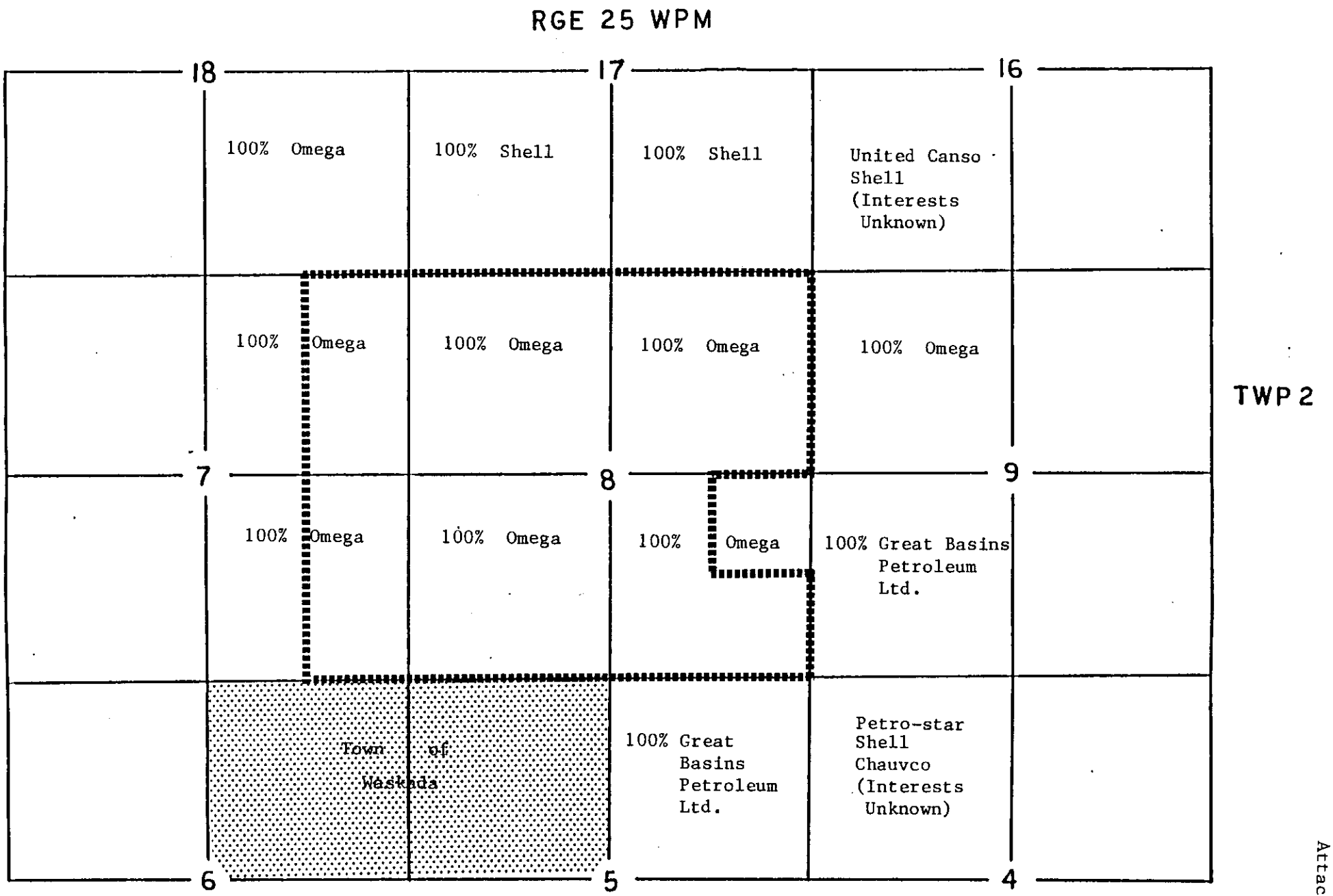
The Proposed Waskada Unit No.8



Proposed Waskada Unit No.8

Attachment 1

Lessee Map In and Adjoining
The Proposed Waskada Unit No.8



Attachment 2

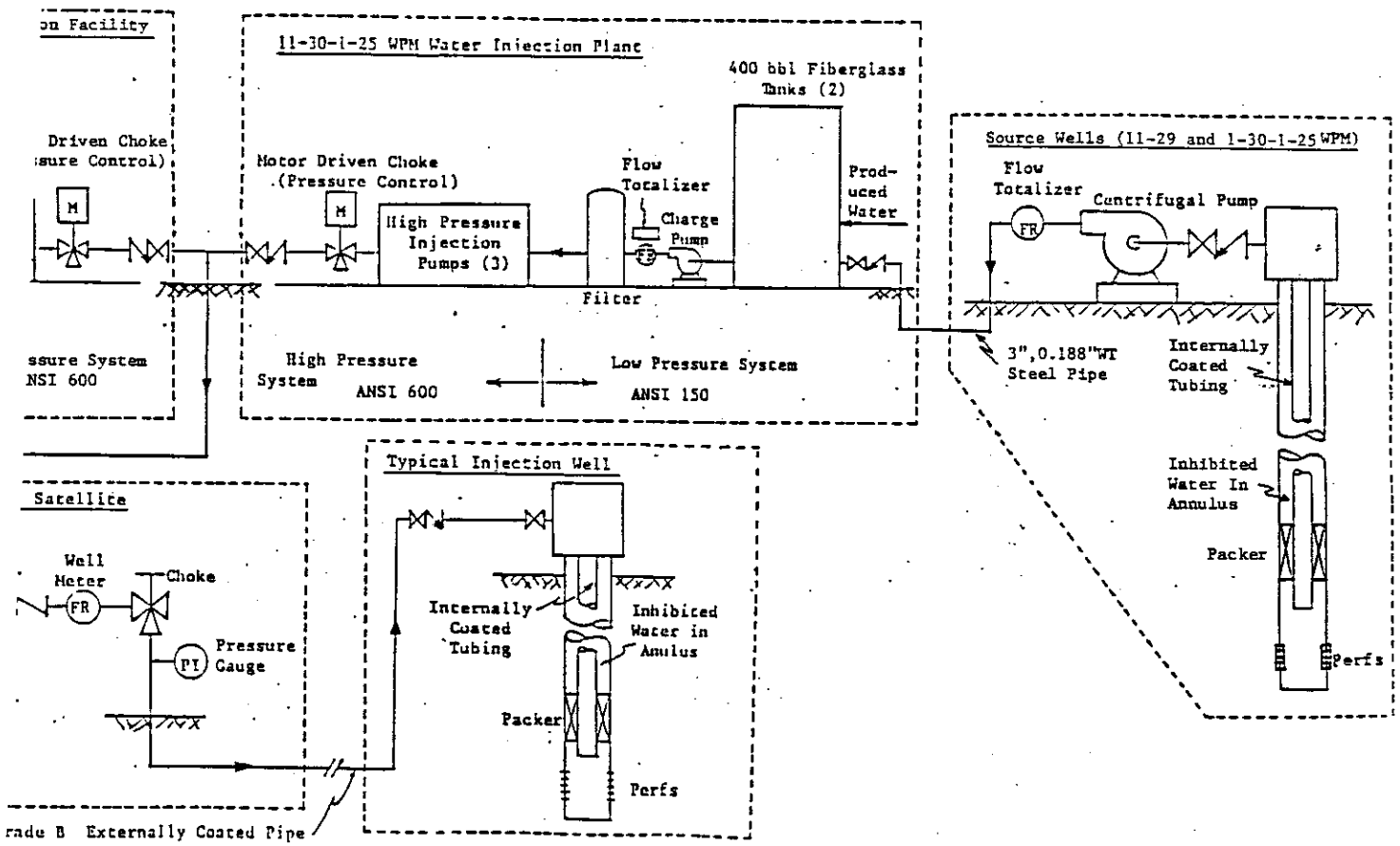
Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No.8

Well	Completed Zone	Status
1-7-2-25 WPM	Lower Amaranth	Producing Oil Well
7-7-2-25 WPM	N/A	Abandoned Well
8-7-2-25 WPM	Lower Amaranth	Producing Oil Well
9-7-2-25 WPM	Lower Amaranth	Producing Oil Well
10-7-2-25 WPM	Lower Amaranth	Producing Oil Well
16-7-2-25 WPM	Lower Amaranth	Producing Oil Well
1-8-2-25 WPM	Lower Amaranth	Producing Oil Well
2-8-2-25 WPM	Lower Amaranth	Producing Oil Well
3-8-2-25 WPM	Lower Amaranth	Producing Oil Well
4-8-2-25 WPM	Lower Amaranth	Producing Oil Well
5-8-2-25 WPM	Lower Amaranth	Producing Oil Well
6-8-2-25 WPM	Lower Amaranth	Producing Oil Well
7-8-2-25 WPM	Lower Amaranth	Producing Oil Well
*8-8-2-25 WPM	Lower Amaranth	Producing Oil Well
9-8-2-25 WPM	Lower Amaranth	Producing Oil Well
10-8-2-25 WPM	Lower Amaranth	Producing Oil Well
11-8-2-25 WPM	Lower Amaranth	Producing Oil Well
12-8-2-25 WPM	Lower Amaranth	Producing Oil Well
13-8-2-25 WPM	Lower Amaranth	Producing Oil Well
14-8-2-25 WPM	Lower Amaranth	Producing Oil Well
15-8-2-25 WPM	Lower Amaranth	Producing Oil Well
16-8-2-25 WPM	Lower Amaranth	Producing Oil Well
4-9-2-25 WPM	Lower Amaranth	Producing Oil Well
5-9-2-25 WPM	Lower Amaranth	Producing Oil Well
12-9-2-25 WPM	Lower Amaranth	Producing Oil Well
13-9-2-25 WPM	Lower Amaranth	Producing Oil Well
4-16-2-25 WPM	Lower Amaranth	Producing Oil Well
1-17-2-25 WPM	Lower Amaranth	Producing Oil Well
2-17-2-25 WPM	Lower Amaranth	Producing Oil Well
3-17-2-25 WPM	Lower Amaranth	Producing Oil Well
4-17-2-25 WPM	Lower Amaranth	Producing Oil Well
1-18-2-25 WPM	Lower Amaranth	Producing Oil Well

* Well 8-8 was recompleted as a Lower Amaranth oil well in May/85 and plans are to add it to the Unit in the next expansion.

;ram of the Proposed

ection System



Attachment 4

Electric
Elec-
der Elec-
h.p. Balder

Caldwell 12
er). 5—16"
AF 12751—
h.p. Fans.
Caldwell 5

e Aeration
Perferate
Caps. 18"
ps. 18" Bi
olid Pipe
Pipe. 18"
Aluminu
e Rings.
ing
2—10' I
—8" Sli
Bin Stand
d Plate an
ve. Approx
pports. 51
Screens. 30
Flat Deck
lb. Axles.
ons: Cash or
r Identifica-
no respon-
description

This equip-
it condition.
e been made
ipment and
one year and
e entered for

by the Coul-
adies.
TION SALES
a, Manitoba,
204-522-8276
n Downey and
aylor
2-2c

LOST

LOST—Lost from Waskada, a tan and black shepherd, no collar or tags. He answers to the name of Major. Phone 673-254[illegible] Waskada. Owner Norm Perreaux, Box 65, Waskada. 1-2c

NOTICE

NOTICE

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 8, has made application under "The Mines Act" to convert the following wells to water injection.

Omega Waskada 5-8-2-25 (WPM)
Omega Waskada 7-8-2-25 (WPM)
Omega Waskada 13-8-2-25 (WPM)
Omega Waskada 15-8-2-25 (WPM)

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

Dated at Winnipeg, this 12th day of August, 1985.

—C. Kang, Chairman
The Oil and Natural Gas Conservation Board

NOTICE—We Repair shoes, tarps, swather canvas, saddles, hockey gloves, etc. at Bar M Saddlery at Pipestone, phone 854-2977. 1-4c

DOWN OR UP

The children of famous parents might argue whether it's more difficult to live down a name than to live up to one.

[illegible] above estate duly verified by Statutory Declaration, must be filed with the undersigned at Box 520, 243 Regian St. West, Virden, Manitoba, R0M 2C0 on or before the 28th day of September, A.D. 1985.

Dated at the Town of Virden, in the Province of Manitoba, this 21st day of August, A.D. 1985.

McNEILL, SMITH, POOLE
Solicitors for the Executor

NOTICE TO CREDITORS

IN THE MATTER OF THE ESTATE OF GORDON EWART PUE, late of the Postal District of Melita, in the Province of Manitoba, Retired Farmer, deceased.

ALL CLAIMS against the above estate duly verified by Statutory Declaration must be filed at the office of the undersigned at Melita, Manitoba on or before the 27th day of September, A.D. 1985.

DATED at the Town of Melita, in Manitoba this 23rd day of August, A.D. 1985.

R. A. HOLMES
BARRISTER & SOLICITOR
Solicitor For the Administratrix

MISCELLANEOUS

FOR RENT—To December 31, 1985, deluxe two bedroom fully equipped mobile home. Leisure World Park, Weslaco, Texas. $125.00 per week US funds. Art Kinney, 204-773-2489, Russell, Manitoba.

FOR SALE—Excellent Drill Stem Pipe $1.60/ft.; 33 ft. railway rails $2.80/ft. Phone Brandon 725-2627 office hours.

located in a rapidly grow[illegible] drilling area in southwestern Manitoba. Guaranteed clientele. Phone 1-522-3245.

BUSINESS OPPORTUNITY—Priced reasonable to sell all equipment to start your own ceramic business. Molds, Africana stains and glazes ½ price or less phone 352-4290 or 352-4462.

MISCELLANEOUS—HOTEL INVESTMENT OPPORTUNITIES. Limited partnerships—Good returns. Mexico—Well known Accupulco Hotel. Winnipeg Hotel—Excellent Potential. Long Term Investments. Info. write: Canadian Hotel Group, 1144 Markham Road, Winnipeg, Manitoba R3T 4C9.

EMPLOYMENT OPPORTUNITY—Required a General Practitioner for a 20-bed hospital in a growing community, 110 miles northeast of Edmonton on Highway 45. Applications and inquiries may be sent to: Mr. J. Dudar, Board Chairman, Box 298, Myrnam, Alta., T0B 3K0. Ph. 403-366-2441.

EMPLOYMENT OPPORTUNITY—Mountain resort now accepting applications for winter employment. Positions available include chambermaids, cafeteria workers, gas station attendants, dining room waitresses, gift shop clerks, bartenders, front desk clerks. Apply in writing for application to Glacier Park Lodge, Rogers Pass, B.C. Please include self-addressed stamped envelope.

Melita Nad Era - Aug 29/85

Manitoba

Action / Route Slip

Date: August 12, 1985

To: Charles Kang

From: H. Clare Moster

Telephone:

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

Comments

1. Please return Notice to this office when signed.
2. Letter may be sent direct to Omega.

MG 1298 PS-F 162

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 8, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 5-8-2-25 (WPM)
Omega Waskada 7-8-2-25 (WPM)
Omega Waskada 13-8-2-25 (WPM)
Omega Waskada 15-8-2-25 (WPM)

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

Dated at Winnipeg, this 12th day of August, 1985.

C. Kang, Chairman
The Oil and Natural Gas
Conservation Board

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 16, 1985

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

Attention: Mr. C. Kang, Chairman

Dear Sir,

Re: Pressure Maintenance Operations
Proposed Waskada Unit No. 8

In response to your letter dated August 9, 1985, please find attached a copy of the letter notifying all the involved surface owners of our proposed plans. If there are any further questions related to this matter, please contact the undersigned.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish
Manager - Engineerng

RAB:ad
c.c. B. Dubreuil, Man.Pet.Branch
Waskada (LAm) Waterflood
Approvals File

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 4th AVENUE S.W.
CALGARY, ALBERTA CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 16, 1985

As Per Attached Addressee List

Dear

Re: Proposed Waskada Unit No. 8 Waterflood Project
Sections 7 and 8, Twp. 2, Rge. 25 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme in Sections 7 and 8, Twp. 2, Rge. 25 WPM. The well locations included in the proposed project are 1-7, 8-7, 9-7, 16-7, 1-8, 2-8, 3-8, 4-8, 5-8, 6-8, 7-8, 9-8, 10-8, 11-8, 12-8, 13-8, 14-8, 15-8 and 16-8-2-25 WPM. (See Attachment 1).

The proposed project involves the injection of produced water into wells 5-8, 7-8, 13-8 and 15-8-2-25 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be made based on the results of this project.

If you have any comments or concerns related to the proposed project please contact either myself or Mr. Richard Brekke at (403) 261-0743.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish, P. Eng.,
Manager - Engineering

RAB:ad
Encls.
c.c. Waskada Unit No. 8 File
Land Dept.

WASKADA UNIT NO. 8

SURFACE OWNERS

ADDRESSEE LIST

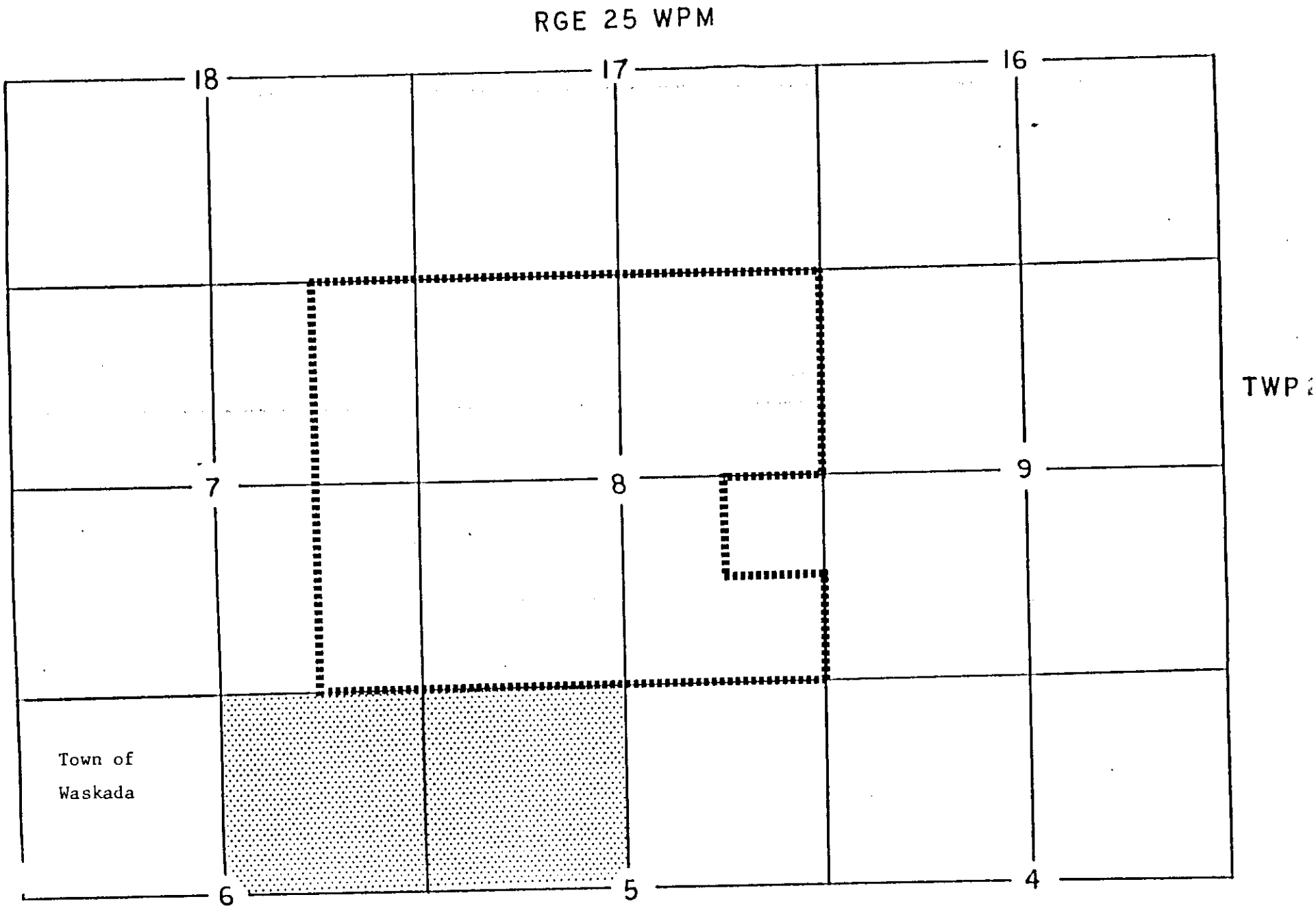
Ernest Roy Stewart
Box 204
Waskada, Manitoba ROM 2EO

Clinton Campbell Dowker
Box 112
Waskada, Manitoba ROM 2EO

Sara Wright
Box 528, 120 Broadway N.
Deloraine, Manitoba ROM OMO

William Garfield Wright Sr. &
William Garfield Wright Jr.
Box 42
Waskada, Manitoba ROM 2EO

Proposed Waskada Unit No. 8 Waterflood
Project Area



.AFFIC ACT

commodities in their final movement ationally, via the Manitoba/Interna- boundary, as follows:

Products raised or produced on by tillage and cultivation of the soil as, vegetables, fruits, grains and not including such products or com- ies which, as a result of some treat- have been so changed as to possess forms, qualities or properties, but ding seed grain,

estock, (c) honey, (d) peat moss, ough, unfinished granite blocks and direct from quarries located in Man-

et 12609 (20/85)

Trailer Towing Ltd.,

ary, Alberta.

plication for extension of Public Ser- Vehicle Certificate for the transporta- of K.A.C.R., Nipawin Hydro Electric ect Sask., Nipawin, Saskatchewan, of ers, mobile homes, modular buildings components; from various points in the vince of Saskatchewan to various s in the Province of Manitoba and vice a.

et 12612 (20/85)

ld Bros. Transport Ltd.,

nipeg, Manitoba.

plication for extension of Public Ser- Vehicle Certificate for the transporta- for Carnation, Inc., Toronto, Ontario, od products from Carberry, Manitoba Portage la Prairie, Manitoba to the itoba/Ontario border for furtherance uthorized.

ket 12611 (20/85)

istra Trucking Ltd.,

n River, Manitoba.

pplication for extension of Public Ser- Vehicle Certificate for the transporta- of general merchandise to and from nipeg, Manitoba to and from Swan er, Manitoba and a twenty-five mile ius thereof.

nipper Support Received From:

Kelsey Farm Equipment Ltd., Swan er, Manitoba.

Swan River Scrap Metal Ltd., Swan er, Manitoba.

Merv's Radio & T.V. Ltd., Swan River, nitoba.

Swan Valley Building Supplies Ltd., an River, Manitoba.

Siewert Concrete Products Ltd., Mini- as, Manitoba.

Hunt Farm Equipment Manitoba Ltd., an River, Manitoba.

g. Hadiken Concrete & Supply Ltd., Swan River, Manitoba.
h. Westman Culvert & Metal, Winnipeg, Manitoba.
i. Onofrechuk Ent., Swan River, Manitoba.
j. Earl G. Hrappstead Ltd., Swan River, Manitoba.
k. Riverside Seed & Sales, Minitonas, Manitoba.
l. Bel-Log Industries Ltd., Birch River, Manitoba.
m. R. M. of Swan River, Swan River, Manitoba.
n. Rio Vista Farm, Bowsman, Manitoba.
o. Swan Auto Supply Ltd., Swan River, Manitoba.
p. Swan Valley Fire Service, Swan River, Manitoba.
q. Swan Valley Cabinet & Woodworks Ltd., Swan River, Manitoba.
r. Grazier Custom Mfg. Ltd., Swan River, Manitoba.
s. Russell Apiaries, Swan River, Manitoba.
t. Northwest Diesel & Equipment Ltd., Swan River, Manitoba.
u. Revelstoke Co. Ltd., Swan River, Manitoba.

Please Note:

A fee of $50.00 shall accompany the Statements of Opposition.

No Statement of Opposition will be accepted after the above date of September 16, 1985.

All Respondents will immediately receive from the Board a copy of the relevant application and supporting documents.

All Respondents shall also file with the Document Control Officer further statements and other documents, certified as true and correct, which, together with the Statement of Opposition, if unanswered, are sufficient to demonstrate that the public convenience will not be promoted by the granting of the authority in question. Such further material shall be filed with Fourteen (14) days of receipt of the copy of the application and supporting documents on or before Monday, September 30, 1985, whichever is later.

If the Board is not satisfied sufficient evidence has been filed by a Respondent, his Statement of Opposition will be struck. All applications in which a Statement of Opposition has been accepted will be set for public hearing.

L. G. OLIJNEK,
Secretary,
THE MANITOBA MOTOR TRANSPORT BOARD.

—34

UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 8, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 5-8-2-25 (WPM)
Omega Waskada 7-8-2-25 (WPM)
Omega Waskada 13-8-2-25 (WPM)
Omega Waskada 15-8-2-25 (WPM)

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

Dated at Winnipeg, this 12th day of August, 1985.

C. KANG,
Chairman,
The Oil and Natural Gas Conservation Board.

—34

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

August 23, 1985

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. R. A. Beamish,
Manager - Engineering

Dear Sirs:

Re: Proposed Pressure Maintenance Operations
Waskada Unit No. 8

Receipt of your letter dated August 16, 1985 and the enclosed copy of the letter sent to surface owners is acknowledged.

A notice pertaining to the application is being advertised (copy enclosed), and once the notice period has expired, processing of your application will be completed.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

HCM/lk

c.c. Petroleum Branch

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

August 9, 1985

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Pressure Maintenance Operations
Proposed Waskada Unit No. 8

Your application dated August 6, 1985 for approval to conduct pressure maintenance operations by waterflooding in the proposed Waskada Unit No. 8 is acknowledged.

You are referred to clause 126(d) of The Petroleum Drilling and Production Regulations, 1984 which requires that the operator of a proposed enhanced recovery operation provide proof that the surface owner(s) of the project area be notified of the operator's plans. Your application material does not include such proof of notification. Although processing of your application will be commenced, you are required to submit the required proof of notification prior to final disposition of the application.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles Kang
Chairman

LRD/lk

b.c. Petroleum Branch

August 14, 1985

Queen's Printer
Statuatory Publications
200 Waughan Street

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch
555 - 330 Graham Avenue

945-6574

MANITOBA GAZETTE

Please have the attached Notice appear in the next issue of the Manitoba Gazette under The Mines Act.

L. R. Dubreuil

LRD/ch
Attachment

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

September 17, 1985

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Board Order No. PM 45
Waskada Lower Amaranth A Pool
Pressure Maintenance Operations

Enclosed is Board Order No. PM 45 authorizing pressure maintenance by waterflooding in Waskada Lower Amaranth Unit No. 1, Waskada Unit No. 2, Waskada Unit No. 3, Waskada Unit No. 5 and Waskada Unit No. 8. This Order supercedes Board Order No. PM 40, Board Order No. PM 42 and other Board approvals of specific injection wells in the above noted Units. In addition, this Order authorizes your pressure maintenance operations in Waskada Unit No. 8.

The provisions of this Order are essentially the same as in previous Orders and approvals. You will note that provisions relating to monitoring the presence of communication between the Lower Amaranth and Mission Canyon zones have been modified to reflect actual procedures that have been used, refer to subclause 3(4) of Pressure Maintenance Rules.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang,
Chairman

LRD/lk

b.c. Petroleum Branch

→ BOB file

Manitoba

Action / Route Slip

Date: September 17, 1985

To: Wm. McDonald
J. F. Redgwell
Charles Kang
Hon. Wilson D. Parasiuk

From: H. Clare Moster

Telephone:

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

Comments Re: Board Order No. PM 45

- Order recommended for signature of 3 Board members and Minister
- Certificate to be completed and signed by Chairman
- Certificate & Order to be filed with Registrar of Regulations
- Send 1 signed copy of Order to Omega (covering letter attached)
- Return 1 signed copy of Order plus copy of Certificate to Branch

MG-1298 PS-I-182

PS-1-25

MANITOBA

Inter-Departmental Memo

Date September 16, 1985

To The Oil and Natural Gas Conservation Board

C. Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Expansion of Pressure Maintenance Operations

Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd. has made application for approval to conduct pressure maintenance operations by waterflooding in the Waskada Unit No. 8 Notice of the application was publicshed in the Manitoba Gazette (August 24, 1985), the Melita New Era (August 29, 1985) and sent to offsetting working interest owners. No objections or interventions have been received.

Recommendation:

It is recommended that the application be approved and that Board Order No. PM 45 (copy attached) be issued.

Discussion:

Board Order No. PM 45 provides for pressure maintenance by waterflooding in four (4) Units in the Waskada Lower Amaranth A Pool and is a consolidation of previous approvals made pursuant to Board Orders No. PM 40 and No. 42. The Order contains essentially identical provisions relating to pressure maintenance operations as in the above mentioned Orders.

In our memo of August 9, 1985, it was noted that Omega had not provided proof (as required by the Regulations) that the surface owner's of the project area had been informed of Omega's plans. However, Omega has since provided copies of the required notifications.

Original Signed by H. C. Moster

H. Clare Moster

LRD/lk

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

September 3, 1985

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Waskada Unit No. 3
Conversion to Water Injection
Omega Waskada 13-31-1-25 (WPM)
Omega Waskada 15-31-1-25 (WPM)
Omega Waskada 13-32-1-25 (WPM)
Omega Waskada 15-32-1-25 (WPM)
Omega Waskada 15-36-1-25 (WPM)

With respect to your application dated July 16, 1985, you are hereby authorized to utilize the subject wells as water injection wells and such approval is subject to the terms and conditions contained in The Oil and Natural Gas Conservation Board Order No. PM 40.

Please notify the Waskada District office of the Petroleum Branch prior to recompletion and initiation of injection at the subject wells.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang,
Chairman

c.c. Petroleum Branch

PS-1-25

MANITOBA
Inter-Departmental Memo

Date September 3, 1985

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Enlargement of Waskada Unit No. 3

Pressure Maintenance Project

First | Fold

Background

Omega Hydrocarbons, as Unit Operator, applied to have the area covered by the Waskada Unit No. 3 waterflood pressure maintenace project expanded and to convert five (5) additional wells to water injection.

A notice pertaining to the application was published in the Manitoba Gazette and Melita New Era and no objections were received.

Board Order No. PM 40 lists the currently authorized water injection wells and provides for the inclusion of such other wells as the Board may approve.

Recommendation

It is recommended that the attached letter of approval be signed by the Chairman and sent to Omega Hydrocarbons.

H. Clare Moster

HCM/lk

rooms, family room with patio doors, L shaped living-dining room (built in china cabinet), 2 full baths, fridge, stove and double ens included. This trailer been externally redone—6 inch insulation, siding and triple pane windows. 18'x33' above ground swimming pool, surrounded by deck. This house can be easily moved if need be. Phone Irv or Brenda Skelton, Coulter, 649-2232. 51-2p

FOR SALE—1970 12 x 60 mobile home, two bedroom, propane heat, 12 x 16 and 8 x 24 additions. Call 634-2473, Pierson. 49-6c

EED AND SEED

R SALE—Rye, new variety own from certified seed. $3.00 bushel at the bin. Phone 5-2448 or 665-2338, Medora. 52-4c

R SALE—200 Round Bales Native Hay and 50 Bales of ome Alfalfa baled with 850 ew Holland baler. Phone 859-68, Rossburn. 52-2c

R SALE—Standing corn, itable for sileage. Phone 2-3728, Melita. 52-2c

Think Safety and Drive Carefully.

guaranteed with airless sprayer up to 3,000 lbs. pressure. No paint thinner needed, giving you longer paint life. Free estimates. Phone N. Vandendorpe, 747-2156 or Jeff Bugg 747-3141, Deloraine. 36-23p

WILL DO

WILL DO—Repairs to freezers, fridges and other appliances, central and window air conditioner units. Reasonable rates for labour and mileage. Guaranteed results. Call Bob at Arctic Fire, 665-2306, Napinka. 48-7c

WILL DO—Will babysit Monday through Friday in my home and on some weekends. Phone 522-8334, Melita. 49-6c

NOTICE

Waskada Oil Field

Omega Hydrocarbans Ltd., operator of Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-31-1-25 (WPM)
Omega Waskada 15-31-1-25 (WPM)
Omega Waskada 13-32-1-25 (WPM)
Omega Waskada 13-36-1-26 (WPM)
Omega Waskada 15-36-1-26 (WPM)

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

Dated at Winnipeg, this 24th day of July, 1985.

—R. B. Chenier, Chairman
The Oil and Natural Gas Conservation Board

52-1c

and Housekeeper, qualified for five month old infant, to start in September. 5-6 hours a day and 5-6 days per week. Details to be discussed, $4.30 per hour. If interested, please phone 522-8196, Melita. 52-3c

Melita New Era - Aug 15/85

3. "Tacking" (also described as "self-interlining") means the joining together of ems of authority held by a carrier or by elated carriers to notionally allow the ansportation of goods from a point of orig- to a point of destination as a through ovement when no item of authority autho- zes the service by the carrier or either elated carrier through from origin to des- nation.

4. A carrier shall be considered to be re- ted to another carrier if they are "related ersons" as defined in Section 251 of the icome Tax Act (Canada).

5. Interline or Interchange between two more unrelated carriers is permitted by e Board so long as each carrier par- cipating in the interline or interchange ovement has proper operating authority r the portion of the move in which it is gaged.

6. Where the common point in the items authority sought to be tacked is outside e Province of Manitoba, the tacking rules the jurisdiction where the common point located shall apply.

7. Where the common point in the items authority is located within Manitoba, **cking of any extra-provincial item of au- ority with any other item of authority is ermitted by the Board provided that:**

a) Each of the items of authority to be cked contain a common point where pick p and delivery service is authorized;

(b) The service is operated through such mmon point; and

(c) There is no restriction against tack- g at such common point in the carrier's rtificate, or either related carrier's cer- ficate.

8. **Tacking of any intra-provincial item f authority with any other intra-provincial em of authority is not permitted by the oard, unless specifically authorized in a arrier's certificate.**

9. All previous decisions shall be consid- red to be revised to be consistent with this olicy.

10. Any person adversely affected by the olicy may apply to the Board for relief at ny time prior to September 1, 1986, and the rovisions of Part VI of the Motor Trans- ort Board Rules of Practice and Pro- edure shall apply to the application.

ommentary

The extra-provincial Tacking Policy is onsistent with that adopted by The Cana- ian Conference of Motor Transport Ad- inistrators.

The intra-provincial Tacking Policy has een the Policy of the Board for many ears, and is necessary to ensure a proper

assessment and monitoring of the public need and convenience for intra-provincial transportation services.

—31

UNDER THE MINES ACT

DALY OIL FIELD

Mead Petroleums and Farms Ltd. has made application under The Mines Act for waiver of the off-target penalty for a well drilled in Legal Subdivision 14 of Section 26-9-29 (WPM). The well is drilled at a point 115.1 metres South and 33.6 metres West of the centre of the Legal Subdivision due to topographic conditions.

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

Copies of the application may be obtained from Mead Petroleums and Farms Ltd., Box 172, Virden, Manitoba, R0M 2C0, or viewed at the offices of the Manitoba Petroleum Branch, 555-330 Graham Avenue, Winnipeg, Manitoba.

Dated July 15, 1985.

THE OIL AND NATURAL GAS CONSERVATION BOARD.
R. B. CHENIER,
Chairman.

—31

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 13-31-1-25 (WPM)
Omega Waskada 15-31-1-25 (WPM)
Omega Waskada 13-32-1-25 (WPM)
Omega Waskada 13-36-1-26 (WPM)
Omega Waskada 15-36-1-26 (WPM)

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

Dated at Winnipeg, this 24th day of July, 1985.

R. B. CHENIER,
Chairman,
The Oil and Natural Gas
Conservation Board.

—31

UNDER APPLICATION TO THE LEGISLATURE

Applicants for Private Bills properly the subject of the Legislative Assembly of Manitoba should take notice of the following rule:

Notice of application for Private Bill

107(1) Every petitioner for a Private Bill shall publish, within twelve months prior to the presentation of the petition for the Private Bill.

(a) in one issue of the Manitoba Gazette; and

(b) at least once in each of two weeks during the twelve month period aforementioned in an issue of a newspaper published in the English language or the French language and having a general circulation in the area of the province in which the persons or a majority of the persons, who would be interested in or affected by the Private Bill reside;

a notice, in the form set out in Schedule "A-1", signed by or on behalf of the petitioner and clearly and distinctly specifying the nature and object of the petition and any exceptional provision proposed to be inserted in the Bill.

For further particulars, apply to the Clerk of the Legislative Assembly, Legislative Building, Winnipeg, Manitoba. (R3C 0V8)

—31

July 24, 1985

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch
555 - 330 Graham Avenue

945-6574

Queen's Printer
Statuatory Publications
200 Vaughan Street

MANITOBA GAZETTE

Please have the attached Notice appear in the next issue of the Manitoba Gazette under The Mines Act.

L. R. Dubreuil

LRD/oc
Attachment

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 13-31-1-25 (WPM)
Omega Waskada 15-31-1-25 (WPM)
Omega Waskada 13-32-1-25 (WPM)
Omega Waskada 13-36-1-26 (WPM)
Omega Waskada 15-36-1-26 (WPM)

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

Dated at Winnipeg, this 24th day
of July, 1985.

R. B. Chenier, Chairman
The Oil and Natural Gas
Conservation Board

PS-f-25

MANITOBA
Inter-Departmental Memo

Date July 19, 1985

To The Oil and Natural Gas Conservation Board
Wm. McDonald, Deputy Chairman
J. F. Redgwell, Member

From Energy & Mines
H. Clare Moster, P. Eng.
Director, Petroleum Branch
555 - 330 Graham Avenue

Telephone

Subject

First | Fold

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

Omega Hydrocarbons Ltd. as operator of the Waskada Unit No. 3 has made application for approval to convert five wells in the Unit to water injection.

Recommendation:

It is recommended that notice of the application be published in The Manitoba Gazette and the Melita New Era. Copies of the notice should also be sent to working interest owners offsetting the proposed injectors. In the absence of objections to the notice, it is recommended that the application be approved.

Discussion:

Omega proposes to expand waterflood operations into the recently enlarged Waskada Unit 3. The expansion will utilize the established injection pattern in the area (inverted nine spot). Although this pattern has not resulted in definite response in Waskada Unit 3, positive response has been noted in other parts of the Pool which have utilized the pattern for a longer period of time. The alternative to expanded pressure maintenance is continued primary production which has experienced rapid production decline. (see Figure No. 1) It is estimated that ultimate recovery under primary production will not exceed 5% of the original oil in place while waterflood could result in recoveries in excess of 25% of the original oil in place. On the basis of potential increases in ultimate recovery, approval of the application is recommended.

Figure No. 2 indicates working interest ownership in areas directly offsetting the proposed injection wells. In that working interest owners other than Omega are represented in the area, publication of a notice and notification of these interest holders is recommended.

. . . . 2

Board Order No. PM 40 provides for water injection in certain wells in Waskada Unit No. 3 (plus other Units) and "such other wells in the Unit Areas as the Board may approve." Omega has indicated it plans to comply with all the provisions of the Board Order. Consequently, approval of the application can be in the form of a letter of authorization from the Board.

for H. Clare Moster, P. Eng.

HCM/dp

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection

Omega Waskada 13-31-1-25 (WPM)
Omega Waskada 15-31-1-25 (WPM)
Omega Waskada 13-32-1-25 (WPM)
Omega Waskada 13-36-1-26 (WPM)
Omega Waskada 15-36-1-26 (WPM)

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

Dated at Winnipeg, this 24th day
of July, 1985.

R. B. Chenier, Chairman
The Oil and Natural Gas
Conservation Board

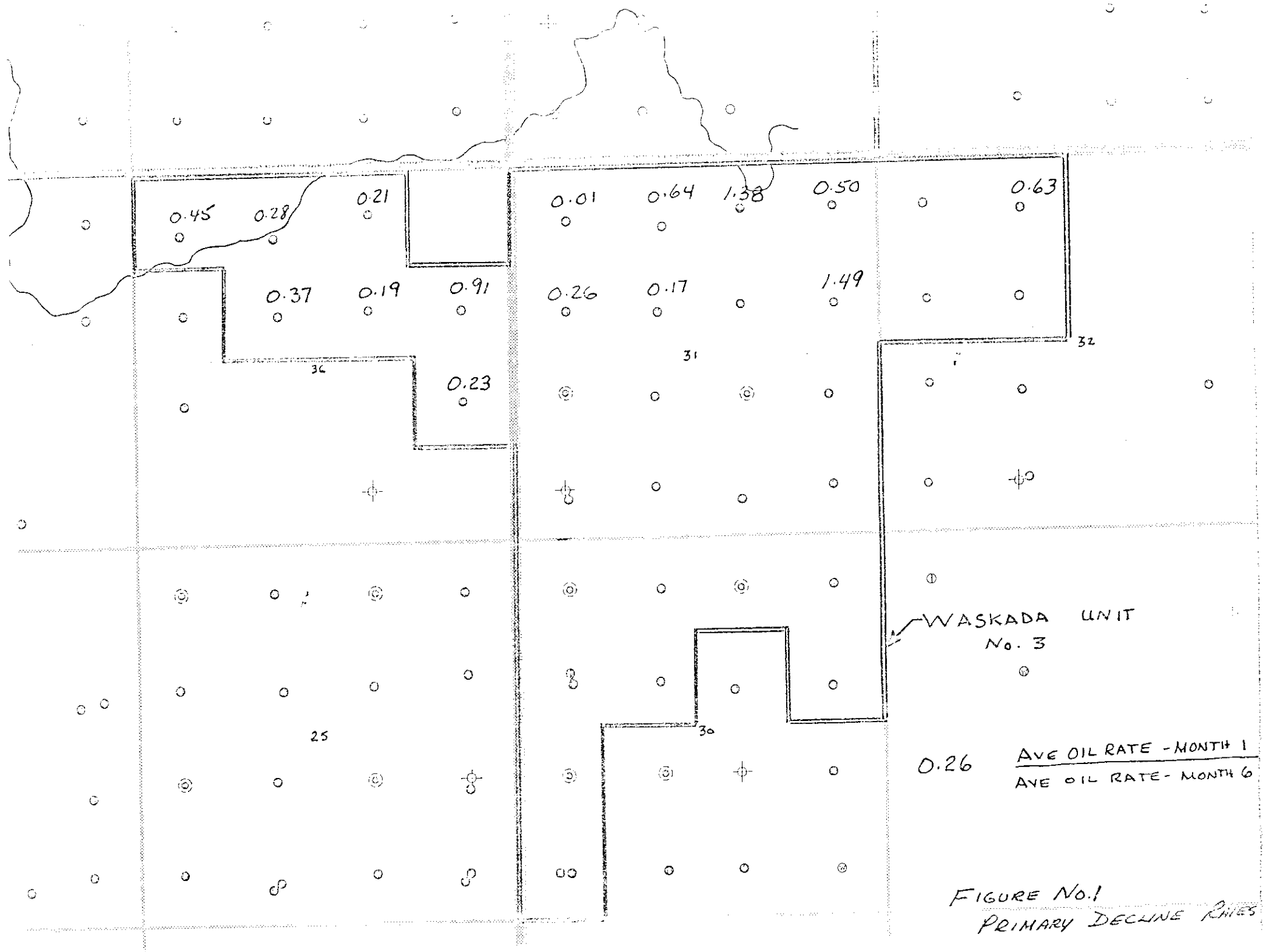


FIGURE No. 1
PRIMARY DECLINE RATES

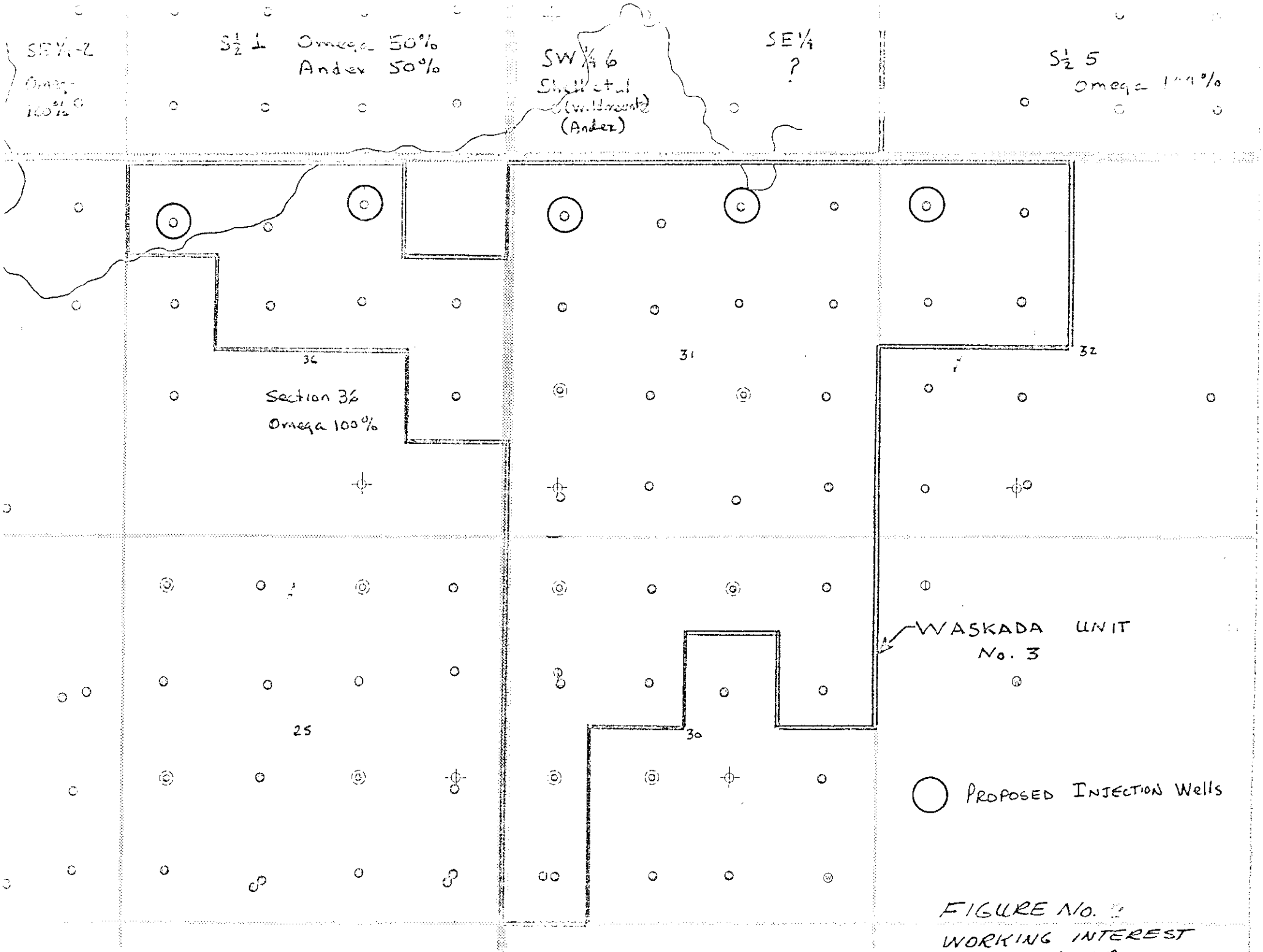


FIGURE No. 2
WORKING INTEREST
OWNERSHIP

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 16, 1985

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

Attention: Mr. Wm. McDonald
Deputy Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 40 be amended to include the additional areas contained within a recently completed expansion of Waskada Unit No. 3. The expanded Unit consists of 19 new tracts containing Lower Amaranth wells 9-31, 10-31, 11-31, 12-31, 13-31, 14-31, 15-31, 16-31, 11-32, 12-32, 13-32 & 14-32-1-25 WPM and 8-36, 9-36, 10-36, 11-36, 13-36, 14-36 & 15-36-1-26 WPM. Unit expansion documents have been signed by all parties involved and are currently awaiting Manitoba Government approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 40, Omega Hydrocarbons Ltd. also requests permission to inject water commencing August 15th, 1985 into wells;

Omega Waskada	13-31-1-25	WPM
Omega Waskada	15-31-1-25	WPM
Omega Waskada	13-32-1-25	WPM
Omega Waskada	13-36-1-26	WPM
Omega Waskada	15-36-1-26	WPM

As operator of both the existing pressure maintenance scheme and the proposed expansion area we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing scheme.

.../2

Corrosion prevention methods within the waterflood expansion area will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments(XC-320) at each production well are also planned, to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging 900 m^3/d while the two (2) existing source water wells are capable of producing an additional 500 m^3/d of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed expansion area. Since, Omega plans to continue expanding the waterflood into other areas of the Lower Amaranth pool one additional Blairmore source water well is scheduled to be drilled later this year. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

Omega Hydrocarbons Ltd. is in the process of completing an updated reservoir model study as well as a PVT study in Township 2 Range 26 WPM. The reservoir model study was initiated in February, 1985 and should be completed by August 15th, 1985. An inverted nine spot pattern surrounding injection well 13A-24-1-26 WPM was chosen as the model study area based on the length of production history. To date the reservoir model has been successfully history matched and preliminary predictions have been run which indicate similar oil recoveries as the previous study. In an attempt to predict waterflood performance in all the various areas of the Lower Amaranth pool three separate prediction cases are being run. The different cases were chosen to represent areas of average permeability, low permeability and differing oil properties. The basic assumptions used in each of the cases are as follows;

Case 1 (Average permeability)	-	existing PVT properties; field average Ø/k relationship; history matched water saturations, transmisibilities and relative permeability curves.
Case 2 (Low permeability)	-	existing PVT properties; a Ø/k relationship from well 16-18-1-25 WPM; water saturations determined by capillary pressure curves; history matched relative permeability curves.
Case 3 (Modified PVT data)	-	same as Case 1 except that the oil density and viscosity have been increased to reflect the oil properties observed in the NW portion of the pool.

Oil recovery rate versus time plots obtained from these waterflood predictions, along with individual pattern oil in place values will be used to generate field scale predictions. The waterflood predictions for the areas contained within PM Order No. 40 will be submitted as soon as they become available.

Funds for additional PVT study work have been approved, however, based on a review of the existing production wells in Township 2 Range 26 WPM it was decided that bottom hole sampling would be delayed until the start of the 1985 drilling program. Surface oil samples are currently being taken at five newly drilled wells (15-3, 16-3, 4-4, 5-4 and 12-4-2-26WPM). From the analysis of these surface samples a well will be selected for bottomhole sampling. A final PVT study report is anticipated by September, 1985.

In further support of this submission please find attached the following information;

1) Lessor Map of the Expansion Area
2) Lessee Map of the Expansion Area
3) Well Status Summary
4) Lower Amaranth Net Pay Map (85 01 28)
5) Schematic Diagram of the Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

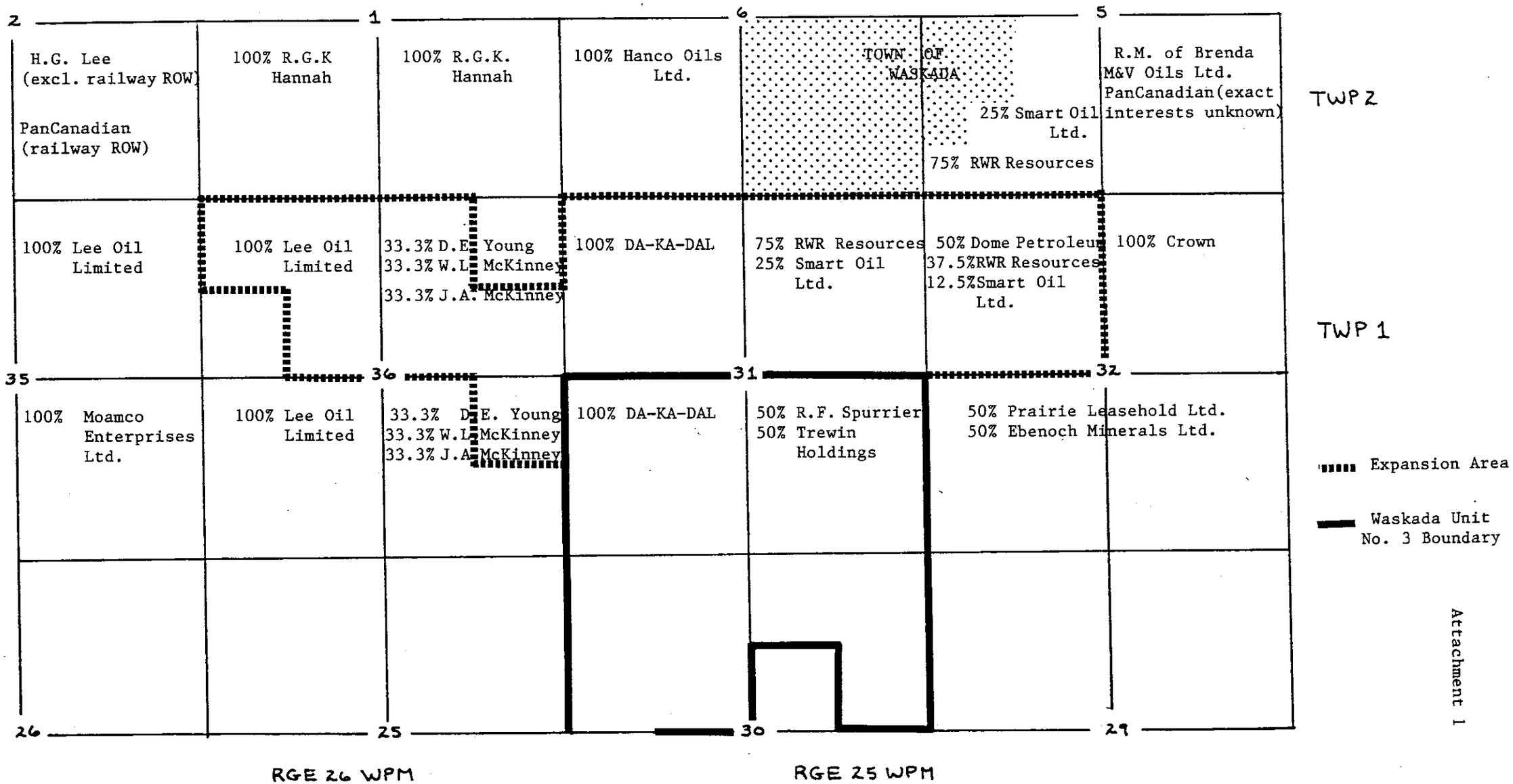
G.E. Patey
Vice President-Production

Enclo:

cc Bob Dubreuil-Manitoba Petroleum Branch
R.A. Beamish
Waskada (L.Am) Waterflood Approvals File

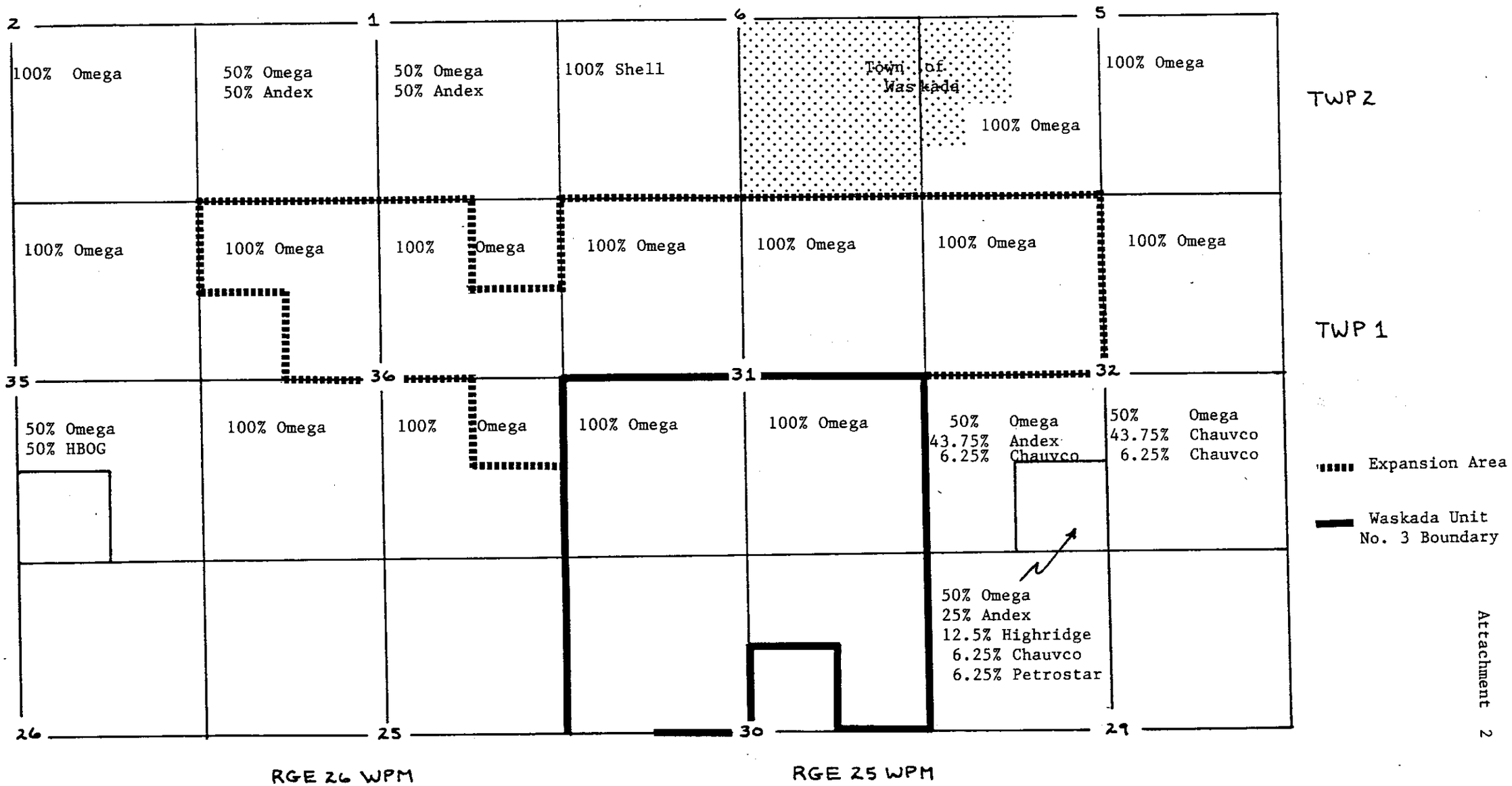
RAB/tct

Lessor Map In and Adjoining
The Proposed Expansion Area



Attachment 1

Lessee Map In and Adjoining
The Proposed Expansion Area



Attachment 2

Well Status Summary For Wells In and Adjoining The Proposed Expansion Area

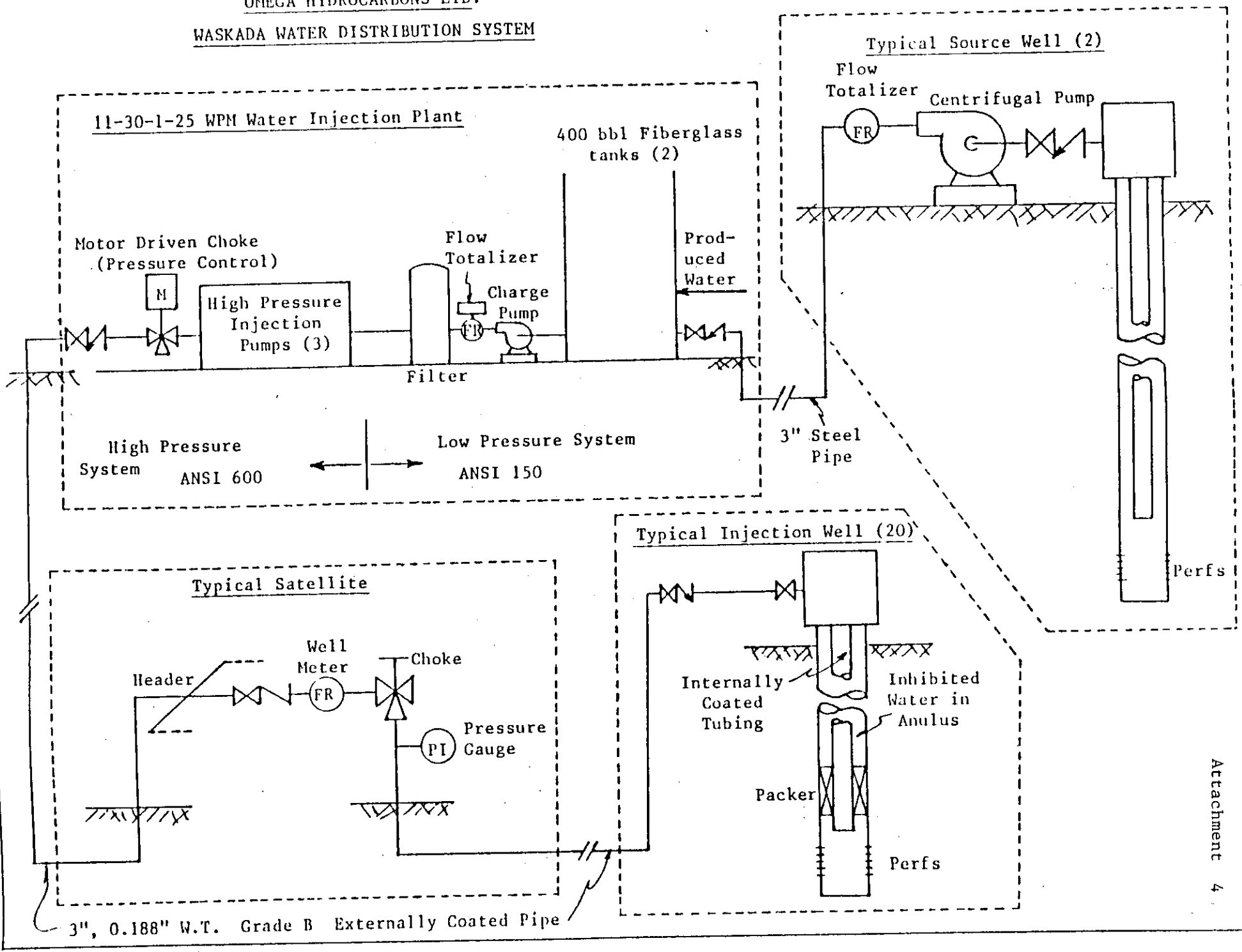
Well	Completed Zone	Status
5-31-1-25 WPM	Lower Amaranth	Water Injector
6-31-1-25 WPM	Lower Amaranth	Producing Oil Well
7-31-1-25 WPM	Lower Amaranth	Water Injector
8-31-1-25 WPM	Lower Amaranth	Producing Oil Well
9-31-1-25 WPM	Lower Amaranth	Producing Oil Well
10-31-1-25 WPM	Lower Amaranth	Producing Oil Well
11-31-1-25 WPM	Lower Amaranth	Producing Oil Well
12-31-1-25 WPM	Lower Amaranth	Producing Oil Well
13-31-1-25 WPM	Lower Amaranth	Producing Oil Well
14-31-1-25 WPM	Lower Amaranth	Producing Oil Well
15-31-1-25 WPM	Lower Amaranth	Producing Oil Well
16-31-1-25 WPM	Lower Amaranth	Producing Oil Well
5-32-1-25 WPM	Lower Amaranth	Producing Oil Well
6-32-1-25 WPM	Lower Amaranth	Producing Oil Well
11-32-1-25 WPM	Lower Amaranth	Producing Oil Well
12-32-1-25 WPM	Lower Amaranth	Producing Oil Well
13-32-1-25 WPM	Lower Amaranth	Producing Oil Well
14-32-1-25 WPM	Lower Amaranth	Producing Oil Well
9-35-1-26 WPM	Lower Alida	Producing Oil Well
16-35-1-26 WPM	Lower Amaranth	Producing Oil Well
2-36-1-26 WPM	N/A	Abandoned Well
5-36-1-26 WPM	Lower Amaranth	Producing Oil Well
8-36-1-26 WPM	Lower Amaranth	Producing Oil Well
9-36-1-26 WPM	Lower Amaranth	Producing Oil Well
10-36-1-26 WPM	Lower Amaranth	Producing Oil Well
11-36-1-26 WPM	Lower Amaranth	Producing Oil Well
12-36-1-26 WPM	Lower Alida	Producing Oil Well
13-36-1-26 WPM	Lower Amaranth	Producing Oil Well

.../2

Well		Completed Zone	Status
14-36-1-26	WPM	Lower Amaranth	Producing Oil Well
15-36-1-26	WPM	Lower Amaranth	Producing Oil Well
2-5-2-25	WPM	Lower Amaranth	Producing Oil Well
3-5-2-25	WPM	Lower Amaranth	Producing Oil Well
5-6-2-25	WPM	N/A	Abandoned Well
1-1-2-26	WPM	Lower Amaranth	Producing Oil Well
2-1-2-26	WPM	Lower Amaranth	Producing Oil Well
3-1-2-26	WPM	Lower Amaranth	Producing Oil Well
4-1-2-26	WPM	Lower Amaranth	Producing Oil Well
1-2-2-26	WPM	Lower Amaranth	Producing Oil Well

OMEGA HYDROCARBONS LTD.

WASKADA WATER DISTRIBUTION SYSTEM



Attachment 4

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 22, 1985

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

Attention Mr. C. Kang, Chairman

Dear Sir,

Re: Pressure Maintenance Operations
Waskada Unit No. 2 Expansion

In response to your letter dated August 12, 1985, please find attached a copy of the letter notifying the surface owner of LSD5-35-1-26 WPM of our proposed plans. If there are any further questions related to this matter, please contact the undersigned.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish
Manager - Engineering

RAB:ad
Encls.

c.c. B. Dubreuil, Man.Pet.Branch
Waskada (LAm) Waterflood
Approvals File

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 22, 1985

Mr. Marvin G. Rowe
Unit 3, 1920-31 Street S.W.,
Calgary, Alberta
T3E 2M9

Dear Sir,

Re: Waskada Unit No. 2 Expansion
Sections 34 and 35, Twp.1,Rge.26 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to expand the existing pressure maintenance scheme into Sections 34 and 35 Twp.1, Rge.26 WPM. The well locations included in the proposed expansion are 2-34, 8-34, 2-35,3-35, 5-35,6-35 and 12-35-1-26WPM.

The expanded pressure maintenance scheme will involve the injection of produced water into well 5-35-1-26 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be made based on the results of this project.

If you have any comments or concerns related to the proposed project please contact either myself or Mr. Richard Brekke at (403) 261-0743.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish, P. Eng.,
Manager - Engineering

RAB:ad
Encls.
c.c. Waskada Unit No.2 File
Land Dept.

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

August 12, 1985

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Omega Waskada 5-35-1-26 (WPM)
Conversion to Water Injection

With respect to your application dated August 6, 1985, you are hereby authorized to utilize the subject well as a water injection well and such approval is subject to the terms and conditions contained in The Oil and Natural Gas Conservation Board Order No. PM 40 and to the following:

1. In accordance with clause 126(d) of The Petroleum Drilling and Production Regulations, 1984, you are required to submit, prior to initiation of injection, proof that the surface owner of the subject wellsite has been made aware of your plans.

2. Notification of our Waskada District Office prior to recompletion and initiation of injection at the subject well.

Yours sincerely,

THE OIL AND NATURAL GAS
CONSERVATION BOARD

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles Kang
Chairman

LRD/HCM/lk

b.c. Petroleum Branch

PS-1-25

MANITOBA
Inter-Departmental Memo

Date August 12, 1985

To The Oil and Natural Gas Conservation Board

Charles Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Additional Water Injection Well

Waskada Unit No. 2

First | Fold

Omega Hydrocarbons as operator of Waskada Unit No. 2 has made application for approval to convert the well Omega Waskada 5-35-1-26 (WPM) to a water injection well.

Recommendation

It is recommended that the application be approved without advertisement for objections. A draft letter of approval is attached.

Discussion

Omega has proposed an expansion of the area of Waskada Unit No. 2 to include a total of seven additional drilling spacing units (tracts). It is also planned to extend existing pressure maintenance operations into the enlarged Unit Area through continuation of the established inverted nine spot injection pattern (see Figure No.1).

Implementation of pressure maintenance by water injection in Waskada Unit No. 2 and other areas of the Waskada Lower Amaranth A Pool has resulted in production rate response which is indicative of an increase in the recovery efficiency. The current application represents a minor expansion of this already successful operation.

Figure No. 2 indicates current producing rates and water-oil ratios for wells in the proposed expansion area. It is noted that most of the active wells in the area are, at best, marginally economic and would likely be abandoned shortly under the current production levels. Conversion of 5-35-1-26 to water injection is expected to enhance the production rates and therefore ultimate recovery rates in this area.

....2

Attachment No. 2 to Omega's application indicates the proposed injection well is offset on all sides by areas in which Omega is the sole working interest owner. By execution of the Waskada Unit No. 2 Unit Agreement, the mineral owner of the spacing unit has indicated consent to Omega's proposed operations. Based on the above, it is felt that advertisement for objections will not be necessary.

It is noted that clause 126(d) of The Petroleum Drilling and Production Regulations, 1984 requires that the operator submit proof of notification to the surface owner of his intentions. This has not been provided. The attached draft letter requires that Omega submit such proof of notification prior to initiating injection.

Board Order No. PM 40 which authorizes pressure maintenance operations in Waskada Unit No. 2 and other Units provides for injection in a number of stated wells and "such other wells in the Unit Areas as the Board may approve". Consequently, approval of this application can be affected by a letter from the Board.

H. Clare Moster

LRD/lk

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 22, 1985

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

Attention Mr. C. Kang, Chairman

Dear Sir,

Re: Pressure Maintenance Operations
Waskada Unit No. 2 Expansion

In response to your letter dated August 12, 1985, please find attached a copy of the letter notifying the surface owner of LSD5-35-1-26 WPM of our proposed plans. If there are any further questions related to this matter, please contact the undersigned.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish
Manager - Engineering

RAB:ad
Encls.

c.c. B. Dubreuil, Man.Pet.Branch
Waskada (LAm) Waterflood
Approvals File

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 22, 1985

Mr. Marvin G. Rowe
Unit 3, 1920-31 Street S.W.,
Calgary, Alberta
T3E 2M9

Dear Sir,

Re: Waskada Unit No. 2 Expansion
Sections 34 and 35, Twp.1,Rge.26 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to expand the existing pressure maintenance scheme into Sections 34 and 35 Twp.1, Rge.26 WPM. The well locations included in the proposed expansion are 2-34, 8-34, 2-35,3-35, 5-35,6-35 and 12-35-1-26WPM.

The expanded pressure maintenance scheme will involve the injection of produced water into well 5-35-1-26 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be made based on the results of this project.

If you have any comments or concerns related to the proposed project please contact either myself or Mr. Richard Brekke at (403) 261-0743.

Yours truly,
OMEGA HYDROCARBONS LTD.

R.A. Beamish, P. Eng.,
Manager - Engineering

RAB:ad
Encls.
c.c. Waskada Unit No.2 File
Land Dept.

FIG NO. 1

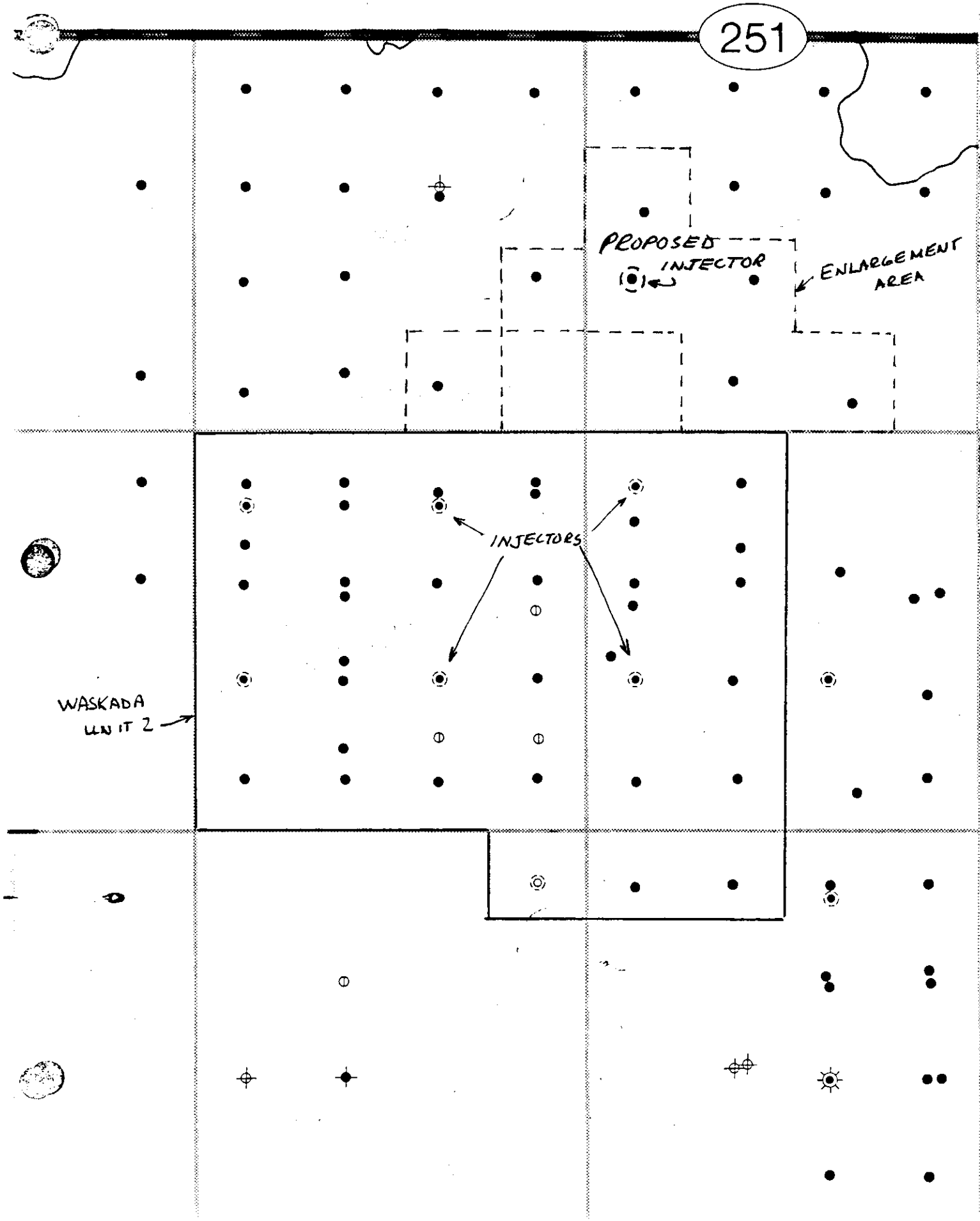
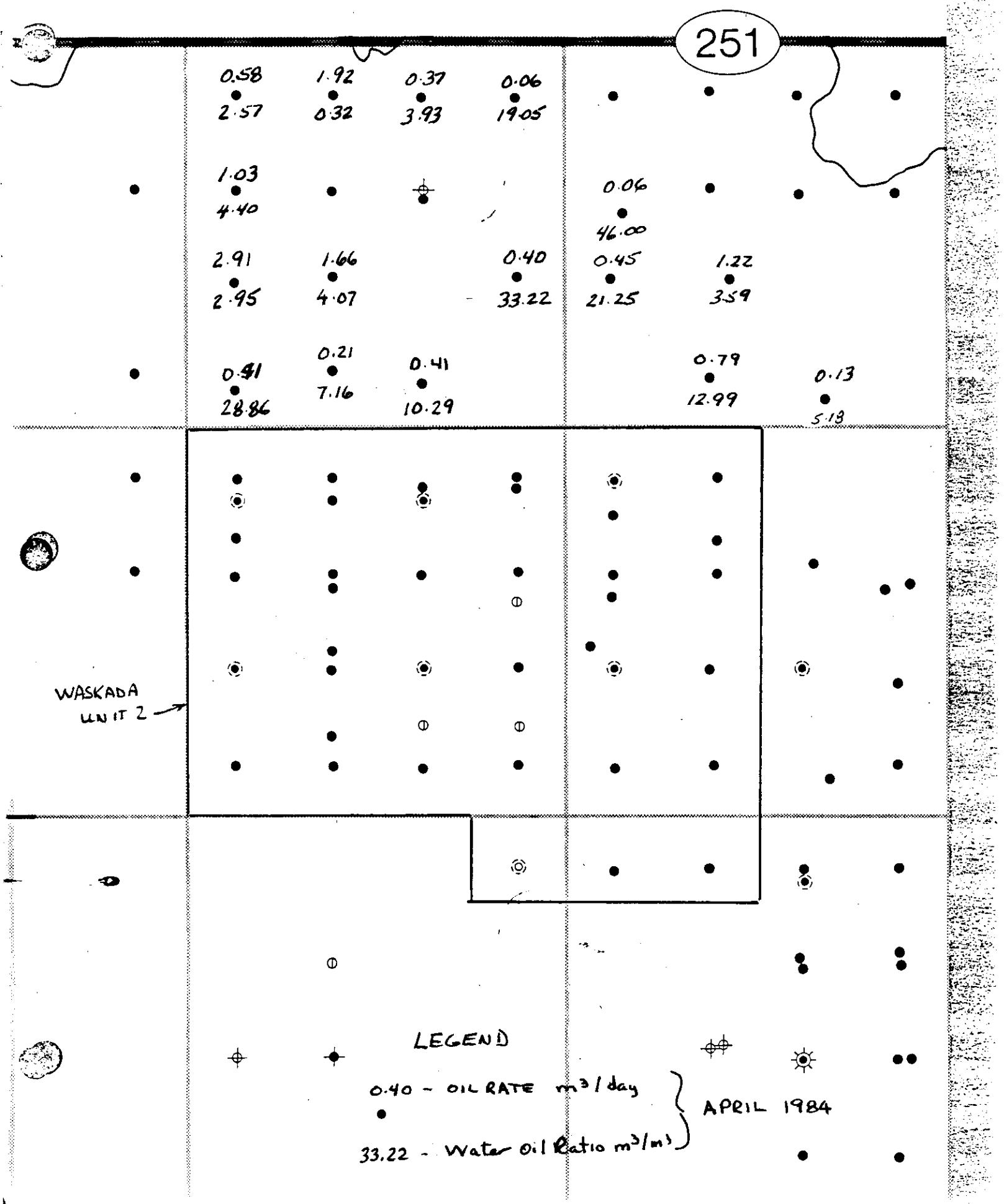

251
PROPOSED INJECTOR
ENLARGEMENT AREA
INJECTORS
WASKADA UNIT 2

FIG No. 2


251
0.58
2.57
1.92
0.32
0.37
3.93
0.06
19.05
1.03
4.40
0.06
46.00
2.91
2.95
1.66
4.07
0.40
33.22
0.45
21.25
1.22
3.59
0.41
28.86
0.21
7.16
0.41
10.29
0.79
12.99
0.13
5.13
WASKADA UNIT 2
LEGEND
0.40 - OIL RATE m³/day
33.22 - Water Oil Ratio m³/m³
APRIL 1984

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

August 6, 1985

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

Attention: Mr. W. McDonald
Deputy Chairman

Dear Sir,

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No.40 be amended to include the additional areas contained within a proposed expansion of Waskada Unit No. 2. The Unit expansion will consist of 7 new tracts containing Lower Amaranth wells 2-34, 8-34, 2-35, 3-35, 5-35, 6-35 and 12-35-1-26 WPM. As of this date the Unit expansion documents have been signed by all parties except the Manitoba Department of Energy and Mines. All the approvals required to expand Waskada Unit No. 2 are expected to be in place by September 1, 1985. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained in PM Order No. 40, Omega Hydrocarbons Ltd. also requests permission to inject water into well;

Omega Waskada 5-35-1-26 WPM

coincident with the effective date of the expanded Unit.

As operator of both the existing pressure maintenance scheme and the proposed expansion area we plan to continue operating in accordance with the current pressure maintenance rules. Prior to the commencement of water injection a bottomhole pressure measurement will be taken at the proposed injector. A maximum allowable wellhead pressure of 10,000 kPa will be set for the new water injection well and the additional production/ injection data will be reported monthly in the same manner as the existing scheme.

...../2

Corrosion prevention methods within the waterflood expansion area will include cathodic protection, internally coated flowlines and well treatments. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been on ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging 900 m^3/d while the two (2) existing source water wells are capable of producing an additional 500 m^3/d of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed expansion area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

Omega Hydrocarbons Ltd. is in the process of completing an updated reservoir model study as well as a PVT study in Township 2 Range 26 WPM. The reservoir model study was initiated in February, 1985 and should be completed by August 31, 1985. An inverted nine spot pattern surrounding injection well 13A-24-1-26 WPM was chosen as the model study area based on the amount of production history. At present the reservoir model has been successfully history matched and the final predictions are currently being run. Funds for the additional PVT study work have been approved and the final report should be completed by the end of September, 1985.

In further support of this submission please find attached the following information:

1) Lessor Map of the Expansion Area
2) Lessee Map of the Expansion Area
3) Well Status Summary
4) Schematic Diagram of the Water Injection System

Should you have any comments or questions related to the submission, please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,
OMEGA HYDROCARBONS LTD.

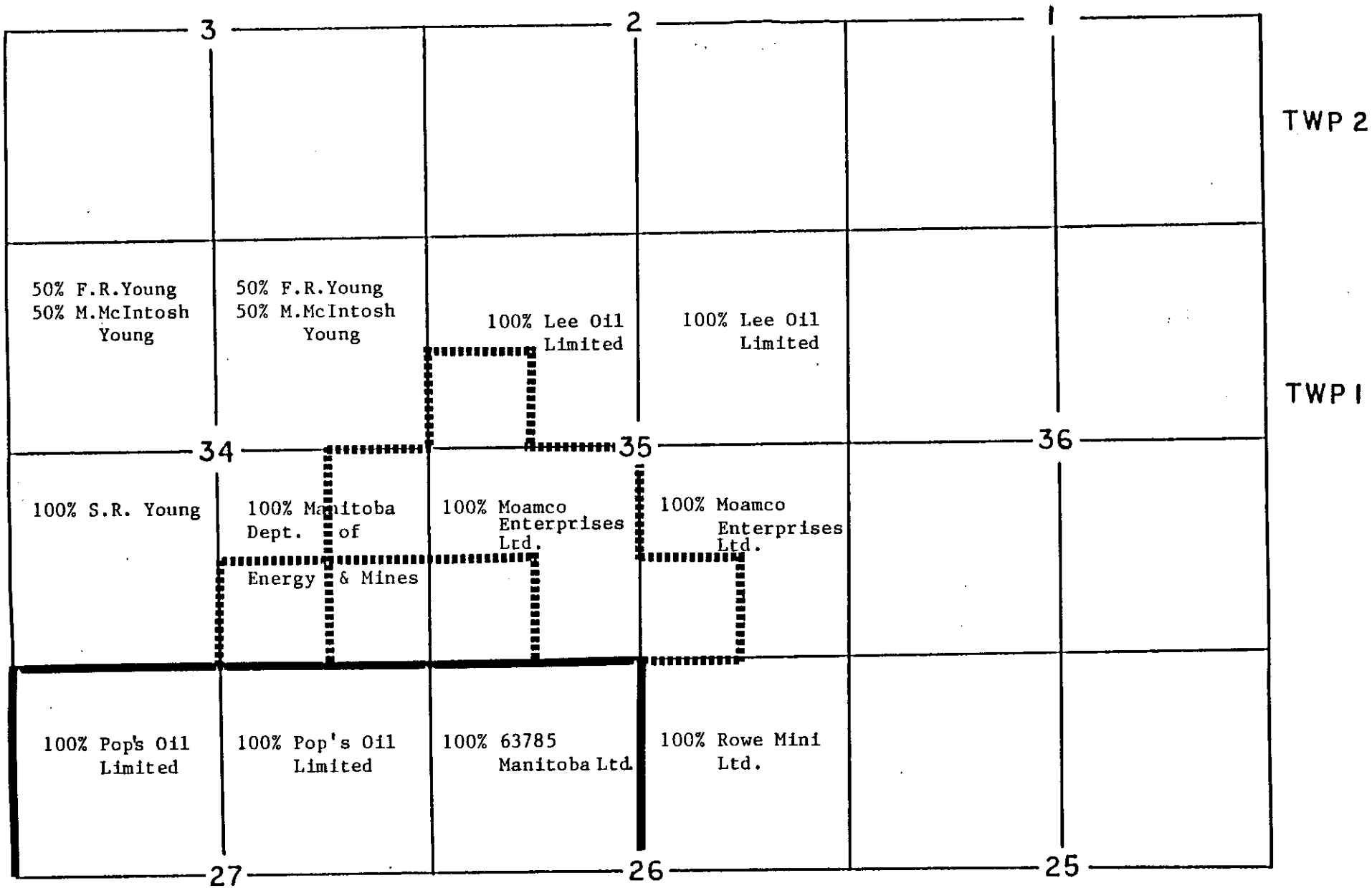
G.E. Patey
Vice President-Production

GEP:ad
Encls.
c.c. R. Dubreuil - Man. Pet.Branch
R.A. Beamish
Waskada (LAm)Waterflood Approvals File

Lessor Map In and Adjoining

The Proposed Expansion Area

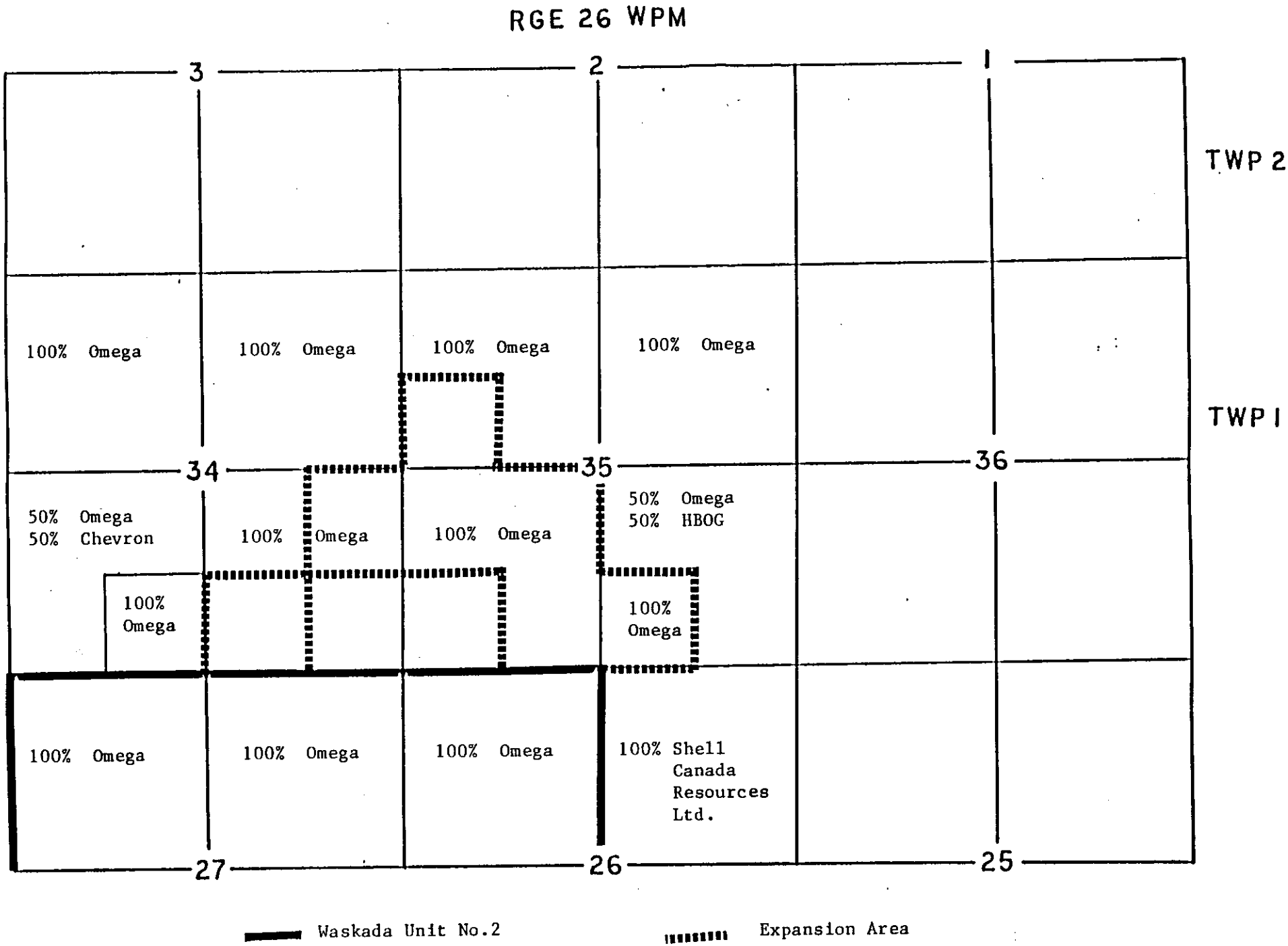
RGE 26 WPM



Attachment 1

Lessee Map in and Adjoining

The Proposed Expansion Area



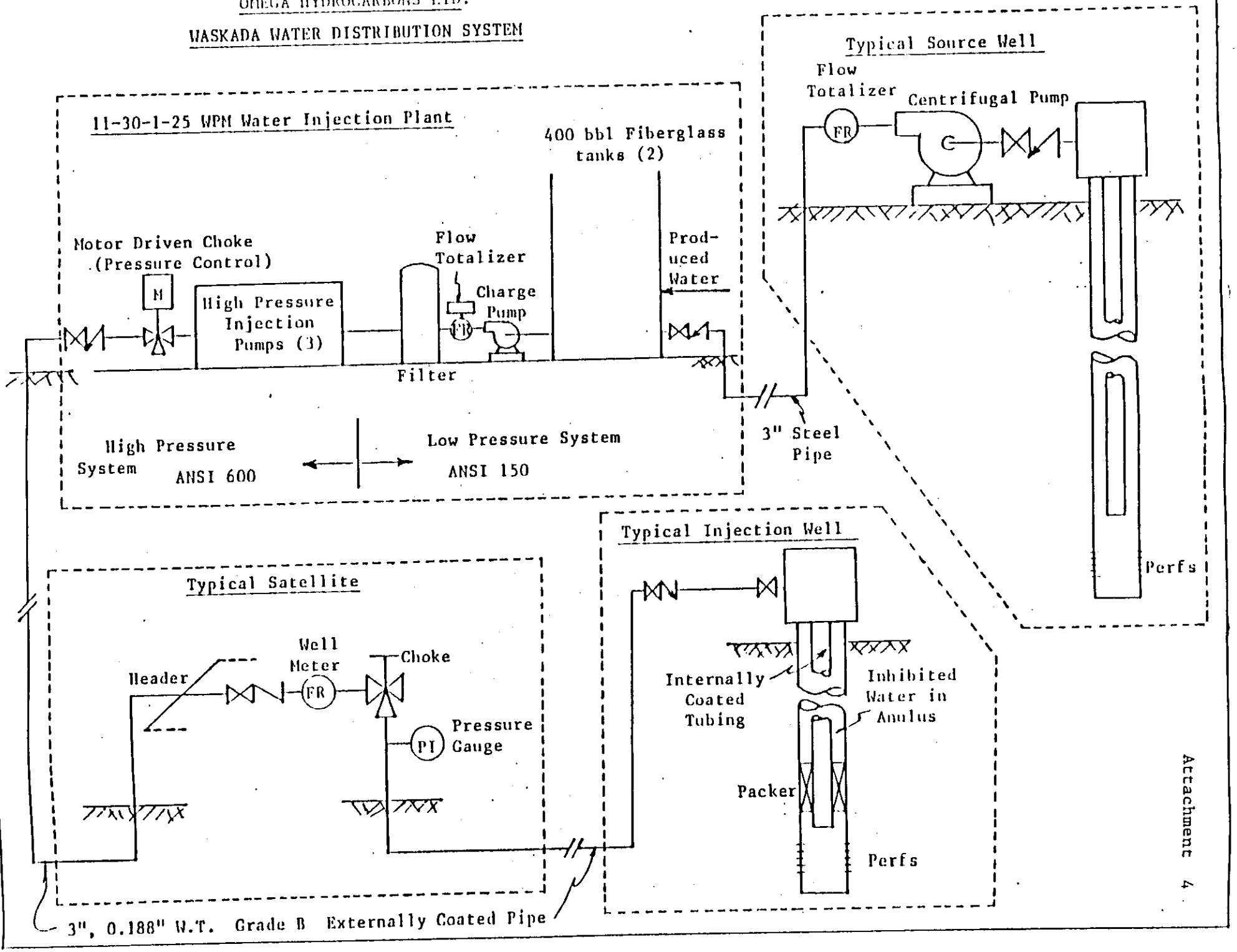
Attachment 2

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No.2
Expansion Area

Well	Completed Zone	Status
13-26-1-26 WPM	Lower Amaranth	Water Injector
13A-26-1-26 WPM	Lower Alida	Producing Oil Well
14-26-1-26 WPM	Lower Amaranth	Producing Oil Well
14-27-1-26 WPM	Upper Alida	Producing Oil Well
14A-27-1-26 WPM	Lower Amaranth	Producing Oil Well
15-27-1-26 WPM	Upper Alida	Producing Oil Well
15A-27-1-26 WPM	Lower Amaranth	Water Injector
16-27-1-26 WPM	Upper Alida	Producing Oil Well
16A-27-1-26 WPM	Lower Amaranth	Producing Oil Well
1-34-1-26 WPM	Lower Alida	Producing Oil Well
2-34-1-26 WPM	Lower Amaranth	Producing Oil Well
3-34-1-26 WPM	Lower Amaranth	Producing Oil Well
6-34-1-26 WPM	Lower Amaranth	Producing Oil Well
8-34-1-26 WPM	Lower Amaranth	Producing Oil Well
10-34-1-26 WPM	Lower Amaranth	Producing Oil Well
16-34-1-26 WPM	Lower Amaranth	Producing Oil Well
2-35-1-26 WPM	Lower Amaranth	Producing Oil Well
3-35-1-26 WPM	Lower Amaranth	Producing Oil Well
5-35-1-26 WPM	Lower Amaranth	Producing Oil Well
6-35-1-26 WPM	Lower Amaranth	Producing Oil Well
7-35-1-26 WPM	Lower Alida	Producing Oil Well
8-35-1-26 WPM	Lower Amaranth	Producing Oil Well
10-35-1-26 WPM	Lower Alida	Producing Oil Well
11-35-1-26 WPM	Lower Alida	Producing Oil Well
12-35-1-26 WPM	Lower Amaranth	Producing Oil Well
13-35-1-26 WPM	Lower Amaranth	Water Injector
14-35-1-26 WPM	Lower Amaranth	Producing Oil Well

OMEGA HYDROCARBONS LTD.

WASKADA WATER DISTRIBUTION SYSTEM



Attachment 4

WASSADA UNIT No 2

Tracts being added: Nos. 28-34, inclusive

Working Int. Owner:

Omega (100%)

Royalty Int. Owners:
(new tracts)

#2550 (2-35-1-26)

SE 35 M.G. Rowe → HGOG → Omega (50%)

#2921 (6-35-1-26)

SW 35 H.G. Rowe → HGOG → Omega (50%)

Moamco Enterprises Ltd. ?

SW 35 H.G. Rowe → M.G. Rowe → Moamco

Aug. 21/85

Bob Beamish advised that H.G. Rowe transferred his mineral (royalty) interest in SW 35 to M.G. Rowe who in turn transferred it into the corporation (MOAMCO)

Omega to send in documents to support above to complete our files.

JM

Manitoba

Energy and Mines Petroleum

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

(204) 945-6577

February 2, 1987

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
CALGARY, AB T2P 0H3

Attention: Mr. G.E. Patey
Vice-President, Production

Re: **Waskada Lower Amaranth A Pool**
Pressure Maintenance Order No. 4
Omega et al Waskada 7-33-1-26 (WPM)
Omega Waskada 13-33-1-26 (WPM)
Omega Sasko Waskada 15-33-1-26 (WPM)
Omega Waskada 13-3-2-26 (WPM)
Omega et al Waskada 15-3-2-26 (WPM)
Omega Waskada 5-4-2-26 (WPM)
Omega et al Waskada 7-4-2-26 (WPM)

Enclosed is Pressure Maintenance Order No. 4 authorizing water injection operations in the Waskada Lower Amaranth A Pool (includes proposed injectors in Waskada Unit No. 15).

Please note that subclause 1(4) of the Pressure Maintenance Order No. 4 stipulates that the completion of the wells will be as prescribed by the Executive Director of the Petroleum Division. You are consequently required to submit completed applications for each well to be converted (form MG416) for the approval of the proposed recompletion program, prior to conversion of the subject wells to injection.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

encl

> Bob

Manitoba

lip

Date: January 22, 1987 → Bob

To: (1) Bill McDona

(2) Charles Kan

(1) In future Board Orders switch position of signatures as follows:

Deputy Chairman ← → Chairman

☐ Take Action ☐ Per Your

☐ May We Discuss ☐ For Your

ies

(2) Bottom 1½" margin may create problem!

Comments: Board

(3) Have sample "Route Slip" typed when package done.

1. Bill's signature requi
2. Charles signature requ
3. Minister's signature required on 6 copies of Order.
4. Date 6 copies of Order.
5. Certificates to be completed and signed by Charles.
6. File with Registrar and return extra signed copies to Petroleum.

MG-1298 PS-I 182

PS-1-05

Manitoba

Memorandum

Date: January 21, 1987

To: The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From: H. Clare Moster
Executive Director
Petroleum Division

Telephone:

Subject:

Waskada Lower Amaranth A Pool
Pressure Maintenance Operations

First | Fold

Omega Hydrocarbons Ltd. has made application for approval to conduct pressure maintenance operations in the subject Pool by conversion of a number of wells in the proposed Waskada Unit No. 15 to water injection. Notices of the application were published in the Manitoba Gazette (November 8, 1986) and the Deloraine Times and Star (November 12, 1986) and were sent to the offsetting working interest owners. No objections to the application were received.

Recommendation:

It is recommended that the application be approved and the Board Order No. PM 54 (Pressure Maintenance (Waskada Lower Amaranth A Pool) Order No. 4) be implemented. This new Order would provide for approval of all of Omega's pressure maintenance operations in the subject Pool (except the pilot waterflood in Section 11-2-26 WPM).

Discussion:

The proposed Board Order No. PM 54 includes all the normal relevant provisions included in recent pressure maintenance orders.

H. Clare Moster

MA/LRD/lk

THE REGULATIONS ACT

CERTIFICATE

I, Charles S. Kang, Chairman of The Oil and Natural Gas Conservation Board, hereby certify that the attached regulation is the original Order:--

(a) entitled Pressure Maintenance (Waskada Lower Amaranth A Pool) Order No. 4

(b) made pursuant to The Mines Act;

(c) by The Oil and Natural Gas Conservation Board;

(d) on the day of A.D. 1987;

(e) approved by the Honourable the Minister of Energy and Mines on the day of A.D. 1987; and

(f) which regulation comes into force on the day of filing with the Registrar of Regulations.

DATED this day of A.D 1987

_____

Charles S. Kang
Chairman
The Oil and Natural Gas
Conservation Board

THE MINES ACT
(C.C.S.M. c.M160)

Pressure Maintenance (Waskada Lower Amaranth A Pool) Order No. 4*

Regulation
Filed

Definitions
1 In this order,

"pool" means the Waskada Lower Amaranth A Pool;

"unit areas" means the Waskada Lower Amaranth Unit No. 1, Waskada Unit No. 2, Waskada Unit No. 3, Waskada Unit No. 4, Waskada Unit No. 5, Waskada Unit No. 7, Waskada Unit No. 8, Waskada Unit No. 13 and Waskada Unit No. 15;

"unit operator" means Omega Hydrocarbons Ltd.

Pressure Maintenance Operations
2 In response to an application dated October 8, 1986 from the unit operator for approval of a project to inject water into the pool in proposed Waskada Unit No. 15, the board orders that the unit operator shall conduct pressure maintenance operations by the injection of water into the pool underlying the unit areas.

3 The pressure maintenance operation shall be in accordance with and subject to the rules set out in the schedule.

Repeal
4. Manitoba Regulation 227/86 (Board Order No. PM 52) is repealed.

THE OIL AND NATURAL GAS CONSERVATION BOARD:

Date

Charles S. Kang
Chairman

Wm. McDonald
Deputy Chairman

Approved:

Minister, Department of Energy and Mines

* This Order is Oil and Natural Gas Conservation Board Order No. PM 54.

SCHEDULE
(Section 3)

PRESSURE MAINTENANCE RULES

1(1) Water shall be injected into the pool through the wells:

Omega Waskada WIW 13-17-1-25 (WPM)
Omega Waskada WIW 7-18-1-25 (WPM)
Omega Waskada Prov. WIW 5-20-1-25 (WPM)
Omega Waskada WIW 7-20-1-25 (WPM)
Omega Waskada WIW 13-20-1-25 (WPM)
Omega Waskada WIW 15-20-1-25 (WPM)
Omega Waskada WIW 5-30-1-25 (WPM)
Omega Waskada Prov. WIW A7-30-1-25 (WPM)
Omega Waskada WIW 13-30-1-25 (WPM)
Omega Waskada WIW 15-30-1-25 (WPM)
Omega Waskada WIW 5-31-1-25 (WPM)
Omega Waskada WIW 7-31-1-25 (WPM)
Omega Waskada WIW 13-31-1-25 (WPM)
Omega Waskada WIW 15-31-1-25 (WPM)
Omega Waskada WIW 13-32-1-25 (WPM)
Omega Waskada Prov. WIW 16-11-1-26 (WPM)
Omega Waskada WIW 5-13-1-26 (WPM)
Omega Waskada WIW 7-13-1-26 (WPM)
Omega Waskada WIW 13-13-1-26 (WPM)
Omega Waskada WIW 15-13-1-26 (WPM)
Omega Waskada WIW 15-14-1-26 (WPM)
Omega Waskada Prov. WIW 16-22-1-26 (WPM)
Omega Waskada WIW 7-23-1-26 (WPM)
Omega Waskada WIW 15-23-1-26 (WPM)
Omega Waskada WIW 5-24-1-26 (WPM)
Omega Waskada WIW 7-24-1-26 (WPM)
Omega Waskada WIW 13-24LAm-1-26 (WPM)
Omega Waskada WIW 15-24-1-26 (WPM)
Omega Waskada WIW 5-25-1-26 (WPM)
Omega Waskada WIW 7-25-1-26 (WPM)
Omega Waskada WIW 13-25-1-26 (WPM)
Omega Waskada WIW 15-25-1-26 (WPM)
Omega Waskada WIW 5-26-1-26 (WPM)
Omega Waskada WIW 7-26-1-26 (WPM)
Omega Waskada WIW 13-26-1-26 (WPM)
Omega Waskada WIW 5-27-1-26 (WPM)
Omega Waskada WIW 7-27-1-26 (WPM)
Omega Waskada WIW 13-27LAm-1-26 (WPM)
Omega Waskada WIW 15-27LAm-1-26 (WPM)
Omega et al Waskada WIW 7-33-1-26 (WPM)
Omega Waskada WIW 13-33-1-26 (WPM)
Omega Sasko Waskada WIW 15-33-1-26 (WPM)
Omega Chevron Waskada WIW 5-34-1-26 (WPM)

0877P

Omega Chevron Waskada WIW 13-34-1-26 (WPM)
Omega Chevron Waskada WIW 15-34-1-26 (WPM)
Omega Waskada WIW 5-35-1-26 (WPM)
Omega Waskada WIW 13-35-1-26 (WPM)
Omega Waskada WIW 15-35-1-26 (WPM)
Omega Waskada WIW 5-36-1-26 (WPM)
Omega Waskada WIW 7-36-1-26 (WPM)
Omega Waskada WIW 13-36-1-26 (WPM)
Omega Waskada WIW 15-36-1-26 (WPM)
Omega Waskada WIW 7-5-2-25 (WPM)
Omega Waskada WIW 5-8-2-25 (WPM)
Omega Waskada WIW 7-8-2-25 (WPM)
Omega Waskada WIW 13-8-2-25 (WPM)
Omega Waskada WIW 15-8-2-25 (WPM)
Omega Andex Waskada WIW 5-1-2-26 (WPM)
Omega Andex Waskada WIW 7-1-2-26 (WPM)
Omega et al Waskada WIW 13-1-2-26 (WPM)
Omega Waskada WIW 15-1-2-26 (WPM)
Omega Chevron Waskada WIW 5-2-2-26 (WPM)
Omega Waskada WIW 7-2-2-26 (WPM)
Omega Waskada Prov. WIW 15-2-2-26 (WPM)
Omega Waskada WIW 7-3-2-26 (WPM)
Omega Waskada WIW 13-3-2-26 (WPM)
Omega et al Waskada WIW 15-3-2-26 (WPM)
Omega Waskada WIW 5-4-2-26 (WPM)
Omega et al Waskada WIW 7-4-2-26 (WPM)

and such other wells in the unit areas as the Board may approve.

1(2) After the commencement of injection, the unit operator shall, subject to any remedial work required to be performed on the wells referred to in subsection (1), endeavour to maintain continuous injection.

1(3) Notwithstanding the provisions of subsection (2), the Board may, upon application by the unit operator, approve the suspension of water injection into any well or wells, provided that the Board is satisfied that pressure maintenance operations in the unit areas will not be adversely affected.

1(4) The completion of the wells referred to in subsection (1) will be as prescribed by the Executive Director of the Petroleum Division.

2 The unit operator, upon the the request of the Board, shall satisfy the Board as to the source, suitability and method of treatment of the water to be injected.

(1) Before injection of water is commenced, the unit operator shall submit, to the Board, results of a survey conducted to determine the static reservoir pressure in a minimum of one well in each injection pattern.

3(2) The unit operator shall, not less than six months nor more than 12 months after the commencement of injection, and at yearly intervals thereafter, conduct a survey to determine the static reservoir pressure in a minimum of one well in each injection pattern within the unit areas.

3(3) The unit operator shall submit the details of the surveys described in subsections (1) and (2) to the Petroleum Division, including a list of the wells to be surveyed, the measurement technique to be used, and the intended shut-in periods for each well, and approval shall be obtained from the Executive Director of the Petroleum Division before the program is carried out and within 30 days of the completion date of the surveys, a report shall be submitted to the Petroleum Division including:

(a) the static reservoir pressure data obtained from the survey, corrected to a common datum;
(b) an isobaric map of the pool within the unit areas based on the data obtained; and
(c) a discussion of the survey results and pressure distribution within the pool.

3(4) Unless otherwise authorized by the Board, the unit operator shall, in those portions of the unit areas where the Mississippian Formations are known to be oil bearing, conduct a pressure or other survey to investigate the presence and effect of communication between the pool and the Mississippian Formations within one year of commencement of injection and at intervals of three years thereafter.

3(5) The Board may, at any time, require the unit operator to carry out such additional reservoir pressure surveys as it deems necessary.

4 The unit operator shall immediately report to the Board any indication of channelling or break-through of injected water to producing wells or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

5 The maximum wellhead pressure at which water is injected into the wells referred to in subsection 1(1) shall not exceed 10 000 kPa or such other maximum pressure as the Board may prescribe and the Board may, from time to time, prescribe a maximum or minimum rate at which water shall be injected into any well in the unit areas.

6(1) The unit operator shall, not later than the last day of each month, file with the Petroleum Division, a report of the quantity, source and pressure of water injected during the preceding month into each well referred to in subsection 1(1).

6(2) The unit operator shall, not later than the last day of each month, file with the Petroleum Division a summary report of production and injection operations during the preceding month, which report shall include:

(a) a tabulation of total oil, total water and total gas produced;
(b) a tabulation of the number of producing wells and injection wells which were active;
(c) the results of at least one twenty-four hour production test on each producing well in the unit areas including volumes of oil, gas and water produced during the test; and
(d) a summary of any remedial operations carried out on any well in the unit areas.

7 The unit operator, shall, within 60 days of the end of each calendar year, file with the Petroleum Division a report of the pressure maintenance program, setting out graphically such interpretive information necessary to evaluate the efficacy of the waterflood.

LOI SUR LES TEXTES RÉGLEMENTAIRES

CERTIFICAT

Je soussigné, Charles S. Kang, président de la Commission de gestion du pétrole et du gaz naturel, certifie par les présentes que le règlement ci-joint constitue l'original du règlement :

a) intitulé "Ordonnance n° 4 sur le maintien de la pression dans le gisement Lower Amaranth A (Waskada)";

b) adopté conformément à la Loi sur les mines;

c) par la Commission de gestion du pétrole et du gaz naturel;

d) le jour d 1987;

e) approuvé par le ministre de l'Énergie et des Mines le jour d 1987;

f) lequel règlement entre en vigueur sur dépôt auprès du registraire des règlements.

Fait ce jour d 1987.

Le président de la Commission de gestion
du pétrole et du gaz naturel,

Charles S. Kang

ANNEXE A

LOI SUR LES MINES
(C.P.L.M., c. M160)

Ordonnance n° 4 sur le maintien de la pression dans le gisement Lower Amaranth A (Waskada)*

Règlement
Date de dépôt :

Définitions

1 Les définitions qui suivent s'appliquent à la présente ordonnance :

"gisement" Le gisement Lower Amaranth A (Waskada). ("pool")

"zones" La zone n° 1 (Waskada Lower Amaranth), ainsi que les zones n°s 2, 3, 4, 5, 7, 8, 13 et 15 (Waskada). ("unit areas")

"exploitant" Omega Hydrocarbons Ltd. ("unit operator")

Le maintien de la pression

2 Vu la demande d'approbation de l'exploitant, datée du 8 octobre 1986, relative à l'injection d'eau dans le gisement de la zone proposée n° 15 (Waskada), la Commission ordonne le maintien de la pression par l'exploitant au moyen d'injection d'eau dans le gisement situé sous les zones.

3 Le maintien de la pression est effectué conformément aux règles figurant à l'annexe.

Abrogation

4 Le règlement du Manitoba 227/86 (ordonnance n° MP 52) est abrogé.

_____
date

POUR LA COMMISSION DE GESTION DU PÉTROLE ET DU GAZ NATUREL,

le président,

Charles S. Kang

le vice-président,

William McDonald

Approuvée par le ministre de l'Énergie et des Mines,

* La présente ordonnance est l'ordonnance n° MP 54 de la Commission de gestion du pétrole et du gaz naturel.

ANNEXE
(article 3)

Règles relatives au maintien de la pression

1(1) L'eau doit être injectée dans le gisement par les puits suivants :

Omega Waskada PIE 13-17-1-25 (OMP)
Omega Waskada PIE 7-18-1-25 (OMP)
Omega Waskada Prov. PIE 5-20-1-25 (OMP)
Omega Waskada PIE 7-20-1-25 (OMP)
Omega Waskada PIE 13-20-1-25 (OMP)
Omega Waskada PIE 15-20-1-25 (OMP)
Omega Waskada PIE 5-30-1-25 (OMP)
Omega Waskada Prov. PIE A7-30-1-25 (OMP)
Omega Waskada PIE 13-30-1-25 (OMP)
Omega Waskada PIE 15-30-1-25 (OMP)
Omega Waskada PIE 5-31-1-25 (OMP)
Omega Waskada PIE 7-31-1-25 (OMP)
Omega Waskada PIE 13-31-1-25 (OMP)
Omega Waskada PIE 15-31-1-25 (OMP)
Omega Waskada PIE 13-32-1-25 (OMP)
Omega Waskada Prov. PIE 16-11-1-26 (OMP)
Omega Waskada PIE 5-13-1-26 (OMP)
Omega Waskada PIE 7-13-1-26 (OMP)
Omega Waskada PIE 13-13-1-26 (OMP)
Omega Waskada PIE 15-13-1-26 (OMP)
Omega Waskada PIE 15-14-1-26 (OMP)
Omega Waskada Prov. PIE 16-22-1-26 (OMP)
Omega Waskada PIE 7-23-1-26 (OMP)
Omega Waskada PIE 15-23-1-26 (OMP)
Omega Waskada PIE 5-24-1-26 (OMP)
Omega Waskada PIE 7-24-1-26 (OMP)
Omega Waskada PIE 13-24LAm-1-26 (OMP)
Omega Waskada PIE 15-24-1-26 (OMP)
Omega Waskada PIE 5-25-1-26 (OMP)
Omega Waskada PIE 7-25-1-26 (OMP)
Omega Waskada PIE 13-25-1-26 (OMP)
Omega Waskada PIE 15-25-1-26 (OMP)
Omega Waskada PIE 5-26-1-26 (OMP)
Omega Waskada PIE 7-26-1-26 (OMP)
Omega Waskada PIE 13-26-1-26 (OMP)
Omega Waskada PIE 5-27-1-26 (OMP)
Omega Waskada PIE 7-27-1-26 (OMP)
Omega Waskada PIE 13-27LAm-1-26 (OMP)
Omega Waskada PIE 15-27LAm-1-26 (OMP)
Omega et al Waskada PIE 7-33-1-26 (OMP)
Omega Waskada PIE 13-33-1-26 (OMP)
Omega Sasko Waskada PIE 15-33-1-26 (OMP)
Omega Chevron PIE 5-34-1-26 (OMP)
Omega Chevron Waskada PIE 13-34-1-26 (OMP)
Omega Chevron Waskada PIE 15-34-1-26 (OMP)
Omega Waskada PIE 5-35-1-26 (OMP)
Omega Waskada PIE 13-35-1-26 (OMP)
Omega Waskada PIE 15-35-1-26 (OMP)

Omega Waskada PIE 5-36-1-26 (OMP)
Omega Waskada PIE 7-36-1-26 (OMP)
Omega Waskada PIE 13-36-1-26 (OMP)
Omega Waskada PIE 15-36-1-26 (OMP)
Omega Waskada PIE 7-5-2-25 (OMP)
Omega Waskada PIE 5-8-2-25 (OMP)
Omega Waskada PIE 7-8-2-25 (OMP)
Omega Waskada PIE 13-8-2-25 (OMP)
Omega Waskada PIE 15-8-2-25 (OMP)
Omega Andex Waskada PIE 5-1-2-26 (OMP)
Omega Andex Waskada PIE 7-1-2-26 (OMP)
Omega et al Waskada PIE 13-1-2-26 (OMP)
Omega Waskada PIE 15-1-2-26 (OMP)
Omega Chevron Waskada PIE 5-2-2-26 (OMP)
Omega Waskada PIE 7-2-2-26 (OMP)
Omega Waskada Prov. PIE 15-2-2-26 (OMP)
Omega Waskada PIE 7-3-2-26 (OMP)
Omega Waskada PIE 13-3-2-26 (OMP)
Omega et al Waskada PIE 15-3-2-26 (OMP)
Omega Waskada PIE 5-4-2-26 (OMP)
Omega et al Waskada PIE 7-4-2-26 (OMP)

Elle l'est également par les autres puits situés dans les zones que la Commission approuve.

1(2) L'exploitant doit assurer une injection constante, une fois celle-ci commencée, sauf les travaux de réparation requis à l'égard des puits visés au paragraphe (1).

1(3) Malgré les dispositions du paragraphe (2), la Commission peut, à la requête de l'exploitant, suspendre l'injection d'eau dans un ou plusieurs puits si elle est d'avis que les opérations de maintien de la pression dans les zones n'auront pas à en souffrir.

1(4) Le complètement des travaux relatifs aux puits visés au paragraphe (1) se fera conformément aux instructions du directeur général de la Division du pétrole.

2 L'exploitant doit indiquer à la Commission, à la demande de celle-ci, la provenance, l'adéquation ainsi que la méthode de traitement de l'eau injectée.

3(1) Avant de commencer l'injection d'eau, l'exploitant doit transmettre à la Commission les résultats d'un relevé concernant la pression statique du réservoir à l'égard d'au moins un puits par maillage.

3(2) Au moins 6 mois et au plus 12 mois après le début de l'injection, l'exploitant doit relever la pression statique du réservoir à l'égard d'au moins un puits par maillage situé dans les zones. Il le fait ensuite annuellement.

3(3) L'exploitant transmet les résultats des relevés visés aux paragraphes (1) et (2) à la Division du pétrole, accompagnés de la liste des puits à relever, de la technique de mesure envisagée ainsi que des périodes de fermeture prévues à l'égard de chaque puits. Le programme ne peut être entrepris sans l'autorisation du directeur général de la Division du pétrole. Un rapport doit être fait à la Division du pétrole dans les 30 jours de l'achèvement des relevés. Il énonce notamment :

es données relatives à la pression statique du réservoir obtenues lors du relevé et ramenées à un même niveau;
b) une carte isobarique de la partie de gisement située dans les zones dressée à partir des données recueillies;
c) une analyse des résultats du relevé et de la répartition de la pression dans le gisement.

3(4) Sauf autorisation contraire de la Commission, l'exploitant doit, par relevé relatif à la pression ou par d'autres relevés, étudier l'existence et les effets d'une communication entre le gisement et les formations mississipiennes à l'égard des parties de zones où ces formations sont reconnues pétrolifères. Cette étude est faite dans l'année du début de l'injection, et ensuite répétée de façon triennale.

3(5) La Commission peut en tout temps exiger de l'exploitant des relevés supplémentaires relatifs à la pression du réservoir, selon ce qu'elle juge à-propos.

4 L'exploitant doit immédiatement signaler à la Commission tout indice d'infiltration d'eau injectée dans les puits de production ou d'effets préjudiciables qui peuvent être attribués aux opérations de maintien de la pression.

5 La pression de tête de puits maximale à laquelle l'eau est injectée dans les puits visés au paragraphe 1(1) est de 10 000 kPa, ou celle prescrite par la Commission. Celle-ci peut fixer les débits maximal et minimal auxquels l'eau doit être injectée dans l'un ou l'autre des puits situés dans les zones.

6(1) L'exploitant doit remettre à la Division du pétrole, au plus tard le dernier jour de chaque mois, un rapport énonçant la quantité, la provenance et la pression de l'eau injectée dans chacun des puits visés au paragraphe 1(1) au cours du mois précédant.

6(2) L'exploitant doit remettre à la Division du pétrole, au plus tard le dernier jour de chaque mois, un rapport sommaire de la production et de l'injection au cours du mois précédant. Le rapport doit énoncer :
a) une table de la production totale de pétrole, d'eau et de gaz;
b) une table des puits de production et des puits d'injection en activité;
c) les résultats d'au moins une évaluation de la production menée durant 24 heures à l'égard de chaque puits de production des zones, y compris les volumes de pétrole, de gaz et d'eau produits pendant l'évaluation;
d) un résumé des opérations correctives menées à l'égard de l'un ou l'autre des puits situés dans les zones.

7 L'exploitant doit remettre à la Division du pétrole, dans les 60 jours de la fin de chaque année civile, un rapport relatif au programme de maintien de la pression qui indique graphiquement les données nécessaires à l'évaluation de l'efficacité de l'injection d'eau.

Manitoba

Memorandum

Date January 16, 1987

To Bob Dubreuil
Petroleum, Energy & Mines
555-330 Graham

From Benoit Charon
Legal Translation Services
350-444 St. Mary Ave
- 4599

Telephone

Subject Translation; c/F 01720

Attached are translated Certificate and Regulation (Order No PM 54) as requested.

BC

First | Fold

L.A. 317-86 — Environment Canada — P.T.H. No. 83 — R.M. of Arthur

Application by Environment Canada for a permit for a Stream Flow Measuring Structure adjacent to P.T.H. No. 83, N.E.¼, Section 20-1-27 West, R.M. of Arthur.

L.A. 318-86 — C/Saw Lumber o/b/o J. Skene — P.T.H. No. 9 — R.M. of West St. Paul

Application by C/Saw Lumber o/b/o Jolene Skene for a permit for an addition to an Existing Dwelling adjacent to P.T.H. No. 9, Lots 5, 6, and 7, Part R.L. 21 and 22, Parish of St. Paul, R.M. of West St. Paul.

L.A. 319-86 — Shell Canada Products — P.T.H. No. 15 — R.M. of Springfield

Application by Shell Canada Products for a permit Keylock Pumps adjacent to P.T.H. No. 15, N.E.¼, Section 33-10-5 East, R.M. of Springfield.

L.A. 320-86 — R. Porhownik — P.T.H. No. 9 — R.M. of St. Andrews

Application by Raye Porhownik for a permit for an Access Driveway and Roadway onto P.T.H. No. 9, Part R.L. 128, Parish of St. Andrews, R.M. of St. Andrews.

The Highway Traffic Board will be prepared to consider any submissions regarding the above applications at this hearing. Any persons wishing to make a submission should either contact the Secretary at the hearing or forward their written submission in advance to: A. Poltaruk, Secretary, The Highway Traffic Board, Room 206-301 Weston Street, Winnipeg, Manitoba.
Phone: 945-8912

A. POLTARUK, MMM CD
Secretary,
—45 THE HIGHWAY TRAFFIC BOARD.

THE HIGHWAY TRAFFIC BOARD

Notice is hereby given that a hearing of The Highway Traffic Board will be held on Tuesday, November 18, 1986 at 1:00 P.M. in the 4th Floor Board Room of the Provincial Building, 27-2nd Avenue, S.W., Dauphin, Manitoba.

Permits — Part I — Section 9 H.P.A. and Part III — Section 17 H.P.A.

L.A. 295-86 — R. Kutcher o/b/o I.C.G. — P.T.H. No. 5 — R.M. of Shell River

Application by R. Kutcher o/b/o I.C.G. Utilities Ltd. for a permit for a Gas Pipeline adjacent to P.T.H. No. 5, S.W.¼, Section 9-26-28 West, R.M. of Shell River.

L.A. 306-86 — Turtle River Conservation District — P.T.H. No. 5 — R.M. of McCreary

Application by Turtle River Conservation District for a permit for a WaterBlock Crossing onto P.T.H. No. 5, N.E.¼, Sec. 28-20-15 West, R.M. of McCreary.

L.A. 311-86 — L. Davidson — P.T.H. No. 16 — R.M. of Russell

Application by L. W. Davidson for a permit to Relocate an Existing Access Driveway onto P.T.H. No. 16, S.E.¼, Section 24-20-28 West, R.M. of Russell.

L.A. 312-86 — T. Zentner — P.T.H. No. 16 — R.M. of Russell

Application by Timothy Zentner for a permit for a Garage adjacent to and Two (2) Access Driveways onto P.T.H. No. 16 (Service Road), S.E.¼ Section 34-20-28 West, R.M. of Russell.

S-109-86 — N. D. Ayotte — P.T.H. No. 20 — R.M. of Ochre River

Application by N. D. Ayotte for a permit for a Sign adjacent to P.T.H. No. 20, S.E.¼, Section 5-25-17 West, R.M. of Ochre River.

S-115-86 — Cardeager Ford Mercury Sales Ltd. — P.T.H. No. 5 — R.M. of Shell River

Application by Cardeager Ford Mercury Sales Ltd. for a permit for a Sign adjacent to P.T.H. No. 5, N.E.¼, Section 6-26-28 West, R.M. of Shell River.

The Highway Traffic Board will be prepared to consider any submissions regarding the above applications at this hearing. Any persons wishing to make submission should either contact the Secretary at the hearing or forward their written submission in advance to: A. Poltaruk, Secretary, The Highway Traffic Board, Room 206-301 Weston Street, Winnipeg, Manitoba.
Phone: 945-8912

A. POLTARUK, MMM CD
Secretary,
—45 THE HIGHWAY TRAFFIC BOARD.

UNDER THE MINES ACT

NOTICE
WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 15, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 7-33-1-26 WPM
Omega Waskada 13-33-1-26 WPM
Omega Sasko Waskada 15-33-1-26 WPM
Omega Waskada 13-3-2-26 WPM
Omega et al Waskada 15-3-2-26 WPM
Omega Waskada 5-4-2-26 WPM
Omega et al Waskada 7-4-2-26 WPM

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

Dated at Winnipeg, this 28th day of October, 1986.

CHARLES S. KANG,
Chairman.
—45

of putting down your plans for next year and seeing the projected sales and dollar returns. Transferring these dollar values along with your costs to the projected cash flow tells you when you may need operating money and when you will have surplus funds to pay off loans. Often a good idea is to do last year's actual cash flow. Unless you make major changes in your operation your projected cash flow should be fairly similar. And if you do make a major change, then you can compare them to see how the change will affect your cash flow. One major change that has already occurred is the price of

good show.

Beef cattle events

In conjunction with some members of the Turtle Mountain Agriculture Society we have planned a series of beef meetings in Boissevain. Some of the fellows

NOTICE
WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Wasakda Unit No. 15, has made application under "The Mines Act" to convert the following wells to water injection:

Omega at al Waskada
7-33-1-26 WPM
Omega Waskada
13-33-1-26 WPM
Omega Sasko Waskada
15-33-1-26 WPM
Omega Waskada
13-3-2-26 WPM
Omega et al Waskada
15-3-2-26 WPM
Omega Waskada
5-4-2-26 WPM
Omega et al Waskada
7-4-2-26 WPM

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

Date at Winnipeg, this 28th day of October, 1986.

Charles S. Kang
Chairman

Deloraine Times & Star
Nov 12, 1986

October 30, 1986

Queen's Printer
Statutory Publications
200 Vaughan Street

Marc Arbez
Petroleum Engineer
Petroleum Division
Department of Energy & Mines
555 - 330 Graham Avenue

MANITOBA GAZETTE

Please have the attached Notice appear in the next issue of the Manitoba Gazette Under The Mines Act.

Marc Arbez

CH/ch
Attachment

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 15, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 7-33-1-26 WPM
Omega Waskada 13-33-1-26 WPM
Omega Sasko Waskada 15-33-1-26 WPM
Omega Waskada 13-3-2-26 WPM
Omega et al Waskada 15-3-2-26 WPM
Omega Waskada 5-4-2-26 WPM
Omega et al Waskada 7-4-2-26 WPM

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

DATED at Winnipeg, this 28th day of October, 1986.

Charles S. Kang
Chairman

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 15, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 7-33-1-26 WPM
Omega Waskada 13-33-1-26 WPM
Omega Sasko Waskada 15-33-1-26 WPM
Omega Waskada 13-3-2-26 WPM
Omega et al Waskada 15-3-2-26 WPM
Omega Waskada 5-4-2-26 WPM
Omega et al Waskada 7-4-2-26 WPM

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

DATED at Winnipeg, this 28th day of October, 1986.

Charles S. Kang
Chairman

Manitoba

Memorandum

Date
October 22, 1986

To
The Oil and Natural Gas
Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From
H. Clare Moster
Executive Director
Petroleum Division

Telephone

Subject

Re: Pressure Maintenance - Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., as operator of the proposed Waskada Unit No. 15, has made application for approval to conduct pressure maintenance operations in the Waskada Lower Amaranth A Pool. Omega proposes to inject water in the following wells:

Omega et al Waskada 7-33-1-26 WPM
Omega Waskada 13-33-1-26 WPM
Omega Sasko Waskada 15-33-1-26 WPM
Omega Waskada 13-3-2-26 WPM
Omega et al Waskada 15-3-2-26 WPM
Omega Waskada 5-4-2-26 WPM
Omega et al Waskada 7-4-2-26 WPM

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star and sent to the offsetting working interest owners (see Table No. 2). A copy of the proposed notice is attached.

In the absence of objections to the notice, it is recommended that the application be approved, and that Board Order No. PM 52 be rescinded in favour of a new Board Order No. PM 53 which will include the injectors for the proposed Waskada Unit No. 15.

Discussion:

Omega has successfully conducted pressure maintenance by waterflooding in a major portion of the Waskada Lower Amaranth A Pool for over three years. In response to waterflooding, the oil production rate decline has been arrested and, in some cases, reversed. Computer-simulated model studies of the waterflood operations in the Pool indicate that waterflooding

ill result in up to 25% recovery of the original oil-in-place. Under normal primary production operations, it is estimated that less than 10% of the original oil-in-place can be recovered.

Figure No. 1 shows the proposed Unit No. 15 configuration. Table No. 1 illustrates the severity of the primary production decline in the area and emphasizes the need for pressure maintenance operations. The Table lists average daily oil production in the first month in which each well produced at least 20 days and the corresponding production rate for May, 1986. The average length of production is about 20 months, but oil rates have declined to only 17% of initial rates.

While the proposed waterflood area is wholly operated by Omega, several offset tracts are operated by other companies (see Figure No. 1). Because of this and evidence that waterflooding could affect wells more than one location removed from injection, notice of the application should be published. It is proposed that the notice be published in the Manitoba Gazette and the Deloraine Times and Star and sent to the offsetting working interst owners (see Table No. 2).

If no valid interventions or objections are received, it is proposed that Board Order No. PM 52 be rescinded and that a revised Board Order be issued to include the water injection wells for the proposed Waskada Unit No. 15. The revised Order would include all the normal provisions contained in Board Order No. PM 52.

Completion of the wells and proposed surface facilities are similar to current facilities in use in the Waskada Field Waterfloods, and are acceptable.

Original signed by H. C. Moster

H. Clare Moster

LRD/dh/lk

Table No. 1
Proposed Waskada Unit No. 15
Primary Production Decline

Well	Initial Oil Rate (m^3/d)*	Initial Month	Months Produced	Current Oil Rate (m^3/d) (July/86)
6-33-1-26	9.05	01-86	7	6.72
7-33	1.97	09-85	11	0.45
8-33	5.31	08-85	12	0.39
9-33	1.30	12-82	44	0.41
10-33	1.93	12-85	8	1.66
11-33	0.30	12-85	8	0.58
13-33	3.99	10-85	10	0.46
14-33	2.39	09-85	11	0.50
15-33	8.22	08-85	12	2.04
16-33	7.43	08-85	12	0.49
4-3-2-26	1.86	06-85	14	0.73
9-3	7.05	07-84	25	0.79
10-3	5.45	02-84	30	0.53
11-3	10.64	06-84	26	0.63
12-3	5.68	08-84	24	1.34
13-3	4.51	08-85	12	1.09
14-3	0.79	01-83	43	0.59
15-3	2.62	09-85	11	0.73
16-3	2.79	09-85	11	0.91
1-4	7.13	09-84	23	0.71
2-4	6.13	09-84	23	0.64
3-4	7.39	01-85	19	2.68
4-4	1.31	08-85	12	0.19
5-4	3.46	07-85	13	0.26
6-4	3.90	01-85	19	0.97
7-4	3.05	09-84	23	0.50
9-4	5.20	02-84	30	1.75
10-4	2.48	09-84	23	0.19
11-4	1.67	08-85	12	0.29
12-4	2.64	08-85	12	0.18
14-4	2.54	08-85	12	0.31
9-5	2.13	09-85	11	0.59
10-5	0.32	11-85	9	0.10
3-10	0.58	05-85	15	0.32
Total**	105.72		490	18.02
Avg/well**	4.41		20.4	0.75

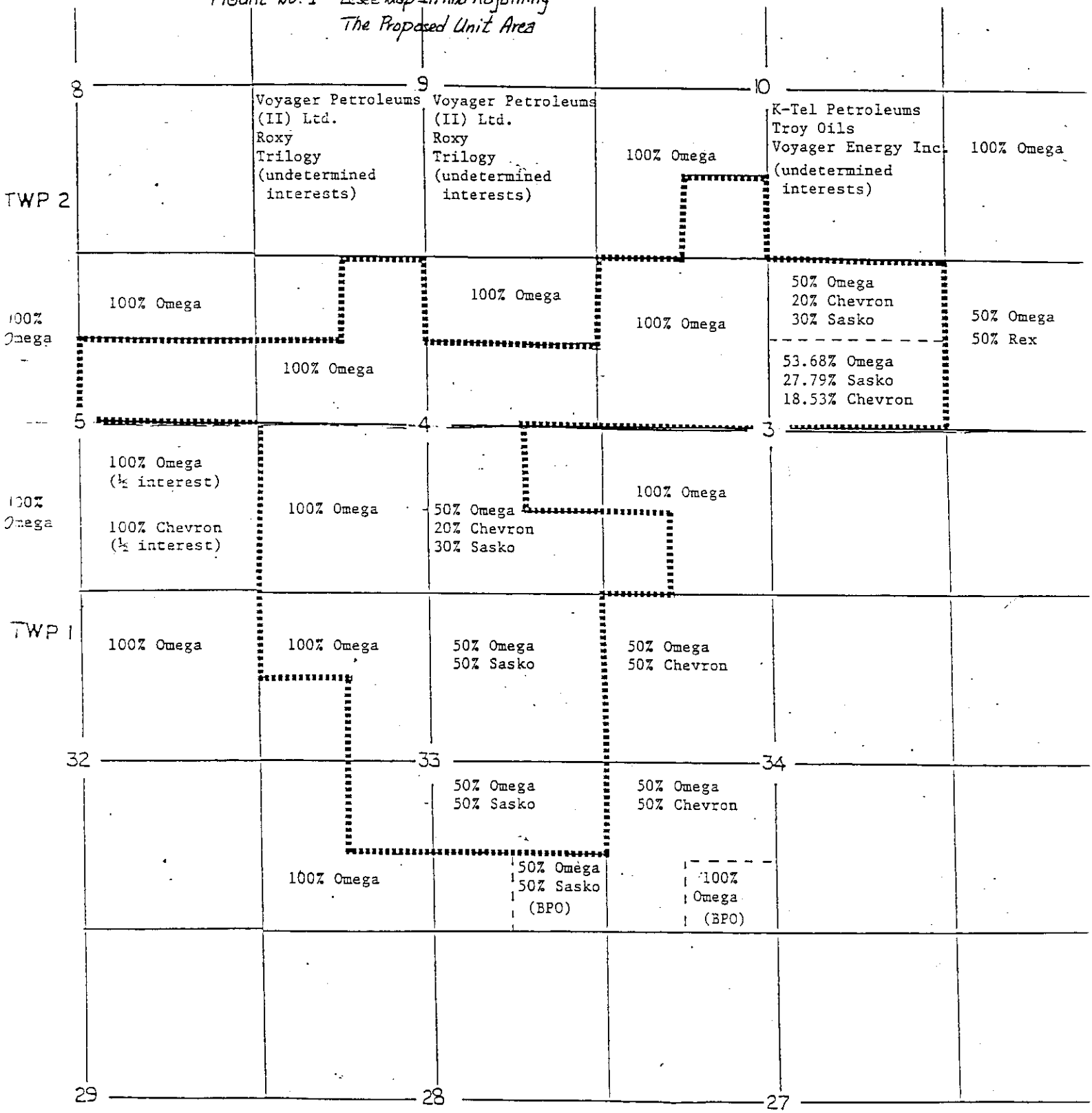
* Calculate for first month in which the well produced for 20 or more days.

** Includes only wells which have produced at least 12 months.

Table No. 2
Proposed Waskada Unit No. 15
Offsetting Working Interest Ownership

Working Interest Owner:	Area of Interest:
Chevron Canada Resources	SE1/4 5-2-26, SE1/4 4-2-26, NE1/4 3-2-26, W1/2 32-1-26
Rex Petroleums Ltd.	NW1/4 2-2-26
Roxy Petroleum Ltd.	S1/2 9-2-26
Sasko Oil and Gas Inc.	SE1/4 4-2-26, NE1/4 3-2-26, S1/2 33-1-26
Trilogy Resource Corporation	S1/2 9-2-26
Troy Oils Ltd.	SE1/4 10-2-26
Voyager Energy Company	SE1/4 10-2-26, S1/2 9-2-26
K-Tel Petroleums Ltd.	SW1/4 10-2-26
Andex Oil Co. Ltd.	SE1/4 9-2-26

FIGURE NO. 1 - Lesee Map In And Adjoining The Proposed Unit Area



Proposed Waskada Unit No. 15

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 15, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 7-33-1-26 WPM
Omega Waskada 13-33-1-26 WPM
Omega Sasko Waskada 15-33-1-26 WPM
Omega Waskada 13-3-2-26 WPM
Omega et al Waskada 15-3-2-26 WPM
Omega Waskada 5-4-2-26 WPM
Omega et al Waskada 7-4-2-26 WPM

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

DATED at Winnipeg, this day of , 1986.

Charles S. Kang
Chairman

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 8, 1986

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnpeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the area contained inside the proposed Waskada Unit No. 15. The new Unit consists of 34 tracts and contains Lower Amaranth wells 6-33, 7-33, 8-33, 9-33, 10-33, 11-33, 13-33, 14-33, 15-33, 16-33-1-26 and 4-3, 9-3, 10-3, 11-3, 12-3, 13-3, 14-3, 15-3, 16-3, 1-4, 2-4, 3-4, 4-4, 5-4, 6-4, 7-4, 9-4, 10-4, 11-4, 12-4, 14-4, 9-5, 10-5, 3-10-2-26 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega et al Waskada	7-33-1-26 WPM
Omega Waskada	13-33-1-26 WPM
Omega Sasko Waskada	15-33-1-26 WPM
Omega Waskada	13-3-2-26 WPM
Omega et al Waskada	15-3-2-26 WPM
Omega Waskada	5-4-2-26 WPM
Omega et al Waskada	7-4-2-26 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 15 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging 1180m^3/d while the four (4) existing source water wells are capable of producing an additional 1250m^3/d of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

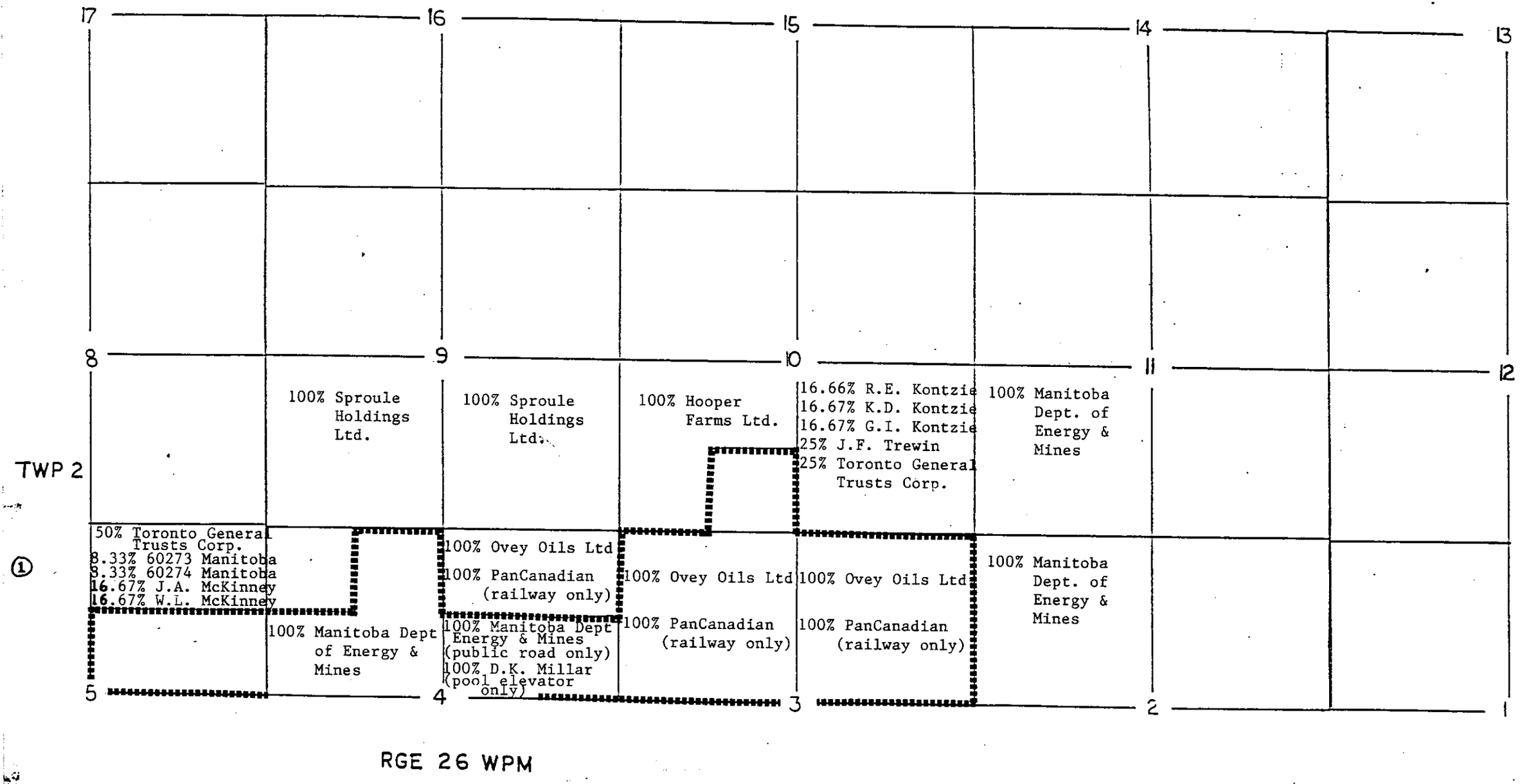
G.E. Patey

G.E. Patey
Vice President Production

RAB:cw
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map In And Adjoining

The Proposed Unit Area

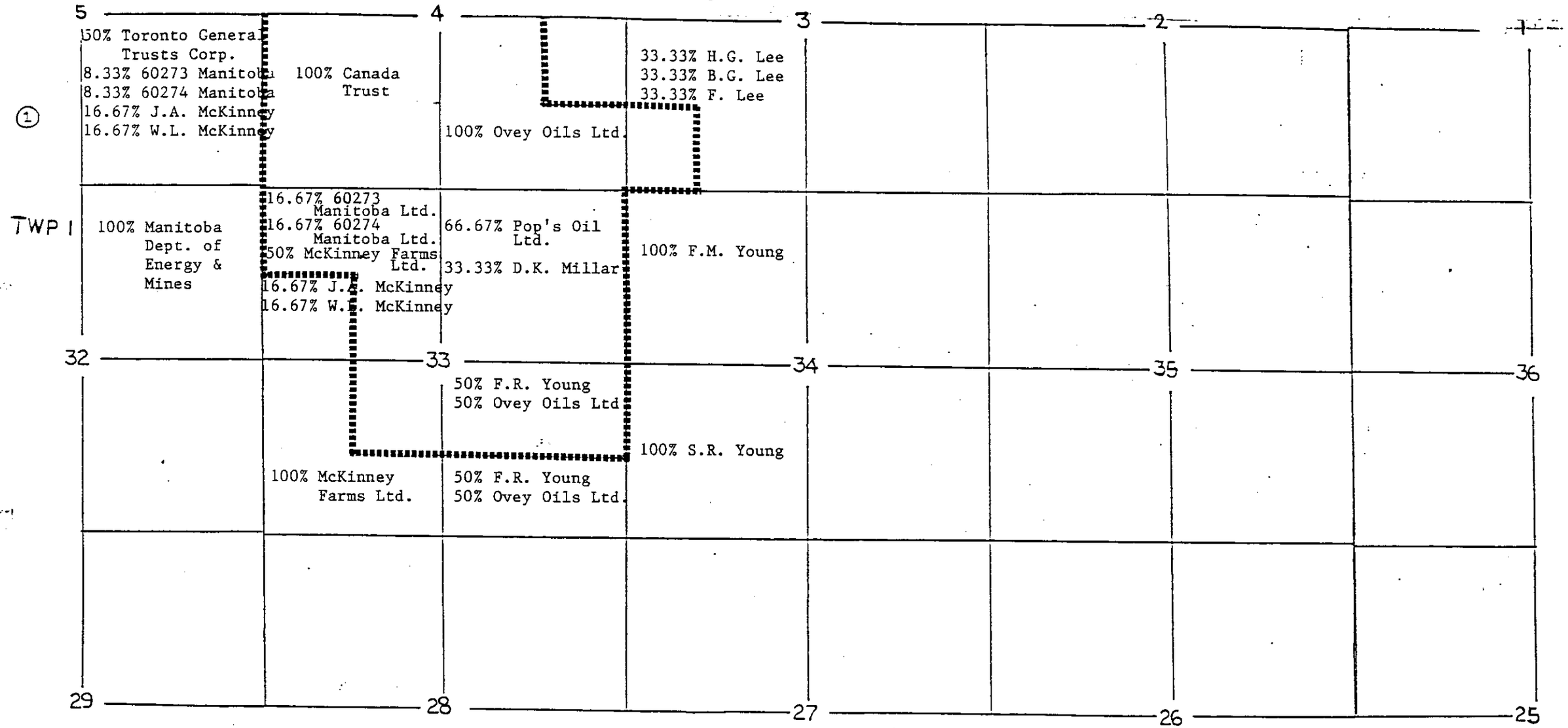


Proposed Waskada Unit No. 15

Attachment 1

Lessor Map In And Adjoining

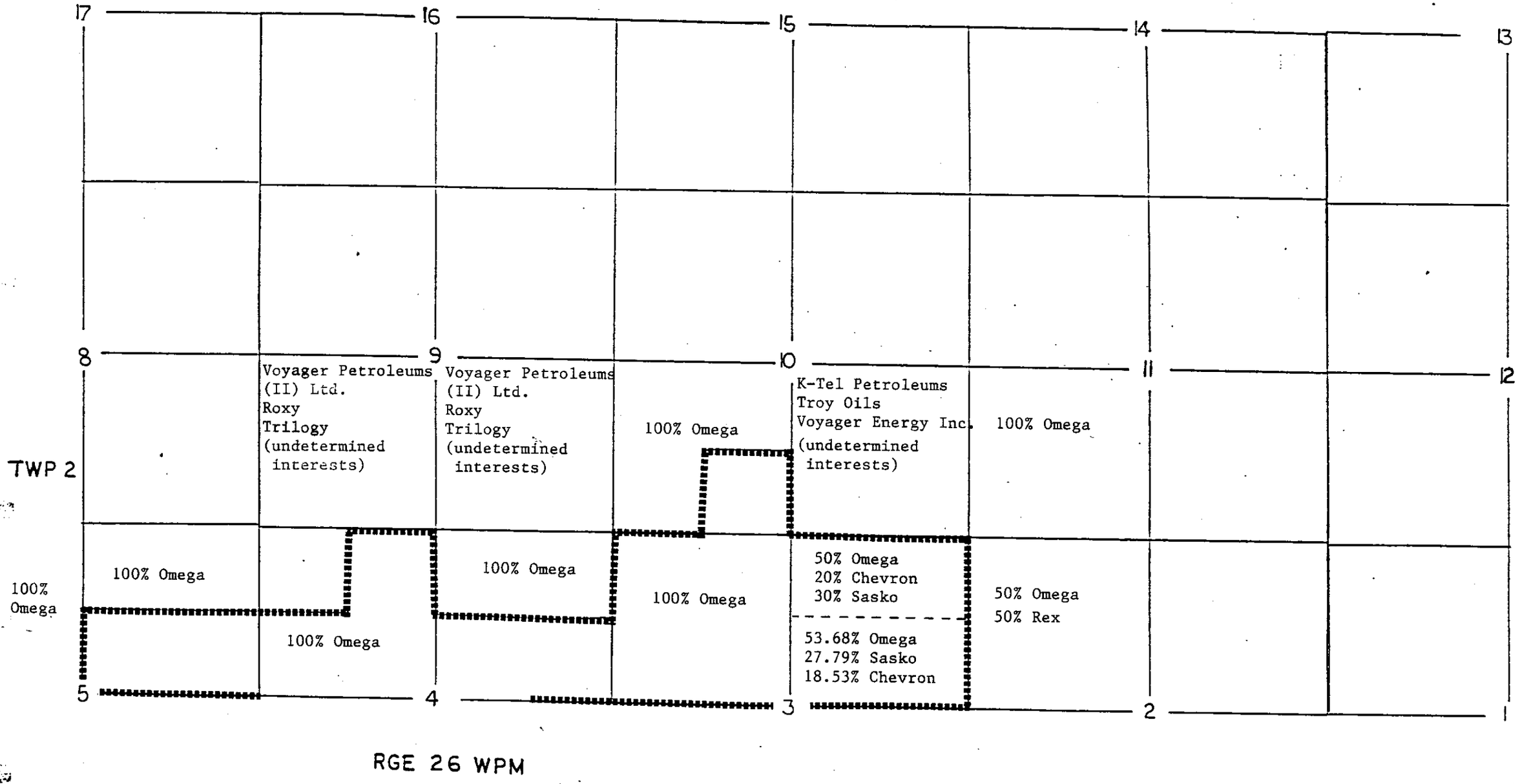
The Proposed Unit Area



1 ⟹ W/2 5-2-26 WPM 16.67% 60273 Manitoba Ltd.
16.67% 60274 Manitoba Ltd.
33.33% J.A. McKinney
33.33% W.L. McKinney,
100% PanCanadian (railway only)

Proposed Waskada Unit No. 15

Lessee Map In And Adjoining
The Proposed Unit Area

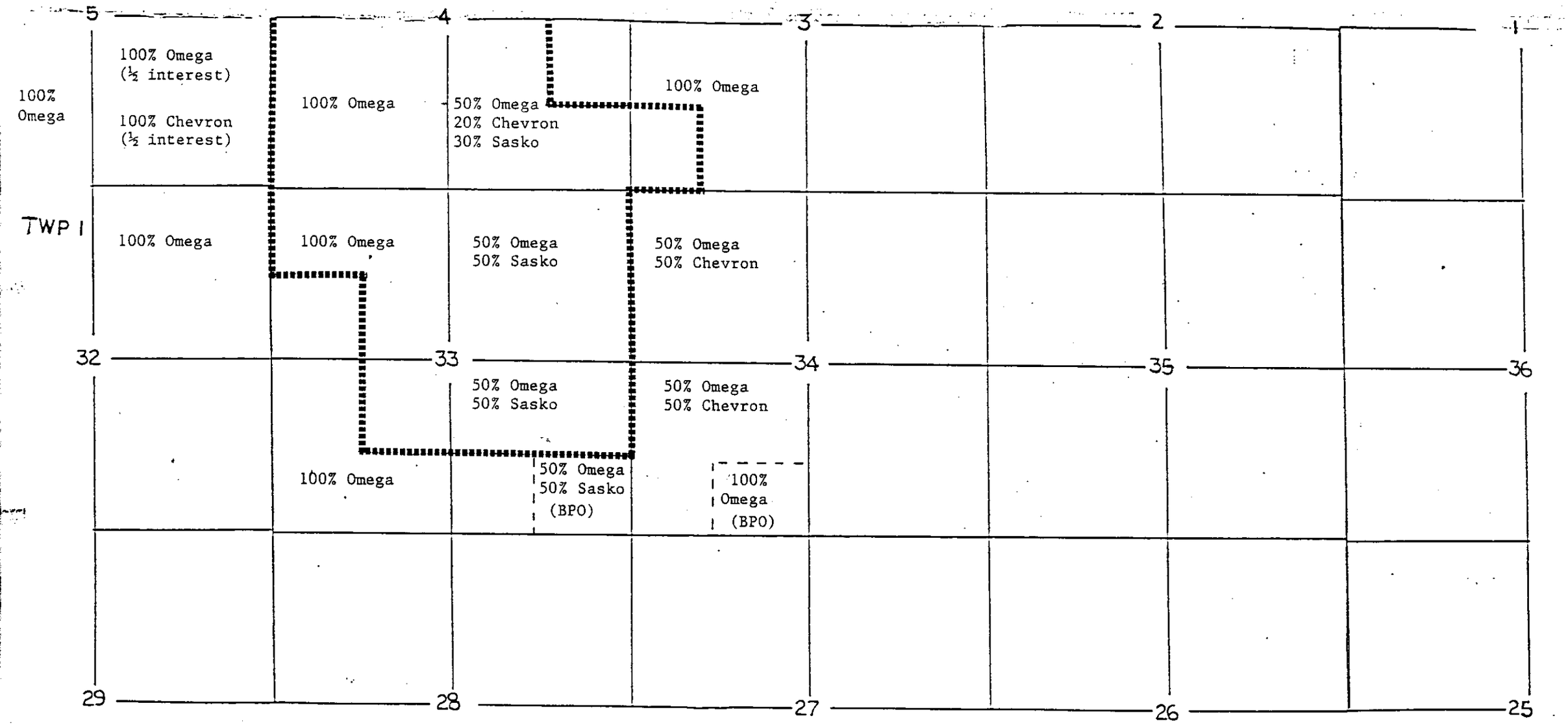


Proposed Waskada Unit No. 15

Attachment 2

Lessee Map In And Adjoining

The Proposed Unit Area



RGE 26 WPM

Proposed Waskada Unit No. 15

Attachment 3

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No. 15

Well Location	Completed Zone	Status
1-33-1-26 WPM	Lower Amaranth	Producing Oil Well
2-33-1-26 WPM	Lower Amaranth	Producing Oil Well
6-33-1-26 WPM	Lower Amaranth	Producing Oil Well
7-33-1-26 WPM	Lower Amaranth	Producing Oil Well
8-33-1-26 WPM	Lower Amaranth	Producing Oil Well
9-33-1-26 WPM	Lower Amaranth	Producing Oil Well
10-33-1-26 WPM	Lower Amaranth	Producing Oil Well
11-33-1-26 WPM	Lower Amaranth	Producing Oil Well
13-33-1-26 WPM	Lower Amaranth	Producing Oil Well
14-33-1-26 WPM	Lower Amaranth	Producing Oil Well
15-33-1-26 WPM	Lower Amaranth	Producing Oil Well
16-33-1-26 WPM	Lower Amaranth	Producing Oil Well
4-34-1-26 WPM	Lower Amaranth	Producing Oil Well
5-34-1-26 WPM	Lower Amaranth	Injection Well
12-34-1-26 WPM	Lower Amaranth	Producing Oil Well
13-34-1-26 WPM	Lower Amaranth	Injection Well
14-34-1-26 WPM	Lower Amaranth	Producing Oil Well
5-2-2-26 WPM	Lower Amaranth	Injection Well
12-2-2-26 WPM	Lower Amaranth	Producing Oil Well
3-3-2-26 WPM	Lower Amaranth	Producing Oil Well
4-3-2-26 WPM	Lower Amaranth	Producing Oil Well
5-3-2-26 WPM	Upper Alida	Producing Oil Well
6-3-2-26 WPM	Upper Alida	Producing Oil Well
7-3-2-26 WPM	Lower Amaranth	Injection Well
8-3-2-26 WPM	Lower Amaranth	Producing Oil Well
9-3-2-26 WPM	Lower Amaranth	Producing Oil Well
10-3-2-26 WPM	Lower Amaranth	Producing Oil Well
11-3-2-26 WPM	Lower Amaranth	Producing Oil Well
12-3-2-26 WPM	Lower Amaranth	Producing Oil Well
13-3-2-26 WPM	Lower Amaranth	Producing Oil Well
14-3-2-26 WPM	Lower Amaranth	Producing Oil Well
15-3-2-26 WPM	Lower Amaranth	Producing Oil Well
16-3-2-26 WPM	Lower Amaranth	Producing Oil Well

Well Location	Completed Zone	Status
1-4-2-26 WPM	Lower Amaranth	Producing Oil Well
2-4-2-26 WPM	Lower Amaranth	Producing Oil Well
3-4-2-26 WPM	Lower Amaranth	Producing Oil Well
4-4-2-26 WPM	Lower Amaranth	Producing Oil Well
5-4-2-26 WPM	Lower Amaranth	Producing Oil Well
6-4-2-26 WPM	Lower Amaranth	Producing Oil Well
7-4-2-26 WPM	Lower Amaranth	Producing Oil Well
8-4-2-26 WPM	Upper Alida	Producing Oil Well
9-4-2-26 WPM	Lower Amaranth	Producing Oil Well
10-4-2-26 WPM	Lower Amaranth	Producing Oil Well
11-4-2-26 WPM	Lower Amaranth	Producing Oil Well
12-4-2-26 WPM	Lower Amaranth	Producing Oil Well
14-4-2-26 WPM	Lower Amaranth	Producing Oil Well
9-5-2-26 WPM	Lower Amaranth	Producing Oil Well
10-5-2-26 WPM	Lower Amaranth	Producing Oil Well
11-5-2-26 WPM	Lower Amaranth	Producing Oil Well
1-9-2-26 WPM	Lower Amaranth	Suspended Well
3-9-2-26 WPM	N/A	Abandoned Well
3-10-2-26 WPM	Lower Amaranth	Producing Oil Well
4-11-2-26 WPM	Lower Amaranth	Producing Oil Well

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 8, 1986

Waskada Unit No. 15
Surface Owners
(Addressee list attached)

Dear Sir/Madam:

Re: Proposed Waskada Unit No. 15 Waterflood Project
Section 33, Twp 1, Rge 26 WPM
Sections 3, 4, 5 and 10 Twp 2, Rge 26 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme within the lands described above. The well locations included in the proposed project are 6-33, 7-33, 8-33, 9-33, 10-33, 11-33, 13-33, 14-33, 15-33, 16-33-1-26 and 4-3, 9-3, 10-3, 11-3, 12-3, 13-3, 14-3, 15-3, 16-3, 1-4, 2-4, 3-4, 4-4, 5-4, 6-4, 7-4, 9-4, 10-4, 11-4, 12-4, 14-4, 9-5, 10-5, 3-10-2-26 WPM

The proposed project involves the injection of produced water into wells 7-33, 13-33, 15-33-1-26 and 13-3, 15-3, 5-4, 7-4-2-26 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President, Production

RAB:cw
c.c. Waskada Unit No. 15 File
Land Depart.

Proposed Waskada Unit No. 15
Surface Owners
Addressee List

James A. McKinney
Box 70
Waskada, Manitoba
ROM 2EO

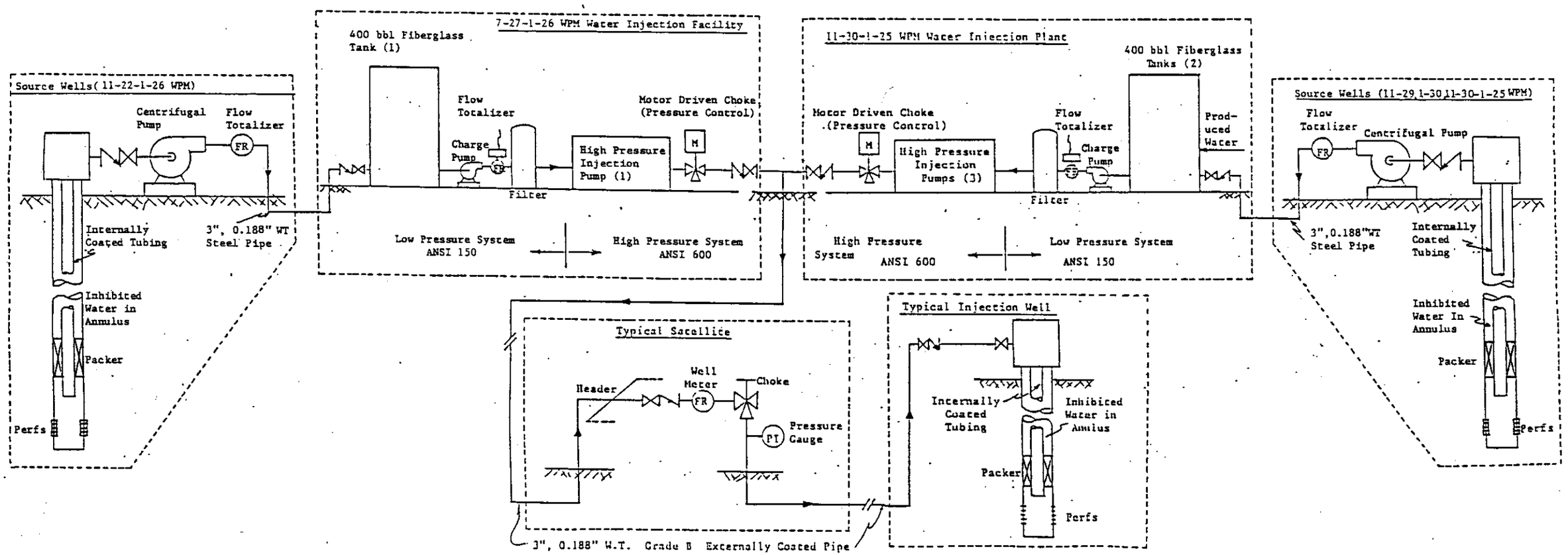
McKinney Farms Ltd.
Box 70
Waskada, Manitoba
ROM 2EO

Brock & Francine Lee
Box 656
Carman, Manitoba
ROG 0J0

Ovey S. Young
Box 89
Waskada, Manitoba
ROM 2EO

Helen Loretta Hooper
Box 58
Waskada, Manitoba
ROM 2EO

Schematic Diagram
Of The Existing Water
Injection System



Attachment 5

Manitoba

Energy and Mines

Petroleum

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

(204) 945-6577

October 21, 1986

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Waskada Lower Amaranth A Pool
Pressure Maintenance Operations
Proposed Waskada Unit No. 15

Your letter of application dated October 8, 1986 for approval to conduct pressure maintenance operations in the proposed Waskada Unit No. 15 is acknowledged.

The application is currently being processed. You will be advised of the disposition of the application in due course.

Yours sincerely,

[illegible]

H. Clare Moster, P. Eng.
Executive Director
Petroleum Division

LRD/lk

c.c. Charles S. Kang
Chairman
The Oil and Natural Gas
Conservation Board

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 8, 1986

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnpeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the area contained inside the proposed Waskada Unit No. 15. The new Unit consists of 34 tracts and contains Lower Amaranth wells 6-33, 7-33, 8-33, 9-33, 10-33, 11-33, 13-33, 14-33, 15-33, 16-33-1-26 and 4-3, 9-3, 10-3, 11-3, 12-3, 13-3, 14-3, 15-3, 16-3, 1-4, 2-4, 3-4, 4-4, 5-4, 6-4, 7-4, 9-4, 10-4, 11-4, 12-4, 14-4, 9-5, 10-5, 3-10-2-26 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega et al Waskada	7-33-1-26 WPM
Omega Waskada	13-33-1-26 WPM
Omega Sasko Waskada	15-33-1-26 WPM
Omega Waskada	13-3-2-26 WPM
Omega et al Waskada	15-3-2-26 WPM
Omega Waskada	5-4-2-26 WPM
Omega et al Waskada	7-4-2-26 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 15 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging 1180m^3/d while the four (4) existing source water wells are capable of producing an additional 1250m^3/d of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

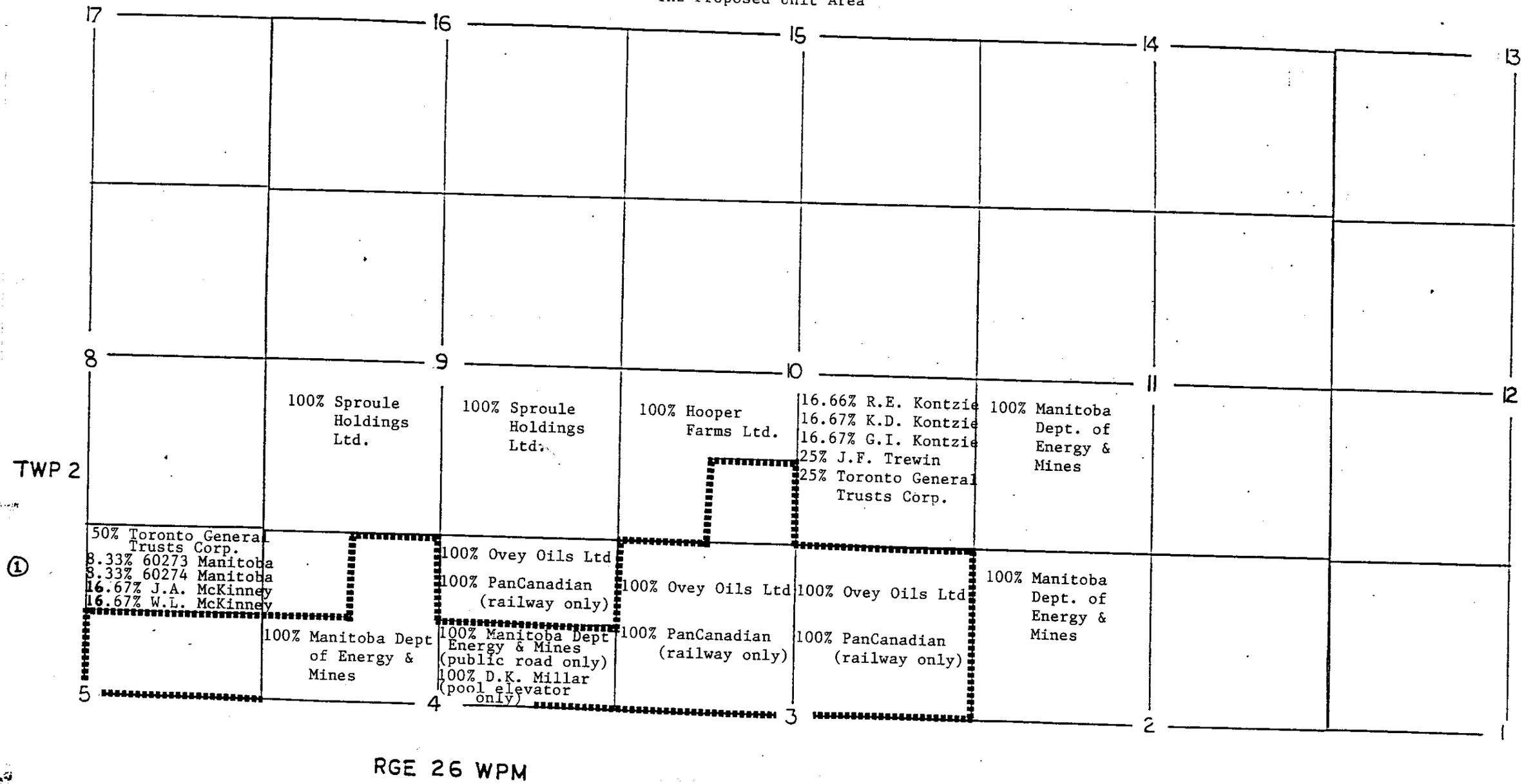
G.E. Patey

G.E. Patey
Vice President Production

RAB:cw
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map In And Adjoining

The Proposed Unit Area

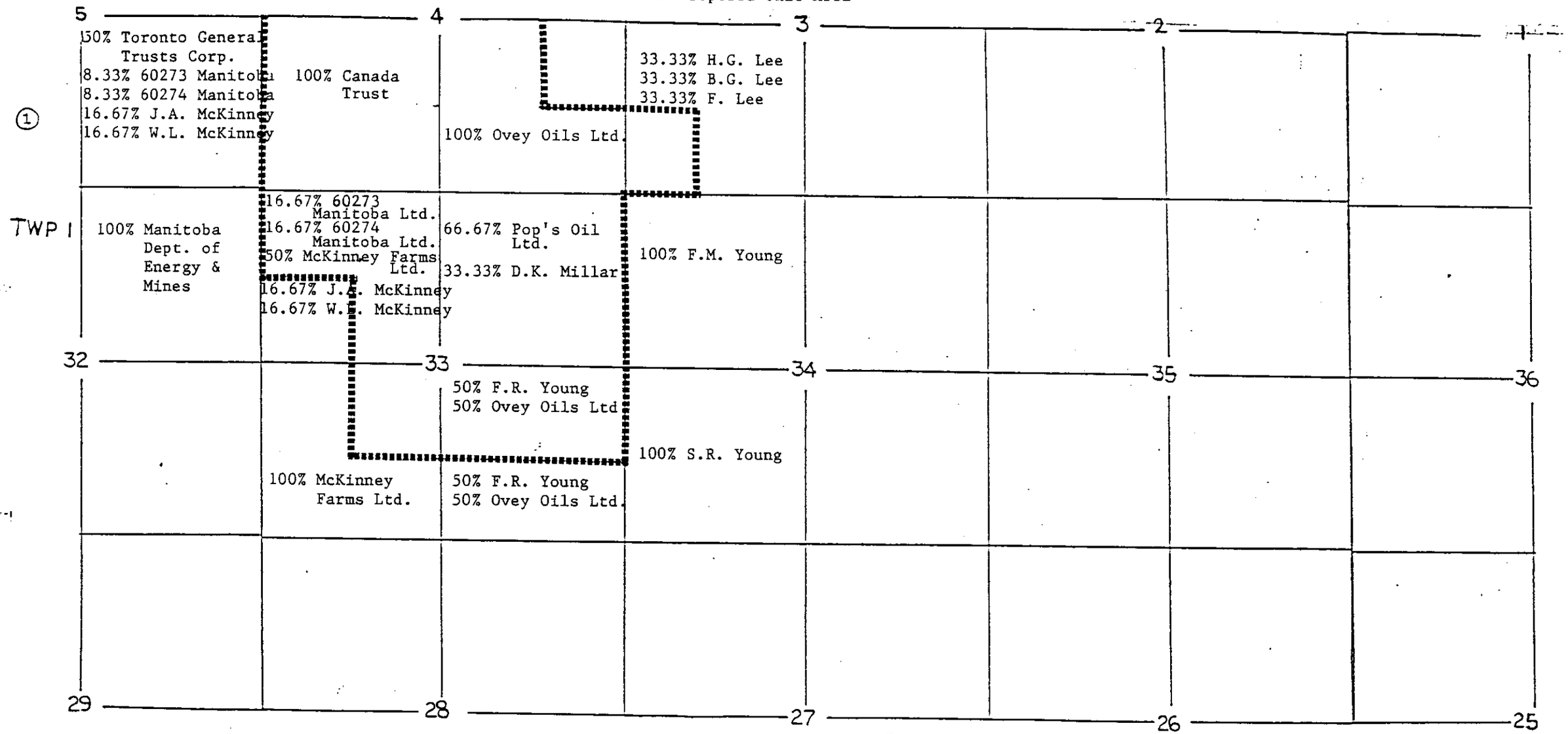


Proposed Waskada Unit No. 15

Attachment 1

Lessor Map In And Adjoining

The Proposed Unit Area



① ⟹ W/2 5-2-26 WPM 16.67% 60273 Manitoba Ltd.
16.67% 60274 Manitoba Ltd.
33.33% J.A. McKinney
33.33% W.L. McKinney
100% PanCanadian (railway only)

Proposed Waskada Unit No. 15

Attachment 3

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No. 15

Well Location	Completed Zone	Status
1-33-1-26 WPM	Lower Amaranth	Producing Oil Well
2-33-1-26 WPM	Lower Amaranth	Producing Oil Well
6-33-1-26 WPM	Lower Amaranth	Producing Oil Well
7-33-1-26 WPM	Lower Amaranth	Producing Oil Well
8-33-1-26 WPM	Lower Amaranth	Producing Oil Well
9-33-1-26 WPM	Lower Amaranth	Producing Oil Well
10-33-1-26 WPM	Lower Amaranth	Producing Oil Well
11-33-1-26 WPM	Lower Amaranth	Producing Oil Well
13-33-1-26 WPM	Lower Amaranth	Producing Oil Well
14-33-1-26 WPM	Lower Amaranth	Producing Oil Well
15-33-1-26 WPM	Lower Amaranth	Producing Oil Well
16-33-1-26 WPM	Lower Amaranth	Producing Oil Well
4-34-1-26 WPM	Lower Amaranth	Producing Oil Well
5-34-1-26 WPM	Lower Amaranth	Injection Well
12-34-1-26 WPM	Lower Amaranth	Producing Oil Well
13-34-1-26 WPM	Lower Amaranth	Injection Well
14-34-1-26 WPM	Lower Amaranth	Producing Oil Well
5-2-2-26 WPM	Lower Amaranth	Injection Well
12-2-2-26 WPM	Lower Amaranth	Producing Oil Well
3-3-2-26 WPM	Lower Amaranth	Producing Oil Well
4-3-2-26 WPM	Lower Amaranth	Producing Oil Well
5-3-2-26 WPM	Upper Alida	Producing Oil Well
6-3-2-26 WPM	Upper Alida	Producing Oil Well
7-3-2-26 WPM	Lower Amaranth	Injection Well
8-3-2-26 WPM	Lower Amaranth	Producing Oil Well
9-3-2-26 WPM	Lower Amaranth	Producing Oil Well
10-3-2-26 WPM	Lower Amaranth	Producing Oil Well
11-3-2-26 WPM	Lower Amaranth	Producing Oil Well
12-3-2-26 WPM	Lower Amaranth	Producing Oil Well
13-3-2-26 WPM	Lower Amaranth	Producing Oil Well
14-3-2-26 WPM	Lower Amaranth	Producing Oil Well
15-3-2-26 WPM	Lower Amaranth	Producing Oil Well
16-3-2-26 WPM	Lower Amaranth	Producing Oil Well

Well Location	Completed Zone	Status
1-4-2-26 WPM	Lower Amaranth	Producing Oil Well
2-4-2-26 WPM	Lower Amaranth	Producing Oil Well
3-4-2-26 WPM	Lower Amaranth	Producing Oil Well
4-4-2-26 WPM	Lower Amaranth	Producing Oil Well
5-4-2-26 WPM	Lower Amaranth	Producing Oil Well
6-4-2-26 WPM	Lower Amaranth	Producing Oil Well
7-4-2-26 WPM	Lower Amaranth	Producing Oil Well
8-4-2-26 WPM	Upper Alida	Producing Oil Well
9-4-2-26 WPM	Lower Amaranth	Producing Oil Well
10-4-2-26 WPM	Lower Amaranth	Producing Oil Well
11-4-2-26 WPM	Lower Amaranth	Producing Oil Well
12-4-2-26 WPM	Lower Amaranth	Producing Oil Well
14-4-2-26 WPM	Lower Amaranth	Producing Oil Well
9-5-2-26 WPM	Lower Amaranth	Producing Oil Well
10-5-2-26 WPM	Lower Amaranth	Producing Oil Well
11-5-2-26 WPM	Lower Amaranth	Producing Oil Well
1-9-2-26 WPM	Lower Amaranth	Suspended Well
3-9-2-26 WPM	N/A	Abandoned Well
3-10-2-26 WPM	Lower Amaranth	Producing Oil Well
4-11-2-26 WPM	Lower Amaranth	Producing Oil Well

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

October 8, 1986

Waskada Unit No. 15
Surface Owners
(Addressee list attached)

Dear Sir/Madam:

Re: Proposed Waskada Unit No. 15 Waterflood Project
Section 33, Twp 1, Rge 26 WPM
Sections 3, 4, 5 and 10 Twp 2, Rge 26 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme within the lands described above. The well locations included in the proposed project are 6-33, 7-33, 8-33, 9-33, 10-33, 11-33, 13-33, 14-33, 15-33, 16-33-1-26 and 4-3, 9-3, 10-3, 11-3, 12-3, 13-3, 14-3, 15-3, 16-3, 1-4, 2-4, 3-4, 4-4, 5-4, 6-4, 7-4, 9-4, 10-4, 11-4, 12-4, 14-4, 9-5, 10-5, 3-10-2-26 WPM

The proposed project involves the injection of produced water into wells 7-33, 13-33, 15-33-1-26 and 13-3, 15-3, 5-4, 7-4-2-26 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President, Production

RAB:cw
c.c. Waskada Unit No. 15 File
Land Depart.

Proposed Waskada Unit No. 15
Surface Owners
Addressee List

James A. McKinney
Box 70
Waskada, Manitoba
ROM 2EO

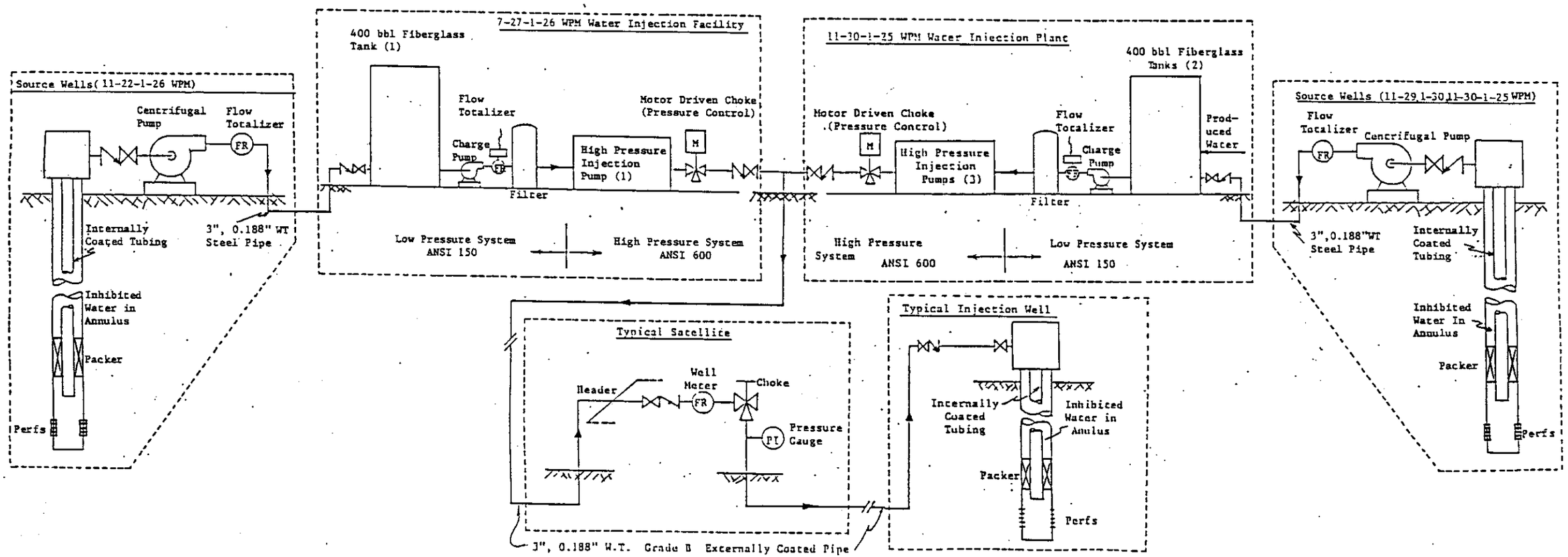
McKinney Farms Ltd.
Box 70
Waskada, Manitoba
ROM 2EO

Brock & Francine Lee
Box 656
Carman, Manitoba
ROG 0J0

Ovey S. Young
Box 89
Waskada, Manitoba
ROM 2EO

Helen Loretta Hooper
Box 58
Waskada, Manitoba
ROM 2EO

Schematic Diagram
Of The Existing Water
Injection System



Attachment 5

Manitoba

Memorandum

Date September 26, 1986

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Division

Telephone

Subject

First | Fold

Re: Waskada Lower Amarnath A Pool
Pressure Maintenance Operations

Omega Hydrocarbons Ltd. has made application for approval to conduct pressure maintenance operations in the subject Pool by conversion of a number of wells in the proposed Waskada Unit No. 7 and the proposed Waskada Unit No. 13 to water injection. Notices of the applications were published in the Manitoba Gazette (Unit No. 7 - August 23, 1986; Unit No. 13 - August 30, 1986) and the Deloraine Times and Star (Unit No. 7 - August 20, 1986; Unit No. 13 - August 27, 1986) and were sent to the offsetting working interest owners. No objections to the applications were received.

Recommendation:

It is recommended that the applications be approved and that Board Order No. PM 45 be rescinded in favour of a new Board Order No. PM 52. This new Board Order would provide for approval of all Omega's pressure maintenance operations in the subject Pool (except the pilot waterflood in Section 11-2-26 (WPM).

Discussion:

The proposed Board Order No. PM 52 includes all the normal relevant provisions included in recent pressure maintenance orders.

Original Signed by H. C. Moster

H. Clare Moster

Manitoba

Memorandum

Date August 11, 1986

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Branch

Telephone

Subject

Re: Pressure Maintenance - Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., as operator of the proposed Waskada Unit No. 13, has made application for approval to conduct pressure maintenance operations in the Waskada Lower Amaranth A Pool. Omega proposes to inject water in the following wells:

Omega Andex Waskada 5-1-2-26 WPM
Omega Andex Waskada 7-1-2-26 WPM
Omega et al Waskada 13-1-2-26 WPM
Omega Waskada 15-1-2-26 WPM

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star and sent to the offsetting interest owners (see Table No. 2). A copy of the proposed notice is attached.

In the absence of objections to the notice, it is recommended that the application be approved, and that Board Order No. PM 45 be amended to include the proposed water injection wells for Unit No. 13.

Discussion:

Omega has successfully conducted pressure maintenance by waterflooding in a major portion of the Waskada Lower Amaranth Pool for over 3 years. In response to waterflooding, oil production rate decline has been arrested and in some cases, reversed. Computer-simulated model studies of the waterflood operations in the Pool indicate that waterflooding will result in up to 25% recovery of the oil-in-place. Under normal primary production operations, it is estimated that less than 10% of the oil-in-place can be recovered.

Figure No. 1 shows the proposed Unit No. 13 configuration. Table No. 1 illustrates the severity of the primary production decline in the area and emphasizes the need for pressure maintenance operations. The Table lists average daily oil production in the first month in which each well produced at least 20 days and the corresponding production rate for May, 1986 for each well. The average length of production is about 22 months, but oil rates have declined to 17% of the initial rates.

Omega has requested, and it is proposed, that Board Order No. PM 45 be amended to include the proposed water injection wells for the proposed Waskada Unit No. 13.

While the proposed waterflood area is wholly operated by Omega, several offset tracts are operated by other companies (see Figure No. 1). Because of this and evidence that waterflooding could affect wells more than one location removed from injection, notice of the application should be published. It is proposed that the notice be published in the Manitoba Gazette and the Deloraine Times and Star and sent to offsetting working interest owners (see Table No. 2).

Completion of the wells and proposed surface facilities are similar to current facilities in use for the Waskada Lower Amaranth A Pool Waterflood and are acceptable.

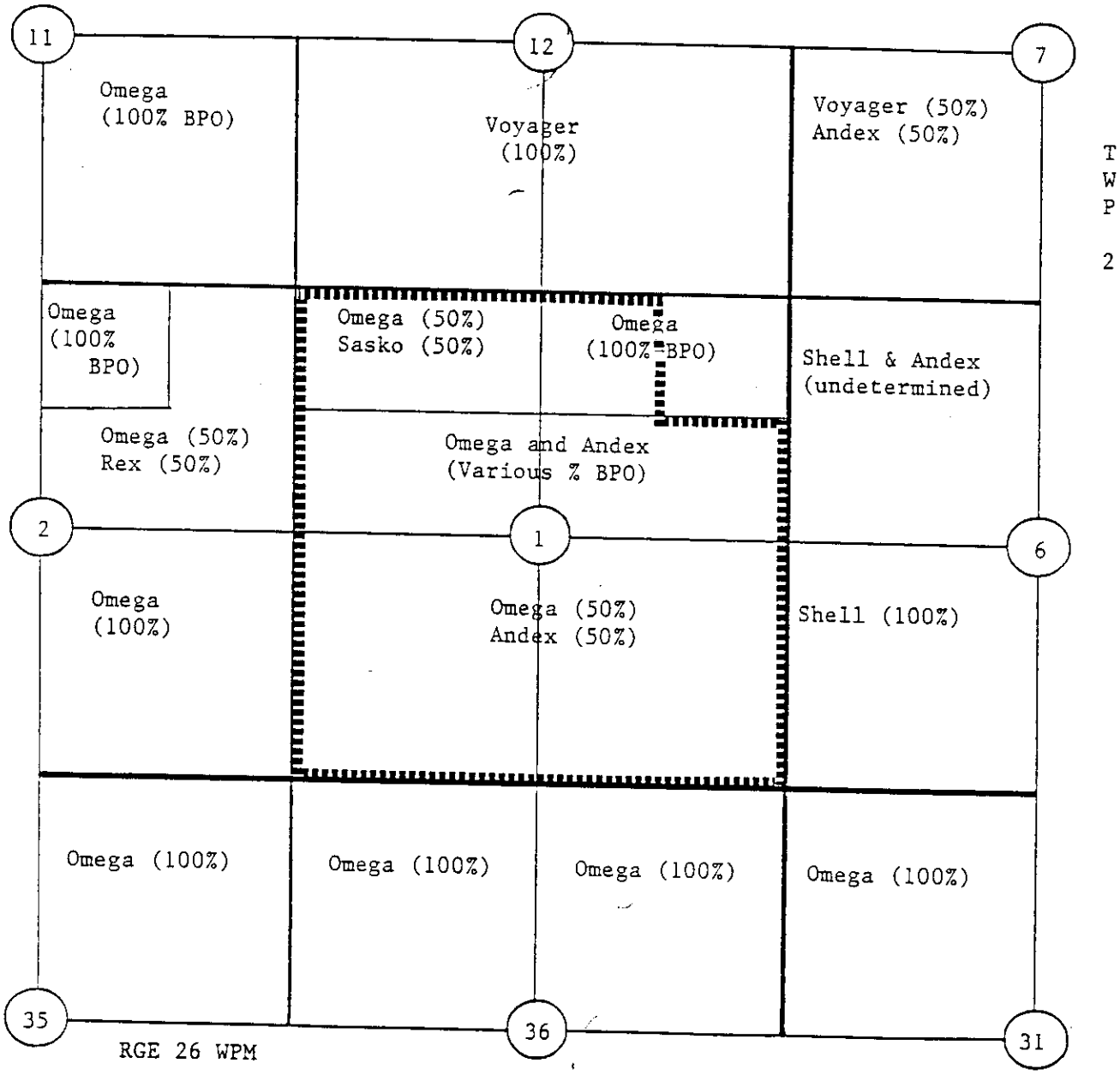
Original Signed By
L. B. DUBREUIL

for H. Clare Moster

MA/lk

FIGURE NO. 1

Lessee Map in and Adjoining
The Proposed Waskada Unit No. 13



Legend

(35) Section Number

▬▬▬▬ Proposed Waskada Unit No. 13

TABLE NO. 1

PROPOSED WASKADA UNIT NO. 13

PRIMARY PRODUCTION DECLINE

Well (2-26 WPM)	Initial Oil Rate (m^3/d)*	Initial Month	Months Produced	Current Oil Rate (m^3/d) (May/86)
1-1	6.12	09-84	21	0.86
2-1	8.43	09-84	21	2.06
3-1	8.85	07-84	23	1.56
4-1	6.46	07-84	23	0.59
5-1	8.37	07-84	23	1.32
6-1	5.50	07-84	23	0.66
7-1	5.58	10-84	20	1.07
8-1	4.35	09-84	21	0.52
9-1	3.31	07-85	11	0.24
10-1	8.70	11-84	19	0.86
11-1	3.95	01-85	17	0.91
12-1	5.06	02-85	16	1.12
13-1	2.05	02-84	28	0.78
14-1	3.00	03-84	27	0.86
15-1	3.80	08-85	10	0.68
Total	76.42 (months produced > 12)		282	13.17
Avg/well	5.88 (months produced > 12)		21.7 (1.8 yrs)	1.01

* Calculated for first month in which the well produced for 20 or more days.

TABLE NO. 2

PROPOSED WASKADA UNIT NO. 13

OFFSETTING WORKING INTEREST OWNERSHIP

Working Interest Owner	Area of Interest
Andex Oil Co. Ltd.	NW¼ 6-2-25, SW¼ 7-2-25, S½ 1-2-26, S½ of N½ 1-2-26
Rex Petroleums Ltd.	NE¼ 2-2-26
Sasko Oil and Gas Inc.	N½ of NW¼ 1-2-26
Shell Oil Canada Limited	W½ 6-2-25
Voyager Energy Company	SW¼ 7-2-25, S½ 12-2-26

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 13, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega et al Waskada 13-1-2-26 (WPM)
Omega Waskada 15-1-2-26 (WPM)

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

DATED at Winnipeg, this day of , 1986.

Charles S. Kang,
Chairman

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 31, 1986

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnpeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the area contained inside the proposed Waskada Unit No. 13. The new Unit consists of 15 tracts and contains Lower Amaranth wells 1-1, 2-1, 3-1, 4-1, 5-1, 6-1, 7-1, 8-1, 9-1, 10-1, 11-1, 12-1, 13-1, 14-1, 15-1-2-26 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega Andex Waskada	5-1-2-26 WPM
Omega Andex Waskada	7-1-2-26 WPM
Omega et al Waskada	13-1-2-26 WPM
Omega Waskada	15-1-2-26 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 13 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $1060m^3/d$ while the four (4) existing source water wells are capable of producing an additional $1250m^3/d$ of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

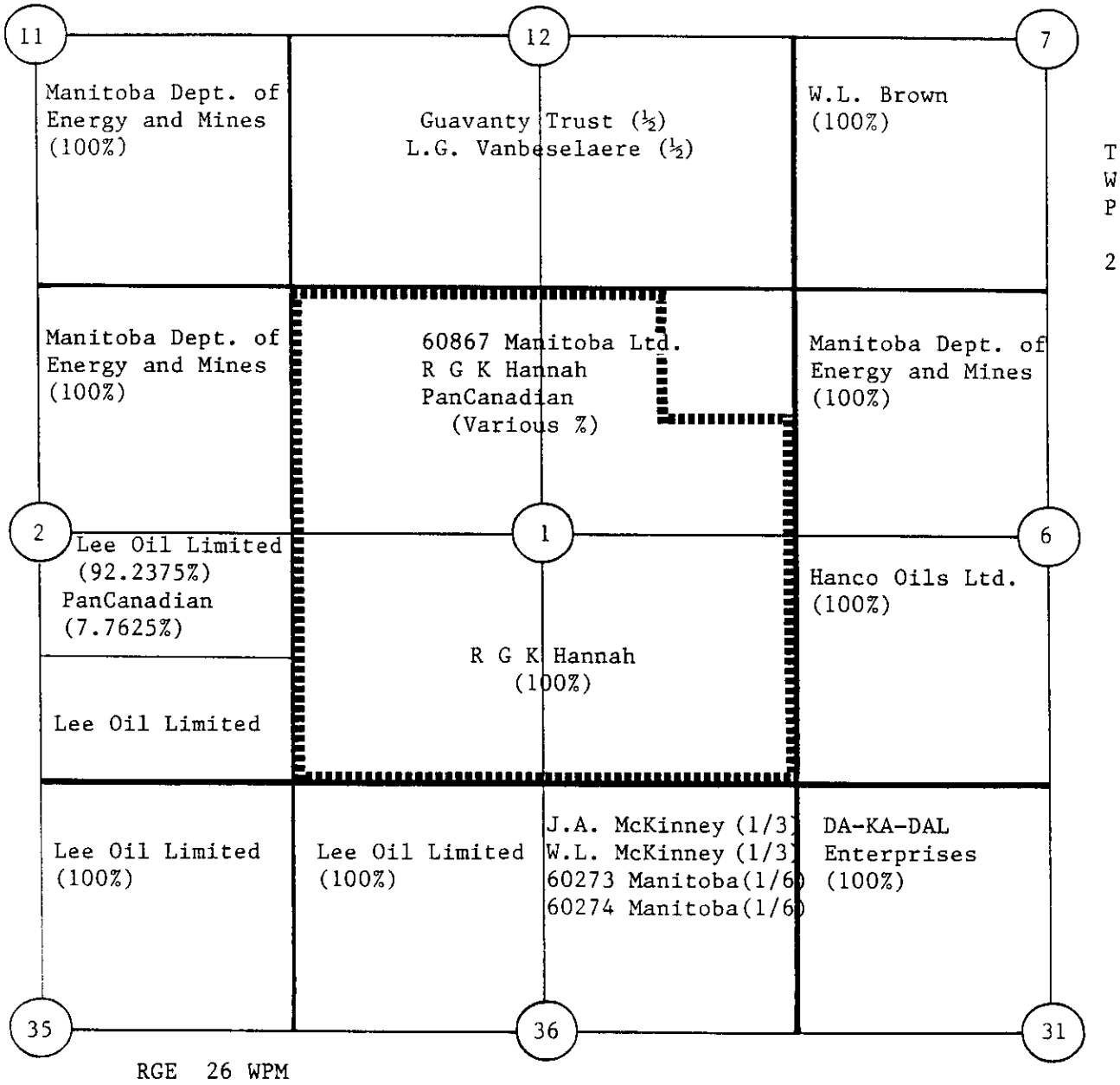
Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President Production

RAB:cw
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map in and Adjoining
The Proposed Waskada Unit No. 13

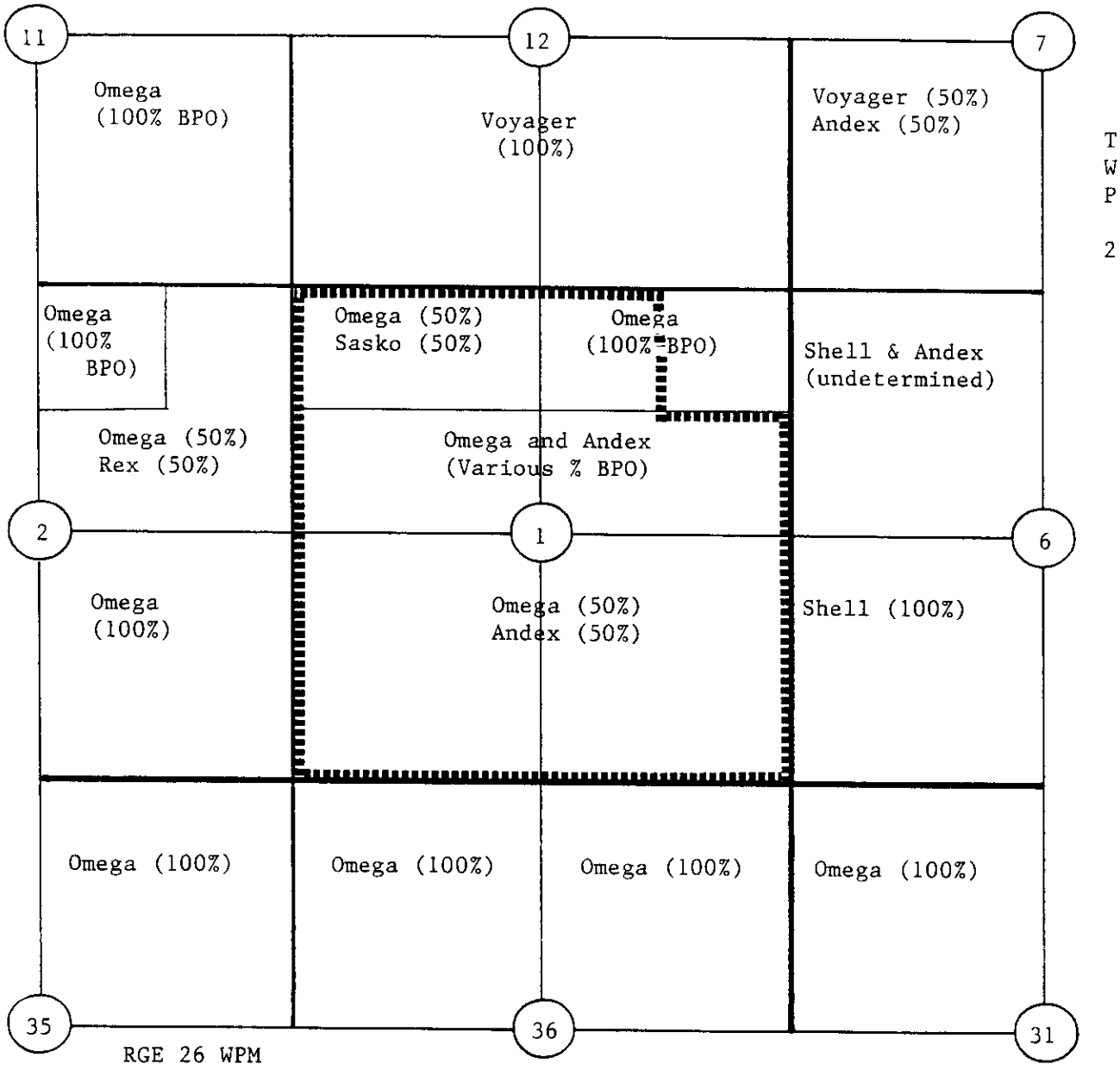


Legend

35 Section Number

Proposed Waskada Unit No. 13

Lessee Map in and Adjoining
The Proposed Waskada Unit No. 13



Legend

(35) Section Number

▬▬▬▬▬▬ Proposed Waskada Unit No. 13

Attachment 3

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No. 13

Well Location	Completed Zone	Status
13-31-1-25 WPM	Lower Amaranth	Injection Well
5-6-2-25 WPM	-	Abandoned Well
16-35-1-26 WPM	Lower Amaranth	Producing Oil Well
13-36-1-26 WPM	Lower Amaranth	Injection Well
14-36-1-26 WPM	Lower Amaranth	Producing Oil Well
15-36-1-26 WPM	Lower Amaranth	Injection Well
16-36-1-26 WPM	Lower Araranth	Producing Oil Well
1-1-2-26 WPM	Lower Amaranth	Producing Oil Well
2-1-2-26 WPM	Lower Amaranth	Producing Oil Well
3-1-2-26 WPM	Lower Amaranth	Producing Oil Well
4-1-2-26 WPM	Lower Amaranth	Producing Oil Well
5-1-2-26 WPM	Lower Amaranth	Producing Oil Well
6-1-2-26 WPM	Lower Amaranth	Producing Oil Well
7-1-2-26 WPM	Lower Amaranth	Producing Oil Well
8-1-2-26 WPM	Lower Amaranth	Producing Oil Well
9-1-2-26 WPM	Lower Amaranth	Producing Oil Well
10-1-2-26 WPM	Lower Amaranth	Producing Oil Well
11-1-2-26 WPM	Lower Amaranth	Producing Oil Well
12-1-2-26 WPM	Lower Amaranth	Producing Oil Well
13-1-2-26 WPM	Lower Amaranth	Producing Oil Well
14-1-2-26 WPM	Lower Amaranth	Producing Oil Well
15-1-2-26 WPM	Lower Amaranth	Producing Oil Well
16-1-2-26 WPM	Lower Amaranth	Formerly Abandoned, Re-entered Producing Oil Well
1-2-2-26 WPM	Lower Amaranth	Producing Oil Well
8-2-2-26 WPM	Lower Amaranth	Producing Oil Well
9-2-2-26 WPM	Lower Amaranth	Producing Oil Well
4-12-2-26 WPM	Lower Amaranth	Suspended Oil Well

Attachment 4

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 31, 1986

Waskada Unit No. 13
Surface Owners
(Addressee list attached)

Dear Sir/Madam:

Re: Proposed Waskada Unit No. 13 Waterflood Project
Sections 1, Twp. 2, Rge. 26 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme in Sections 1, Twp. 2, Rge. 26 WPM. The well locations included in the proposed project are 1 through 15-2-26 WPM.

The proposed project involves the injection of produced water into wells 5-1, 7-1, 13-1, 15-1-2-26 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President, Production

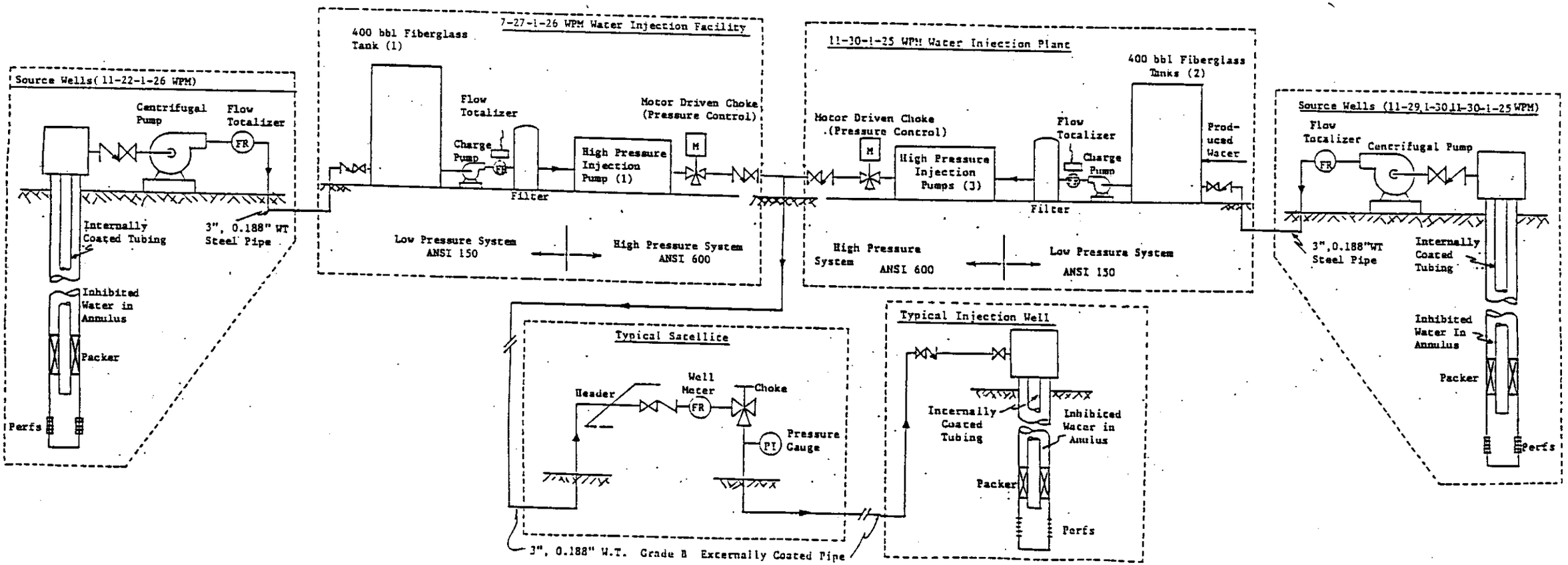
RAB:cw
c.c. Waskada Unit No. 13 File
Land Depart.

Waskada Unit No. 13
Surface Owners
Addressee List

R.G.K. Hannah
Box 24
Waskada, Manitoba
ROM 2EO

M.G. Hannah
Box 7
Waskada, Manitoba
ROM 2EO

Schematic Diagram of the Existing Water Injection System



a news

home on S ay.

Mr. and . rs. Bob Anderson and Mary Ann of Pipestone and Mr. Bill Vere of the district were supper guestrs of Ken and Georgina Burtle on Sunday.

Bob and Marion McKinnon and girls of Brandon spent several days with Marion's mother, Mrs. Mae Slack.

Mrs. Rita Tweed, Robbie and Nancy Vanlinden of Estevan and Mrs. Mary Vanlinden of the district visited the Ken Bugg home on Sunday.

Rita and Robbie Tweed and Nancy Vanlinden of Estevan and Mrs. Mary Vanlinden of the district visited the Ken Bugg hom on Sunday.

days with Cathie and Art Line and family.

McInnes reunion held

The 5th annual McInnes Reunion, the family of Hector McInnes, was held on Saturday, July 19 at Thunder Mountain in Brandon. The hosts for the day were Shirley and Teddie Kitchen of Oakville, Manitoba.

The attraction were the water slides and those that took part in them enjoyed, whether they went slow, fast or like a bullet! Pictures were taken and then the supper was held at the campsite with barbecues going and lots to eat. The big Trivia game this year was won by Erma. We had a few guessing games which proved interesting. The door prize was won by Shirley Kitchen.

Over a bon fire, we decided what we could do next year.

The A-Team - Alissa, Ashley and Ardley are pleased to announce a new member to the team. Alawna Jean was born August 4, weighing 9 lbs 2 oz and was 23 inches long.

Proud parents are Ron and Dolores Leforte. Proud grandparents are Mr. and Mrs. Charlie Janssens and Mr. and Mrs. Bun Leforte.

Aug. 27/86

Unsolved crime

Manitoba Crime Stoppers this month is seeking the assistance of the general public in solving the identity and murder of a man mear Austin, Manitoba.

Wednesday, July 2nd, 1986 was a warm summer evening in Manitoba. However, approximately 74 km east of Brandon, near Austin, a body of an unidentified male was found with several stab wounds. The body was located in the south ditch of the eastbound lane of Trans Canada Highway. It is believed that the man may have been hitchhiking from west to east, alone, along the Trans Canada Highway in western Manitoba.

The victim is described as a male Caucasian, approximately 5' 10" in height, weighing 165 lbs., with blue eyes, grey hair, and between the ages of 45 - 55 years. He was wearing a blue coloured T-shirt with white lettering, grey shorts and tan coloured shoes.

If you were in this area on July 2nd and may have seen something, please call Crime Stoppers.

Crime Stoppers will pay up to $2,000 in cash for information leading to the identity of the victim or to the arrest of any person or persons responsible for this or any unsolved crime in Manitoba. When you call you do not have to identify yourself. You also will not have to appear in court.

Call toll free 1-800-782-TIPS. That's 1-800-782-8477.

This message is brought to you by the Deloraine Business Association in co-operation with this community newspaper.

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 13, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Andex Waskada
5-1-2-26(WPM)

Omega Andex Waskada
7-1-2-26(WPM)

Omega et al Waskada
13-1-2-26(WPM)

Omega Waskada
15-1-2-26(WPM)

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

DATED at Winnipeg, this 15th day of August, 1986.

Charles S. Kang,
Chairman

NOTICE OF TENDER

TAKE NOTICE that tenders will be received until 12:00 Noon on September 12, 1986 at the Office of Sheldon W. Lanchbery, P.O. Box 489, Deloraine, Manitoba ROM OMO for the following land:

NW ¼ 9-2-23 WPM, excepting all mines and minerals

Highest or any tender not necessarily accepted. For further information contact Sheldon W. Lanchbery at 747-2082.

permit to Modify an Existing Access Driveway onto P.T.H. No. 16, N.W.¼, Section 25-14-16 West, R.M. of Langford.

S-085-86 — D. Morris — P.T.H. No. 10 — City of Brandon

Application by D. Morris for a permit for a Sign adjacent to P.T.H. No. 10 S.W.¼, Section 35-10-19 West, City of Brandon.

S-086-86 — D. Morris — P.T.H. No. 1 — R.M. of Whitehead

Application by D. Morris for a permit for a Sign adjacent to P.T.H. No. 1, S.E.¼, Section 35-10-20 West, R.M. of Whitehead.

S-087-86 — Turtle River Watershed — P.T.H. No. 5 — R.M. of Ste. Rose

Application by Turtle River Watershed Conservation District for a permit for a Sign adjacent to P.T.H. No. 5, N.W.¼, Section 3-23-15 West, R.M. of Ste. Rose.

S-088-86 — Turtle River Watershed — P.T.H. No. 5 — R.M. of Ste. Rose

Application by Turtle River Watershed Conservation District for a permit for a Sign adjacent to P.T.H. No. 5, N.W.¼, Section 3-23-15 West, R.M. of Ste. Rose.

Speed Zones — Section 97 and 98 Highway Traffic Act

010-S-M — P.T.H. No. 10

Consideration to be given to a Modified Speed Zone on portions of P.T.H. No. 10, a Reduction in the Speed Limit to 70 km/h in the vicinity of Big Island Lake, Flin Flon Unorganized Territory.

The Highway Traffic Board will be prepared to consider any submissions regarding the above applications at this hearing. Any persons wishing to make a submission should either contact the Secretary at the hearing or forward their written submission in advance to: A. Poltaruk, Secretary, The Highway Traffic Board, Room 206-301 Weston Street, Winnipeg, Manitoba. Phone: 945-8912

A. POLTARUK, MMM CD
Secretary,
—35 THE HIGHWAY TRAFFIC BOARD.

UNDER THE MINES ACT

NOTICE
WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 13, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega et al Waskada 13-1-2-26 (WPM)
Omega Waskada 15-1-2-26 (WPM)

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

Dated at Winnipeg, this 15th day of August, 1986.

—35 CHARLES S. KANG,
Chairman.

August 19, 1986

Queen's Printer
Statutory Publications
200 Vaughan Street

MANITOBA GAZETTE

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch
555 - 330 Graham Ave.

945-6574

Please have the attached Notice appear in the next issue of the Manitoba Gazette under The Mines Act.

Original Signed By
L. R. Dubreuil

MA/oc
Attachment

Original Signed By
L. R. Dubreuil

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 13, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega et al Waskada 13-1-2-26 (WPM)
Omega Waskada 15-1-2-26 (WPM)

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

DATED at Winnipeg, this 15th day of August , 1986.

Charles S. Kang,
Chairman

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 13, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega et al Waskada 13-1-2-26 (WPM)
Omega Waskada 15-1-2-26 (WPM)

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

DATED at Winnipeg, this 15th day of August, 1986.

Charles S. Kang,
Chairman

Copies of notice sent out Aug 19

Manitoba

Action / Route Slip

Date: August 5, 1986

To Bob Dubreuil

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

- [ ] Take Action
- [ ] Per Your Request
- [ ] Circulate, Initial and Return
- [ ] For Approval and Signature
- [ ] Make _____ Copies
- [ ] May We Discuss
- [ ] For Your Information
- [ ] Return With Comments or Revisions
- [X] Draft Reply for Signature of Chairman
- [ ] Please File

Comments

Thanks

Rose

DEPARTMENT OF ENERGY AND MINES
AUG 6 1986
PETROLEUM BRANCH

MG 1298 PS 1 182

OMEGA
HYDROCARBONS LTD
1300 SUN LIFE PLAZA III
[illegible] 8th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261 0744

July 31, 1986

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnpeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the area contained inside the proposed Waskada Unit No. 13. The new Unit consists of 15 tracts and contains Lower Amaranth wells 1-1, 2-1, 3-1, 4-1, 5-1, 6-1, 7-1, 8-1, 9-1, 10-1, 11-1, 12-1, 13-1, 14-1, 15-1-2-26 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega Andex Waskada	5-1-2-26 WPM
Omega Andex Waskada	7-1-2-26 WPM
Omega et al Waskada	13-1-2-26 WPM
Omega Waskada	15-1-2-26 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 13 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $1060m^3/d$ while the four (4) existing source water wells are capable of producing an additional $1250m^3/d$ of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President Production

RAB:cw
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
CALGARY, Alberta
T2P 0H3

Attention: Mr. G.E. Patey
Vice-President, Production

Dear Sirs:

Re: Waskada Lower Amaranth A Pool
Board Order No. PM 52
Omega Waskada 13-17-1-25 (WPM)
Omega Waskada 7-18-1-25 (WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25 (WPM)
Omega Waskada 13-20-1-25 (WPM)
Omega Waskada 15-20-1-25 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega et al Waskada 13-1-2-26 (WPM)
Omega Waskada 15-1-2-26 (WPM)

Enclosed is Board Order No. 52 authorizing water injection operations in the Waskada Lower Amaranth A Pool.

Please note, however, that injection shall not be initiated in the subject wells until the Board has approved the proposed Waskada Units No. 7 and 13.

Also, please note that subclause 1(4) of Board Order No. PM 52 stipulates that the completion of the wells will be as prescribed by the Executive Director. You are consequently required to submit completed applications for each well to be converted (using form MG 416) for approval of the proposed recompletion program, prior to conversion of the wells to injection.

Sincerely yours

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

LRD/lk

b.c. Wm. McDonald
B. Ball
Petroleum

Manitoba

Memorandum

Date September 26, 1986

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Division

Telephone

Subject

Re: Waskada Lower Amarnath A Pool
Pressure Maintenance Operations

Omega Hydrocarbons Ltd. has made application for approval to conduct pressure maintenance operations in the subject Pool by conversion of a number of wells in the proposed Waskada Unit No. 7 and the proposed Waskada Unit No. 13 to water injection. Notices of the applications were published in the Manitoba Gazette (Unit No. 7 - August 23, 1986; Unit No. 13 - August 30, 1986) and the Deloraine Times and Star (Unit No. 7 - August 20, 1986; Unit No. 13 - August 27, 1986) and were sent to the offsetting working interest owners. No objections to the applications were received.

Recommendation:

It is recommended that the applications be approved and that Board Order No. PM 45 be rescinded in favour of a new Board Order No. PM 52. This new Board Order would provide for approval of all Omega's pressure maintenance operations in the subject Pool (except the pilot waterflood in Section 11-2-26 (WPM).

Discussion:

The proposed Board Order No. PM 52 includes all the normal relevant provisions included in recent pressure maintenance orders.

H. Clare Moster

* Old vehicles at the Lauder waste disposal grounds; and
* Bales in ditches — possibly by advertising in future years that this be attended to.

Council a' asked foreman Ron Splett to check on availability of timed water taps for the shop and a municipal well, to prevent water running after fill-ups. The new municipal well at Emblem, secretary

RMC approved a proposal of subdivision at SE 9-6-22 owned by G. L. and L. L. Gibson. Council also entered into an unspecified agreement with the Minister of Agriculture.

Paying the bills...

Current accounts approved for payment last week totalling $49,841.19 in-

authorities and $1,000.00 to the Hartney Flying Club.

Additional payments amounting to $8,275.22 were also authorized, including
— $5,347.00 for insurance.
— $1,225.60 for work on roads and for gravel.
— $1,260.00 for spraying grasshoppers.

Training...

RMC council authorized its new secretary treasurer to attend a municipal elections seminar in Hartney on September 3 and a four-day municipal affairs seminar at Gimli, October 6 to 9. Cavers was also authorized to take the

to forward
year's cour
The full
meeting: 1
cillors Lloy
Ed Vinck
regular me
Tuesday, S

Birth

Danielle
like to ann
brother, Er
28. Proud
Hilda Ve
Margaret I

Protect electronics from lightning

by DANA DAILEY

A direct hit by lightning is a rare occurence and cannot only destroy the electronics in a satellite system, but can also set a house on fire. However, most hits are indirect and cause power surges. It is better to take precautions than to make a service call.

Use an eight foot ground rod, a foot or so away from supporting pole and about six inches below the ground, to protect lawn mowers.

On the top of the ground rod, a ¼ inch copper wire or 3/8 inch aluminum wire should be clamped on. This wire should follow a smoooth curve, with no sharp bends to the mounting pole and attached or clamped to a none painted surface on the pole.

Surge protectors can also be used to protect against small or large voltage spikes. These are available at local stores.

Brown and Ramsay exhibit paintings in Winnipeg

Local artists, Shirley Brown of Deloraine and Carol Ramsay of Waskada have been chosen by jury to each show one of their pieces of art work for the annual MAWA members show.

Chosen were oil on canvas by Carol entitled "Corn and Wild Sunflower" and Shirley's large pencil drawing, "When Luck Runs Out." The show, which is co-sponsored by the Canadian Women's Music and Cultural Festival, opens August 26 at 8:00 p.m. and runs until September 7. Gallery hours at the 536½ Main Street, Winnipeg location are from 12:00 to 5:00 p.m. Artists will be present at opening.

In memoriam

In loving memory of our brother and uncle, Lloyd Laminman, who passed away August 17, 1985.

In tears we saw you thinking
We watch you fade away
You suffered much in silence
And fought so hard to stay.
Our hearts were almost broken
When a cure was not to be
But when we saw you sleeping
So peacefully free from pain
We could not wish you back
To suffer that again.

Sadly missed by Florence and Gerald, Hazel and Alex, Gordon and Kevin, Karen and Dale.

Aug. 20/86

Birth

Wayne and Audrey Keeler are very proud to announce the safe arrival of their second child, Bryan Wayne Kenneth, born July 24 at 8:58 a.m., weighing 7 lbs 15 oz. and measuring 19½ inches); a baby brother for Robert.

Proud grandmother is Mrs. Marjorie Keeler of Brandon.

A special "thank you" to Dr. Cooper of Souris for his patience, kindness and skill. Also our deep appreciation to the staff of Souris Hospital for their excellent care.

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 7, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-17-1-25(WPM)
Omega Waskada 7-18-1-25(WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25(WPM)
Omega Waskada 13-20-1-25(WPM)
Omega Waskada 15-20-1-25(WPM)

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

Dated at Winnipeg, this 31st day of July, 1986.

Charles S. Kang,
Chairman

Director of Surveys at Winnipeg, Manitoba, as No. 19096.

Dated at Winnipeg, Manitoba, this 5th day of August, 1986.

HARRY HARAPIAK,
Honourable Harry Harapiak,
Minister of Northern Affairs.

MARGARET PAUL,
Witness to the Signature of the
Honourable Harry Harapiak, or
his designate.

—34

UNDER THE MINES ACT

NOTICE
WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 7, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-17-1-25 (WPM)
Omega Waskada 7-18-1-25 (WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25 (WPM)
Omega Waskada 13-20-1-25 (WPM)
Omega Waskada 15-20-1-25 (WPM)

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

Dated at Winnipeg, this 31st day of July, 1986.

CHARLES S. KANG,
Chairman

—34

PU

UNDER

UNINCORPORATED

I, John M. Bucklaschuk, Minister
Section 570(6) of The Municipal Act,
the Statutes of Manitoba, and do he
rated Village District of Grunthal, n
Rural Municipality of Hanover and
North 1/2 of the North 1/2 and the Sou
to and form part of the Unincorpor
described in By-law No. 1474 of The
of January, 1987.

11489—34

SALE OF LAN
THE T

By virtue of a warrant issued by
of Manitoba, under his hand and t
directed, and bearing the date of th
the several parcels of land hereinaf
due thereon with costs, I do hereby
arrears for a period of one year or
they were imposed; b) the proporti
amounts as penalties calculated at
thereof, following the day the lands
paid, I will on the 24th day of Sep
Minnedosa, at the hour of two o'cloc
said lands for arrears of taxes and

Further take notice that The T
to the amount due thereon for the
thereof on all described lands eve
costs is offered by another bidder o

Description
Desc Lot 5, Blk. 7, Plan E . . . . . .
Ex S 16F and Ex Lane 4992 being E
N 22F and Ex Lane 4992 Lot 2, Blk.
Lot 6, Blk. 15, Plan E . . . . . .
Lot 1/2, Blk. 16, Plan E . . . . . .
Lot 5, Blk. 27, Plan E . . . . . .
Desc Lot 1/8, Blk. 40, Plan E . . .
Lot 4/5, Blk. 50, Plan E and Lot 9/
Lot 5, Blk. 3, Plan G . . . . . .
Lot 4, Blk. 13, Plan G . . . . . .
Lot 8/10, Blk. 17, Plan G . . . . . .
Lot 7/8, Blk. 28, Plan G . . . . . .
S 50F Lot 1, Blk. 32, Plan G and E
Plan G . . . . . .
Ex E 55F Lot 12/14, Blk. K, Plan
E½ Lot 15/16, Blk. K, Plan H . . .
Lot 3, Blk. 1, Plan 4 and S 5F Lot 4
N1/2 Lot 1/5, Blk. 5, Plan 4 . . . . .
Desc Lot 11/17, Blk. 6, Plan 4 . . .
Lot 15/16, Blk. 12, Plan 4 . . . . . .
Desc Lot 36/38, Blk. 13, Plan 4 . .
Desc. Lot 1/3, Blk. 17, Plan 4 . . .
Lot 18/20, Blk. 34, Plan 4 . . . . . .
Lot 5/8, Blk. 38, Plan 4 . . . . . .

August 1, 1986

Queen's Printer
Statutory Publications
200 Vaughan Street

Marc Arbez
Petroleum Engineer
Petroleum Branch
555 - 330 Graham Avenue

MANITOBA GAZETTE

Please have the attached Notice appear in the next issue of the Manitoba Gazette under The Mines Act.

Marc Arbez

Marc Arbez

LRD/ch
Attachment

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 7, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-17-1-25 (WPM)
Omega Waskada 7-18-1-25 (WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25 (WPM)
Omega Waskada 13-20-1-25(WPM)
Omega Waskada 15-20-1-25 (WPM)

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

DATED at Winnipeg, this 31st day of July, 1986.

Charles S. Kang,
Chairman

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

Copies sent out Aug. 7 Table 2 + Omega

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 7, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-17-1-25 (WPM)
Omega Waskada 7-18-1-25 (WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25 (WPM)
Omega Waskada 13-20-1-25(WPM)
Omega Waskada 15-20-1-25 (WPM)

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

DATED at Winnipeg, this 31st day of July, 1986.

Charles S. Kang,
Chairman

Manitoba

Memorandum

Date July 24, 1986

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Branch

Telephone

Subject Pressure Maintenance - Waskada Lower Amaranth A Pool

First | Fold

Omega Hydrocarbons Ltd., as operator of the proposed Waskada Unit No. 7, has made application for approval to conduct pressue maintenance operations in the Waskada Lower Amaranth A Pool. Omega proposes to inject water in the following wells:

Omega Waskada 13-17-1-25 WPM
Omega Waskada 7-18-1-25 WPM
Omega Waskada Prov. 5-20-1-25 WPM
Omega Waskada 7-20-1-25 WPM
Omega Waskada 13-20-1-25 WPM
Omega Waskada 15-20-1-25 WPM

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star and sent to the offsetting interest owners (see Table No. 2). A copy of the proposed notice is attached.

In the absence of objections to the notice, it is recommended that the application be approved, and that Board Order No. PM 45 be amended to include the proposed water injection wells for Unit No. 7.

Discussion:

Omega has successfully conducted pressure maintenance by waterflooding in a major portion of the Waskada Lower Amaranth Pool for over 3 years. In response to waterflooding, oil production rate decline has been arrested and in some cases, reversed to show an actual increase in oil production. Computer-simulated model studies of the waterflood operations in the Pool appear to show that waterflooding will result in up to 25% recovery of the oil-in-place. Under normal primary production operations, it is estimated that less than 10% of the oil-in-place can be recovered.

Figure No. 1 shows the proposed Unit No. 7 configuration.

....2

Table No. 1 illustrates the severity of the primary production decline in the area and emphasizes the need for pressure maintenance operations. The Table lists average daily oil production in the first month in which each well produced at least 20 days and the corresponding production rate for April, 1986 for each well. The average length of production is about 28 months, but oil rates have declined to 29% of the initial rates.

Omega has requested that Board Order No. PM 45 be amended to include the proposed Unit. It is proposed that Board Order No. PM 45 be amended to include the proposed water injection wells for Unit No. 7.

While the proposed waterflood area is wholly operated by Omega, several offset tracts are operated by other companies (see Figure No. 1). Because of this and evidence that waterflooding could affect wells more than one location removed from injection, notice of the application should be published. It is proposed that the notice be published in the Manitoba Gazette and the Deloraine Times and Star and sent to offsetting working interest owners (see Table No. 2).

Completion of the wells and proposed surface facilities are similar to current facilities in use for the Waskada Lower Amaranth A Pool Waterflood and are acceptable.

Original signed by H. C. Moster

H. Clare Moster

MA/lk

FIGURE NO. 1

Lessee Map In and Adjoining
The Proposed Waskada Unit No. 7

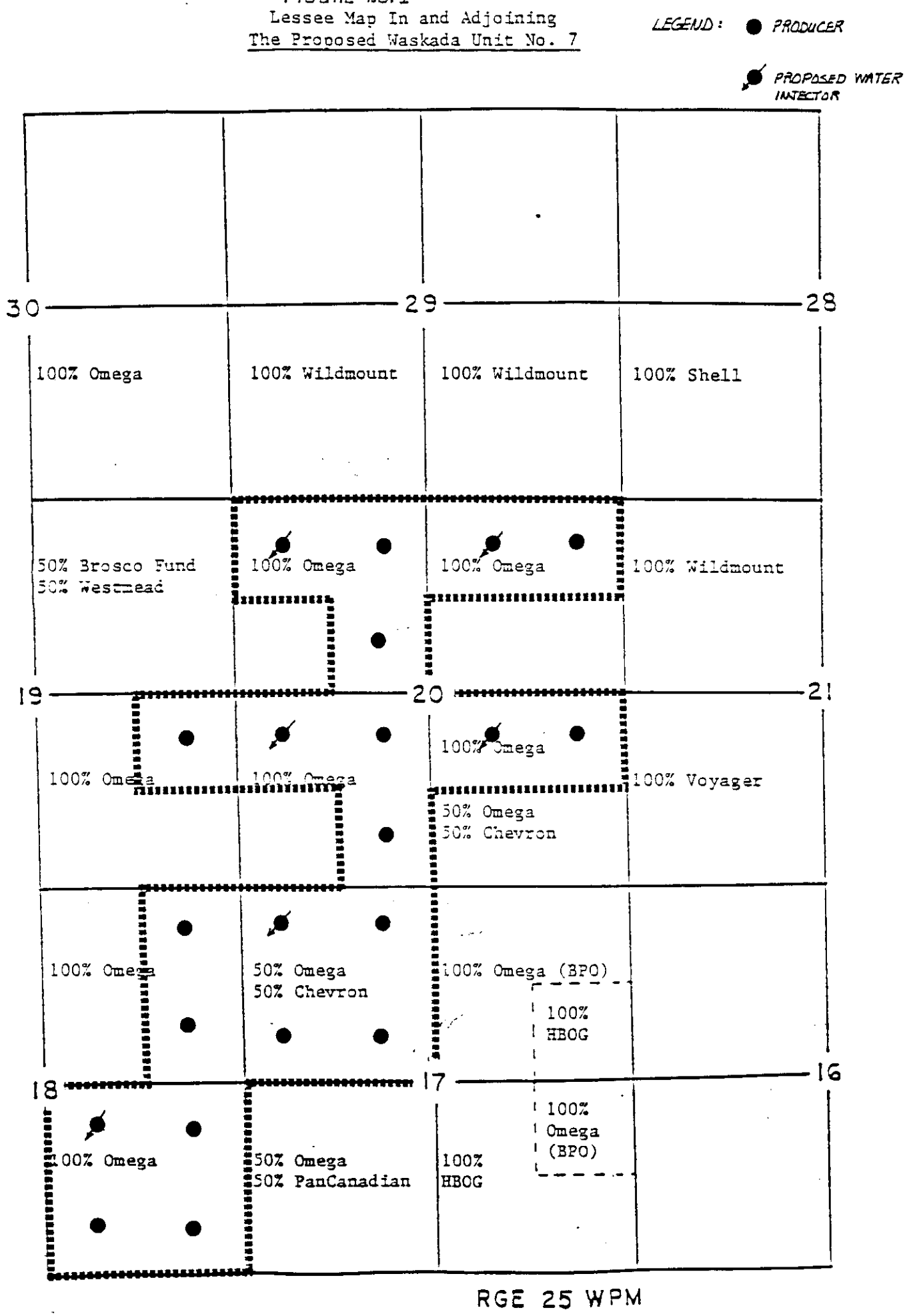


TABLE NO. 1

PROPOSED WASKADA UNIT NO. 7

PRIMARY PRODUCTION DECLINE

Well (1-25 WPM)	Initial Oil Rate (m^3/d)*	Initial Month	Months Produced	Current Oil Rate (m^3/d) (April/86)
11-17	10.3	09-83	32	1.0
12-17	8.6	09-83	32	0.8
13-17	2.6	09-83	32	0.3
14-17	12.0	12-82	41	0.7
1-18	6.6	08-84	21	0.05
2-18	2.1	07-84	22	0.02
7-18	5.4	07-84	22	0.7
8-18	2.6	01-84	28	0.3
9-18	1.6	01-84	28	0.1
16-18	0.8	01-85	16	0.1
8-19	3.1	10-85	7	0.7
3-20	1.9	06-84	23	0.3
5-20	1.4	09-85	8	0.7
6-20	Not Enough Production Data			
7-20	1.2	03-84	26	5.8
8-20	4.9	08-85	9	1.7
11-20	4.6	11-83	30	2.0
13-20	1.0	01-84	28	1.6
14-20	6.7	12-84	27	6.1
15-20	8.0	12-82	41	1.0
16-20	6.0	08-84	21	0.1
Total	71.8	(months produced > 12)	470	21.0
Avg/Well	4.2	(months produced > 12)	27.6 (2.3 yrs)	1.2

* Calculated for first month in which the well porduced for 20 or more days.

TABLE NO. 2

PROPOSED WASKADA UNIT NO. 7

OFFSETTING WORKING INTEREST OWNERSHIP

Working Interest Owner	Area of Interest
Brosco Fund Limited/Westmead Limited	NE¼ 19-1-25
Chevron Canada Resources Ltd.	NW¼ 17-1-25, S½ of SE¼-20-1-25
Hudson's Bay Oil and Gas Company Limited	SE¼ 17-1-25, SE¼ of NE¼ 17-1-25
PanCanadian Petroleum Limited	SW¼ 17-1-25
Shell Oil Canada Limited	SW¼ 28-1-25
Voyager Energy Company	SW¼ 21-1-25
Wildmount Resources Ltd.	S½ 29-1-25

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 7, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada 13-17-1-25 (WPM)
Omega Waskada 7-18-1-25 (WPM)
Omega Waskada Prov. 5-20-1-25 (WPM)
Omega Waskada 7-20-1-25 (WPM)
Omega Waskada 13-20-1-25(WPM)
Omega Waskada 15-20-1-25 (WPM)

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

DATED at Winnipeg, this day of , 1986.

Charles S. Kang,
Chairman

Manitoba

Action / Route Slip

Date: July 22, 1986

To Clare Moster
Petroleum Branch

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

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

Comments: Chairman

Re: Omega letter dated July 18 to Chairman, copy to Bob Dubreuil requesting that PM Order No. 45 be amended.

Charles S. Kang

DEPARTMENT OF ENERGY AND MINES
JUL 22 1986
PETROLEUM BRANCH

MG 1298 PS-1-182

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 18, 1986

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnpeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the area contained inside the newly formed Waskada Unit No. 7. The new Unit consists of 21 tracts and contains Lower Amaranth wells 11-17, 12-17, 13-17, 14-17, 1-18, 2-18, 7-18, 8-18, 9-18, 16-18, 8-19, 3-20, 5-20, 6-20, 7-20, 8-20, 11-20, 13-20, 14-20, 15-20, 16-20-1-25 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega Chevron Waskada	13-17-1-25 WPM
Omega Waskada	7-18-1-25 WPM
Omega Waskada	5-20-1-25 WPM
Omega Waskada	7-20-1-25 WPM
Omega Waskada	13-20-1-25 WPM
Omega Waskada	15-20-1-25 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 7 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $1060m^3/d$ while the four (4) existing source water wells are capable of producing an additional $1250m^3/d$ of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

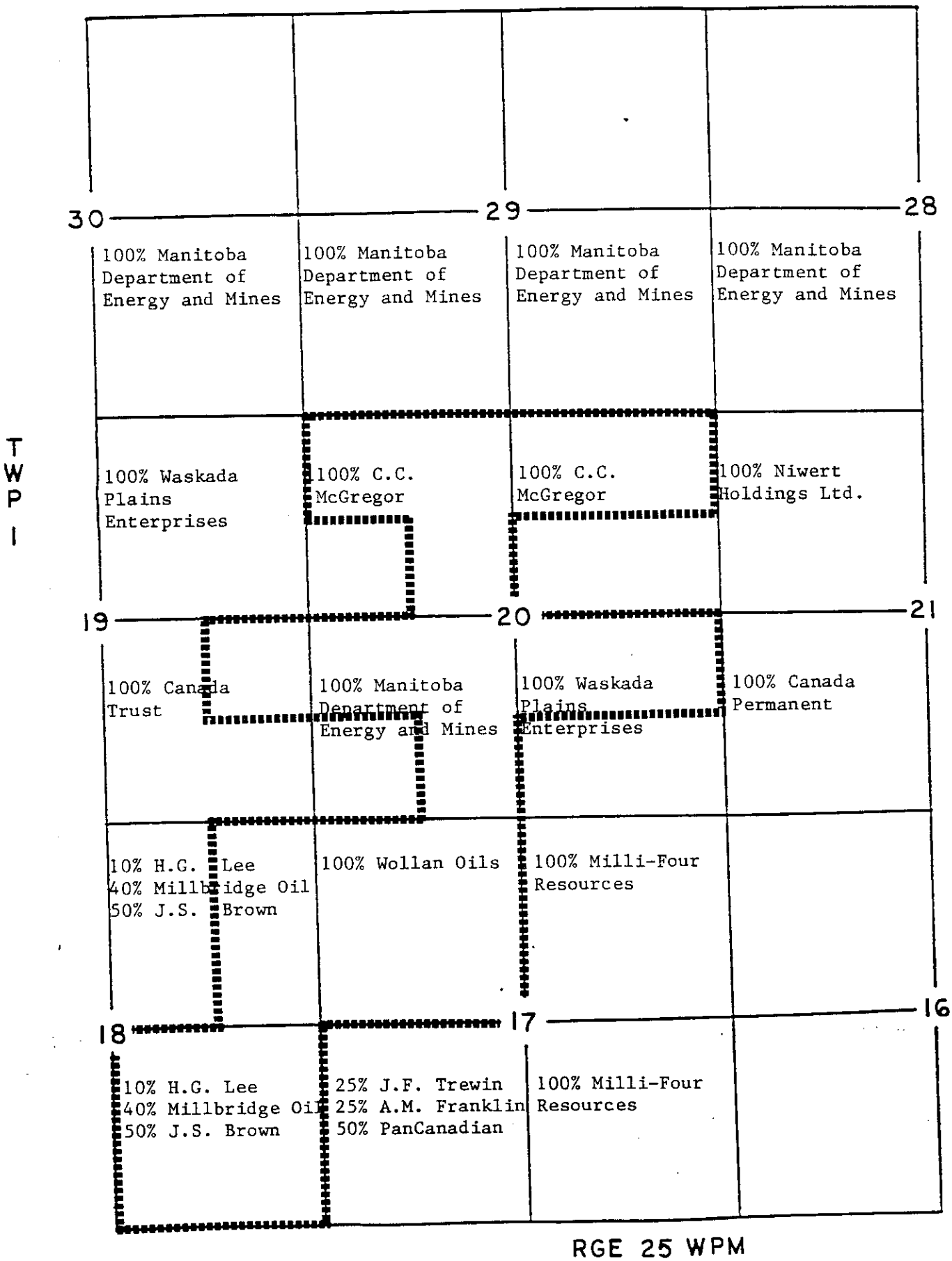
Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President Production

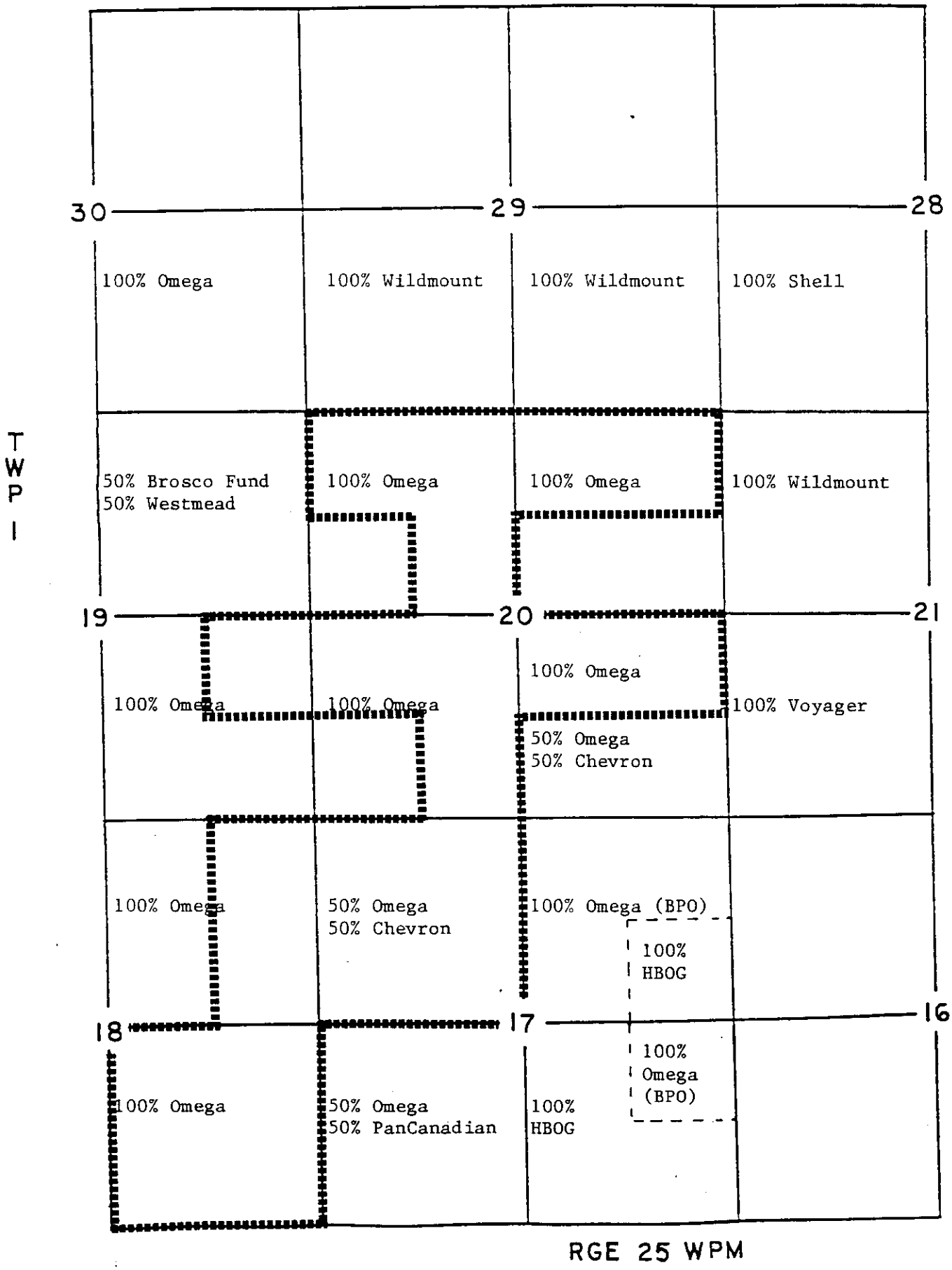
RAB:vb
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map In and Adjoining
The Proposed Waskada Unit No. 7



Proposed Waskada Unit No. 7

Lessee Map In and Adjoining
The Proposed Waskada Unit No. 7



Proposed Waskada Unit No. 7

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No. 7

Well	Completed Zone	Status
14-7-1-25 WPM	Lower Amaranth	Producing Oil Well
15-7-1-25 WPM	Lower Amaranth	Producing Oil Well
16-7-1-25 WPM	Lower Amaranth	Producing Oil Well
13-8-1-25 WPM	N/A	Abandoned Well
6-17-1-25 WPM	Lower Amaranth	Producing Oil Well
10-17-1-25 WPM	Lower Amaranth	Producing Oil Well
11-17-1-25 WPM	Lower Amaranth	Producing Oil Well
12-17-1-25 WPM	Lower Amaranth	Producing Oil Well
13-17-1-25 WPM	Lower Amaranth	Producing Oil Well
14-17-1-25 WPM	Lower Amaranth	Producing Oil Well
15-17-1-25 WPM	Lower Amaranth	Producing Oil Well
1-18-1-25 WPM	Lower Amaranth	Producing Oil Well
2-18-1-25 WPM	Lower Amaranth	Producing Oil Well
3-18-1-25 WPM	Lower Amaranth	Producing Oil Well
6-18-1-25 WPM	Lower Amaranth	Producing Oil Well
7-18-1-25 WPM	Lower Amaranth	Producing Oil Well
8-18-1-25 WPM	Lower Amaranth	Producing Oil Well
9-18-1-25 WPM	Lower Amaranth	Producing Oil Well
10-18-1-25 WPM	Lower Amaranth	Producing Oil Well
15-18-1-25 WPM	Lower Amaranth	Producing Oil Well
16-18-1-25 WPM	Lower Amaranth	Producing Oil Well
8-19-1-25 WPM	Lower Amaranth	Producing Oil Well
9-19-1-25 WPM	Lower Amaranth	Producing Oil Well
10-19-1-25 WPM	N/A	Abandoned Well
3-20-1-25 WPM	Lower Amaranth	Producing Oil Well
4-20-1-25 WPM	N/A	Abandoned Well
5-20-1-25 WPM	Lower Amaranth	Producing Oil Well
6-20-1-25 WPM	Lower Amaranth	Producing Oil Well
7-20-1-25 WPM	Lower Amaranth	Producing Oil Well
8-20-1-25 WPM	Lower Amaranth	Producing Oil Well
9-20-1-25 WPM	Lower Amaranth	Producing Oil Well
10-20-1-25 WPM	Lower Amaranth	Producing Oil Well
11-20-1-25 WPM	Lower Amaranth	Producing Oil Well
12-20-1-25 WPM	Lower Amaranth	Producing Oil Well
13-20-1-25 WPM	Lower Amaranth	Producing Oil Well
14-20-1-25 WPM	Lower Amaranth	Producing Oil Well
15-20-1-25 WPM	Lower Amaranth	Producing Oil Well
16-20-1-25 WPM	Lower Amaranth	Producing Oil Well
13-21-1-25 WPM	Lower Amaranth	Producing Oil Well
4-28-1-25 WPM	Lower Amaranth	Producing Oil Well
1-30-1-25 WPM	Blairmore	Source Water Well

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 18, 1986

Waskada Unit No. 7
Surface Owners
(addressee list attached)

Dear Sir/Madam:

Re: Proposed Waskada Unit No. 7 Waterflood Project
Sections 17, 18, 19 and 20, Twp. 1, Rge. 25 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme in Sections 17, 18, 19 and 20, Twp. 1, Rge. 25 WPM. The well locations included in the proposed project are 11-17, 12-17, 13-17, 14-17, 1-18, 2-18, 7-18, 8-18, 9-18, 16-18, 8-19, 3-20, 5-20, 6-20, 7-20, 8-20, 11-20, 13-20, 14-20, 15-20 and 16-20-1-25 WPM.

The proposed project involves the injection of produced water into wells 13-17, 7-18, 5-20, 7-20, 13-20 and 15-20-1-25 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President, Production

RAB:vb
c.c. Waskada Unit No. 7 File
Land Dept.

Waskada Unit No. 7
Surface Owners
Addressee List

Rolf Waldemar Wollan
704 Westshore
Richardson, Texas
75080 U.S.A.

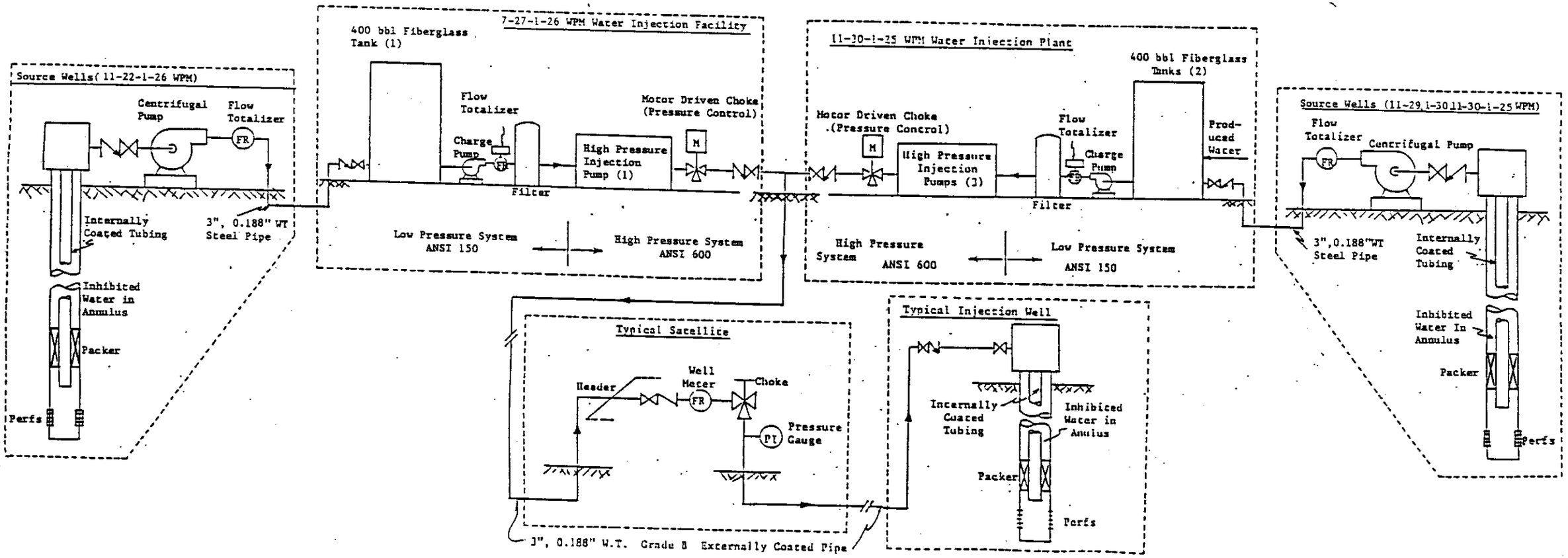
Theodore Norman McGregor
Box 95
Waskada, Manitoba
ROM 2EO

Robert Donald McGregor
Box 34
Waskada, Manitoba
ROM 2EO

Leslie James McGregor
Waskada, Manitoba
ROM 2EO

Charles Carlton McGregor
5 Kasuirak Bay
Brandon, Manitoba
R7A 6H8

Schematic Daigram of the Existing Water Injection System



Attachment 5

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: G. E. Patey
Vice President, Production

Dear Sirs:

Re: Waskada Unit No. 3
Pressure Maintenance Operations

Pursuant to Pressure Maintenance Rule 1(1) of Board Order No. PM 45, the Board hereby approves conversion of the following wells to water injection:

Omega Waskada Prov. A7-30-1-25 (WPM)
Omega Waskada 5-36-1-26 (WPM)
Omega Waskada 7-36-1-26 (WPM)
Omega Waskada 7-5-2-25 (WPM)

Pressure maintenance operations involving these wells are to be conducted according to the provisions of Board Order No. PM 45.

With respect to the well Omega Waskada 5-36-1-26 (WPM), please note that water injection is not authorized until the well is included in a Unit which has been approved by the Board.

Please ensure that necessary recompletion applications are submitted to the Petroleum Branch.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

LRD/lk

b.c. Wm. McDonald
B. Ball
Petroleum Branch

Manitoba

Memorandum

Date July 2, 1986

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Branch

Telephone

Subject Waskada Unit No. 3

Pressure Maintenance Operations

First | Fold

Omega Hydrocarbons Ltd., Operator of Waskada Unit No. 3 made application (dated May 6, 1986) for approval to expand its pressure maintenance operations in the subject Unit by conversion of four wells to water injection. Notice of the application was published in the Deloraine Times and Star (June 11, 1986) and the Manitoba Gazette (June 7, 1986) and was sent to offsetting working interest owners. No objections were received.

Recommendations:

It is recommended that the application be approved. A proposed letter of approval from the Board is attached.

Discussion:

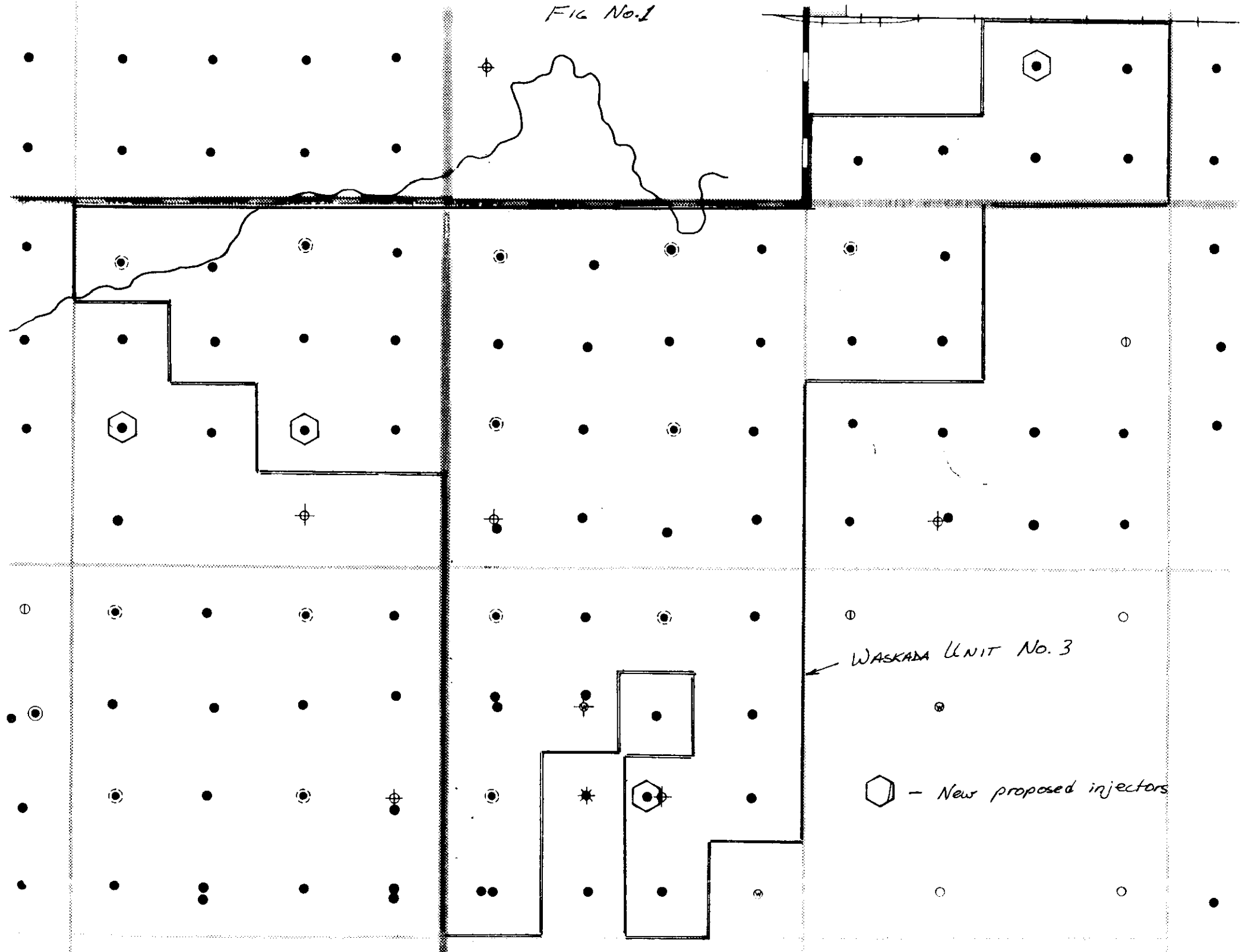
Figure No. 1 shows the current extent of Waskada Unit No. 3 and highlights the wells proposed for conversion to water injection. The proposed water injection wells continue the inverted nine-spot injection pattern. Note that one well (Omega Waskada 5-36-1-26 (WPM)) is not within the current Unit area. Delay in execution of royalty consents has resulted in exclusion of this tract from the Unit at this time. However, the tract will be included in a future enlargement which should be forthcoming in the very near future. Consequently, approval of injection in this location is recommended. The proposed approval letter states that injection shall not commence at this location until the tract is included in the Unit.

Pressure Maintenance Rule 1(1) of Board Order No. PM 45 empowers the Board to approve injection into additional wells. Consequently, a revised Board Order is not necessary at this time.

for H. Clare Moster

LRD/lk

FIG No. 1



Preparations for ball games

Perry Cassils (above) lives near Dand. He was mowing the old school grounds June 4 in preparation for some up-coming ball games.

Where the school used to stand, the site has been levelled for seeding down to grass.

Card of thanks

The community nurses wish to thank all those who attended and supported their tea and bake sale on Thursday.

Winners of the grocery hampers were: Wendy Maxwell, Ben Arde, Holly Denys and Sylvia Missinne.

Also thank you to Lorraine Stovin for enabling us to hold the Baby Clinic at the library. Winner of the Cabbage Patch Kid draw was Jennifer Poole.

HORTICULTURAL SOCIETY MEETING

The Horticultural Society meeting will be held on Thursday, June 12 at 8:00 p.m. at the Town Complex. Program: Preparing vegetables and houseplants for exhibiting. Everyone welcome. Please notice time change. D32-1p

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada Prov. A7-30-1-25(WPM)
Omega Waskada 5-36-1-26(WPM)
Omega Waskada 7-36-1-26(WPM)
Omega Waskada 7-5-2-25(WPM)

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

Dated at Winnipeg, this 26th day of May, 1986.
Wm. McDonald, Deputy Chairman
The Oil and Natural Gas Conservation Board

June 11/86 Deloraine Times + STAR

S-035-86 — Canadian Waterslides Ltd. — P.T.H. No. 1 — R.M. of Springfield

Application by Canadian Waterslides Ltd. for a permit for a Sign adjacent to P.T.H. No. 1, N.E.¼, Section 11-10-4 East, R.M. of Springfield.

S-038-86 — Connelly Signs — P.T.H. No. 59 — R.M. of St. Clements

Application by Connelly Signs for a permit for a Sign adjacent to P.T.H. No. 59, S.E.¼, Section 8-15-6 East, R.M. of St. Clements.

S-039-86 — Cargill Ltd. — P.T.H. No. 2 — R.M. of Grey

Application by Cargill Ltd. for a permit for a Sign adjacent to P.T.H. No. 2, N.E.¼, Section 19-8-4 West, R.M. of Grey.

The Highway Traffic Board will be prepared to consider any submissions regarding the above applications at this hearing. Any person wishing to make a submission should either contact The Secretary at the hearing or forward their written submission in advance to: A. Poltaruk, Secretary, The Highway Traffic Board, Room 206-301 Weston Street, Winnipeg, Manitoba R3E 3H4.

Phone: 945-8912

A. Poltaruk, MMM CD
Secretary,
—23 THE HIGHWAY TRAFFIC BOARD.

UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada Prov. A7-30-1-25 (WPM)
Omega Waskada 5-36-1-26 (WPM)
Omega Waskada 7-36-1-26 (WPM)
Omega Waskada 7-5-2-25 (WPM)

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

Dated at Winnipeg, this 26th day of May, 1986.

WM. McDONALD,
Deputy Chairman,
The Oil and Natural Gas
—23 Conservation Board.

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 8, has made application under "The Mines Act" to convert the following well to water injection:

Omega Waskada 13-9-2-25 (WPM)

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

Dated at Winnipeg, this 26th day of May, 1986.

WM. McDONALD,
Deputy Chairman,
The Oil and Natural Gas
—23 Conservation Board.

UNDER APPLICATION TO THE LEGISLATURE

Applicants for Private Bills properly the subject of the Legislative Assembly of Manitoba should take notice of the following rule:

Notice of application for Private Bill

107(1) Every petitioner for a Private Bill shall publish, within twelve months prior to the presentation of the petition for the Private Bill.

(a) in one issue of the Manitoba Gazette; and

DEMANDES À LA LÉGISLATURE

Quiconque demande à l'Asssemblée législative du Manitoba la présentation d'un projet de loi privé devrait prendre connaissance de la règle suivante:

Avis relatifs aux demandes de projet de loi privé

107(1) Les pétitionnaires publient, dans les 12 mois précédant la remise de la pétition, un avis rédigé selon la formule figurant à l'annexe A-1 et signé par eux ou en leur nom qui précise la nature et l'objet de la pétition, ainsi que les dispositions par-

(b) at least once in each of tw
during the twelve month period af
tioned in an issue of a newspaper p
in the English language or the Fre
guage and having a general circu
the area of the province in which
sons or a majority of the perso
would be interested in or affecte
Private Bill reside;
a notice, in the form set out in
"A-1", signed by or on behalf of
tioner and clearly and distinctly s
the nature and object of the petitio
exceptional provision propos
inserted in the Bill.
For further particulars, appl
Clerk of the Legislative Assembly
tive Building, Winnipeg, Manito
0V8)
—23

NOTICE OF P
OF THE

Take notice that Lt. Col. L
Fulton, D.S.O., E.D., Col. G. Willi
son, Brig. Gen. George C. Aldo
A.D.C., Lt. Col. David Campbel
Norman R. Donough, C.D., Lt. C
I. James, Lt. Col. Hugh G. Johnst
C.D., David McFettridge, Col.
Gildas L. Molgat, C.D., Capt.
Thomas Saunders, C.D., Col. D
Scott, C.D., Lt. Col. Robert G
Q.C., Lt. Col. William R. Spence
Col. Burton F. Waters, C.D., Lt.
Wainwright, C.D., Lt. Col. F
Werry, O.M.M., C.D., intend to p

May 27, 1986

Queen's Printer
Statutory Publications
200 Vaughan Street

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch
555 - 330 Graham Avenue

MANTIOBA GAZETTE

Please have the attached Notices (2) appear in the next issue of the Manitoba Gazette under The Mines Act.

L. R. Dubreuil

LRD/ch
Attachment

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 3, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Waskada Prov. A7-30-1-25 (WPM)
Omega Waskada 5-36-1-26 (WPM)
Omega Waskada 7-36-1-26 (WPM)
Omega Waskada 7-5-2-25 (WPM)

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

Dated at Winnipeg, this 26th day
of May, 1986.

Wm. McDonald, ~~Deputy~~ Chairman
The Oil and Natural Gas
Conservation Board

Manitoba

Memorandum

Date	May 22, 1986		
To	The Oil and Natural Gas Conservation Board Charles S. Kang - Chairman Wm. McDonald - Deputy Chairman Bruce Ball - Member	From	H. Clare Moster Director, Petroleum Branch
		Telephone	
Subject	Waskada Lower Amaranth A Pool Expanded Pressure Maintenance - Waskada Unit No. 3		

First | Fold

Omega Hydrocarbons Ltd., as operator of the Waskada Unit No. 3, has applied for approval to expand its waterflood operations in the Unit by conversion of 4 additional wells from producers to water injection wells.

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star and sent to the offsetting interest owners (see Table No. 2). A copy of the proposed notice is attached.

Discussion:

Omega has successfully conducted pressure maintenance by waterflooding in a major portion of the Waskada Lower Amaranth Pool for 3 years. In response to waterflooding, the oil production rate decline has been arrested and in some cases, reversed to show an actual increase in oil production. Based on computer-simulated model studies of the waterflood operations in the Pool, it appears that waterflooding will result in a recovery of up to 25% of the original oil-in-place. Under primary production conditions, it is estimated that less than 10% of the original oil-in-place will be recoverd.

Figure No. 1 shows the present Unit No. 3 configuration along with the proposed expansion.

Table No. 1 illustrates the severity of the primary production decline in the area and emphasizes the need for pressure maintenance operations. The Table lists average daily oil production in the first month in which each well produced at least 20 days and the corresponding producing rate for January, 1986 for each well. The average length of production is only about 20 months, but oil rates have declined to 30% of the initial values.

Omega has requested that Board Order No. PM 45 be amended to include the proposed expansion. However, Board Order No. PM 45 empowers the Board to authorize injection into "such other wells in the Unit Areas

... cont'd

as the Board may approve". Consequently, in the interest of expediency, it is proposed to authorize the proposed injectors by a letter of approval from the Board. A draft letter of approval will be forwarded to the Board following expiry of the notice period.

Table No. 2 lists working interest ownership in, and adjoining, the area of the proposed expansion. It is noted that working interest owners that are not a party of the Unit agreement have interests in offset lands that could be affected by the proposal. Therefore, it is recommended that the notice be published and also sent to the affected working interest owners. A proposed notice is attached.

H. Clare Moster

MA/dh

TABLE NO. 1

WASKADA UNIT NO. 3 EXPANSION

PRIMARY PRODUCTION DECLINE

Well	Initial Oil Rate (m^3/d)**	Initial Month	Months Produced	Current Oil Rate (m^3/d) (Jan/86)
2-30-1-25	4.20	11-82	39	0.24
*7-30-1-25	10.97	01-86	1	10.97
8-30-1-25	2.32	10-83	28	1.25
5-36-1-26	12.61	10-83	28	2.00
6-36-1-26	11.85	06-85	8	1.23
*7-36-1-26	8.45	01-86	1	8.45
16-36-1-26	5.03	08-85	6	0.49
1-5-2-25	6.29	02-85	12	1.42
2-5-2-25	5.16	04-85	10	2.05
3-5-2-25	1.79	12-82	38	1.37
*4-5-2-25	3.58	11-85	3	3.62
7-5-2-25	2.51	11-84	15	2.15
8-5-2-25	5.52	01-85	13	4.99
Total	57.28		197	17.19
Avg per well	5.73		19.7	1.72
			1.64 yrs.	

* omitted from average initial and current oil rate calculations.

** calculated for first month in which the well produced for 20 or more days.

TABLE NO. 2

WASKADA UNIT NO. 3 EXPANSION

OFFSETTING WORKING INETEREST OWNERSHIP

Andex Oil Co. Ltd.	W½ 4-2-25
✓Tundra Oil and Gas	N½ 19-1-25
Chauvco Resources Ltd.	NE¼ 5-2-25 NW¼ 29-1-25
✓ Copperhead Oil Co. Ltd.	NW¼ 19-1-25
Corvair Oil Ltd.	NW¼ 19-1-25
United Canso Oil and Gas Ltd.	NE¼ 5-2-25
Dome Petroleum Limited	SW¼ 35-1-26
Petro-Star Petroleums Ltd.	NE¼ 5-2-25
Shell Canada Resources Limited	W½ 4-2-25 NW¼ 29-1-25
Viking Oil and Gas Ltd.	NE¼ 5-2-25
Wildmount Resources Ltd. (c/o Trilogy)	SW¼ 29-1-25

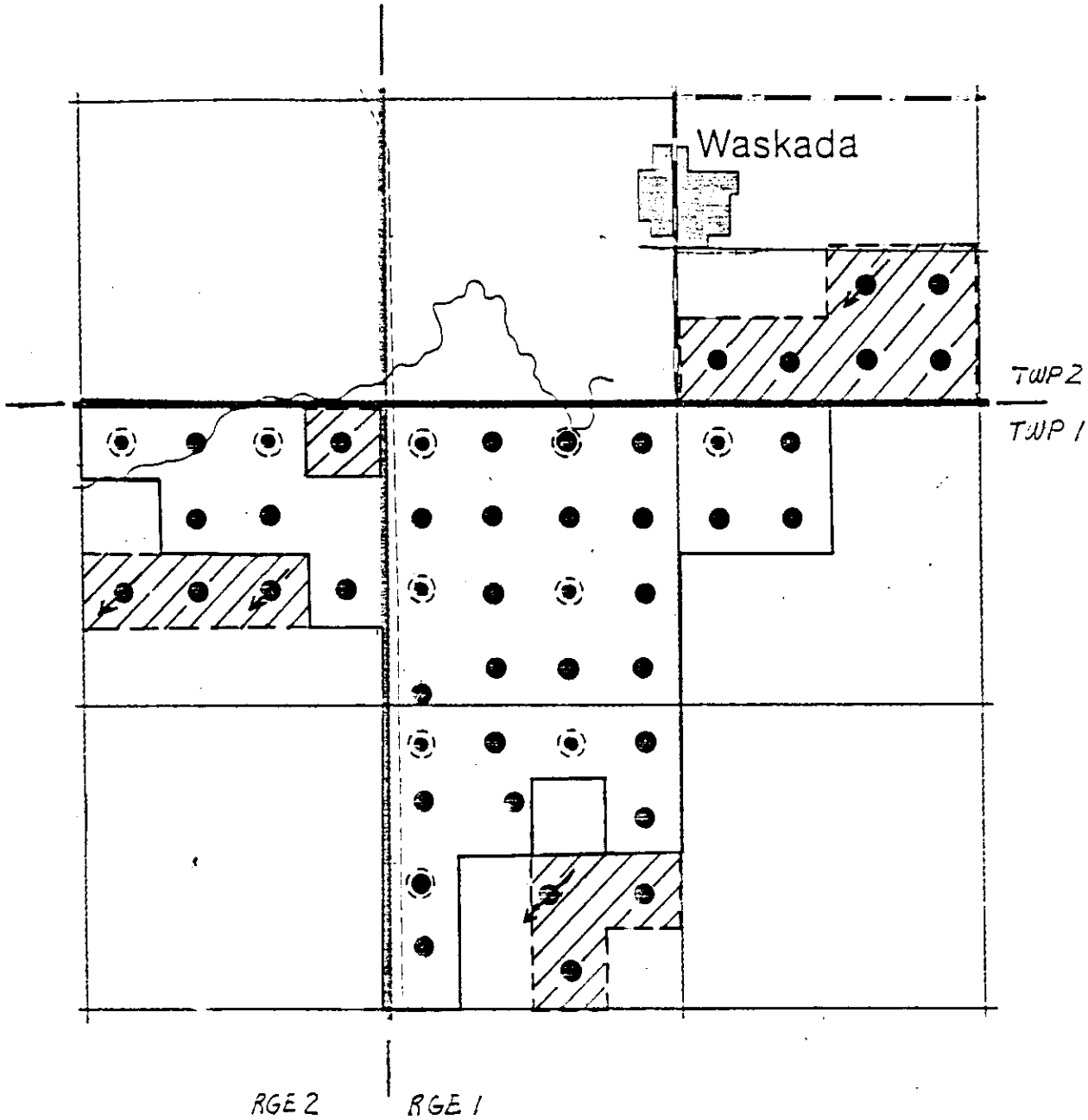


FIGURE NO. 1

LEGEND

● PRODUCER

(●) WATER INJECTION

PROPOSED WATER INJECTOR

PRESENT UNIT NO. 3.

EXPANDED UNIT NO. 3 ADDITIONAL TRACTS.

NOTE: ONLY LOWER AMARANTH WELLS IN UNIT NO. 3 ARE SHOWN ON MAP.

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

May 6, 1986

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

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the additional areas contained within the currently proposed expansion of Waskada Unit No. 3. The expanded Unit consists of 13 new tracts containing Lower Amaranth wells 2-30, 7-30 and 8-30-1-25 WPM, 5-36, 6-36, 7-36 and 16-36-1-26 WPM and 1-5, 2-5, 3-5, 4-5, 7-5 and 8-5-2-25 WPM. Unit expansion documents have been circulated to all the parties involved for their signatures and have also been submitted to the Manitoba Government for approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 45, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega Waskada Prov.	7A-30-1-25 WPM
Omega Waskada	5-36-1-26 WPM
Omega Waskada	7-36-1-26 WPM
Omega Waskada	7-5-2-25 WPM

As operator of both the existing pressure maintenance schemes and the proposed expansion area we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximun allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing scheme.

Corrosion prevention methods within the waterflood expansion area will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $970m^3/d$ while the four (4) existing source water wells are capable of producing an additional $1100m^3/d$ of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed expansion area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Expansion Area
2) Lessee Map of the Expansion Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

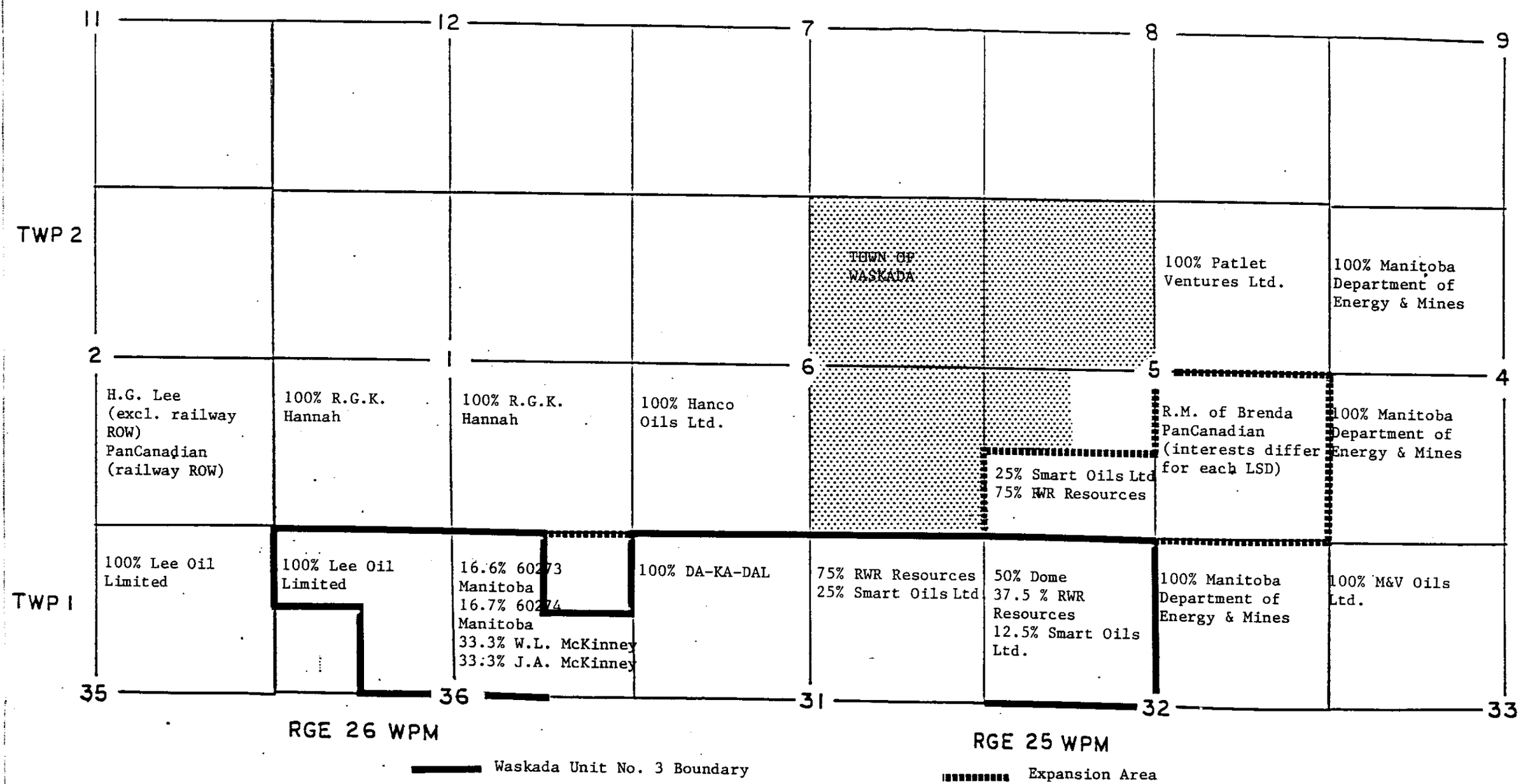
Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey,
Vice President, Production

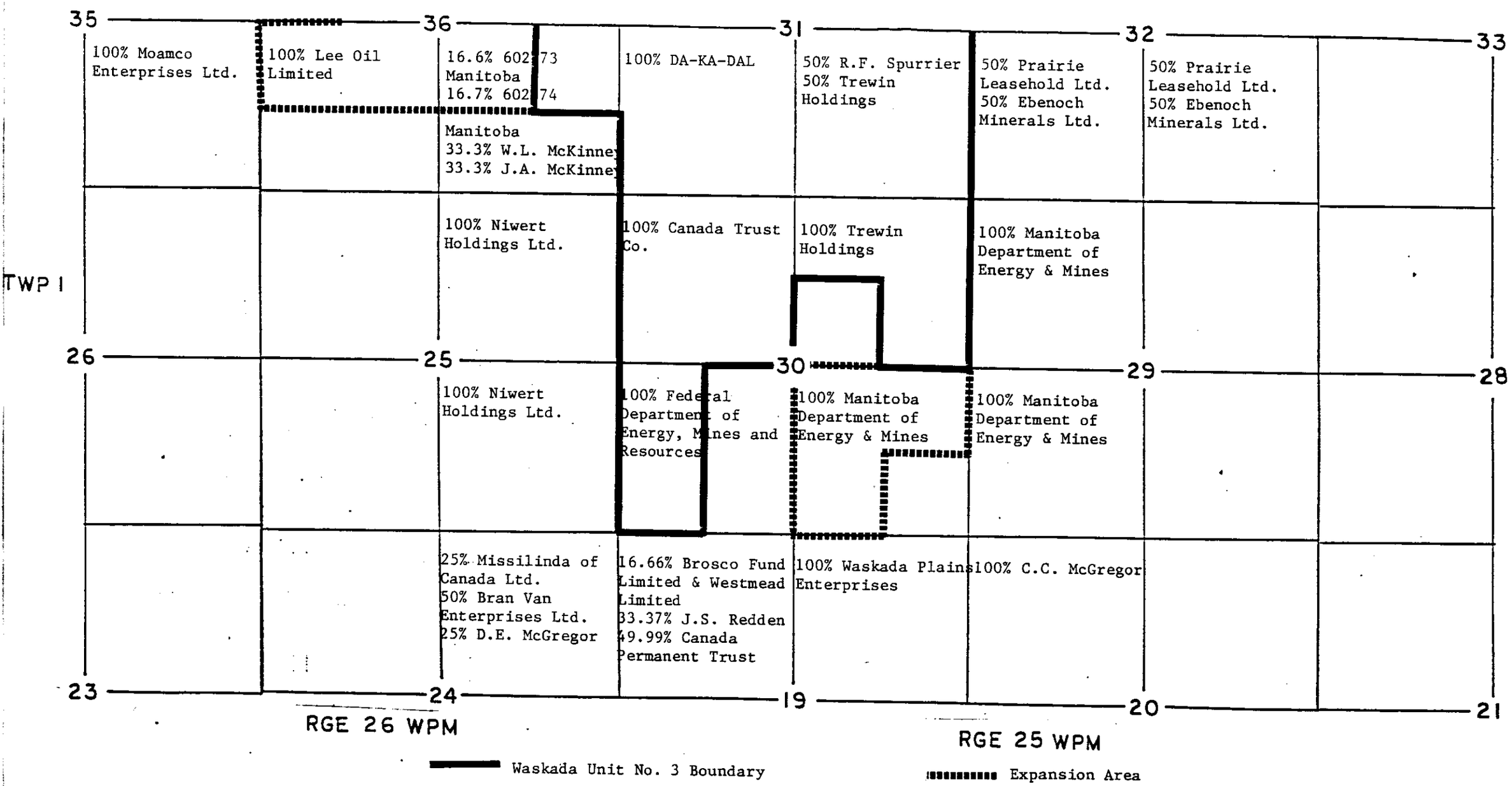
RAB:vb
Encl.
c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

Lessor Map In and Adjoining
The Proposed Expansion Area



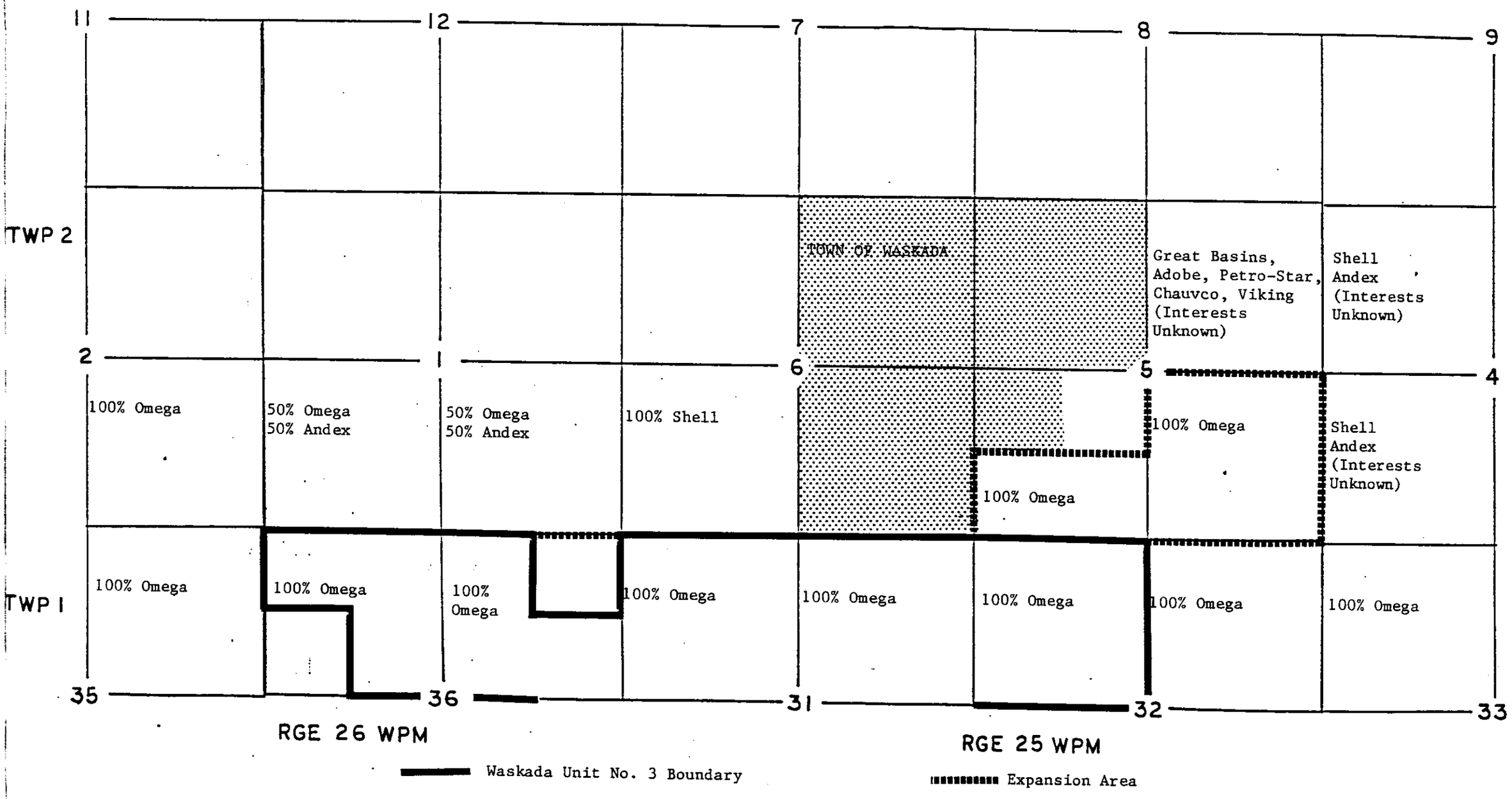
Attachment 1(a)

Lessor Map In and Adjoining
The Proposed Expansion Area



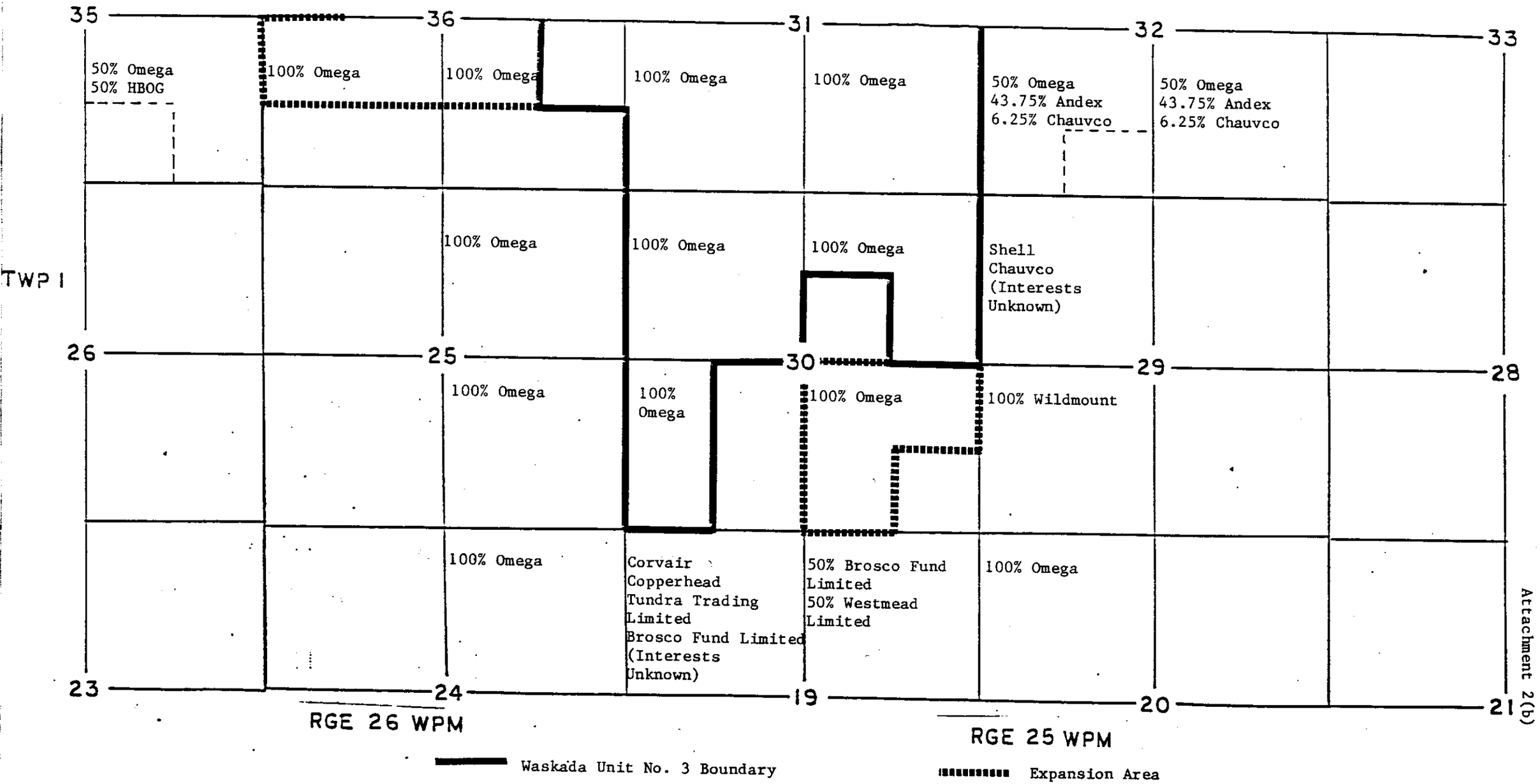
Attachment 1(b)

Lessee Map In and Adjoining
The Proposed Expansion Area



Attachment 2(a)

Lessee Map In and Adjoining
The Proposed Expansion Area



Attachment 2(b)

Well Status Summary
For Wells In and Adjoining
The Proposed Expansion Area

Well	Completed Zone	Status
14-19-1-25 WPM	Upper Alida	Producing Oil Well
15-19-1-25 WPM	Lower Amaranth	Producing Oil Well
1-30-1-25 WPM	Blairmore	Source Water Well
2-30-1-25 WPM	Lower Amaranth	Producing Oil Well
3-30-1-25 WPM	Upper Alida	Producing Oil Well
6-30-1-25 WPM	Upper Alida	Gas Injector
7A-30-1-25 WPM	Lower Amaranth	Producing Oil Well
8-30-1-25 WPM	Lower Amaranth	Producing Oil Well
9-30-1-25 WPM	Lower Amaranth	Producing Oil Well
10-30-1-25 WPM	Lower Alida	Producing Oil Well
11-30-1-25 WPM	Blairmore	Source Water Well
11A-30-1-25 WPM	Lower Amaranth	Producing Oil Well
12-31-1-25 WPM	Lower Amaranth	Producing Oil Well
13-31-1-25 WPM	Lower Amaranth	Water Injector
15-31-1-25 WPM	Lower Amaranth	Water Injector
13-32-1-25 WPM	Lower Amaranth	Water Injector
14-32-1-25 WPM	Lower Amaranth	Producing Oil Well
13-33-1-25 WPM	Lower Amaranth	Producing Oil Well
8-35-1-26 WPM	Lower Amaranth	Producing Oil Well
9-35-1-26 WPM	Lower Alida	Producing Oil Well
4-36-1-26 WPM	Lower Amaranth	Producing Oil Well
5-36-1-26 WPM	Lower Amaranth	Producing Oil Well
6-36-1-26 WPM	Lower Amaranth	Producing Oil Well
7-36-1-26 WPM	Lower Amaranth	Producing Oil Well
8-36-1-26 WPM	Lower Amaranth	Producing Oil Well
9-36-1-26 WPM	Lower Amaranth	Producing Oil Well
10-36-1-26 WPM	Lower Amaranth	Producing Oil Well
11-36-1-26 WPM	Lower Amaranth	Producing Oil Well
12-36-1-26 WPM	Lower Alida	Producing Oil Well
15-36-1-26 WPM	Lower Amaranth	Water Injector
16-36-1-26 WPM	Lower Amaranth	Producing Oil Well
4-4-2-25 WPM	Unknown	Unknown
5-4-2-25 WPM	Lower Amaranth	Producing Oil Well
12-4-2-25 WPM	Unknown	Unknown
1-5-2-25 WPM	Lower Amaranth	Producing Oil Well
2-5-2-25 WPM	Lower Amaranth	Producing Oil Well
3-5-2-25 WPM	Lower Amaranth	Producing Oil Well
4-5-2-25 WPM	Lower Amaranth	Producing Oil Well
7-5-2-25 WPM	Lower Amaranth	Producing Oil Well
8-5-2-25 WPM	Lower Amaranth	Producing Oil Well
9-5-2-25 WPM	Lower Amaranth	Producing Oil Well
10-5-2-25 WPM	Unknown	Unknown

Attachment 4

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

May 6, 1986

Waskada Unit No. 3 Expansion
Surface Owners
(addressee list attached)

Dear Sir/Madam:

Re: Waskada Unit No. 3 Expansion
Section 30, Twp 1, Rge 25 WPM
Section 36, Twp 1, Rge 26 WPM
Section 5, Twp 2, Rge 25 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to expand the existing pressure maintenance scheme into Section 30, Twp 1, Rge 25 WPM, Section 36, Twp 1, Rge 26 WPM and Section 5, Twp 2, Rge 25 WPM. The well locations included in the proposed expansion are 2-30, 7-30, 8-30-1-25 WPM, 5-36, 6-36, 7-36, 16-36-1-26 WPM and 1-5, 2-5, 3-5, 4-5, 7-5 and 8-5-2-25 WPM.

The expanded pressure maintenance scheme will involve the injection of produced water into wells 7-30-1-25 WPM, 5-36-1-26, 7-36-1-26 WPM and 7-5-2-25 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice President, Production

RAB:vb
c.c. Waskada Unit No. 3 File
Land Dept.

Waskada Unit No. 3 Expansion
Surface Owners
Addressee List

Murray Gibson Hanah
Waskada, Manitoba
ROM 2E0

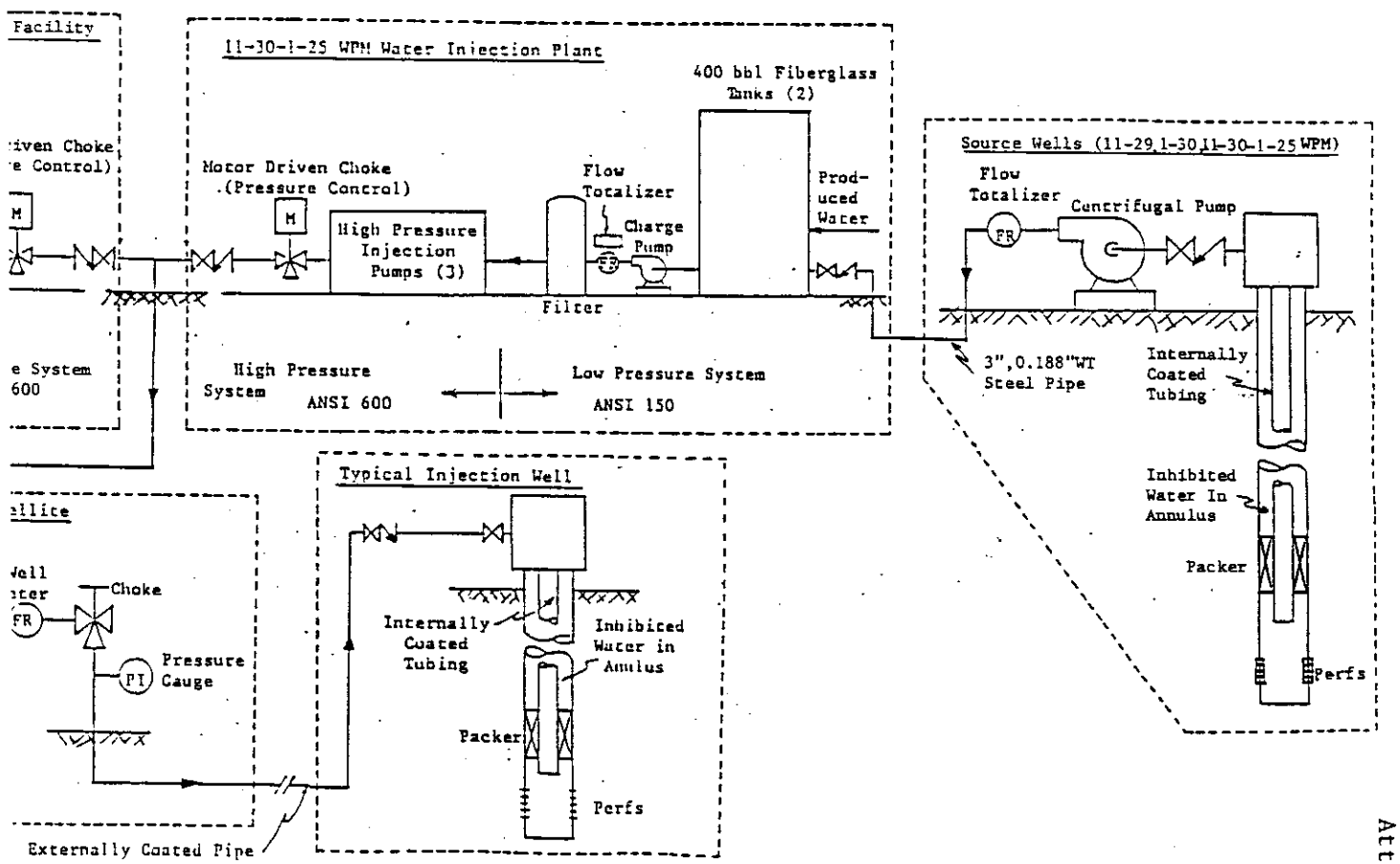
Marjorie Mae Cameron
Box 23
Waskada, Manitoba
ROM 2E0

Clayton Murray Hannah
Box 5
Waskada, Manitoba
ROM 2E0

Howard Glover Lee
Waskada, Manitoba
ROM 2E0

Donalda Beverly Trewin
Box 175
Waskada, Manitoba
ROM 2E0

EXISTING WATER INJECTION SYSTEM



Attachment 5

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

February 6, 1986

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

Your letter of January 31, 1986 relating to the proposed expansion of pressure maintenance operations in the subject Pool is acknowledged. Further to the Board's letter of January 9, 1986, you are authorized to initiate water injection in the wells noted in your letter upon unitization of the area.

Your request to delete the wells in Section 1-2-26 (WPM) is acknowledged and accepted.

Yours sincerely,

Wm. McDonald,
Deputy Chairman

LRD/lk

b.c. Petroleum Branch

x.c. Charles S. Kang
J. F. Redgwell

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

January 31, 1986

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

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this letter is to amend a previously submitted application by Omega Hydrocarbons Ltd. to expand the pressure maintenance operations within Waskada Unit No. 5. Due to differing opinions between Andex Oil Co. Ltd. and ourselves concerning the tract factors within Section 1, Twp. 2, Rge. 26 WPM it has been decided that the effected tracts be excluded from this expansion. Therefore, the Unit expansion will now consist of 16 new tracts containing Lower Amaranth wells 3-34, 4-34, 5-34, 6-34, 10-34, 12-34, 13-34, 14-34, 15-34, 16-34-1-26 WPM and 15-2, 1-3, 2-3, 3-3, 7-3 and 8-3-2-26 WPM. This change in the number of new tracts also effects the number of proposed injection wells. Omega Hydrocarbons Ltd. hereby requests permission to inject water only into wells;

Omega Chevron Waskada	5-34-1-26	WPM
Omega Chevron Waskada	13-34-1-26	WPM
Omega Chevron Waskada	15-34-1-26	WPM
Omega Waskada	15-2-2-26	WPM
Omega Waskada	7-3-2-26	WPM

Should you have any comments or questions related to this amendment please contact Mr. Bob Beamish or Mr. Richard Brekke at (402) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice-President - Production

GEP:vb
c.c. R. Dubreuil - Man. Pet. Branch
R.A. Beamish
Waskada (LAm) Waterflood
Approvals File

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. G. E. Patey,
Vice President, Production

Dear Sirs:

Re: Waskada Lower Amaranth A Pool
Additional Water Injection Wells

Omega Chevron Waskada 5-34-1-26 (WPM)
Omega Chevron Waskada 13-34-1-26 (WPM)
Omega Chevron Waskada 15-34-1-26 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 7-1-2-26 (WPM)
Omega Andex Waskada 13-1-2-26 (WPM)
Omega Waskada Prov. 15-2-2-26 (WPM)
Omega Waskada 7-3-2-26 (WPM)

Your application for approval to convert the subject wells to water injection is hereby approved pursuant to the provisions of Board Order No. PM 45.

Please note that you are not authorized to commence injection operations until the Board has approved the enlargement of Waskada Unit No. 5.

Also, please note that subclause 1(4) of Board Order No. PM 45 stipulates that the completion of the wells will be as prescribed by the Director. You are consequently required to submit completed applications for each well to be converted (using form MG 416) for approval of the proposed recompletion program, prior to conversion of the wells to injection.

Yours sincerely,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang,
Chairman

LRD/lk

c.c. Petroleum Branch

by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8, within 14 days of the publication of this notice, the Board may approve the application.

Dated at Winnipeg, this 3rd day of December, 1985.

Wm. McDONALD,
Deputy Chairman.

—50

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 5, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Chevron Waskada 5-34-1-26 (WPM)
Omega Chevron Waskada 13-34-1-26 (WPM)
Omega Chevron Waskada 15-34-1-26 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 13-1-2-26 (WPM)
Omega Waskada Prov. 15-2-2-26 (WPM)
Omega Waskada 7-3-2-26 (WPM)

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

Dated at Winnipeg, this 29th day of November, 1985.

CHARLES S. KANG,
Chairman,
The Oil and Natural Gas Conservation Board.

—50

UNDER THE REAL PROPERTY ACT

Notice is hereby given that on or after the 30th day of December, 1985, a provisional Certificate of Title will be issued to Isaac "F" Enns, Grounds Keeper, and Katherina Enns, his wife, both of the Postal District of Winkler, in Manitoba, under the provisions of the above Act for the following land:

All that portion of the S.E.¼ 6-3-4, W.P.M., described as follows:

Commencing at the point of intersection of the Ely. boundary of said Quarter Section with the Sly. boundary of the Railway Right-of-Way Plan No. 76, M.L.T.O.; Thence Sly. along the said Ely. boundary a distance of 1,048.4 feet to a point; Thence Wly. and parallel with the Sly. boundary of said Quarter Section a distance of 465 feet to a point; Thence Nly. and parallel with the Ely. boundary of said Quarter Section to the point of intersection with the Sly. boundary of the said Right-of-Way; Thence S. Ely. along the Sly. boundary of the said Right-of-Way to the point of commencement.

subject to all subsisting registered charges, to replace Certificate of Title No. 97263 issued from the Land Titles Office at Morden to the said Isaac "F" Enns and Katherina Enns,

which certificate it is alleged has been lost or destroyed.

NOTE: There are memorials on the face of the said Certificate of Title indicating that part of the above described land has been transferred out.

Dated at the Land Titles Office at Morden, Manitoba, this 27th day of November, 1985.

M. WILSON,
District Registrar.

15757—50

LAND TITLES OFFICE
DISTRICT OF BRANDON

Notice is hereby given that on or after 15 days following Publication of this notice, unless cause to the contrary be shown, I will upon the registration of a dealing affecting the land hereinafter mentioned dispense with the production of Duplicate Certificate of Title No. 35525 issued from the Boissevain Land Titles Office in the name of George Harvey Clark, of the Post Office of Lyleton, in the Province of Manitoba, Garage Keeper, as registered owner of the following land:

All mines and minerals together with full power to enter and work the same in, upon or under the North East Quarter of Section 23 and the South West Quarter of Section 26, both in Township 1 and Range 28 West of the Principal Meridian, in the Province of Manitoba, excepting out of the South West Quarter of said Section 26 those portions thereof which lie between two lines parallel with and each said line being 49½ feet perpendicularly distant on opposite sides from the centre line of the Waskada Branch of the Canadian Pacific Railway as shown on a plan thereof registered in the Boissevain Land Titles Office as No. 16.

which certificate it is alleged has been lost or destroyed, or I will upon request issue a Provisional Certificate of Title subject to all subsisting registered charges, to replace said Certificate of Title.

Dated at the Land Titles Office at Brandon, this 8th day of November, 1985.

BRIAN M. PHILLIPS,
Assistant District Registrar.

15758—50

Manitoba

Memorandum

Date: January 7, 1986

To: The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From: H. Clare Moster

Telephone:

Subject: Waskada Lower Amaranth A Pool
Expanded Pressure Maintenance - Waskada Unit No. 5

First | Fold

Omega Hydrocarbons Ltd. has made application for approval to expand its pressure maintenance operations in the subject Pool by conversion of 8 additional wells from producers to water injection wells.

Notice of the application was published in the Manitoba Gazette (December 14, 1985) and the Melita New Era (December 19, 1985) and was forwarded to all offsetting working interest owners. No objections to the application have been received.

Recommendations:

It is recommended that the application be approved subject to the conditions of Board Order No. PM 45. A draft letter of approval is attached.

Discussion:

Board Order No. PM 45 empowers the Board to authorize injection into "such other wells as the Board may approve". Consequently, this application can be approved by a letter from the Board and does not require issuance of a new Board Order.

Omega is in the process of obtaining the consents of royalty owners for the enlargement of Waskada Unit No. 5. Water injection in the subject wells should not proceed until the Unit enlargement becomes effective (i.e. - all affected royalty owners consented and the Unit agreement approved by the Board).

Original Signed by H. C. Moster

H. Clare Moster

LRD/lk

LOST

FOR RENT—Two bedroom suite, available immediately. Ph: 748-2045 or 748 58, Virden. 17-2c

GIVE AWAY

TO GIVE AWAY—One 4 month old female siamese/persian kitten. Off-white color. 522-3406. 18-1c

LAND FOR SALE

LAND FOR SALE—Located SE of Melita. NW 23-3-26, NE 22-3-26. NW 26-3-26, 460 acres cultivated, will sell in separate parcels. Keith McMaster, 522-3796 or Ken McMaster, 522-8205. 18-4p

Remember to include a prayer of thanks for the things you have the next time you're praying for all the things you want.

Notice to Creditors

IN THE MATTER OF THE ESTATE OF HOWARD ELWYN MAYES, late of the Town-site of Pierson, in the Province of Manitoba, Farmer, deceased.

ALL CLAIMS against the above estate duly verified by Statutory Declaration must be filed at the office of the undersigned on or before the 13th day of January, A.D. 1986.

DATED at Melita, in Manitoba this 9th day of December, A.D. 1985.

R. A. Holmes
Barrister & Solicitor
Box 397
Melita, Manitoba
ROM 1LO
Solicitor for the Executors

FEED AND SEED

FOR SALE—Good feed oats, $1.80 at the bin. Ph. 665-2448 Medora, after 7 p.m. 16-4p

TILSTON FEED—Milk replacer, high protein calf feed, minerals, vitamins, Ralgro, Rumensin, salt, health supplies. High protein molasses range block, $7.95. Softener salt, $4.50. 8 kg. cat food, $9.95. Feed lot mineral, $10.95. Vitamin pack, $6.25. Phone: 686-2324. 17-4p

Elections decide just whose conscience will be our guide.

The Sharp Shop
P.O. Box 703
Oxbow, Sask. S0C 2B0
Ph: (306) 483-2808

• • •

Skates: Daoust
CCM
Bauer
New and Used
Skate Sharpening
Skate Laces
Hockey Tape
Toy Tractors
"ages 3 and over"
Located At:
Highway 18, East, Oxbow
Division of Scott Trusses Ltd.

HELP WANTED

HELP WANTED—Part time help required for housekeeping staff and restaurant. Inquire at Melita Inn, 522-3252. 16-2c

HELP WANTED—General Handyman. Mechanically inclined. Apply to Tweed's Garage, Medora. 665-2230. 16-2c

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 5, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Chevron Waskada 5-34-1-26 (WPM)
Omega Chevron Waskada 13-34-1-26 (WPM)
Omega Chevron Waskada 15-34-1-26 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 13-1-2-26 (WPM)
Omega Waskada Prov. 15-2-2-26 (WPM)
Omega Waskada 7-3-2-26 (WPM)

If no objection or intervention in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C OV8, within 14 days of the publication of this notice, the Board may approve the application.

Dated at Winnipeg, this 29th day of November, 1985.

Charles S. Kang, Chairman
The Oil and Natural Gas Conservation Board.

ess Directory

Roydon's Electric

• • •

Home, Farm and Commercial Wiring
Free Estimates

• • •

Roydon Porter
Phone 522-3778 Melita, Manitoba

Minshull Electric
For Your Home, Farm and Commercial Needs

• ★ •

Phone: 634-2282
Pierson Man.

DANIEL'S ELECTRIC LTD.
Residential, Commercial and Farm Wiring, Electric Heat

• ★ •

Licenced Electrician
Phone 634-2334 Pierson, Man.

SOUTH WEST

EYERS-NESTIBO

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 5, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Chevron Waskada 5-34-1-26 (WPM)
Omega Chevron Waskada 13-34-1-26 (WPM)
Omega Chevron Waskada 15-34-1-26 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 13-1-2-26 (WPM)
Omega Waskada Prov. 15-2-2-26 (WPM)
Omega Waskada 7-3-2-26 (WPM)

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

Dated at Winnipeg, this 29th day of Nov., 1985.

Charles S. Kang, Chairman
The Oil and Natural Gas
Conservation Board

TABLE NO. 2

WASKADA UNIT NO. 5 - Expansion

OFFSETTING WORKING INTEREST OWNERSHIP

Working Interest Owner	Area of Interest	Sec.	Twp.	Rge.
Chauvco	NE	28	1	26
	NW	6	2	26
Petro-star	NE	28	1	26
	NW	6	2	26
Andex Oil Co. Ltd.	NE	28	1	26
Shell	NW	6	2	26
Canadian Roxy	NE	28	1	26
Chevron	E	33	1	26
	SE	4	2	26
Wildmount	SW	6	1	26
Voyager	S	12	2	26
Senlac	S	12	2	26
Sasko Oil & Gas Ltd.	E	33	1	26
	SE	4	2	26

December 4, 1985

Queen's Printer
Statuatory Publications
200 Vaughan Street

L. R. Dubreuil
Chief, Petroleum Engineer
Petroleum Branch
555 - 330 Graham Avenue

945-6574

MANITOBA GAZETTE

Please have the attahhed Notice appear in the next issue of the Manitoba Gazette under The Mines Act.

L. R. Dubreuil

LRD/ch
Attachment

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed enlarged Waskada Unit No. 5, has made application under "The Mines Act" to convert the following wells to water injection:

Omega Chevron Waskada 5-34-1-26 (WPM)
Omega Chevron Waskada 13-34-1-26 (WPM)
Omega Chevron Waskada 15-34-1-26 (WPM)
Omega Andex Waskada 5-1-2-26 (WPM)
Omega Andex Waskada 13-1-2-26 (WPM)
Omega Waskada Prov. 15-2-2-26 (WPM)
Omega Waskada 7-3-2-26 (WPM)

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

Dated at Winnipeg, this 29th day
of Nov., 1985.

Charles S. Kang, Chairman
The Oil and Natural Gas
Conservation Board

Manitoba

Memorandum

Date November 28, 1985

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
J. F. Redgwell - Member

From H. Clare Moster
Director, Petroleum Branch

Telephone

Subject Waskada Lower Amaranth A Pool
Expanded Pressure Maintenance - Waskada Unit No. 5

First | Fold

Omega Hydrocarbons Ltd., as operator of the Waskada Unit No. 5, has applied for approval to expand its waterflood operations in the Unit by conversion of 8 additional wells from producers to water injection wells.

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Melita New Era and sent to the offsetting working interest owners (see Table No. 2). A copy of the proposed notice is attached.

Discussion:

Omega has successfully conducted pressure maintenance by waterflooding in a major portion of the Waskada Lower Amaranth Pool for almost 3 years. As a result of such operations, oil production rate decline has been arrested and in some cases reversed. This is indicative of increased recovery efficiency.

Omega has recently completed a mathematical simulation of the waterflood operations in the Pool. This mdoel, which has been calibrated to match observed pressure and production data, indicates recovery efficiency under waterflooding will be in excess of 25% while primary recovery efficiency will be less than 10%.

The current application represents an expansion of the already established injection pattern into an area of the pool which has recently been developed (see Figure No. 1).

Table No. 1 illustrates the severity of the primary production decline in this area and emphasizes the need for pressure maintenance operations. The table lists average daily oil production in the first month in which each well produced at least 20 days and the corresponding producing rate for August 1985 for each well. Note that while the average length of production is only about 15 months, oil rates have declined to less than 20% of the initial values.

....2

Omega has requested that Board Order No. PM 45 be amended to include the proposed expansion. However, Board Order No. PM 45 empowers the Board to authorize injection into "such other wells in the Unit Areas as the Board may approve". Consequently, in the interest of expediency, it is proposed to authorize the proposed injectors by a letter of approval from the Board. A draft letter of approval will be forwarded to the Board following expiry of the notice period.

Table No. 2 lists working interest ownership in, and adjoining, the area of the proposed expansion. It is noted that working interest owners that are not a party to the Unit agreement have interests in offset lands that could be affected by the proposal. On this basis publication of a notice is recommended. A proposed notice is attached.

Signature signed by H. C. Moster

H. Clare Moster

LRD/HCM/lk

TABLE NO. 1

WASKADA UNIT 5 EXPANSION

PRIMARY PRODUCTION DECLINE

Well	Initial Oil Rate* (m^3/d)	Initial Month**	Months Produced	Current (Aug.85) Oil Rate (m^3/d)
1-1	6.12	09 84	11	0.85
2-1	8.43	09 84	11	0.94
3-1	8.85	07 84	13	1.42
4-1	6.46	07 84	13	0.91
5-1	8.37	07 84	13	1.79
6-1	5.50	07 84	13	1.15
7-1	5.58	10 84	10	1.00
8-1	4.35	09 84	11	0.38
10-1	8.70	11 84	9	1.58
11-1	3.63	01 85	7	1.56
12-1	5.06	02 85	6	1.88
13-1	2.05	02 84	18	1.43
14-1	3.00	03 84	17	1.18
15-2	3.22	12 82	32	0.28
1-3	2.87	06 84	14	0.72
2-3	6.68	06 84	14	1.00
3-3	8.98	06 84	14	1.03
7-3	5.54	10 83	22	0.74
8-3	4.83	06 84	14	0.89
3-34	0.20	08 81	36	0.23
4-34	1.84	08 84	12	0.31
5-34	2.85	08 84	12	2.40
6-34	8.74	02 84	18	1.71
A10-34	2.43	01 84	19	0.19
12-34	7.75	07 84	13	0.95
13-34	7.33	11 83	21	0.18
14-34	7.34	06 83	24	1.32
15-34	2.47	02 84	18	0.21
16-34	0.90	01 84	19	0.04
Total	150.07		454	28.27
Ave. per well	5.17		15.7 1.3 yrs.	0.97

* Initial Oil Rate calculated for first month in which the well produced for 20 or more days.

** First month in which well produced at least 20 days.

TABLE NO. 2

WASKADA UNIT NO. 5 - Expansion

OFFSETTING WORKING INTEREST OWNERSHIP

Working Interest Owner	Area of Interest	Sec.	Twp.	Rge.
Chauvco	NE	28	1	26
	NW	6	2	26
Petro-star	NE	28	1	26
	NW	6	2	26
Andex Oil Co. Ltd.	NE	28	1	26
Shell	NW	6	2	26
Canadian Roxy	NE	28	1	26
Chevron	E	33	1	26
	SE	4	2	26
Wildmount	SW	6	1	26
Voyager	S	12	2	26
Senlac	S	12	2	26
Sasko Oil & Gas Ltd.	E	33	1	26
	SE	4	2	26

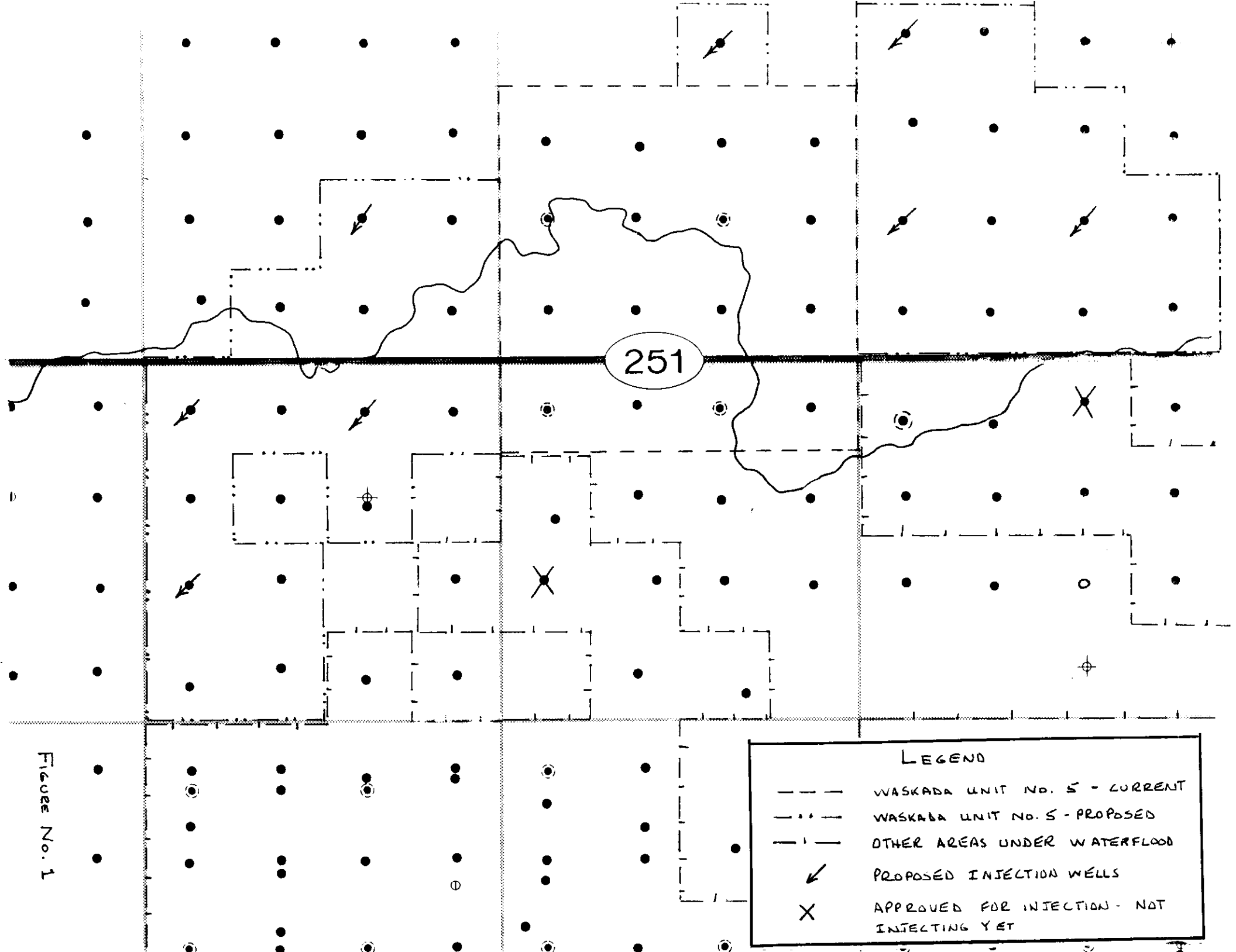

251
LEGEND
WASKADA UNIT No. 5 - CURRENT
WASKADA UNIT No. 5 - PROPOSED
OTHER AREAS UNDER WATERFLOOD
PROPOSED INJECTION WELLS
APPROVED FOR INJECTION - NOT INJECTING YET

Figure No. 1

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

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

Attention: Mr. W. McDonald
Deputy Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 45 be amended to include the additional areas contained within a proposed expansion of Waskada Unit No. 5. The Unit expansion will consist of 29 new tracts containing Lower Amaranth wells 3-34, 4-34, 5-34, 6-34, 10-34, 12-34, 13-34, 14-34, 15-34, 16-34-1-26 WPM and 1-1, 2-1, 3-1, 4-1, 5-1, 6-1, 7-1, 8-1, 10-1, 11-1, 12-1, 13-1, 14-1, 15-2, 1-3, 2-3, 3-3, 7-3, 8-3-2-26 WPM. As of this date the Unit expansion documents have been circulated to all parties involved for final signature. All the approvals required to expand Waskada Unit No. 5 are expected to be in place by December 1, 1985. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained in PM Order No. 45, Omega Hydrocarbons Ltd. also requests permission to inject water into wells;

Omega Chevron Waskada	5-34-1-26	WPM
Omega Chevron Waskada	13-34-1-26	WPM
Omega Chevron Waskada	15-34-1-26	WPM
Omega Andex Waskada	5-1-2-26	WPM
Omega Andex Waskada	7-1-2-26	WPM
Omega et al Waskada	13-1-2-26	WPM
Omega Waskada	15-2-2-26	WPM
Omega Waskada	7-3-2-26	WPM

coincident with the effective date of the expanded Unit.

As operator of both the existing pressure maintenance scheme and the proposed expansion area we intend to continue operating in accordance with

.../2

the current pressure maintenance rules. Therefore, prior to the commencement water injection bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing scheme.

Corrosion prevention methods within the waterflood expansion area will include cathodic protection, internally coated flowlines and well treatments. In an effort to extend the life of the water injection scheme all injection lines and injection well tubing strings will be internally coated. Regular chemical treatments (XC-320) at each production well are also planned, to combat bacterial corrosion which has been an ongoing problem in Waskada.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $900m^3/d$ while the two (2) existing source water wells are capable of producing an additional $500m^3/d$ of water. Since these water volumes will be insufficient to handle the injection requirements for all the recently expanded pressure maintenance areas, Omega intends to increase the source water capacity. Work is currently underway to locate appropriate locations for two (2) additional Blairmore source water wells. A high pressure injection pump and filter system capable of handling an additional $700m^3/d$ of water has already been installed at satellite 7-27-1-26 WPM and is awaiting the completion of the new source water wells. Although, the new source water wells will mainly supply injection water to Sections 26 and 27-1-26 WPM plans are to construct the tie-in in such a way that they can also supplement other injection wells within the system. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information:

1) Lessor Map of the Expansion Area
2) Lessee Map of the Expansion Area
3) Well Status Summary
4) Schematic Diagram of the Proposed Water Injection System

Should you have any comments or questions related to the submission, please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

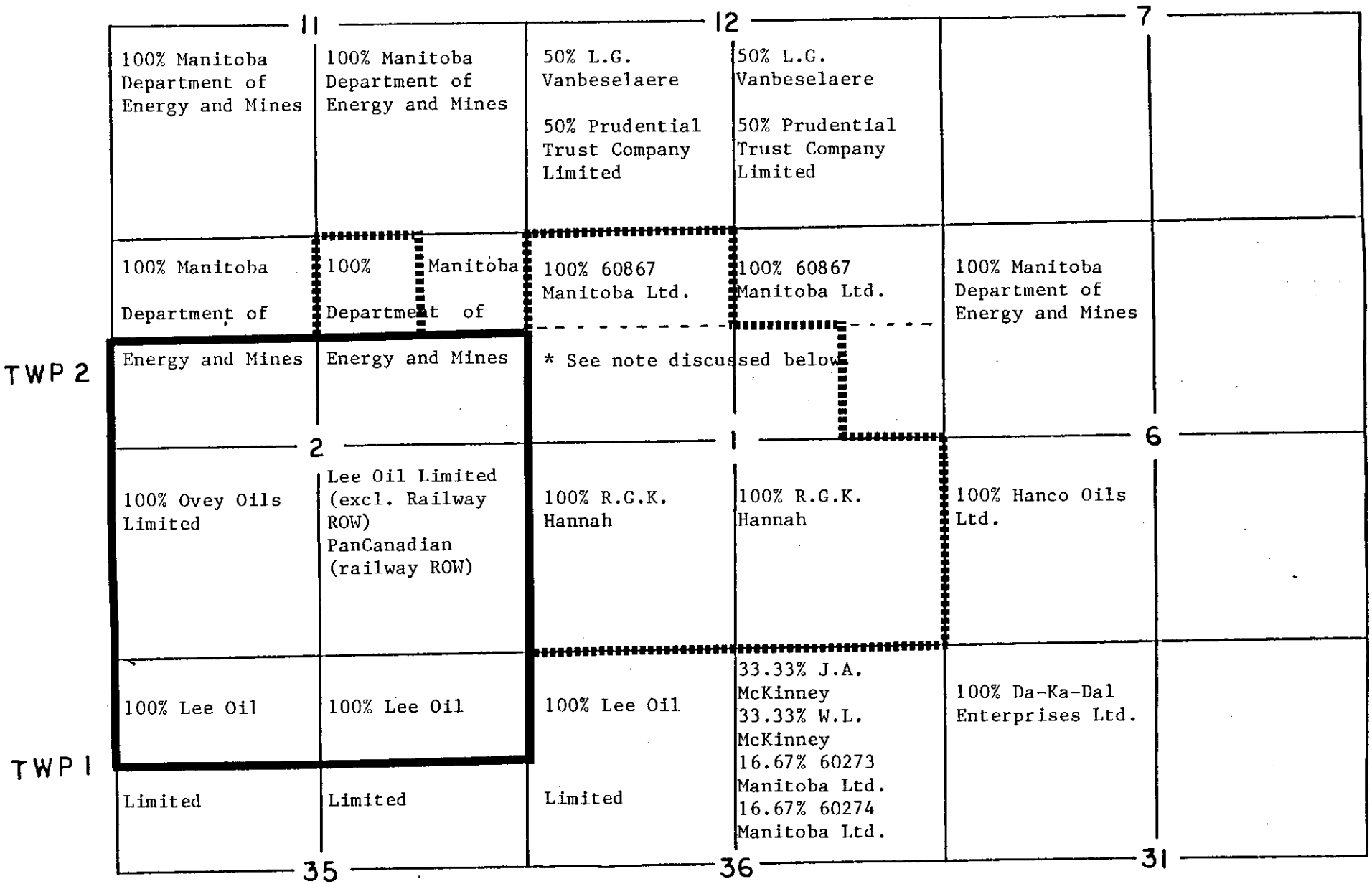
We would appreciate your earliest attention to this matter.

Yours truly,
OMEGA HYDROCARBONS LTD.

G.E. Patey
Vice-President - Production

GEP:vb
Encl.
c.c. R. Dubreuil - Man. Pet. Branch
R.A. Beamish
Waskada (LAm) Waterflood Approvals File

LESSOR MAP IN AND ADJOINING
THE PROPOSED EXPANSION AREA



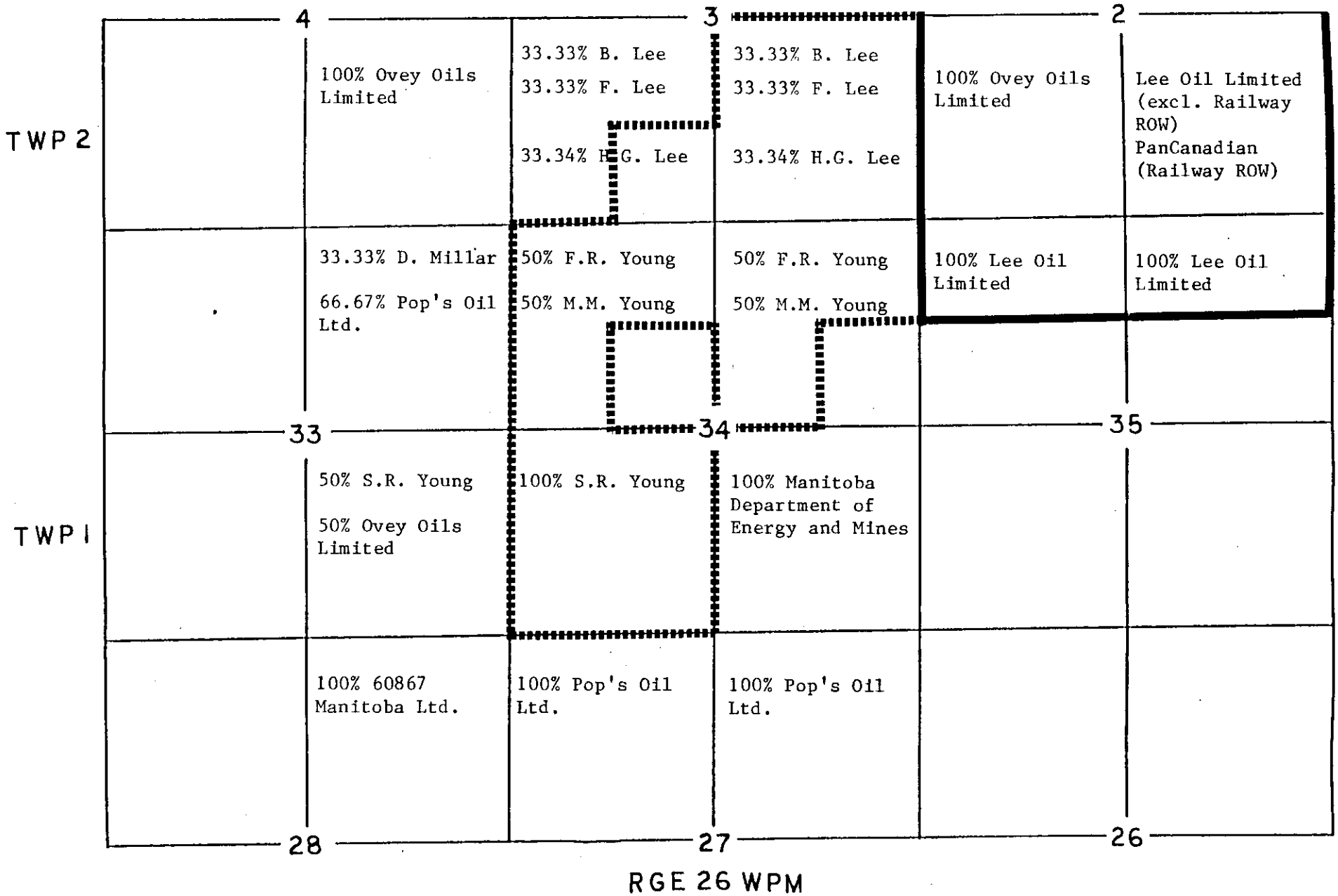
*LSD's 9,10,11,12-1-2-26 WPM - Ptn. N. of Railway ROW
60867 Manitoba Ltd.
- Railway ROW
PanCanadian Petroleum Limited
- Ptn. S. pf Railway ROW
R.G.K. Hannah

Waskada Unit No. 5 Boundary

Expansion Area

Attachment 1(a)

LESSOR MAP IN AND ADJOINING
THE PROPOSED EXPANSION AREA

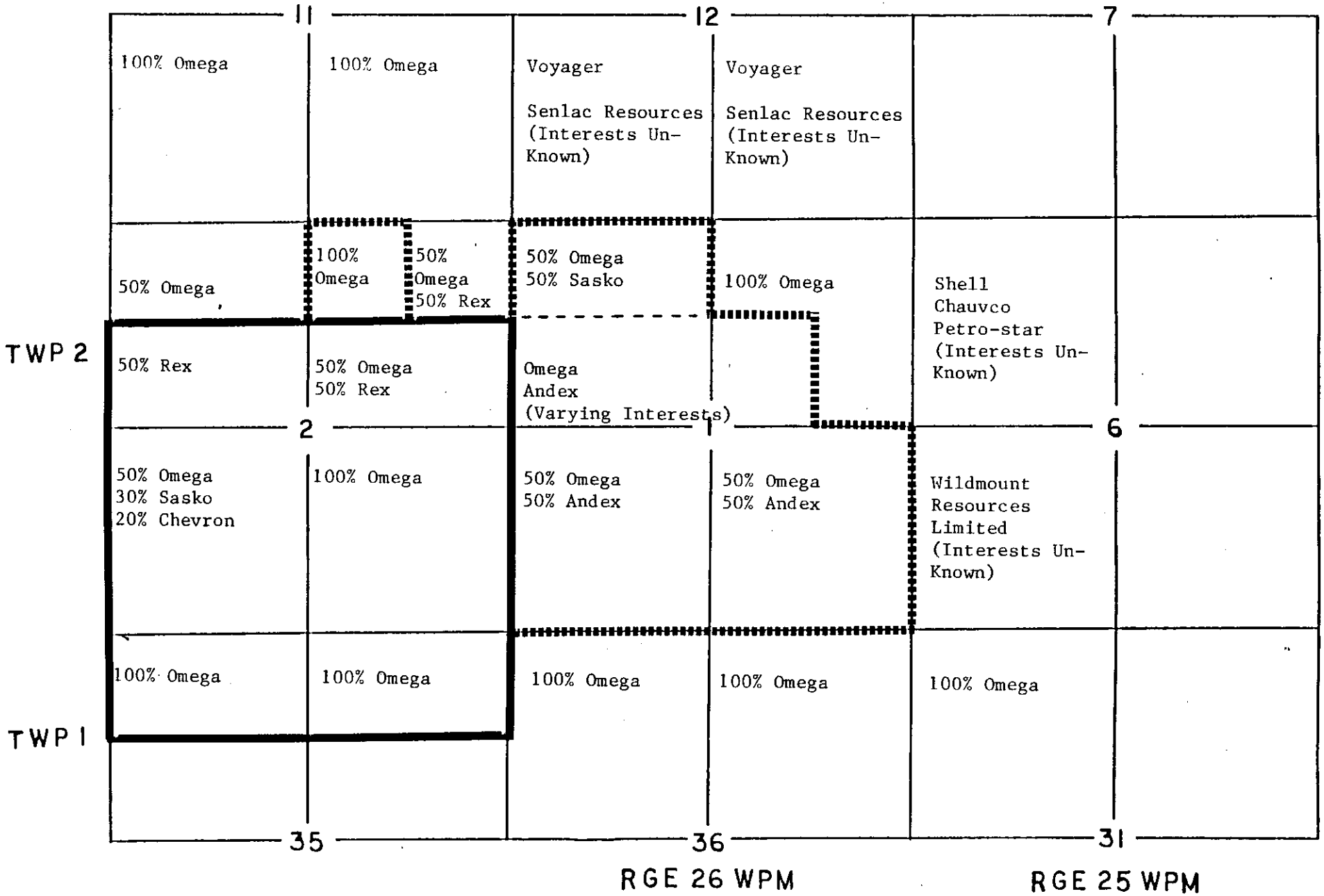


Waskada Unit No. 5 Boundary

Expansion Area

Attachment 1(b)

LESSEE MAP IN AND ADJOINING
THE PROPOSED EXPANSION AREA

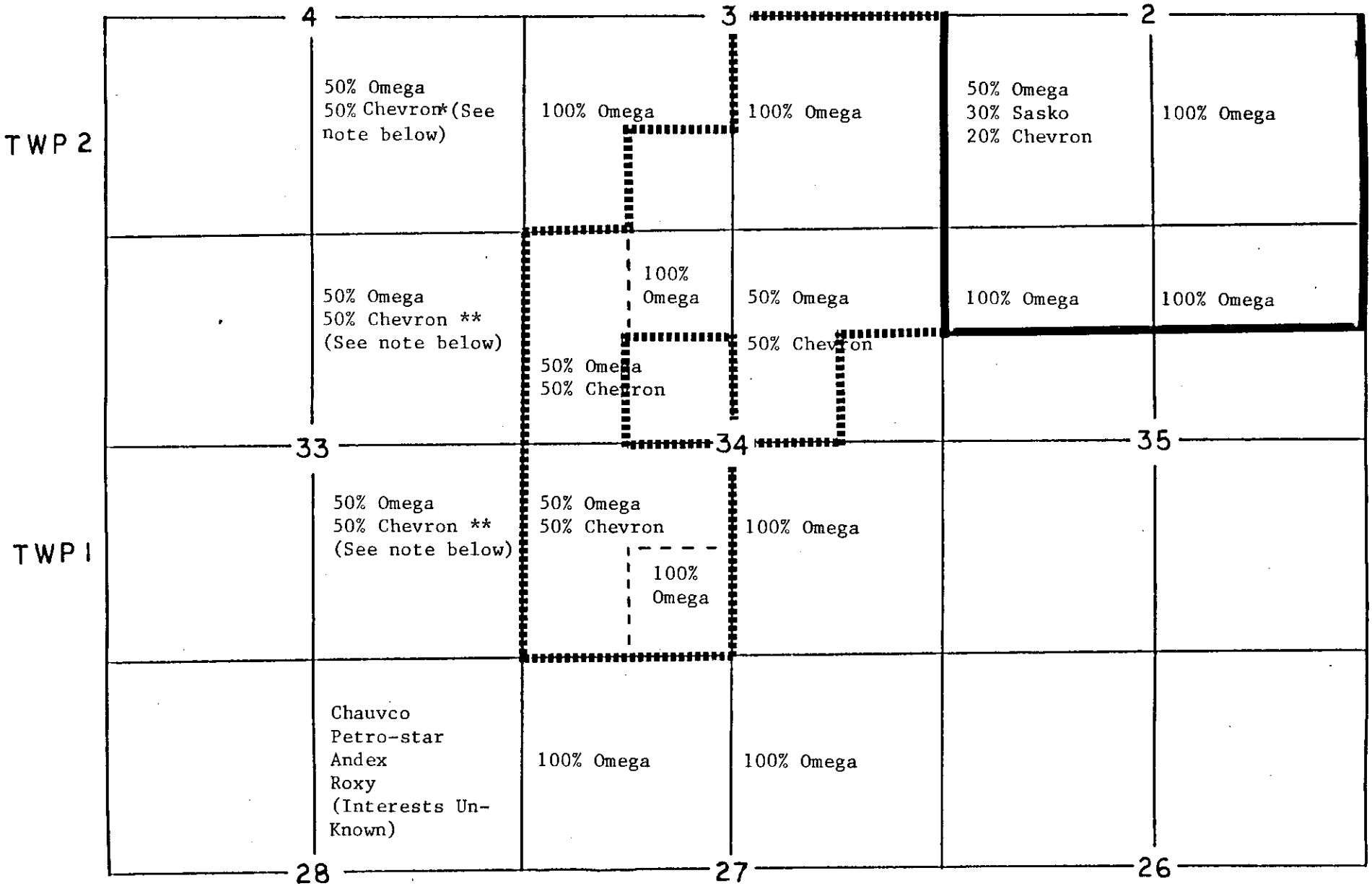


Waskada Unit No. 5 Boundary

Expansion Area

Attachment 2(a)

LESSEE MAP IN AND ADJOINING
THE PROPOSED EXPANSION AREA



RGE 26 WPM

Waskada Unit No. 5 Boundary

Expansion Area

* Omega does not recognize Novation of Sasko for 30% W.I. & Chevron for 20% W.I.

** Omega does not recognize Novation of Sasko for Chevrons 50% W.I.

Attachment 2(b)

Well Status Summary
For Wells In and Adjoining
The Proposed Expansion Area

Well		Completed Zone	Status
13-31-1-25	WPM	Lower Amaranth	Water Injector
13-27-1-26	WPM	Upper Alida	Producing Oil Well
13A-27-1-26	WPM	Lower Amaranth	Water Injector
14-27-1-26	WPM	Upper Alida	Producing Oil Well
14A-27-1-26	WPM	Lower Amaranth	Producing Oil Well
15-27-1-26	WPM	Upper Alida	Producing Oil Well
15A-27-1-26	WPM	Lower Amaranth	Water Injector
16-28-1-26	WPM	Upper Alida	Producing Oil Well
1-33-1-26	WPM	Lower Amaranth	Producing Oil Well
8-33-1-26	WPM	Lower Amaranth	Producing Oil Well
9-33-1-26	WPM	Lower Amaranth	Producing Oil Well
16-33-1-26	WPM	Lower Amaranth	Producing Oil Well
2-34-1-26	WPM	Lower Amaranth	Producing Oil Well
3-34-1-26	WPM	Lower Amaranth	Producing Oil Well
4-34-1-26	WPM	Lower Amaranth	Producing Oil Well
5-34-1-26	WPM	Lower Amaranth	Producing Oil Well
6-34-1-26	WPM	Lower Amaranth	Producing Oil Well
8-34-1-26	WPM	Lower Amaranth	Producing Oil Well
10-34-1-26	WPM	Lower Amaranth	Producing Oil Well
11-34-1-26	WPM	Upper Alida	Producing Oil Well
12-34-1-26	WPM	Lower Amaranth	Producing Oil Well
13-34-1-26	WPM	Lower Amaranth	Producing Oil Well
14-34-1-26	WPM	Lower Amaranth	Producing Oil Well
15-34-1-26	WPM	Lower Amaranth	Producing Oil Well
16-34-1-26	WPM	Lower Amaranth	Producing Oil Well
9-35-1-26	WPM	Lower Alida	Producing Oil Well
10-35-1-26	WPM	Lower Alida	Producing Oil Well
11-35-1-26	WPM	Lower Alida	Producing Oil Well
12-35-1-26	WPM	Lower Amaranth	Producing Oil Well
13-35-1-26	WPM	Lower Amaranth	Water Injector

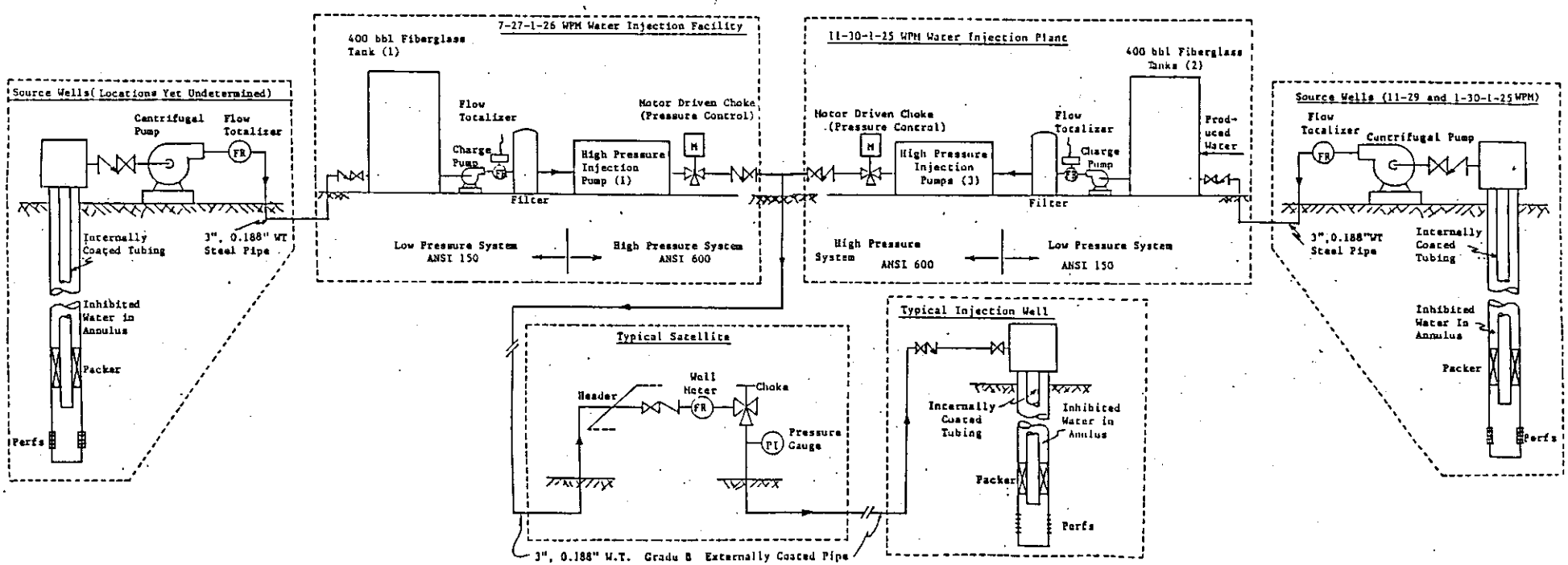
.../2

14-35-1-26	WPM	Lower Amaranth	Producing Oil Well
15-35-1-26	WPM	Lower Amaranth	Water Injector
16-35-1-26	WPM	Lower Amaranth	Producing Oil Well
12-36-1-26	WPM	Lower Alida	Producing Oil Well
13-36-1-26	WPM	Lower Amaranth	Water Injector
14-36-1-26	WPM	Lower Amaranth	Producing Oil Well
15-36-1-26	WPM	Lower Amaranth	Water Injector
16-36-1-26	WPM	Lower Amaranth	Producing Oil Well
5-6-2-25	WPM	N/A	Abandoned Well
1-1-2-26	WPM	Lower Amaranth	Producing Oil Well
2-1-2-26	WPM	Lower Amaranth	Producing Oil Well
3-1-2-26	WPM	Lower Amaranth	Producing Oil Well
4-1-2-26	WPM	Lower Amaranth	Producing Oil Well
5-1-2-26	WPM	Lower Amaranth	Producing Oil Well
6-1-2-26	WPM	Lower Amaranth	Producing Oil Well
7-1-2-26	WPM	Lower Amaranth	Producing Oil Well
8-1-2-26	WPM	Lower Amaranth	Producing Oil Well
9-1-2-26	WPM	Lower Amaranth	Producing Oil Well
10-1-2-26	WPM	Lower Amaranth	Producing Oil Well
11-1-2-26	WPM	Lower Amaranth	Producing Oil Well
12-1-2-26	WPM	Lower Amaranth	Producing Oil Well
13-1-2-26	WPM	Lower Amaranth	Producing Oil Well
14-1-2-26	WPM	Lower Amaranth	Producing Oil Well
15-1-2-26	WPM	Lower Amaranth	Producing Oil Well
16-1-2-26	WPM	N/A	Abandoned Well
1-2-2-26	WPM	Lower Amaranth	Producing Oil Well
2-2-2-26	WPM	Lower Amaranth	Producing Oil Well
3-2-2-26	WPM	Lower Amaranth	Producing Oil Well
4-2-2-26	WPM	Lower Amaranth	Producing Oil Well
5-2-2-26	WPM	Lower Amaranth	Water Injector
6-2-2-26	WPM	Lower Amaranth	Producing Oil Well
7-2-2-26	WPM	Lower Amaranth	Water Injector
8-2-2-26	WPM	Lower Amaranth	Producing Oil Well
9-2-2-26	WPM	Lower Amaranth	Producing Oil Well
10-2-2-26	WPM	Lower Amaranth	Producing Oil Well

.../3

11-2-2-26	WPM	Lower Amaranth	Producing Oil Well
12-2-2-26	WPM	Lower Amaranth	Producing Oil Well
15-2-2-26	WPM	Lower Amaranth	Producing Oil Well
1-3-2-26	WPM	Lower Amaranth	Producing Oil Well
2-3-2-26	WPM	Lower Amaranth	Producing Oil Well
3-3-2-26	WPM	Lower Amaranth	Producing Oil Well
4-3-2-26	WPM	Lower Amaranth	Producing Oil Well
5-3-2-26	WPM	Upper Alida	Producing Oil Well
6-3-2-26	WPM	Upper Alida	Producing Oil Well
7-3-2-26	WPM	Lower Amaranth	Producing Oil Well
8-3-2-26	WPM	Lower Amaranth	Producing Oil Well
9-3-2-26	WPM	Lower Amaranth	Producing Oil Well
10-3-2-26	WPM	Lower Amaranth	Producing Oil Well
11-3-2-26	WPM	Lower Amaranth	Producing Oil Well
16-3-2-26	WPM	Lower Amaranth	Producing Oil Well
1-4-2-26	WPM	Lower Amaranth	Producing Oil Well
2-11-2-26	WPM	Lower Amaranth	Producing Oil Well
4-12-2-26	WPM	Lower Amaranth	Producing Oil Well

SCHEMATIC DIAGRAM OF THE PROPOSED WATER INJECTION SYSTEM



Attachment 4

Manitoba

nergy and Mines

Petroleum

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

(204) 945-6577

February 8, 1988

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
CALGARY, AB T2P 0H3

Attention: Mr. D. Roberts

Re: Waskada Lower Amaranth A Pool
Board Order No. PM 58

Dear Dave:

Enclosed is Oil and Natural Gas Conservation Board Order No. PM 58 authorizing your unitized pressure maintenance operations in the subject Pool. The Order reflects approval of water injection in Waskada Unit No. 14 and incorporates other minor changes which have occurred recently.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

LRD:dah

encl

→ Bob file

Sent to B. McD on Jan. 14th

PS-1

Manitoba

Memorandum

Date January 13, 1988

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

Subject

From L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

Telephone

Re: Waskada Lower Amaranth A Pool
Pressure Maintenance Operations

Omega Hydrocarbons Ltd. made application for approval to expand its pressure maintenance operations in the subject pool by converting two existing production wells in the proposed Waskada Unit No. 14, to water injection. Notice of the application was published in the Manitoba Gazette (December 16, 1987) and the Deloraine Times and Star (December 30, 1987). A copy of the notice was also sent to Hudson's Bay Oil and Gas, the only offset working interest owner in the area. No objections to or interventions in the application have been received.

Recommendation

It is recommended that the application be approved and that Board Order No. PM 58 (attached) be issued.

Discussion

The proposed Board Order No. PM 58 provides for approval for all Omega's Unitized pressure maintenance operations in the subject Pool. It replaces Board Order No. PM 54 and contains all the standard provisions included in previous Orders. Board Order No. PM 58 also reflects the recent approval of water injection into the well Omega Waskada WIW 13-23-1-26 (WPM) and the proposed abandonment of Omega Waskada Prov. 16-22-1-26 (WPM).

L. R. Dubreuil

Recommended for Approval: _____
H. Clare Moster

Attachment

Controlled Areas — Part III — Section 15 — H.P.A.
L.A. 196-86 — Town of Steinbach/Dept. of Highways & Transportion Planning & Design.

An application for a permit for the removal of the 250 (76.2 m) foot control line and establish a 125 (38.1 m) foot control line on a portion of P.T.H. No. 12 within the Northern limits of the Town of Steinbach.

Consideration to be given for the removal of the 250 (76.2 m) foot control line and establish a 125 (38.1 m) foot control line adjacent to a portion of P.T.H. No. 12 within the S.W. ¼ of Section 14 and the S.E. ¼ of Section 15, the East ½ of Section 10 and the West ½ of Section 11, the N.E. ¼ of Section 3 and the N.W. ¼ of Section 2, all in Township 7, Range 6 East of the Principal Meridian located in the Northern limits of the Town of Steinbach.

Speed Zones — Section 97 and 98 H.T.A.
002-S — R.M. of Grey

Consideration to be given to a modified speed zone of 70 km/h on portions P.T.H. No. 2 for a distance of 800 metres at its junction with P.T.H. No. 13 in the vicinity of Elm Creek, R.M. of Grey.

The Highway Traffic Board will be prepared to consider all submissions written or oral on the above applications by contacting the Secretary prior to or at the hearing. Phone: 945-8912.

A. POLTARUK, MMM CD
Secretary,
THE HIGHWAY TRAFFIC BOARD,
Rm. 204-301 Weston Street,
Winnipeg, Manitoba,
R3E 3H4.

19621—52

UNDER THE HIGHWAYS PROTECTION ACT

THE HIGHWAY TRAFFIC BOARD

Notice is hereby given that a hearing of The Highway Traffic Board will be held on Wednesday, January 13, 1988 at 10:00 A.M. Conference Room, Brandon Agricultural Extension Centre, 1129 Queens Avenue, Brandon, Manitoba.

Permits — Part I — Section 9 H.P.A. and Part III — Section 17 H.P.A.

L.A. 388-87-B — Miniota Community Centre

An application for a permit for a Curling Rink (commercial) adjacent to P.T.H. No. 83, S.W. ¼, Section 31-13-26W, Lots 3, 4 & 5, Blk 1, Plan 1647, R.M. of Miniota (Miniota).

L.A. 390-87-A — Camperville Community Council

An application for a permit for an Access Driveway and Relocate an Existing Road Allowance Access Driveway (Public) onto P.T.H. No. 20, Lot 1, Blk 1, Plan 2580 DLTO, Roblin Unorganized Territory (Camperville).

L.A. 391-87-S — Greig McLellan

An application for a permit for an On-premise Sign adjacent to P.T.H. No. 18, S.W. ¼, Section 7-6-16W, R.M. of Strathcona (Ninette).

L.A. 392-87-S — Harry W. Harrell

An application for a permit for an Off-premise Sign adjacent to P.T.H. No. 5, Lot 13, Blk 8, Plan 365, S.E. ¼, Section 9-25-22W, Village of Gilbert Plains.

L.A. 393-87-B — R.M. of Whitewater

An application for a permit for a Dugout (Municipal) adjacent to P.T.H. No. 10, S.W. ¼, Section 20-5-19W, R.M. of Whitewater (Minto).

L.A. 394-87-A — May McNab

An application for a permit to Modify an Existing Access Driveway (Residential) onto P.T.H. No. 5, N.W. ¼, Section 33-15-15W, R.M. of Rosedale (Neepawa).

The Highway Traffic Board will be prepared to consider all submissions written or oral on the above applications by contacting the Secretary prior to or at the hearing. Phone: 945-8912.

A. POLTARUK, MMM CD
Secretary,
THE HIGHWAY TRAFFIC BOARD,
Rm. 204-301 Weston Street,
Winnipeg, Manitoba,
R3E 3H4.

19622—52

UNDER THE MINES ACT

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 14, has made application under "The Mines Act" to convert the following wells to water injection:

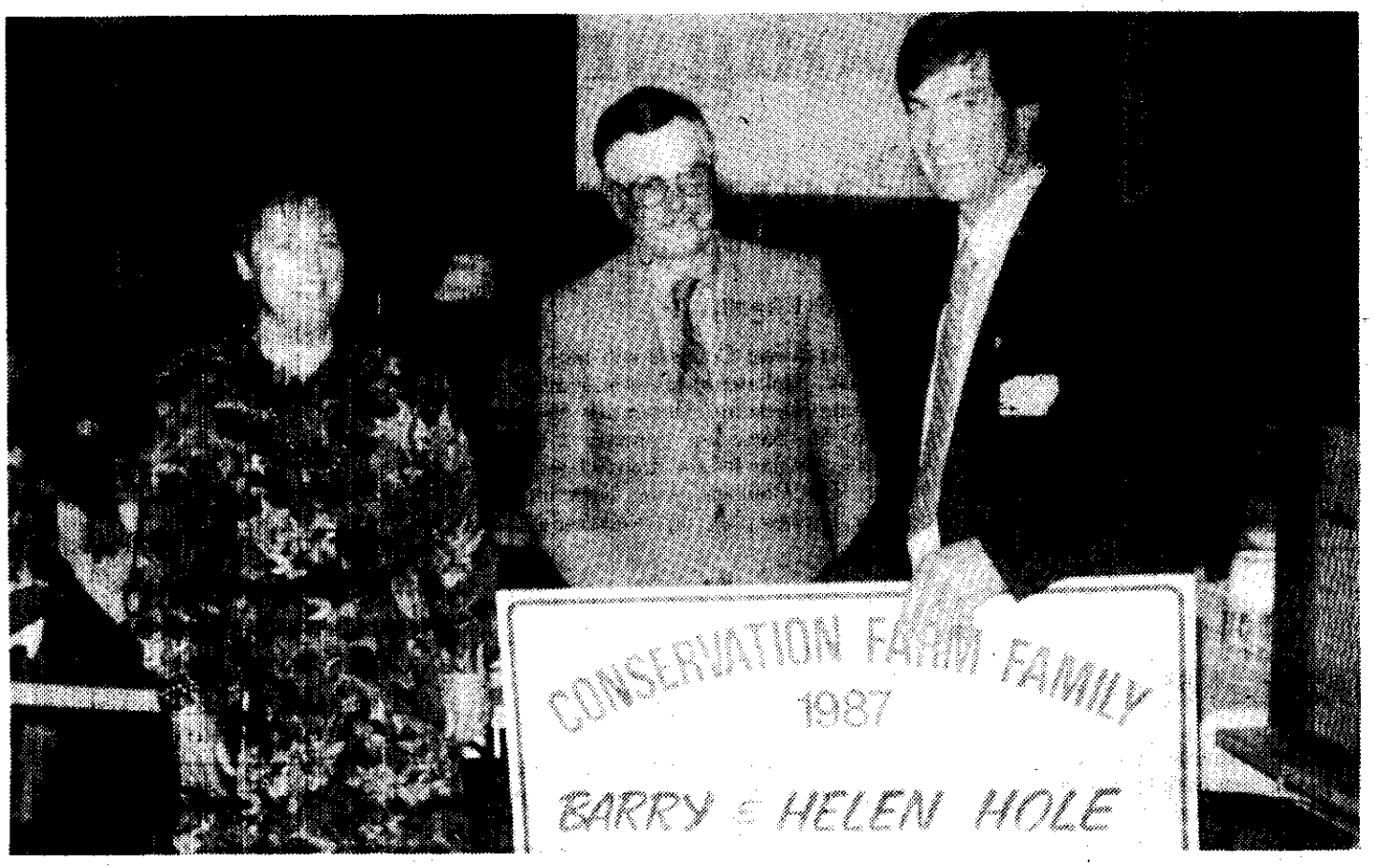
Omega et al Waskada 5-32-1-25 (WPM)
Omega et al Waskada 7-32-1-25 (WPM)

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

Dated at Winnipeg, this 14th day of December, 1987.

CHARLES S. KANG,
Chairman.

19647—52



THE SIGN SAYS IT ALL . . . this year's honors went to the Hole family farm north of Lake Max. in the Turtle Mountain Conservation District

New feed lab fee schedule announced

Fees charged by Manitoba Agriculture for feed analysis will change effective January 1, says Don Waddell, chief of Manitoba Agriculture's poultry and feed analysis section.

After three years without an increase, Waddell said, grain analysis charges at the provincial Feed Analysis Laboratory will rise to $12 from $10, the lab's forage package will increase to $18 from $12, and the analysis of mixed feed packages will go up to $14 from $12.

However, because of the purchase of new equipment, the cost of analyzing minerals has gone down, and so is the price to farmers, he said. As of the beginning of 1988, the fee for analyzing minerals will drop to $2 from the present $5.

"With the newly available mineral packages, livestock producers will be able to check their feedstuffs for the often troublesome combination of minerals — copper, molybdenum and sulphur," Waddell said.

"University of Manitoba research with cattle and sheep has demonstrated that high levels of the latter two minerals can render copper unavailable and reduce animal productivity."

Other minerals analyzed include: zinc, manganese, magnesium and potassium, which are of interest to producers trying to balance rations for high-producing dairy cows.

A complete list of prices, as well as information on how to use the feed lab analysis service, is available from agricultural representatives, regional livestock specialists or the Feed Analysis Laboratory, 203-545 University Crescent, Winnipeg, Manitoba, R3T 2N2.

Card of thanks

Many thanks to the doctors, nurses and staff of the Health Sciences Centre during my stay there. All the lovely cards and letters were deeply appreciated; also the many inquiries. Bless you all.

Albert Vanrobaeys

Birth

Don and Darlene Lamont are proud to announce the arrival of their son, Cory Wayne born December 15, 1987 at 11:48 a.m. at Calgary General Hospital weighing 7 pounds, 11 ounces, length 19½ inches. A brother for Chantelle.

Proud grandparents are Stan and Ann Fedorowich of Killarney and Russ and Marion Lamont of Medora. Great grandparents are Mr. and Mrs. George Ferguson, Killarney and Mrs. Grace Brigden of Melita, Manitoba.

Manitoba

The Oil and Natural Gas Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 14, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 5-32-1-25 (WPM)
Omega et al Waskada 7-32-1-25 (WPM)

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

DATED at Winnipeg, this 14 day of December ,1987

Charles S. Kang
Chairman

Manitoba

Memorandum

Date: December 8, 1987

To: The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From: L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

Subject:

Telephone:

Fold | Fold

Re: Pressure Maintenance Expansion
Waskada Lower Amaranth A Pool

Omega Hydrocarbons Ltd. has made application for approval of expanded pressure maintenance operations in the subject pool. The proposal consists of conversion of two wells to water injection wells.

Recommendation

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star. In addition, a copy of the notice should be sent to Hudson's Bay Oil and Gas (now Dome) the only offset working interest owner other than Omega.

In the absence of objections to a notice, it is recommended that the application be approved.

Discussion

Omega Hydrocarbons operates waterflood projects in the subject pool involving some 270 wells covering in excess of 4 300 hectares.

Water injection operations, which involve conversion of one well in four to injection have retarded and in some cases reversed production rate decline. Under primary depletion, it is estimated that only about 5 percent of the original oil in place would be recovered. It is further estimated that waterflooding may increase recovery to 25% of the original oil in place.

The limited primary recovery is reflected by the severity of the production rate decline. Fig. No. 1 is a map of the proposed project area showing the ratio of current oil rate with initial oil rate and the number of months of production Fig. No. 2 is a plot of typical well production from the area.

Omega proposes to convert wells in Lsd 5 and 7 of Section 32-1-25 (WPM) to water injection. Conversion of these wells would continue the inverted nine spot pattern established in the pool and should result in maximum flood efficiency.

The project expansion would utilize existing injection facilities and proposed well conversions meet the requirements of the Regulations.

Omega is the working interest owner of all offsetting lands except a 50% interest of Hudson's Bay Oil and Gas (now Dome) in Lsd 12 of Section 33-1-25 (WPM) and the NW 1/4 of Section 28-1-25 (W10 unknown). The surface owner of the project area has been notified by Omega of its plans.

To cover the concerns of offsetting working interest owners, it is recommended the application be advertised for objection. The proposed notice is attached.

Original Signed
L. R. Dubreuil

L. R. Dubreuil

Recommended for Approval: Original Signed by H. C. Moster

H. Clare Moster

Attachment

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

NOTICE

WASKADA OIL FIELD

Omega Hydrocarbons Ltd., operator of the proposed Waskada Unit No. 14, has made application under "The Mines Act" to convert the following wells to water injection:

Omega et al Waskada 5-32-1-25 (WPM)
Omega et al Waskada 7-32-1-25 (WPM)

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

DATED at Winnipeg, this day of ,1987

Charles S. Kang
Chairman

FIG. No 1

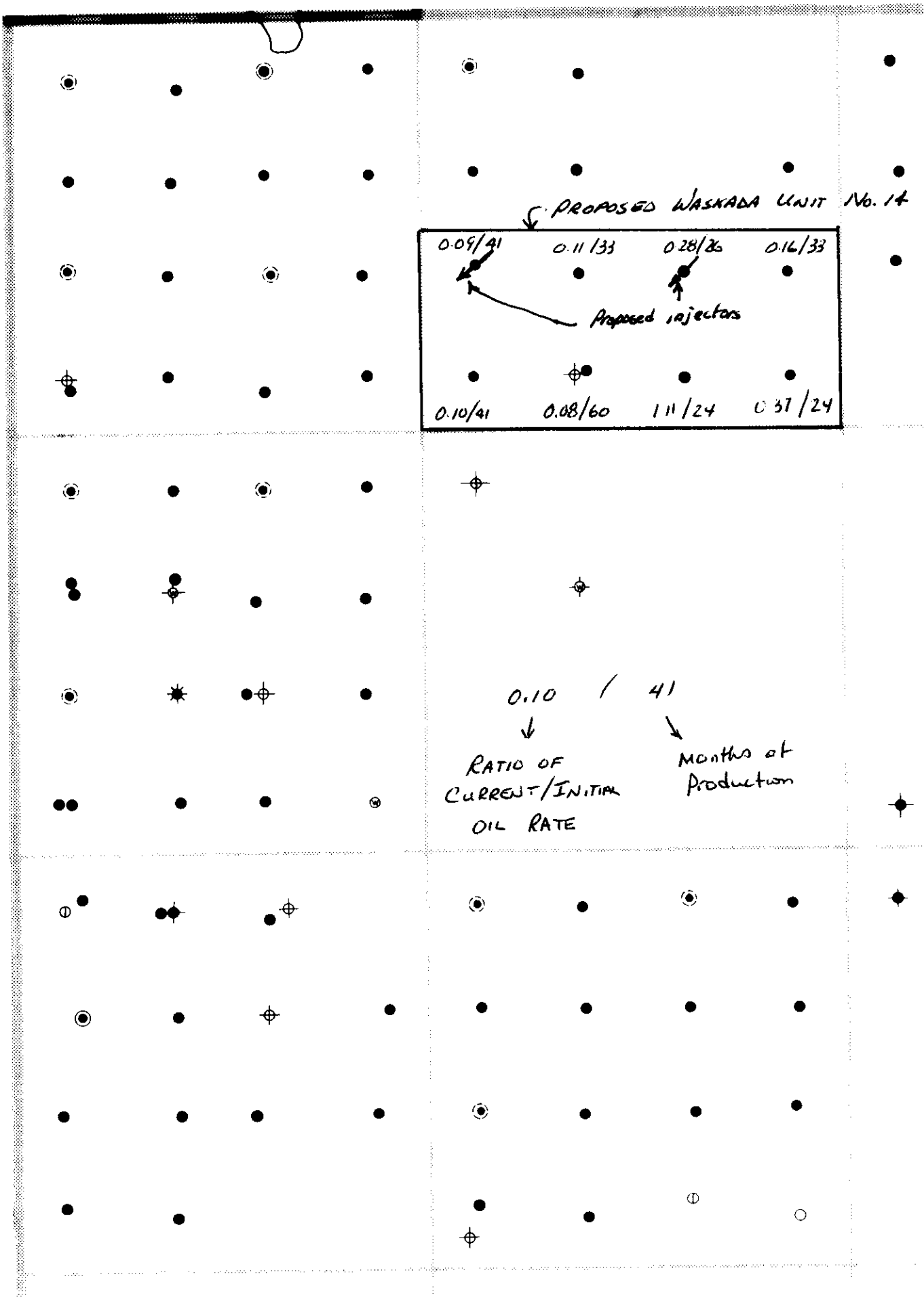
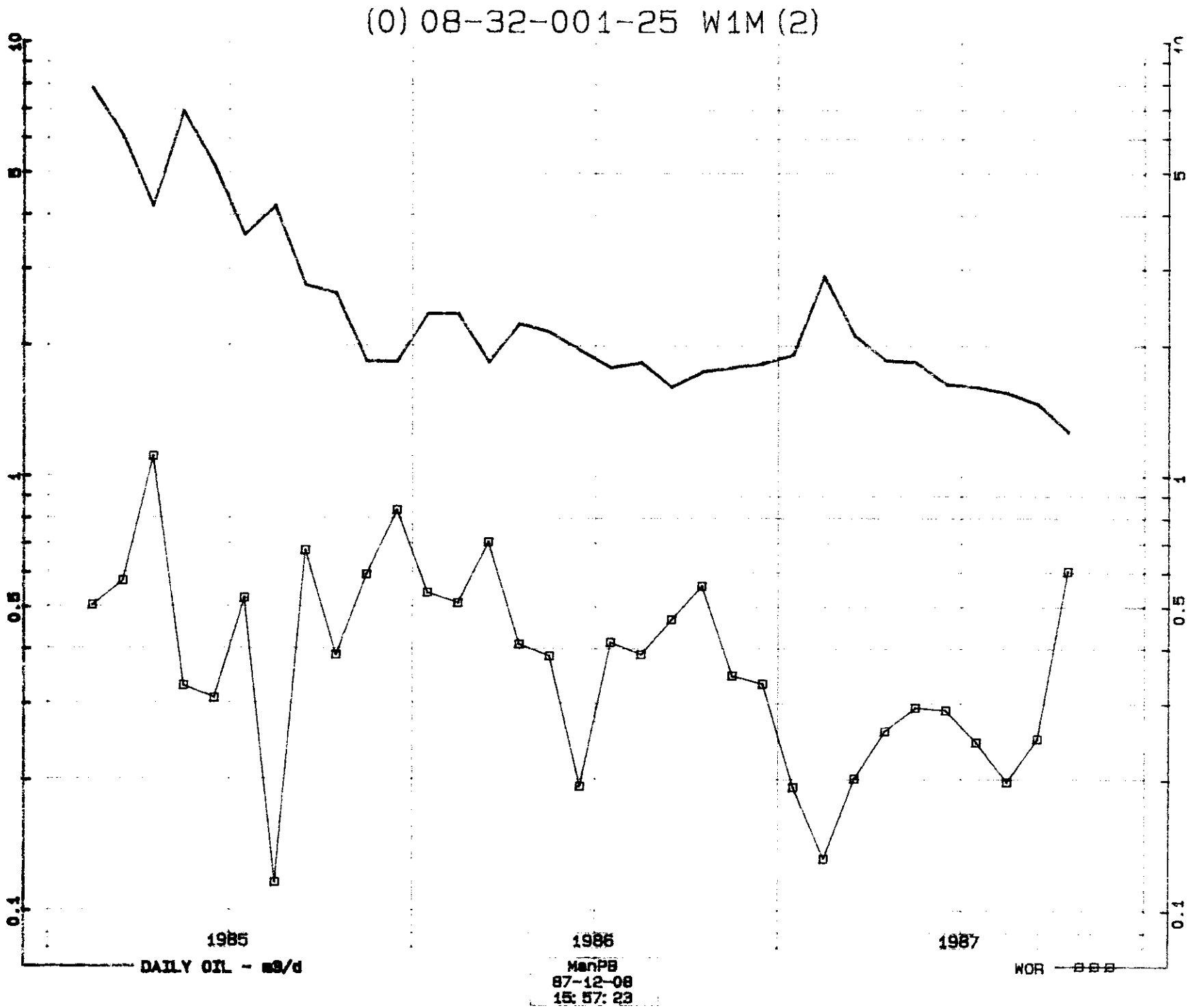

PROPOSED WASKADA UNIT No. 14
0.09/41
0.11/33
0.28/26
0.16/33
Proposed injectors
0.10/41
0.08/60
1.11/24
0.37/24
0.10 / 41
RATIO OF CURRENT/INITIAL OIL RATE
Months of Production

FIG NO 2


(0) 08-32-001-25 W1M (2)
10
5
1
0.5
0.1
1985
1986
1987
DAILY OIL - m3/d
WOR
ManPB
87-12-08
15:57:23

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

December 3, 1987

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

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Expansion of Pressure Maintenance Operations

The purpose of this submission is to request that PM Order No. 4 be amended to include the area contained inside the newly formed Waskada Unit No. 14. The new Unit consists of 8 tracts and contains Lower Amaranth wells 1-32, 2-32, 3-32, 4-32, 5-32, 6-32, 7-32 and 8-32-1-25 WPM. The Unit Agreement has been circulated to all parties involved for their final signature. The appropriate documents have also been submitted to the Manitoba Petroleum Branch for their approval. Pursuant to Section 1, Subsection (1) of the Pressure Maintenance Rules contained within PM Order No. 4, Omega Hydrocarbons Ltd. requests permission to inject water into wells;

Omega et al Waskada	5-32-1-25 WPM
Omega et al Waskada	7-32-1-25 WPM

As operator of both the existing pressure maintenance schemes and the newly formed Unit we plan to continue operating in accordance with the current pressure maintenance rules. Therefore, prior to the commencement of water injection, bottomhole pressure measurements will be taken at each of the proposed injectors. A maximum allowable wellhead pressure of 10,000 kPa will be set for all the new water injection wells and the additional production/injection data will be reported monthly in the same manner as the existing schemes.

Corrosion prevention methods within Waskada Unit No. 14 will include cathodic protection, internally coated flowlines and well treatments. Each individual well's production casing and all pipelines are cathodically protected as they are tied into the main gathering system. In an effort to extend the life of the water injection system all injection lines and injection well tubing strings will be internally coated.

At present, both produced water plus makeup water from the Blairmore formation is being used for injection purposes. Current water production has been averaging $900m^3/d$ while the four (4) existing source water wells are capable of producing an additional $1250m^3/d$ of water. These volumes will be sufficient for handling the injection requirements within the existing waterflood areas as well as the proposed Unit area. Water compatability tests have previously been conducted and were submitted with the original waterflood application.

In further support of this submission please find attached the following information;

1) Lessor Map of the Proposed Unit Area
2) Lessee Map of the Proposed Unit Area
3) Well Status Summary
4) Surface Lease Owner Notification
5) Schematic Diagram of the Existing Water Injection System

Should you have any comments or questions related to the submission please contact Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

We would appreciate your earliest attention to this matter.

Yours truly,

OMEGA HYDROCARBONS LTD.

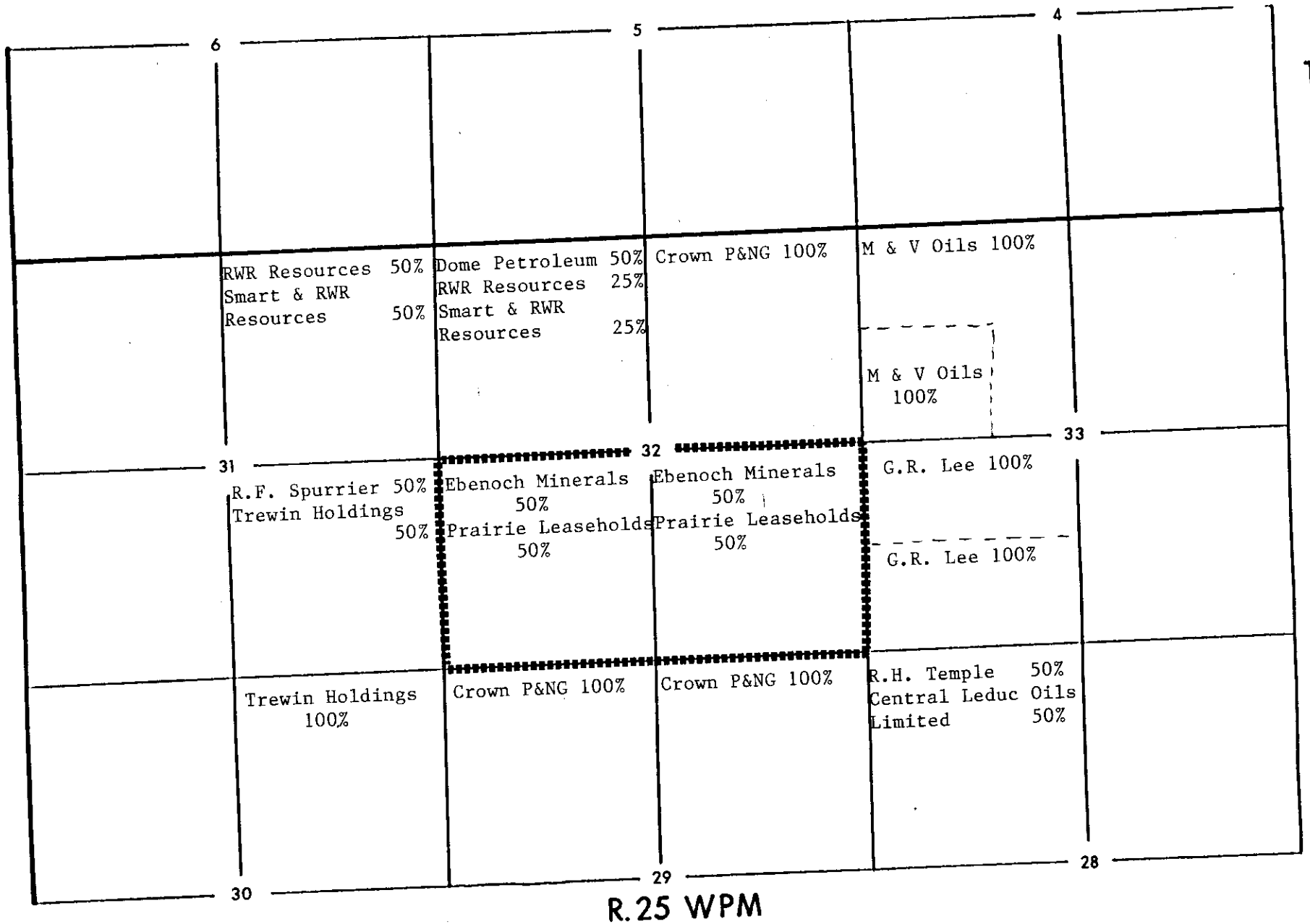
T. J. Hall
President

RAB:ce

Enclosure

c.c. Bob Dubreuil - Manitoba Petroleum Branch
R.A. Beamish
D. Roberts
Waskada (LAm) Waterflood Approvals File

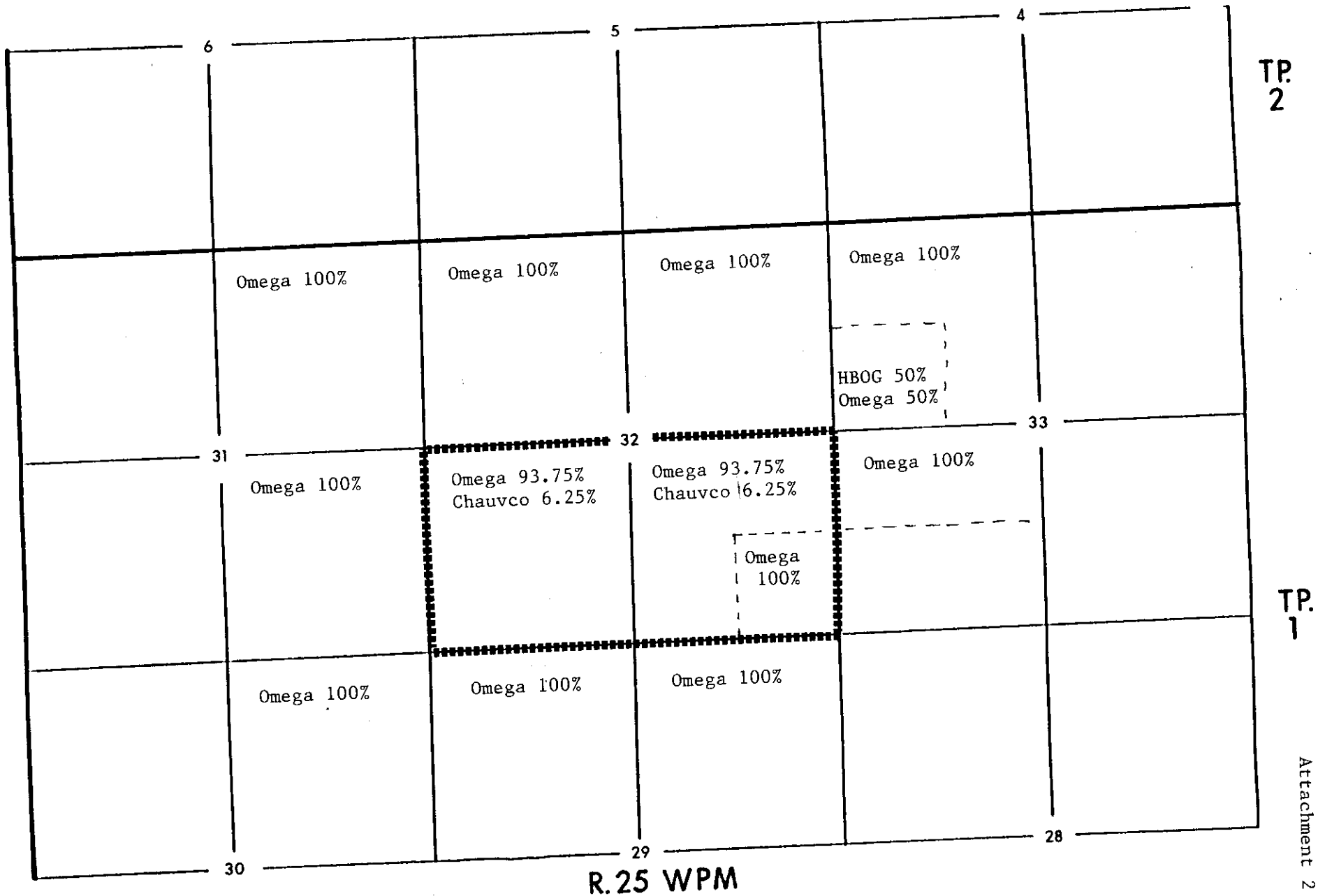
Lessor Map of Proposed Unit 14 And Adjoining Area



Proposed Unit No. 14 Area

Attachment 1

Lessee Map of Proposed Unit 14 And Adjoining Area



Proposed
Unit No. 14 Area

Attachment 2

Well Status Summary
For Wells In and Adjoining
The Proposed Waskada Unit No. 14

Well		Completed Zone	Status
13-29-1-25	WPM	N/A	Abandoned
16-30-1-25	WPM	Lower Amaranth	Producing Oil Well
1-31-1-25	WPM	Lower Amaranth	Producing Oil Well
8-31-1-25	WPM	Lower Amaranth	Producing Oil Well
9-31-1-25	WPM	Lower Amaranth	Producing Oil Well
1-32-1-25	WPM	Lower Amaranth	Producing Oil Well
2-32-1-25	WPM	Lower Amaranth	Producing Oil Well
3-32-1-25	WPM	Lower Amaranth	Producing Oil Well
4-32-1-25	WPM	Lower Amaranth	Producing Oil Well
5-32-1-25	WPM	Lower Amaranth	Producing Oil Well
6-32-1-25	WPM	Lower Amaranth	Producing Oil Well
7-32-1-25	WPM	Lower Amaranth	Producing Oil Well
8-32-1-25	WPM	Lower Amaranth	Producing Oil Well
9-32-1-25	WPM	Lower Amaranth	Producing Oil Well
11-32-1-25	WPM	Lower Amaranth	Producing Oil Well
12-32-1-25	WPM	Lower Amaranth	Producing Oil Well
5-33-1-25	WPM	Lower Amaranth	Producing Oil Well
12-33-1-25	WPM	Lower Amaranth	Producing Oil Well

Attachment 4

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

December 3, 1987

Waskada Unit No. 14
Surface Owners
(addressee list attached)

Dear Sir/Madam:

Re: Proposed Waskada Unit No. 14 Waterflood Project
Section 32, Twp. 1, Rge. 25 WPM

The purpose of this letter is to inform you that Omega Hydrocarbons Ltd. intends to initiate a pressure maintenance scheme in Section 32, Twp. 1, Rge. 25 WPM. The well locations included in the proposed project are 1-32, 2-32, 3-32, 4-32, 5-32, 6-32, 7-32, and 8-32-1-25 WPM.

The proposed project involves the injection of produced water into wells 5-32 and 7-32-1-25 WPM to maintain reservoir pressure and "sweep" oil towards the offsetting production wells. The performance of the waterflood will be evaluated by continually monitoring injection and production data. A decision regarding future development drilling and further waterflood expansions in this area will be based on the results of this project.

If you have any comments or questions related to the proposed project please contact either Mr. Bob Beamish or Mr. Richard Brekke at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

T. J. Hall
President

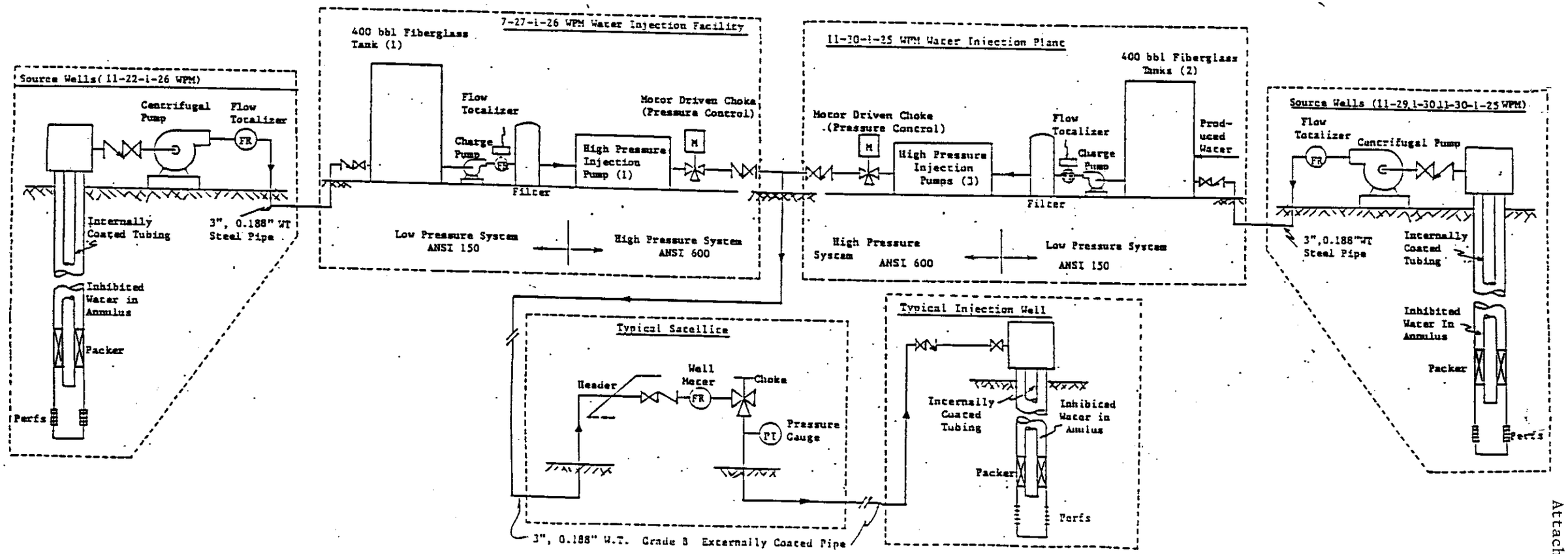
RAB:ce

c.c. Waskada Unit No. 14 File
Land Dept.

Waskada Unit No. 14
Surface Owners
Addressee List

Clayton Murray Hannah
Box 5
Waskada, Manitoba
ROM 2EO

Schematic Daigram of the Existing Water Injection System



Attachment 5

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

JAN 12 1988

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. D. Roberts, P. Eng.

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Additional Injection

Your application dated December 18, 1987 for approval to abandon Omega Waskada Prov. WIW 16-22-1-26 (WPM) and to convert to water injection Omega Waskada 13-23-1-26 (WPM) is acknowledged.

Water injection is hereby authorized in the well Omega Waskada 13-23-1-26 (WPM) subject to Pressure Maintenance Rules of Board Order No. PM 54 and subject to obtaining a reservoir pressure before conversion to injection.

Please note that application for approval of the recompletion program and of abandonment of Omega Waskada Prov. WIW 16-22-1-26 (WPM) must be made to the Petroleum Division utilizing the appropriate form (MG 416).

Yours respectfully,

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

bc: Petroleum Division

→ Bob
file

Manitoba

Action / Route Slip

Date: January 5, 1988

To: Charles S. Kang
Chairman
Oil & Natural Gas Conservation Board

From: Clare Moster
Executive Director, Petroleum

Telephone:

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

Comments: Additional Injection - Omega Waskada

Attached for your approval and signature is a letter to Omega authorizing the conversion of the 13-23-1-26 well to water injection.

Approval of the application is recommended.

MG-1298 PS-F-182

Manitoba

The Oil and Natural Gas
Conservation Board

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

(204) 945-3130

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: Mr. D. Roberts, P. Eng.

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Additional Injection

Your application dated December 18, 1987 for approval to abandon Omega Waskada Prov. WIW 16-22-1-26 (WPM) and to convert to water injection Omega Waskada 13-23-1-26 (WPM) is acknowledged.

Water injection is hereby authorized in the well Omega Waskada 13-23-1-26 (WPM) subject to Pressure Maintenance Rules of Board Order No. PM 54 and subject to obtaining a reservoir pressure before conversion to injection.

Please note that application for approval of the recompletion program and of abandonment of Omega Waskada Prov. WIW 16-22-1-26 (WPM) must be made to the Petroleum Division utilizing the appropriate form (MG 416).

Yours respectfully,

Charles S. Kang
Chairman

bc: Petroleum Division

PS-f-2

Manitoba

Memorandum

Date December 30, 1987

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

Subject

Telephone

Re: Waskada Unit No. 2 - Additional Injection at Omega Waskada 13-23-1-26 (WPM)

Omega Hydrocarbons Ltd. as operator of the subject unit has made application for approval to abandon the well Omega Waskada Prov. WIW 16-22-1-26 (WPM) ("the 16-22 well") and to convert the subject well to water injection.

Recommendation

It is recommended that conversion of the well Omega Waskada 13-23-1-26 ("the 13-23 well") to injection be approved. A proposed letter of approval is attached.

Approval of abandonment of the 16-22 well can be given by the Executive Director upon receipt of a completed appropriate application form.

Discussion

The 16-22 well is located on the downdip side of the Waskada Lower Amaranth A Pool, and appears to be below the original oil water contact (see Fig. No. 1). The well was included as an injection location because completion attempts failed to result in commercial oil production. The well does not conform to the normal inverted nine spot pattern. The 16-22 well went on injection in December, 1983 and through August, 1987 had injected 60 841.6 m^3 of water. As pointed out in Omega's application, offset wells to the east and north have watered out. However, because of the off target location of the well, pressure support and areal sweep are probably not being optimized by injection at 16-22.

The 13-23 well represents a more efficient injection location as it is closer to currently producing areas and being a pattern injection location, would result in areal sweep enhancement.

The 13-23 well has essentially watered out and has produced only minor amounts of oil over the past year and a half. Continued production of the well is clearly uneconomic.

Approval of this well as a water injection well is proposed subject to all the conditions continued in Board Order No. PM 54 which currently governs Omega's waterflood operations in the Waskada Lower Amaranth A Pool. In addition, determination of reservoir pressure before conversion to injection is recommended.

There are no other offset operators (other than Omega) within one half mile of the proposed injector, consequently, advertisement for objections is not necessary.

Approval of the recompletion program for the 13-23 well and abandoment of the 16-22 well should be made ~~to~~ by the Petroleum Division on the appropriate forms.

L. R. Dubreuil

Recommended for Approval: Signed by H. C. Moster

H. Clare Moster

Attachment

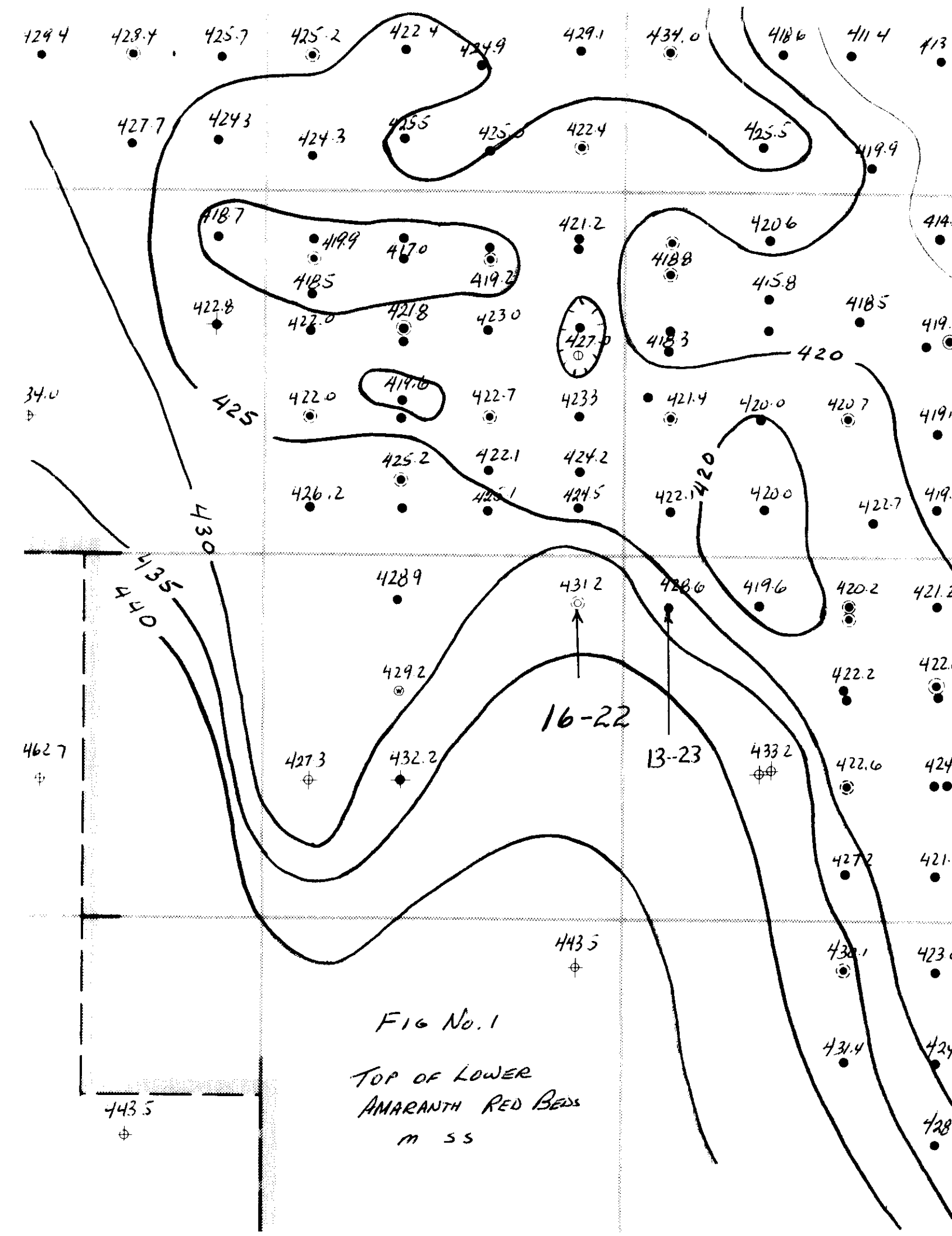


FIG No. 1

TOP OF LOWER
AMARANTH RED BEDS
m SS

OMEGA
HYDROCARBONS LTD.

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

December 18th, 1987

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

Attention: Mr. Charles S. Kang, Chairman

Dear Sir:

Re: Waskada Lower Amaranth A Pool
Request for Amendments to PM Order No. 4

In accordance with PM Order No. 4, Omega Hydrocarbons Limited hereby applies for authorization to abandon well Omega Waskada 16-22-1-26 WPM and to convert well Omega Waskada 13-23-1-26 WPM to a Lower Amaranth water injection well.

Discussion

Water injection at well 16-22-1-26 WPM is intended to provide pressure support for offsetting wells 13-23, 4-26, 1-27 and 2-27-1-26 WPM. Production from wells 13-23 and 1-27-1-26 WPM has now watered out and these locations no longer require pressure support. Loss of injection at 16-22 should not adversely affect the 2-27-1-26 WPM production since the well is adequately supported by injection at 7-27-1-26 WPM. Well 4-26-1-26 WPM is the only well which could suffer from loss of injection at well 16-22. However, conversion of well 13-23-1-26 WPM to water injection would provide improved pressure support for well 4-26.

Conversion of well 13-23-1-26 WPM should greatly improve the waterflood sweep efficiency to the north and east of the well. This area of the reservoir is not currently being swept by a direct offset injection location.

Workover programs for the abandonment of well 16-22-1-26 WPM and the conversion of well 13-23-1-26 WPM are attached. Plots of the production histories for the subject wells and all offsetting wells which may be affected by this proposal are also attached.

. . ./2

If you have any questions regarding this application, please contact me at (403) 261-0743.

Yours truly,

OMEGA HYDROCARBONS LTD.

Dave Roberts, P. Eng.

DR/ns
Letter21.

c.c. R. Dubreuil
B. Beamish
R. Brekke
T. Hall
Waskada (LAm) Waterflood Approvals File

M E M O R A N D U M

DATE: **December 10, 1987**

TO: **Warren Sharp**

FROM: **Dave Roberts**

RE: **Abandonment Program - Omega Waskada Prov. 16-22-1-26 WPM**

---

1) Move in service rig and rig up.
2) Fill hole with inhibited water to 5 mKB.
3) Pull internally coated tubing.
4) Rig up wireline.
5) Run in and set a bridge plug at 910 mKB.
6) Dump bail 3m of cement on the bridge plug.
7) Release wireline.
8) Pressure test casing to 3500 kPa.
9) Release rig.
10) Nipple down the wellhead.
11) Cut off the casing 2m below ground level.
12) Weld a metal cap onto the casing.
13) Return the lease and road to field.

M E M O R A N D U M

DATE: **December 10, 1987**

TO: **Warren Sharp**

FROM: **Dave Roberts**

RE: **Omega Waskada 13-23-1-26 WPM**
Well Conversion Program

PBTD: 929.25 mKB
Existing Perfs: 916 - 929.25 mKB (Lower Amaranth)

1) Move in service rig and rig up.

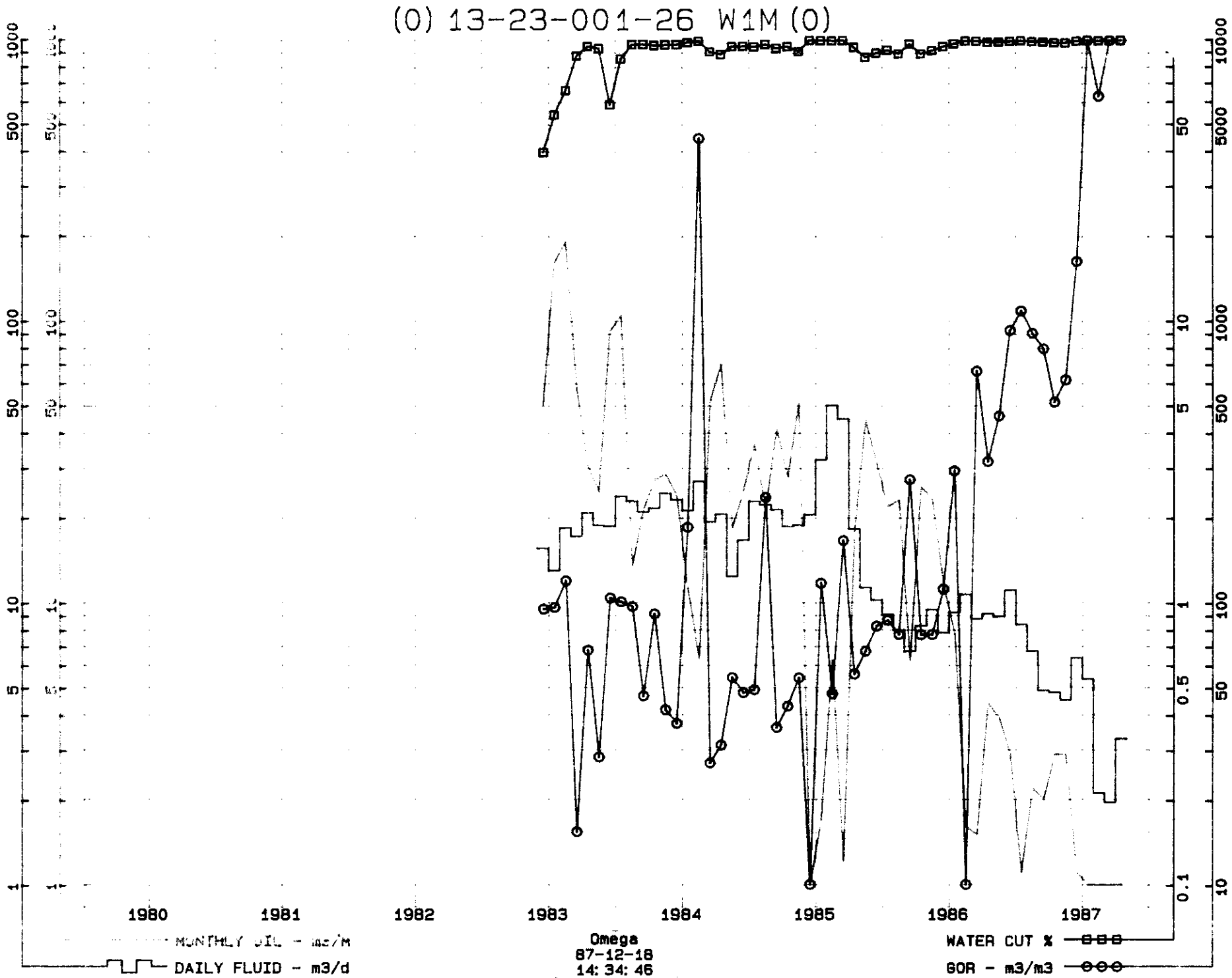
2) Hot oil well if required.

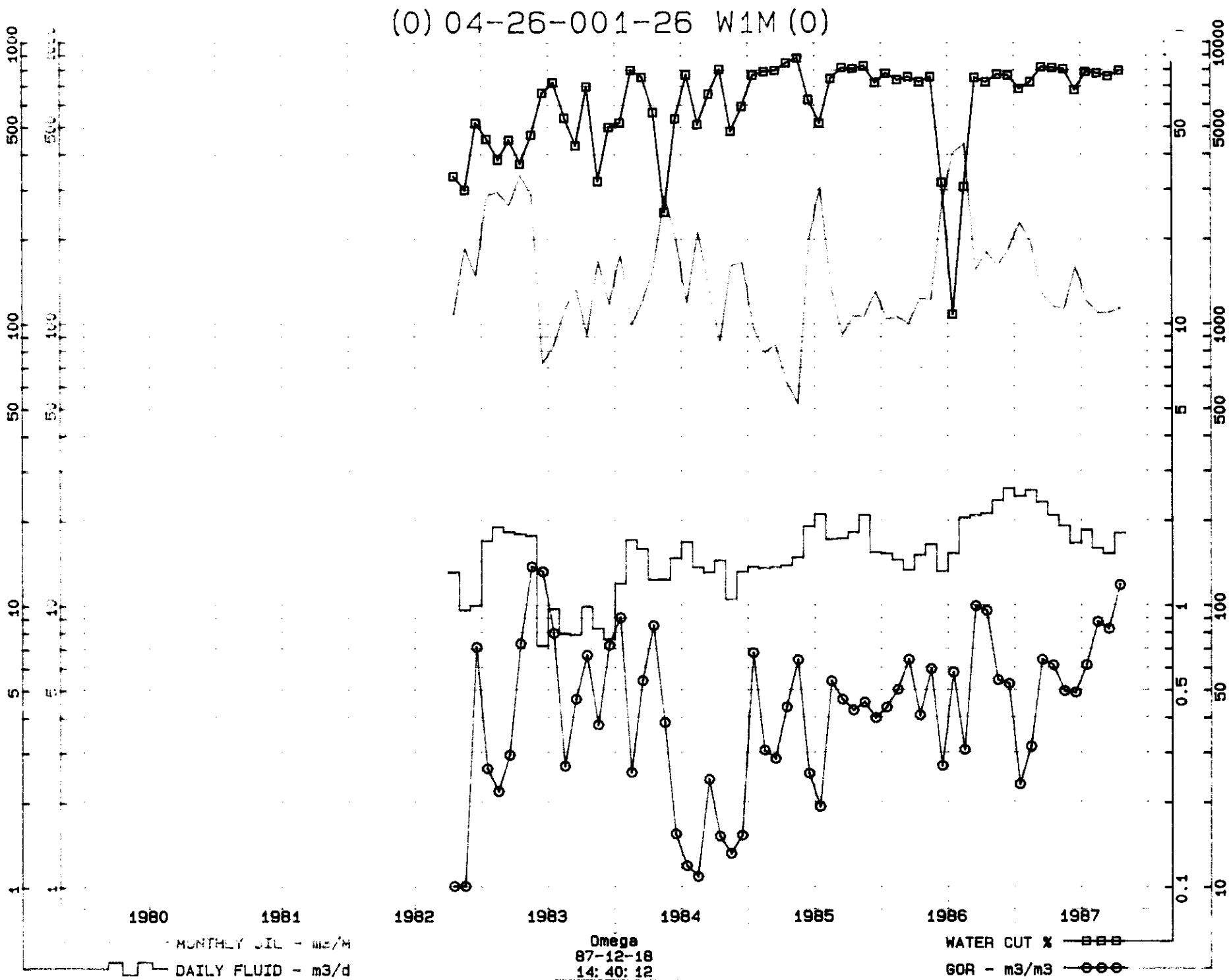
3) Pull BHP and rods.

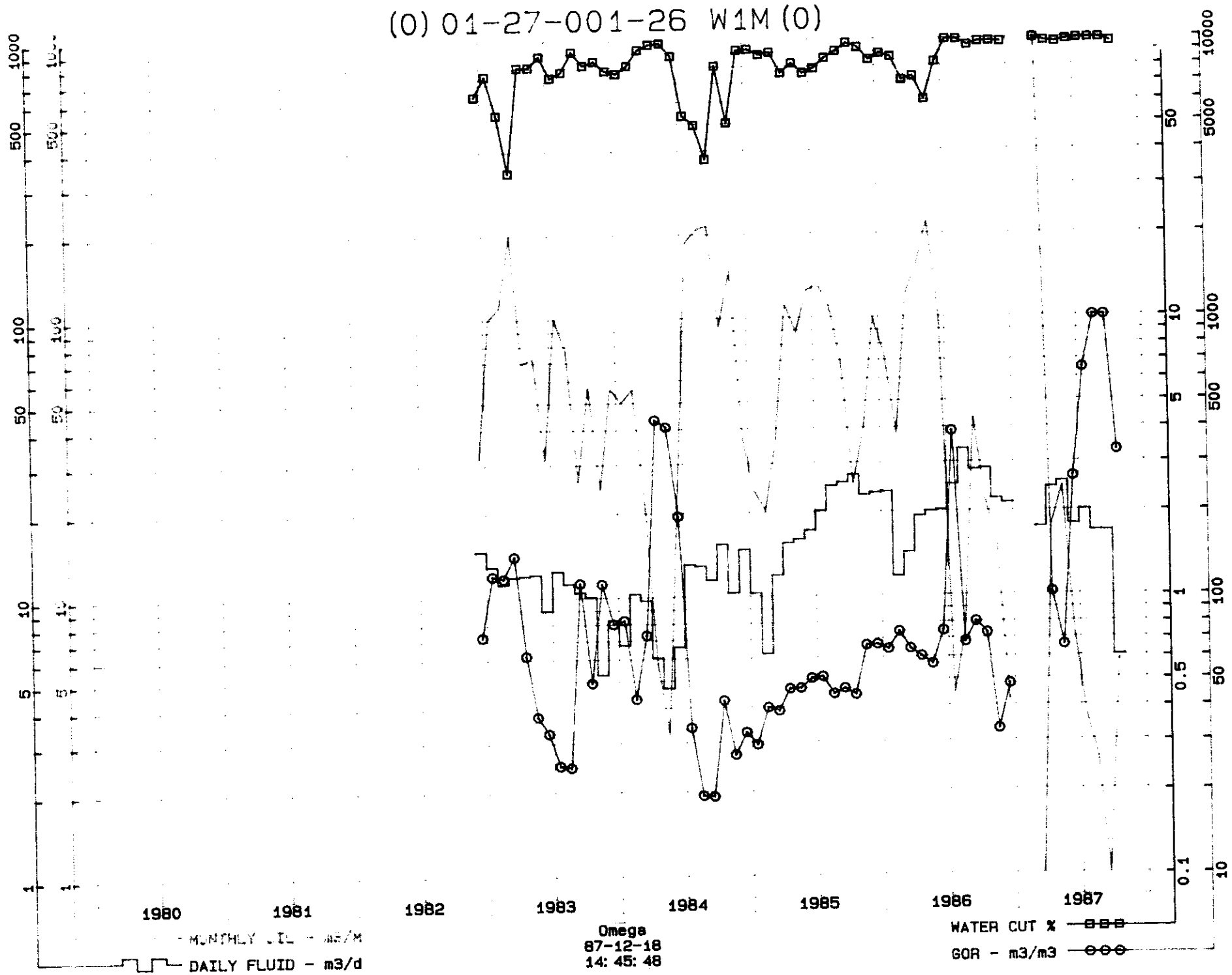
4) Pull existing tubing. Run internally coated tubing and packer assembly. Circulate annulus to inhibited water.

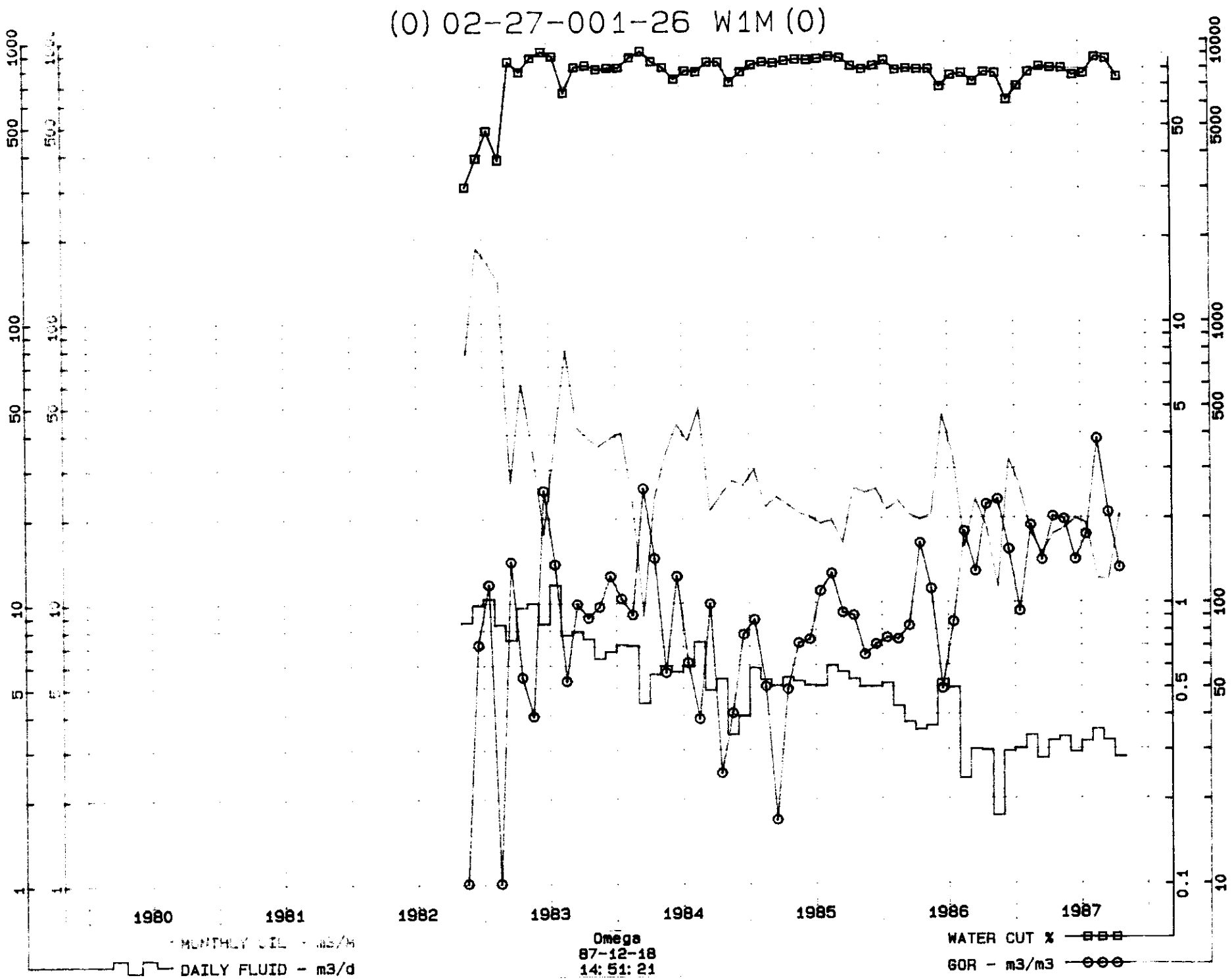
5) Pressure test tubing and set packer at approximately 911 mKB.

6) Release rig and put well on injection.


(0) 13-23-001-26 W1M (0)
1980
1981
1982
1983
1984
1985
1986
1987
MONTHLY OIL - m3/M
DAILY FLUID - m3/d
Omega
87-12-18
14:34:46
WATER CUT %
GOR - m3/m3


(0) 04-26-001-26 W1M (0)
1980
1981
1982
1983
1984
1985
1986
1987
MONTHLY OIL - m3/M
DAILY FLUID - m3/d
Omega
87-12-18
14: 40: 12
WATER CUT %
GOR - m3/m3


(0) 01-27-001-26 W1M (0)
1980
1981
1982
1983
1984
1985
1986
1987
Omega
87-12-18
14: 45: 48
DAILY FLUID - m3/d
WATER CUT %
GOR - m3/m3


(0) 02-27-001-26 W1M (0)
1980
1981
1982
1983
1984
1985
1986
1987
DAILY FLUID - m3/d
Omega
87-12-18
14:51:21
WATER CUT %
GOR - m3/m3

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)13-23-001-26 W1M(0)

Omega
87-12-18
14:59:01

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1983-06-25
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1983-06	129	50.5	33.5	4.8	9.4	6.2	15.6	39.9	0.66	95	0.0	0.0	50.5	33.5	4.8	0.0	0.0
1983-07	648	160.9	190.4	15.5	6.0	7.1	13.0	54.2	1.18	96	0.0	0.0	211.4	223.9	20.3	0.0	0.0
1983-08	744	192.6	379.2	23.1	6.2	12.2	18.4	66.3	1.97	120	0.0	0.0	404.0	603.1	43.4	0.0	0.0
1983-09	690	58.5	436.9	0.9	2.0	15.2	17.2	88.2	7.47	15	0.0	0.0	462.5	1040.0	44.3	0.0	0.0
1983-10	732	30.9	605.0	2.1	1.0	19.8	20.8	95.1	19.53	68	0.0	0.0	493.4	1645.0	46.4	0.0	0.0
1983-11	480	24.7	352.2	0.7	1.2	17.6	18.8	93.4	14.26	28	0.0	0.0	518.1	1997.2	47.1	0.0	0.0
1983-12	288	92.2	132.1	9.6	7.7	11.0	18.7	58.9	1.43	104	0.0	0.0	610.3	2129.3	56.7	0.0	0.0
1984-01	744	105.1	635.5	10.6	3.4	20.5	23.9	85.8	6.05	101	0.0	0.0	715.4	2764.8	67.3	0.0	0.0
1984-02	417	13.4	385.2	1.3	0.8	22.2	22.9	96.6	28.75	97	0.0	0.0	728.8	3150.0	68.6	0.0	0.0
1984-03	744	21.4	631.8	1.0	0.7	20.4	21.1	96.7	29.52	47	0.0	0.0	750.2	3781.8	69.6	0.0	0.0
1984-04	720	27.4	623.3	2.5	0.9	20.8	21.7	95.8	22.75	91	0.0	0.0	777.6	4405.1	72.1	0.0	0.0
1984-05	740	28.7	725.8	1.2	0.9	23.5	24.5	96.2	25.29	42	0.0	0.0	806.3	5130.9	73.3	0.0	0.0
1984-06	713	24.1	667.3	0.9	0.8	22.5	23.3	96.5	27.69	37	0.0	0.0	830.4	5798.2	74.2	0.0	0.0
1984-07	738	11.3	644.2	2.1	0.4	20.9	21.3	98.3	57.01	186	0.0	0.0	841.7	6442.4	76.3	0.0	0.0
1984-08	768	6.3	855.9	28.2	0.2	26.7	26.9	99.3	135.9	4476	0.0	0.0	848.0	7298.3	104.5	0.0	0.0
1984-09	716	51.9	526.7	1.4	1.7	17.7	19.4	91.0	10.15	27	0.0	0.0	899.9	7825.0	105.9	0.0	0.0
1984-10	745	70.4	570.5	2.2	2.3	18.4	20.6	89.0	8.10	31	0.0	0.0	970.3	8395.5	108.1	0.0	0.0
1984-11	717	18.4	352.1	1.0	0.6	11.8	12.4	95.0	19.14	54	0.0	0.0	988.7	8747.6	109.1	0.0	0.0
1984-12	744	25.0	491.8	1.2	0.8	15.9	16.7	95.2	19.67	48	0.0	0.0	1013.7	9239.4	110.3	0.0	0.0
1985-01	740	36.6	669.9	1.8	1.2	21.7	22.9	94.8	18.30	49	0.0	0.0	1050.3	9909.3	112.1	0.0	0.0
1985-02	672	21.5	601.7	5.1	0.8	21.5	22.3	96.6	27.99	237	0.0	0.0	1071.8	10511.0	117.2	0.0	0.0
1985-03	740	41.6	619.4	1.5	1.3	20.1	21.4	93.7	14.89	36	0.0	0.0	1113.4	11130.4	118.7	0.0	0.0
1985-04	719	27.9	531.5	1.2	0.9	17.7	18.7	95.0	19.05	43	0.0	0.0	1141.3	11661.9	119.9	0.0	0.0
1985-05	740	51.7	530.2	2.8	1.7	17.2	18.9	91.1	10.26	54	0.0	0.0	1193.0	12192.1	122.7	0.0	0.0
1985-06	720	0.0	617.4	0.0	0.0	20.6	20.6	100.0	99.99	0	0.0	0.0	1193.0	12809.5	122.7	0.0	0.0
1985-07	725	1.7	971.4	0.2	0.1	32.2	32.2	99.8	571.4	118	0.0	0.0	1194.7	13780.9	122.9	0.0	0.0
1985-08	744	6.3	1552.9	0.3	0.2	50.1	50.3	99.6	246.5	48	0.0	0.0	1201.0	15333.8	123.2	0.0	0.0
1985-09	713	1.2	1336.1	0.2	0.0	45.0	45.0	99.9	1113	167	0.0	0.0	1202.2	16669.9	123.4	0.0	0.0
1985-10	419	17.3	301.6	1.0	1.0	17.3	18.3	94.4	16.85	56	0.0	0.0	1220.1	16971.5	124.4	0.0	0.0
1985-11	720	44.5	295.4	3.0	1.5	9.8	11.3	86.9	6.64	67	0.0	0.0	1264.6	17266.9	127.4	0.0	0.0
1985-12	737	31.4	282.7	2.6	1.0	9.2	10.2	90.0	9.00	83	0.0	0.0	1296.0	17549.6	130.0	0.0	0.0
1986-01	744	2.9	259.8	1.9	0.0	8.4	9.1	92.2	11.86	87	0.0	0.0	1317.9	17809.4	131.9	0.0	0.0
1986-02	672	23.3	200.9	1.5	0.8	7.2	8.0	89.6	8.62	77	0.0	0.0	1341.2	18010.3	133.7	0.0	0.0
1986-03	744	6.2	202.5	1.7	0.2	6.5	6.7	97.0	32.66	274	0.0	0.0	1347.4	18212.8	135.4	0.0	0.0
1986-04	719	25.9	222.2	2.0	0.9	7.4	8.3	89.6	8.56	77	0.0	0.0	1373.3	18433.0	137.4	0.0	0.0
1986-05	726	23.3	262.6	1.5	0.8	8.7	9.5	91.9	11.27	77	0.0	0.0	1396.6	18697.6	139.2	0.0	0.0
1986-06	718	11.5	227.1	1.3	0.4	7.6	7.8	95.1	19.22	112	0.0	0.0	1408.2	18920.7	140.5	0.0	0.0
1986-07	743	7.8	276.7	2.3	0.3	9.0	9.3	97.3	35.73	295	0.0	0.0	1416.0	19199.4	142.8	0.0	0.0
1986-08	744	1.6	330.6	0.3	0.1	10.7	10.7	99.5	206.6	0	0.0	0.0	1417.6	19530.0	142.8	0.0	0.0
1986-09	720	1.5	262.2	1.0	0.1	8.7	8.8	99.4	174.8	667	0.0	0.0	1419.1	19792.2	143.8	0.0	0.0
1986-10	745	4.4	279.5	1.4	0.1	9.0	9.1	98.5	63.52	319	0.0	0.0	1423.5	20071.7	145.2	0.0	0.0
1986-11	720	2.9	264.0	1.3	0.1	8.8	8.9	98.5	67.89	462	0.0	0.0	1427.4	20335.7	147.0	0.0	0.0
1986-12	744	2.9	340.5	2.7	0.1	11.0	11.1	99.2	117.5	921	0.0	0.0	1430.3	20675.2	149.7	0.0	0.0

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)13-23-001-26 W1M(0)

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1983-06-25
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1987-01	724	1.1	251.9	1.2	0.0	8.4	8.4	99.6	229.0	1091	0.0	0.0	1431.4	20928.4	150.9	0.0	0.0
1987-02	672	2.2	186.6	2.0	0.1	6.7	6.7	98.8	84.82	909	0.0	0.0	1433.6	21115.0	152.9	0.0	0.0
1987-03	744	2.0	149.3	1.6	0.1	4.8	4.9	98.7	74.65	800	0.0	0.0	1435.6	21264.3	154.5	0.0	0.0
1987-04	719	2.9	141.2	1.5	0.1	4.7	4.8	98.0	48.69	517	0.0	0.0	1438.5	21405.5	156.0	0.0	0.0
1987-05	744	2.9	137.5	1.8	0.1	4.4	4.5	97.9	47.41	621	0.0	0.0	1441.4	21543.0	157.8	0.0	0.0
1987-06	672	1.1	177.5	1.8	0.0	6.3	6.4	99.4	161.4	1636	0.0	0.0	1442.5	21720.5	159.6	0.0	0.0
1987-07	744	0.0	166.8	0.5	0.0	5.4	5.4	100.0	99.99	99999	0.0	0.0	1442.5	21887.3	160.1	0.0	0.0
1987-08	744	0.3	65.0	1.9	0.0	2.1	2.1	99.5	216.7	6333	0.0	0.0	1442.8	21952.3	162.0	0.0	0.0
1987-09	720	0.1	58.5	1.4	0.0	2.0	2.0	99.8	585.0	14000	0.0	0.0	1442.9	22010.8	163.4	0.0	0.0
1987-10	744	0.0	102.0	0.9	0.0	3.3	3.3	100.0	99.99	99999	0.0	0.0	1442.9	22112.8	164.3	0.0	0.0

SHELL PRODUCTION [illegible] 87-11-13
WELL 100/04-26-001-[illegible] W4M 14:59:1

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.000000%
ON PRDN 1982-10-19
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1982-10	296	107.3	54.2	0.0	8.7	4.4	13.1	33.6	0.51	0	0.0	0.0	107.3	54.2	0.0	0.0	0.0
1982-11	668	187.3	80.1	0.0	6.7	2.9	9.6	30.0	0.43	0	0.0	0.0	294.6	134.3	0.0	0.0	0.0
1982-12	737	147.0	159.1	10.4	4.8	5.2	10.0	52.0	1.08	71	0.0	0.0	441.6	293.4	10.4	0.0	0.0
1983-01	744	286.3	238.8	7.5	9.2	7.7	16.9	45.5	0.83	26	0.0	0.0	727.9	532.2	17.9	0.0	0.0
1983-02	605	294.2	183.1	6.4	11.7	7.3	18.9	38.4	0.62	22	0.0	0.0	1022.1	715.3	24.3	0.0	0.0
1983-03	632	262.9	216.5	7.7	10.0	8.2	18.2	45.2	0.82	29	0.0	0.0	1285.0	931.8	32.0	0.0	0.0
1983-04	720	337.5	199.4	24.6	11.3	6.6	17.9	37.1	0.59	73	0.0	0.0	1622.5	1131.2	56.6	0.0	0.0
1983-05	744	289.3	257.3	39.6	9.3	8.3	17.6	47.1	0.89	137	0.0	0.0	1911.8	1388.5	96.2	0.0	0.0
1983-06	720	72.3	142.4	9.5	2.4	4.7	7.2	66.3	1.97	131	0.0	0.0	1984.1	1530.9	105.7	0.0	0.0
1983-07	744	83.2	216.9	6.6	2.7	7.0	9.7	72.3	2.61	79	0.0	0.0	2067.3	1747.8	112.3	0.0	0.0
1983-08	744	112.1	132.4	3.0	3.6	4.3	7.9	54.2	1.18	27	0.0	0.0	2179.4	1880.2	115.3	0.0	0.0
1983-09	720	133.9	101.3	6.2	4.5	3.4	7.8	43.1	0.76	46	0.0	0.0	2313.3	1981.5	121.5	0.0	0.0
1983-10	732	90.5	210.0	6.0	3.0	6.9	9.9	69.9	2.32	66	0.0	0.0	2403.8	2191.5	127.5	0.0	0.0
1983-11	720	168.0	79.7	6.3	5.6	2.7	8.3	32.2	0.47	38	0.0	0.0	2571.8	2271.2	133.8	0.0	0.0
1983-12	744	116.9	117.5	8.4	3.8	3.8	7.6	50.1	1.01	72	0.0	0.0	2688.7	2388.7	142.2	0.0	0.0
1984-01	744	177.2	192.6	16.0	5.7	6.2	11.9	52.1	1.09	90	0.0	0.0	2865.9	2581.3	158.2	0.0	0.0
1984-02	696	98.5	395.5	2.5	3.4	13.6	17.0	80.1	4.02	25	0.0	0.0	2964.4	2976.8	160.7	0.0	0.0
1984-03	744	120.6	371.3	6.5	3.9	12.0	15.9	75.5	3.08	54	0.0	0.0	3085.0	3348.1	167.2	0.0	0.0
1984-04	706	157.3	205.2	13.3	5.3	7.0	12.3	56.6	1.30	85	0.0	0.0	3242.3	3553.3	180.5	0.0	0.0
1984-05	740	285.1	94.9	10.9	9.2	3.1	12.3	25.0	0.33	38	0.0	0.0	3527.4	3648.2	191.4	0.0	0.0
1984-06	713	201.8	234.9	3.1	6.8	7.9	14.7	53.8	1.16	15	0.0	0.0	3729.2	3883.1	194.5	0.0	0.0
1984-07	738	118.3	396.9	1.4	3.8	12.9	16.8	77.0	3.36	12	0.0	0.0	3847.5	4280.0	195.9	0.0	0.0
1984-08	768	212.5	223.6	2.3	6.6	7.0	13.6	51.3	1.05	11	0.0	0.0	4060.0	4503.6	198.2	0.0	0.0
1984-09	716	133.4	256.2	3.2	4.5	8.6	13.1	65.8	1.92	24	0.0	0.0	4193.4	4759.8	201.4	0.0	0.0
1984-10	745	86.3	360.0	1.3	2.8	11.6	14.4	80.7	4.17	15	0.0	0.0	4279.7	5119.8	202.7	0.0	0.0
1984-11	716	160.7	151.5	2.1	5.4	5.1	10.5	48.5	0.94	13	0.0	0.0	4440.4	5271.3	204.8	0.0	0.0
1984-12	744	164.9	241.5	2.5	5.3	7.8	13.1	59.4	1.46	15	0.0	0.0	4605.3	5512.8	207.3	0.0	0.0
1985-01	740	97.6	323.8	6.6	3.2	10.5	13.7	76.8	3.32	68	0.0	0.0	4702.9	5836.6	213.9	0.0	0.0
1985-02	672	78.8	299.6	2.4	2.6	10.7	13.5	79.2	3.80	30	0.0	0.0	4781.7	6136.2	216.3	0.0	0.0
1985-03	740	84.4	335.5	2.4	2.7	10.9	13.6	79.9	3.98	28	0.0	0.0	4866.1	6471.7	218.7	0.0	0.0
1985-04	719	62.2	352.6	2.7	2.1	11.8	13.8	85.0	5.67	43	0.0	0.0	4928.3	6824.3	221.4	0.0	0.0
1985-05	740	51.7	403.2	3.3	1.7	13.1	14.8	88.6	7.80	64	0.0	0.0	4980.0	7227.5	224.7	0.0	0.0
1985-06	674	198.3	337.2	5.0	7.1	12.0	19.1	63.0	1.70	25	0.0	0.0	5178.3	7564.7	229.7	0.0	0.0
1985-07	729	307.1	321.0	5.9	10.1	10.9	21.0	51.9	1.02	19	0.0	0.0	5485.4	7886.0	235.6	0.0	0.0
1985-08	744	134.0	397.2	7.2	4.3	12.8	17.1	74.8	2.96	54	0.0	0.0	5619.4	8283.2	242.8	0.0	0.0
1985-09	690	90.9	405.0	4.2	3.2	14.1	17.3	81.7	4.46	46	0.0	0.0	5710.3	8688.2	247.0	0.0	0.0
1985-10	744	106.4	455.7	4.5	3.4	14.7	18.1	81.1	4.28	42	0.0	0.0	5816.7	9153.9	251.5	0.0	0.0
1985-11	720	104.4	520.5	4.8	3.5	17.4	20.9	83.0	4.97	46	0.0	0.0	5923.1	9674.4	256.3	0.0	0.0
1985-12	737	131.0	341.8	5.2	4.3	11.1	15.4	72.2	2.61	40	0.0	0.0	6054.1	10016.2	261.5	0.0	0.0
1986-01	744	103.9	369.8	4.5	3.4	11.9	15.3	78.1	3.56	43	0.0	0.0	6158.0	10386.0	266.0	0.0	0.0
1986-02	672	105.9	299.9	5.3	3.8	10.7	14.5	73.9	2.83	50	0.0	0.0	6263.9	10685.9	271.3	0.0	0.0
1986-03	744	100.0	313.0	6.4	3.2	10.1	13.3	75.8	3.13	64	0.0	0.0	6363.9	10998.9	277.7	0.0	0.0
1986-04	719	122.0	327.7	5.0	4.1	10.9	15.1	72.7	2.69	41	0.0	0.0	6485.9	11326.6	282.7	0.0	0.0

* * * S T O P E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)04-26-001-26 W1M(G)

Omega
87-12-13
14:59:01

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PROD 1982-10-19
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1986-05	734	121.4	380.7	7.2	4.0	12.4	16.4	75.8	3.14	59	0.0	0.0	6608.5	11707.3	289.9	0.0	0.0
1986-06	718	268.4	125.9	7.2	9.0	4.2	13.2	31.9	0.47	27	0.0	0.0	6876.9	11833.2	297.1	0.0	0.0
1986-07	716	406.0	49.3	23.4	13.6	1.7	15.3	10.8	0.12	58	0.0	0.0	7282.9	11882.5	320.5	0.0	0.0
1986-08	744	437.7	194.6	13.4	14.1	6.3	20.4	30.8	0.44	31	0.0	0.0	7720.6	12077.1	333.9	0.0	0.0
1986-09	720	154.1	470.3	15.3	5.1	15.7	20.8	75.3	3.05	99	0.0	0.0	7874.7	12547.4	349.2	0.0	0.0
1986-10	743	180.1	475.3	17.2	5.8	15.4	21.2	72.5	2.64	96	0.0	0.0	8054.8	13022.7	366.4	0.0	0.0
1986-11	720	160.6	544.2	8.7	5.4	18.1	23.5	77.2	3.39	54	0.0	0.0	8215.4	13566.9	375.1	0.0	0.0
1986-12	729	184.6	604.5	9.7	6.1	19.9	26.0	76.6	3.27	53	0.0	0.0	8400.0	14171.4	384.8	0.0	0.0
1987-01	722	229.8	504.0	5.3	7.6	16.8	24.4	68.7	2.19	23	0.0	0.0	8629.8	14675.4	390.1	0.0	0.0
1987-02	666	194.2	515.5	6.1	7.0	18.6	25.6	72.6	2.65	31	0.0	0.0	8824.0	15190.9	396.2	0.0	0.0
1987-03	744	128.5	591.0	8.2	4.1	19.1	23.2	82.1	4.60	64	0.0	0.0	8952.5	15781.9	404.4	0.0	0.0
1987-04	719	114.7	510.2	7.0	3.8	17.0	20.9	81.6	4.45	61	0.0	0.0	9067.2	16292.1	411.4	0.0	0.0
1987-05	744	113.3	479.3	5.6	3.7	15.5	19.1	80.9	4.23	49	0.0	0.0	9180.5	16771.4	417.0	0.0	0.0
1987-06	720	159.6	337.8	7.8	5.3	11.3	16.6	67.9	2.12	49	0.0	0.0	9340.1	17109.2	424.8	0.0	0.0
1987-07	744	121.0	451.9	7.4	3.9	14.6	18.5	78.9	3.73	61	0.0	0.0	9461.1	17561.1	432.2	0.0	0.0
1987-08	744	109.0	385.5	9.5	3.5	12.4	16.0	78.0	3.54	87	0.0	0.0	9570.1	17946.6	441.7	0.0	0.0
1987-09	720	109.3	347.8	9.0	3.6	11.6	15.2	76.1	3.18	82	0.0	0.0	9679.4	18294.4	450.7	0.0	0.0
1987-10	744	113.7	444.7	13.4	3.7	14.3	18.0	79.6	3.91	118	0.0	0.0	9793.1	18739.1	464.1	0.0	0.0

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL 10/01-27-001-26 W1M(0)

Omega
07-12-13
14:59:01

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1982-12-26
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1982-12	143	31.8	55.6	2.3	5.3	9.3	14.7	63.6	1.75	72	0.0	0.0	31.8	55.6	2.3	0.0	0.0
1983-01	744	99.6	301.3	11.9	3.2	9.7	12.9	75.2	3.03	119	0.0	0.0	131.4	356.9	14.2	0.0	0.0
1983-02	516	110.0	131.0	12.9	5.1	6.1	11.2	54.4	1.19	117	0.0	0.0	241.4	487.9	27.1	0.0	0.0
1983-03	608	200.0	101.5	28.1	7.9	4.0	11.9	33.7	0.51	141	0.0	0.0	441.4	589.4	55.2	0.0	0.0
1983-04	720	69.5	291.0	4.3	2.3	9.7	12.0	80.7	4.19	62	0.0	0.0	510.9	880.4	59.5	0.0	0.0
1983-05	744	72.3	303.6	2.7	2.3	9.8	12.1	80.8	4.20	37	0.0	0.0	583.2	1184.0	62.2	0.0	0.0
1983-06	714	30.8	236.1	1.0	1.0	7.9	9.0	88.5	7.67	32	0.0	0.0	614.0	1420.1	63.2	0.0	0.0
1983-07	744	100.5	285.5	2.5	3.2	9.2	12.5	74.0	2.84	25	0.0	0.0	714.5	1705.6	65.7	0.0	0.0
1983-08	738	77.5	268.0	1.9	2.5	8.7	11.2	77.6	3.46	25	0.0	0.0	792.0	1973.6	67.6	0.0	0.0
1983-09	714	25.8	284.9	2.9	0.9	9.6	10.4	91.7	11.04	112	0.0	0.0	817.8	2258.5	70.5	0.0	0.0
1983-10	744	56.9	255.3	2.8	1.8	8.2	10.1	81.8	4.49	49	0.0	0.0	874.7	2513.8	73.3	0.0	0.0
1983-11	712	24.2	132.1	2.7	0.8	4.5	5.3	84.5	5.46	112	0.0	0.0	898.9	2645.9	76.0	0.0	0.0
1983-12	744	56.2	200.0	4.5	1.8	6.5	8.3	78.1	3.56	80	0.0	0.0	955.1	2845.9	80.5	0.0	0.0
1984-01	744	49.8	159.2	4.1	1.6	5.1	6.7	76.2	3.20	82	0.0	0.0	1004.9	3005.1	84.6	0.0	0.0
1984-02	696	55.8	241.9	2.4	1.9	8.3	10.3	81.3	4.34	43	0.0	0.0	1060.7	3247.0	87.0	0.0	0.0
1984-03	744	22.0	279.1	1.6	0.7	9.0	9.7	92.7	12.69	73	0.0	0.0	1082.7	3526.1	88.6	0.0	0.0
1984-04	720	5.8	176.0	2.5	0.2	5.9	6.1	96.8	30.34	431	0.0	0.0	1088.5	3702.1	91.1	0.0	0.0
1984-05	740	3.2	142.0	1.3	0.1	4.6	4.7	97.8	44.38	406	0.0	0.0	1091.7	3844.1	92.4	0.0	0.0
1984-06	713	23.7	172.9	4.6	0.8	5.8	6.6	87.9	7.30	194	0.0	0.0	1115.4	4017.0	97.0	0.0	0.0
1984-07	739	186.2	214.2	6.3	6.0	7.0	13.0	53.5	1.15	34	0.0	0.0	1301.6	4231.2	103.3	0.0	0.0
1984-08	768	207.5	204.0	4.0	6.5	6.4	12.9	49.6	0.98	19	0.0	0.0	1509.1	4435.2	107.3	0.0	0.0
1984-09	716	214.3	127.6	4.1	7.2	4.3	11.5	37.3	0.60	19	0.0	0.0	1723.4	4562.8	111.4	0.0	0.0
1984-10	745	92.3	385.4	3.9	3.0	12.4	15.4	80.7	4.18	42	0.0	0.0	1815.7	4948.2	115.3	0.0	0.0
1984-11	697	148.3	150.4	4.0	5.1	5.2	10.3	50.4	1.01	27	0.0	0.0	1964.0	5098.6	119.3	0.0	0.0
1984-12	744	37.0	417.9	1.2	1.2	13.5	14.7	91.9	11.29	32	0.0	0.0	2001.0	5516.5	120.5	0.0	0.0
1985-01	740	23.9	292.1	0.7	0.8	9.5	10.2	92.4	12.22	29	0.0	0.0	2024.9	5808.6	121.2	0.0	0.0
1985-02	672	20.1	153.8	0.8	0.7	5.5	6.2	88.4	7.65	40	0.0	0.0	2045.0	5962.4	122.0	0.0	0.0
1985-03	740	36.2	329.6	1.4	1.2	10.7	11.9	90.1	9.10	39	0.0	0.0	2081.2	6292.0	123.4	0.0	0.0
1985-04	719	112.1	351.5	5.2	3.7	11.7	15.5	75.8	3.14	46	0.0	0.0	2193.3	6643.5	128.6	0.0	0.0
1985-05	740	88.0	404.2	4.1	2.9	13.1	16.0	82.1	4.59	47	0.0	0.0	2281.3	7047.7	132.7	0.0	0.0
1985-06	719	124.7	389.3	6.5	4.2	13.0	17.2	75.7	3.12	51	0.0	0.0	2406.0	7437.2	139.0	0.0	0.0
1985-07	732	131.0	485.5	6.7	4.2	15.9	20.2	78.8	3.71	51	0.0	0.0	2537.0	7922.7	145.7	0.0	0.0
1985-08	744	110.4	657.2	4.5	3.6	21.2	24.8	85.6	5.95	44	0.0	0.0	2647.4	8579.9	150.6	0.0	0.0
1985-09	720	71.1	693.6	3.3	2.4	23.1	25.5	90.7	9.76	46	0.0	0.0	2718.5	9273.5	153.9	0.0	0.0
1985-10	672	25.0	735.1	1.1	0.9	26.3	27.1	96.7	29.40	44	0.0	0.0	2743.5	10008.6	155.0	0.0	0.0
1985-11	641	39.3	573.1	2.6	1.5	21.5	22.9	93.6	14.55	66	0.0	0.0	2782.8	10581.7	157.6	0.0	0.0
1985-12	652	99.1	534.8	6.6	3.2	17.2	20.5	84.4	5.40	67	0.0	0.0	2881.9	11116.5	164.2	0.0	0.0
1986-01	675	72.7	588.3	4.7	2.3	20.9	23.2	88.9	8.02	64	0.0	0.0	2955.6	11705.0	168.9	0.0	0.0
1986-02	565	37.9	237.8	2.8	1.6	10.1	11.7	86.3	6.27	74	0.0	0.0	2993.5	11943.0	171.7	0.0	0.0
1986-03	705	120.0	298.7	7.7	4.1	10.2	14.3	71.3	2.49	64	0.0	0.0	3113.5	12241.8	179.4	0.0	0.0
1986-04	719	152.8	423.2	9.2	5.1	14.1	19.2	73.5	2.77	60	0.0	0.0	3265.8	12665.0	188.6	0.0	0.0
1986-05	673	221.2	339.7	12.5	7.3	12.1	19.4	60.9	1.54	57	0.0	0.0	3487.0	13004.7	201.1	0.0	0.0
1986-06	677	99.7	469.2	7.4	3.5	15.6	19.2	82.5	4.71	74	0.0	0.0	3586.8	13474.0	208.5	0.0	0.0

* * * S T O R E * * *
GREEN PRODUCTION DATA BASE
WELL 10/01-27-001-26 W1M(0)

Page
87-12-15
14:57:01

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1982-12-26
ON INJN NOT ON YET

LANDW: 0
LANDH: 0
LANDW3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1986-07	658	4.4	678.0	1.7	0.2	24.7	24.9	99.4	154.1	386	0.0	0.0	3591.2	14152.3	210.2	0.0	0.0
1986-08	666	7.4	916.1	0.5	0.3	33.1	33.4	99.2	124.1	68	0.0	0.0	3598.6	15070.4	210.7	0.0	0.0
1986-09	680	43.8	752.1	3.5	1.5	26.5	28.1	94.5	17.17	80	0.0	0.0	3642.4	15822.5	214.2	0.0	0.0
1986-10	678	22.0	779.0	1.6	0.8	27.6	28.4	97.3	35.41	73	0.0	0.0	3664.4	16601.5	215.8	0.0	0.0
1986-11	679	15.2	609.6	0.5	0.5	21.5	22.1	97.6	40.11	33	0.0	0.0	3679.6	17211.1	216.3	0.0	0.0
1986-12	150	4.2	129.0	0.2	0.7	20.6	21.3	96.8	30.71	46	0.0	0.0	3683.8	17340.1	216.5	0.0	0.0
SHUT IN																	
1987-03	312	0.0	226.8	0.9	0.0	17.4	17.4	100.0	99.99	99999	0.0	0.0	3683.8	17566.9	217.4	0.0	0.0
1987-04	677	17.7	663.0	1.8	0.6	23.5	24.1	97.4	37.46	102	0.0	0.0	3701.5	18229.9	219.2	0.0	0.0
1987-05	656	24.4	668.4	1.6	0.9	24.5	25.3	96.5	27.39	66	0.0	0.0	3725.9	18898.3	220.8	0.0	0.0
1987-06	597	7.2	436.6	1.9	0.3	17.6	17.8	98.4	60.64	264	0.0	0.0	3733.1	19334.9	222.7	0.0	0.0
1987-07	744	3.7	618.6	2.4	0.1	20.0	20.1	99.4	167.2	649	0.0	0.0	3736.8	19953.5	225.1	0.0	0.0
1987-08	704	2.6	492.5	2.6	0.1	16.8	16.9	99.5	189.4	1000	0.0	0.0	3739.4	20446.0	227.7	0.0	0.0
1987-09	216	0.7	151.0	0.7	0.1	16.8	16.9	99.5	215.7	1000	0.0	0.0	3740.1	20597.0	228.4	0.0	0.0
1987-10	636	5.8	153.9	1.9	0.2	5.8	6.0	96.4	26.53	328	0.0	0.0	3745.9	20750.9	230.3	0.0	0.0

* * * S T O R E * * *
GMEB- PRODUCTION DATA BASE
WELL 100/02-27-001-25 W.M(C)

DBEB
89-10-13
14:58:1.

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PRO.INDE MAN.
WORKING INTEREST 100.00000%
ON PROD 1982-11-18
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WCR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1982-11	312	76.8	34.0	0.0	5.9	2.6	8.5	30.7	0.44	0	0.0	0.0	76.8	34.0	0.0	0.0	0.0
1982-12	742	185.1	117.6	13.1	6.0	3.8	9.8	38.9	0.64	71	0.0	0.0	261.9	151.6	13.1	0.0	0.0
1983-01	744	164.2	156.4	19.1	5.3	5.0	10.3	48.8	0.95	116	0.0	0.0	426.1	308.0	32.2	0.0	0.0
1983-02	648	139.3	86.4	0.7	5.2	3.2	8.4	38.3	0.62	5	0.0	0.0	565.4	394.4	32.9	0.0	0.0
1983-03	608	26.4	160.1	3.7	1.0	6.3	7.4	85.8	6.06	140	0.0	0.0	591.8	554.5	36.6	0.0	0.0
1983-04	720	60.8	227.4	3.3	2.0	7.6	9.6	78.9	3.74	54	0.0	0.0	652.6	781.9	39.9	0.0	0.0
1983-05	744	35.5	273.4	1.4	1.1	8.8	10.0	88.5	7.70	39	0.0	0.0	688.1	1055.3	41.3	0.0	0.0
1983-06	720	17.5	235.1	4.4	0.6	7.8	8.4	93.1	13.43	251	0.0	0.0	705.6	1290.4	45.7	0.0	0.0
1983-07	744	37.1	322.7	5.1	1.2	10.4	11.6	89.7	8.70	137	0.0	0.0	742.7	1613.1	50.8	0.0	0.0
1983-08	744	79.7	158.0	4.2	2.6	5.1	7.7	66.5	1.98	53	0.0	0.0	822.4	1771.1	55.0	0.0	0.0
1983-09	714	42.4	192.0	4.2	1.4	6.5	7.9	81.9	4.53	99	0.0	0.0	864.8	1963.1	59.2	0.0	0.0
1983-10	744	38.5	191.9	3.4	1.2	6.2	7.4	83.3	4.98	88	0.0	0.0	903.3	2155.0	62.6	0.0	0.0
1983-11	712	36.2	150.8	3.5	1.2	5.1	6.3	80.6	4.17	97	0.0	0.0	939.5	2305.8	66.1	0.0	0.0
1983-12	744	38.6	168.9	4.8	1.2	5.4	6.7	81.4	4.38	124	0.0	0.0	978.1	2474.7	70.9	0.0	0.0
1984-01	744	40.6	178.7	4.2	1.3	5.8	7.1	81.5	4.40	103	0.0	0.0	1018.7	2653.4	75.1	0.0	0.0
1984-02	696	23.2	180.6	2.1	0.8	6.2	7.0	88.5	7.78	91	0.0	0.0	1041.9	2834.0	77.2	0.0	0.0
1984-03	744	9.0	126.8	2.3	0.3	4.1	4.4	93.4	14.09	256	0.0	0.0	1050.9	2960.8	79.5	0.0	0.0
1984-04	720	23.6	142.9	3.4	0.8	4.8	5.6	85.8	6.06	144	0.0	0.0	1074.5	3103.7	82.9	0.0	0.0
1984-05	744	33.7	150.1	1.9	1.1	4.8	5.9	81.7	4.45	56	0.0	0.0	1108.2	3253.8	84.8	0.0	0.0
1984-06	713	43.4	125.1	5.4	1.5	4.2	5.7	74.2	2.88	124	0.0	0.0	1151.6	3378.9	90.2	0.0	0.0
1984-07	739	37.6	144.6	2.3	1.2	4.7	5.9	79.4	3.85	61	0.0	0.0	1189.2	3523.5	92.5	0.0	0.0
1984-08	768	49.3	182.6	1.9	1.5	5.7	7.2	78.7	3.70	39	0.0	0.0	1238.5	3706.1	94.4	0.0	0.0
1984-09	716	21.2	124.1	2.1	0.7	4.2	4.9	85.4	5.85	99	0.0	0.0	1259.7	3830.2	96.5	0.0	0.0
1984-10	745	24.3	141.7	0.6	0.8	4.6	5.3	85.4	5.83	25	0.0	0.0	1284.0	3971.9	97.1	0.0	0.0
1984-11	697	27.2	70.9	1.1	0.9	2.4	3.4	72.3	2.61	40	0.0	0.0	1311.2	4042.8	98.2	0.0	0.0
1984-12	744	26.0	95.8	2.0	0.8	3.1	3.9	78.7	3.68	77	0.0	0.0	1337.2	4138.6	100.2	0.0	0.0
1985-01	740	29.9	150.0	2.6	1.0	4.9	5.8	83.4	5.02	87	0.0	0.0	1367.1	4288.6	102.8	0.0	0.0
1985-02	672	21.9	126.7	1.1	0.8	4.5	5.3	85.3	5.79	50	0.0	0.0	1389.0	4415.3	103.9	0.0	0.0
1985-03	740	23.8	131.8	0.4	0.8	4.3	5.0	84.7	5.54	17	0.0	0.0	1412.8	4547.1	104.3	0.0	0.0
1985-04	719	22.4	139.4	1.1	0.7	4.7	5.4	86.2	6.22	49	0.0	0.0	1435.2	4686.5	105.4	0.0	0.0
1985-05	740	20.9	140.7	1.5	0.7	4.6	5.2	87.1	6.73	72	0.0	0.0	1456.1	4827.2	106.9	0.0	0.0
1985-06	720	20.3	131.8	1.5	0.7	4.4	5.1	86.7	6.49	74	0.0	0.0	1476.4	4959.0	108.4	0.0	0.0
1985-07	732	19.1	135.0	2.1	0.6	4.4	5.0	87.6	7.07	110	0.0	0.0	1495.5	5094.0	110.5	0.0	0.0
1985-08	744	19.7	164.0	2.5	0.6	5.3	5.9	89.3	8.32	127	0.0	0.0	1515.2	5253.0	113.0	0.0	0.0
1985-09	583	16.3	120.9	1.5	0.7	5.0	5.6	88.1	7.42	92	0.0	0.0	1531.5	5378.9	114.5	0.0	0.0
1985-10	662	25.6	121.4	2.3	0.9	4.4	5.3	82.6	4.74	90	0.0	0.0	1557.1	5500.3	116.8	0.0	0.0
1985-11	596	24.6	99.6	1.6	1.0	4.0	5.0	80.2	4.05	65	0.0	0.0	1581.7	5599.9	118.4	0.0	0.0
1985-12	701	25.4	120.8	1.8	0.9	4.1	5.0	82.6	4.76	71	0.0	0.0	1607.1	5720.7	120.2	0.0	0.0
1986-01	727	21.4	133.5	1.6	0.7	4.4	5.1	83.2	6.24	75	0.0	0.0	1628.5	5854.2	121.8	0.0	0.0
1986-02	639	23.0	90.3	1.7	0.9	3.4	4.3	79.7	3.92	74	0.0	0.0	1651.5	5944.5	123.5	0.0	0.0
1986-03	687	20.6	86.3	1.7	0.7	3.0	3.7	80.7	4.19	83	0.0	0.0	1672.1	6030.8	125.2	0.0	0.0
1986-04	679	19.7	79.4	3.2	0.7	2.8	3.5	80.[illegible]	4.03	162	0.0	0.0	1691.8	6110.2	128.4	0.0	0.0
1986-05	692	20.6	83.7	2.3	0.7	2.9	3.6	80.2	4.06	112	0.0	0.0	1712.4	6193.9	130.7	0.0	0.0

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)02-27-001-26 W1M(0)

Date
97-12-18
14:59:31

FIELD 1
POOL 1
BLOCK 2
ACCTG 2

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1982-11-18
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WATER CUT %	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1986-06	693	46.7	105.6	2.3	1.6	3.7	5.3	69.3	2.26	49	0.0	0.0	1759.1	6299.5	133.0	0.0	0.0
1986-07	672	32.9	105.4	2.8	1.2	3.8	4.9	76.2	3.20	85	0.0	0.0	1792.0	6404.9	135.8	0.0	0.0
1986-08	712	15.7	54.1	2.8	0.5	1.8	2.4	77.5	3.45	178	0.0	0.0	1807.7	6459.0	138.6	0.0	0.0
1986-09	678	23.3	61.0	3.0	0.8	2.2	3.0	72.4	2.62	129	0.0	0.0	1831.0	6520.0	141.6	0.0	0.0
1986-10	686	18.4	66.1	4.1	0.6	2.3	3.0	78.2	3.59	223	0.0	0.0	1849.4	6586.1	145.7	0.0	0.0
1986-11	680	11.2	37.9	2.6	0.4	1.3	1.7	77.2	3.38	232	0.0	0.0	1860.6	6624.0	148.3	0.0	0.0
1986-12	704	32.5	53.5	5.0	1.1	1.8	2.9	62.2	1.65	154	0.0	0.0	1893.1	6677.5	153.3	0.0	0.0
1987-01	680	25.9	59.1	2.4	0.9	2.1	3.0	69.5	2.28	93	0.0	0.0	1919.0	6736.6	155.7	0.0	0.0
1987-02	576	17.6	62.5	3.3	0.7	2.6	3.3	78.0	3.55	188	0.0	0.0	1936.6	6799.1	159.0	0.0	0.0
1987-03	704	14.9	66.2	2.1	0.5	2.3	2.8	81.6	4.44	141	0.0	0.0	1951.5	6865.3	161.1	0.0	0.0
1987-04	679	17.4	72.9	3.5	0.6	2.6	3.2	80.7	4.19	201	0.0	0.0	1968.9	6938.2	164.6	0.0	0.0
1987-05	680	18.3	75.1	3.6	0.6	2.7	3.3	80.4	4.10	197	0.0	0.0	1987.2	7013.3	168.2	0.0	0.0
1987-06	680	19.8	62.7	2.8	0.7	2.2	2.9	76.0	3.17	141	0.0	0.0	2007.0	7076.0	171.0	0.0	0.0
1987-07	624	19.0	63.6	3.3	0.7	2.4	3.2	77.0	3.35	174	0.0	0.0	2026.0	7139.6	174.3	0.0	0.0
1987-08	700	12.1	89.9	4.6	0.4	3.1	3.5	88.1	7.43	380	0.0	0.0	2038.1	7229.5	178.9	0.0	0.0
1987-09	678	12.0	78.6	2.5	0.4	2.8	3.2	86.8	6.55	208	0.0	0.0	2050.1	7308.1	181.4	0.0	0.0
1987-10	696	20.4	60.5	2.7	0.7	2.1	2.8	74.8	2.97	132	0.0	0.0	2070.5	7368.6	184.1	0.0	0.0

WASKAD41 87-12-29

WELL (5)16-22-001-26 W1M(0) 14:53:24

FIELD	7	PROVINCE MAN.	LAND#1 2
POOL	29	WORKING INTEREST 100.00000%	LAND#2 0
BLOCK	1	ON PRDN NOT ON YET	LAND#3 2822
ACTIV	2	ON INJN 1987-12-21	

MONTH	HOURS	I.WATER m3/M	I.WATER m3/D	C.I.WAT m3
1983-12	264	1322.8	42.7	1322.8
1984-01	744	2638.8	85.1	3961.6
1984-02	696	2221.6	76.6	6183.2
1984-03	634	2013.3	64.9	8196.5
1984-04	720	1371.5	45.7	9568.0
1984-05	744	1876.0	60.5	11446.0
1984-06	689	1573.5	52.5	13019.5
1984-07	744	1874.8	60.5	14894.3
1984-08	748	1642.3	53.0	16536.6
1984-09	595	2894.1	96.5	19430.7
1984-10	745	1673.7	54.0	21104.4
1984-11	720	1458.0	48.6	22562.4
1984-12	744	824.0	26.6	23386.4
1985-01	744	1568.5	50.6	24954.9
1985-02	672	777.0	27.8	25731.9
1985-03	744	1370.7	44.2	27102.6
1985-04	696	1494.9	49.8	28597.5
1985-05	744	1300.6	42.0	29898.1
1985-06	720	1144.7	38.2	30942.8
1985-07	744	1297.4	41.9	32240.2
1985-08	744	1644.3	53.0	33884.5
1985-09	720	2054.5	68.5	35939.0
1985-10	744	2511.1	81.0	38450.1
1985-11	648	960.3	32.0	39410.4
1985-12				
1986-01	424	764.2	24.7	40174.6
1986-02	480	1303.4	46.6	41478.0
1986-03	696	1068.5	34.5	42546.5
1986-04	583	1610.9	53.7	44157.4
1986-05	744	1266.9	40.9	45424.3
1986-06	696	1335.7	44.5	46760.0
1986-07	720	1532.5	49.4	48292.5
1986-08	720	1213.9	39.2	49506.4
1986-09	696	479.8	16.3	50986.2
1986-10	744	1175.7	37.9	52161.9
1986-11	720	1444.7	48.2	53606.6
1986-12	740	1862.5	60.1	55469.1
1987-01	744	1341.1	43.3	56810.2
1987-02	576	1461.4	52.2	58271.6
1987-03	744	1101.3	35.5	59372.9
1987-04	719	253.0	8.4	59625.9
1987-05	432	281.7	9.1	59907.6
1987-06	480	331.4	11.0	60239.0

FIELD	3	PROVINCE MAN.	LAND#1 2
POOL	29	WORKING INTEREST 100.00000%	LAND#2 0
POOK	1	ON PROD NOT ON YET	LAND#3 2822
ACCTG	2	ON INJN 1987-12-21	

MONTH	HOURS	I.WATER m3/M	I.WATER m3/D	C.I.WAT m3
1987-07	120	332.7	10.7	60571.7
1987-09	360	269.9	3.7	60841.6