ENERGY RESOURCES CONSERVATION BOARD
640 Fifth Avenue SW
Calgary, Alberta T2P 3G4

IL 83-1

Informational Letter

To: All Oil, Gas, and Oil Sands Operators 13 January 1983

RESERVOIR LIMIT TESTS ON DISCOVERY OIL WELLS: A GUIDE

This informational letter supplements IL 81-12.

To assist operators in designing and applying for a reservoir limit test, the Energy Resources Conservation Board has prepared a guideline (see attachment) which discusses the need for, and the precautions concerning the practicality of, reservoir limit tests in bounded reservoirs.

As stated in IL 81-12, the Board has granted a test allowance of 500 m^3 to be used during the first three calendar months following commencement of production from a newly completed oil well. When combined with the well's initial allowable, this normally provides adequate production flexibility to obtain diagnostic reservoir information by flow and pressure testing early in the life of a well.

During the past year, the Board's Oil Department received a number of requests for permission to exceed the overall allowable restriction on new oil discoveries for the purpose of conducting reservoir limit tests. In dealing with such requests, the Board's approach has been first to establish whether the test has sound technical merit and is feasible. If so, the practice has been to grant a special test volume which, produced at a predetermined rate, would be sufficient to ensure that the pressure transients would extend to an area of about two drilling spacing units.

Alternatively, where the proposed reservoir limit test appears impractical for technical or conservation reasons, the practice has been to deny the request. In some particular instances, however, substantive reservoir pressure and production data that serve to demonstrate potential reservoir size by material balance may be obtained via high production rates over a very short time. In such instances the practice is to propose such an approach as an alternative to a reservoir limit test.

N. Strom
Board Member

attachment

ATTACHMENT

1 THE NEED FOR RESERVOIR LIMIT TESTS

A reservoir limit test is a drawdown test to determine the pore volume connected to a well. Knowledge of the pore volume connected to a discovery well is vital in determining whether or not to develop a pool. Many such post-discovery decisions are made on the basis of core and log data. However, while such data is readily available and relatively easy to use, it only reflects the reservoir at or near the wellbore, thus usually represents only a small part of the reservoir.

Hence the need exists for surveying a large portion of the reservoir, and it is the reservoir limit test that has been specifically designed with this in mind.

2 THE NATURE OF THE TEST

The test requires that a well that has been shut in to stabilize the reservoir pressure be produced at a constant rate for a period long enough for the onset of a pseudosteady-state flow regime in the reservoir At pseudosteady state, the pressure decline throughout the reservoir becomes a linear function of time with a proportionality constant that is directly related to the reservoir volume.

3 THE FEASIBILITY OF THE TEST

Since the test must satisfy certain strict design criteria in order to be valid, and since the pressure response may render achievement of those criteria impractical, the following must be considered to determine whether or not the test would be feasible in a given reservoir:

- The producing time must exceed the time required for the onset of pseudosteady-state flow in the reservoir. In some cases, particularly where the reservoir is large, the permeability is low or both, the testing time would become impractically long.

- The production rate must be sufficient to cause a discernible pressure drop. This may be difficult to achieve in a low-productivity well.

- The rate should be held constant during the test. This may be difficult to achieve in a prolonged test.

- The test rate should not result in a pressure drawdown that would cause a free-gas saturation, since this could complicate interpretation of the test results.

- The presence of an external drive makes it impractical to conduct a reservoir limit test.

4 TEST DESIGN

4.1 Equations

Proper test design will help to decide on the practicality of reservoir limit testing in a given reservoir. Test design relies on a set of simple flow equations that predict the pressure response during the various flow regimes that may develop in the reservoir after a well is placed on production. During the early producing times, commonly referred to as the infinite acting period, the pressure behaviour in the wellbore can be approximated by

$$P_i - P_{wf,t} = 1.8421\ 10^3\ \frac{quB_o}{kh} \left\{ \frac{1}{2} \left(\ln t_{DA} + \ln \frac{A}{r_w^2} + 0.8091 \right) + s \right\} \qquad (1)$$

where:

$$t_{DA} = 3.6\ 10^{-6}\ \frac{kt}{\phi u c_t A} \qquad (2)$$

Eq. 1 assumes negligible wellbore storage effects and applies when the producing time is less than the time to the end of the infinite acting period as defined by

$$t_{eia} = \frac{\phi u c_t A}{3.6\ 10^{-6} k} (t_{DA})_{eia} \qquad (3)$$

Similarly, at large producing times when pseudosteady-state flow prevails, the pressure behaviour in the wellbore can be described by

$$P_i - P_{wf,t} = 1.8421\ 10^3\ \frac{quB_o}{kh} \left\{ \frac{1}{2} \left(4\pi t_{DA} + \ln \frac{A}{r_w^2} + \ln \frac{2.2459}{C_A} \right) + s \right\} \qquad (4)$$

This equation applies when the producing time is equal to or in excess of the time required for the onset of pseudosteady-state flow as defined by

$$t_{pss} = \frac{\phi u c_t A}{3.6\ 10^{-6} k} (t_{DA})_{pss} \qquad (5)$$

As shown in the table attached, the shape of the reservoir and the relative location of the well affect the pressure behaviour and may induce an additional flow period - the late transition period - when neither Eq. 1 nor Eq. 4 applies. However, the pressure response during this latter flow period need not be defined since it is not necessary to estimate the complete pressure response during the test for design purposes.

The preceding equations are the only ones required to design a reservoir limit test for any well/reservoir configuration, provided they are used within the applicable time range given for the particular drainage shape (see table). Eq. 1 suggests that during the infinite acting period, a plot of flowing bottom-hole pressure versus the logarithm of time results in a "semilog straight line" after the wellbore damage and storage effects have diminished. The slope of this line as defined by

$$m = -2.1202\ 10^3 \frac{qu B_o}{kh} \tag{6}$$

may be used to determine whether or not the pressure gauge has the required resolution. Similarly, Eq. 4 suggests that during the pseudosteady-state flow period, a plot of bottom-hole pressure versus time results in a "Cartesian straight line". The slope of this line as defined by

$$m^* = -0.0417 \frac{qB_o}{Ah\emptyset c_t} \tag{7}$$

may be used to estimate how long the test need be run after the onset of the pseudosteady-state flow regime. In addition, Eq. 7 implies that the slope is inversely proportional to the connected pore volume, which is the basis for reservoir limit testing in bounded reservoirs.

4.2 Assumptions and Test Modifications

The preceding equations are based on the assumption that the well is producing at a constant rate from a thin but homogeneous formation. The formation is also assumed to be free of fractures and filled with a single-phase fluid having constant viscosity and compressibility. These assumptions restrict the application to the flow of undersaturated oil in a homogeneous reservoir. However, several compromises could be used to expand the practical utility of reservoir limit tests. For example, multiple-rate testing, which involves testing at a series of constant rates, may be used where the rate fluctuates. Note, though that the results would be less accurate, especially if the individual rates were not well defined on the pressure-time plot. Similarly, multiphase flow techniques may be used where the pressure is below the bubble point but the results are highly interpretative because of the uncertainty regarding the free-gas saturation in the reservoir.

4.3 Test-Design Calculations

Test-design calculations are made to estimate a range of pressure responses based on a range of possible reservoir properties. To have an idea about the reservoir properties, it is generally good practice to run a short transient test on the well soon after completion. Such tests would provide some of the data required for design calculations and, in addition, help to assess the potential of the well. The latter is very important especially when there is significant wellbore damage.

The common practice in test-design calculations has been to assume that the reservoir is a closed square except where geology in the area suggests otherwise. On the basis of this shape, and assuming an area equivalent to one or two drilling spacing units, the time for the onset of pseudosteady-state flow may be estimated using Eq. 5 together with the appropriate data from the table attached.

If the estimated time is so long as to result in poor economics, operational problems, or both, the reservoir limit test should be replaced by the so-called "economic limits test", which is run to estimate a minimum oil in place using the early-time pressure data. This type of test is mandatory where the reservoir is so large as to result in flaring of significant volumes of solution gas during the test.

Assuming that the time for the onset of pseudosteady-state flow is reasonable, the slope of the straight line on the Cartesian pressure-time plot may be estimated using Eq. 7. Having regard for the sensitivity of the pressure gauge, the resulting slope is used to determine the required testing time after the onset of pseudosteady-state flow in the reservoir. The total testing time is subsequently used in Eq. 4 to estimate the flowing bottom-hole pressures toward the end of the test. If the latter happens to be significantly lower than the bubble-point pressure, the test should be redesigned using successively lower production rates. However, the scheduled production rate must be high enough to result in a measurable slope as given by Eq. 7. Where flowing bottom-hole pressures lower than the bubble point are unavoidable toward the latter part of the test, emphasis should be placed on the early-time pressure data with the objective of determining a minimum oil in place. Eq. 1 can be used to estimate the order of magnitude of the pressure change expected during the early testing time. The estimated pressure change must, of course, be large enough to be detected by the pressure gauge.

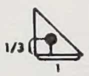
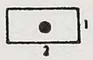
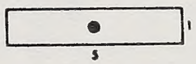
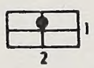
In conclusion, it is pointed out that these equations have been based on a highly idealized reservoir, which is rarely encountered in practice. Pressure anomalies are likely to result from reservoir heterogeneity, which could be misinterpreted as a boundary. It is desirable to run a reservoir limit test for sufficient time to ensure that the drop in pressure from the semi-log straight line is a true reflection of the reservoir boundaries.

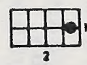
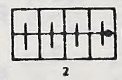
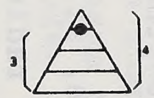
5 REFERENCE

Earlougher, Robert C., Jr, 1977. Advances in Well Test Analysis, Monograph Series, Society of Petroleum Engineers, Volume 5.

6 NOMENCLATURE

A	=	area, m^2
B_o	=	oil formation volume factor, res. m^3/st.m^3
C_A	=	shape factor
c_t	=	total compressibility, kPa^{-1}
h	=	formation thickness, m
k	=	permeability, mD
m	=	slope of the straight line on a plot of pressure versus log time during the infinite acting period, kPa/cycle
m^*	=	slope of the straight line on a plot of pressure versus time during the pseudosteady-state flow period, kPa/h
P_i	=	initial pressure, kPa
$P_{wf,t}$	=	flowing bottom-hole pressure at time t, kPa
q	=	flow rate, st. m^3/day
r_w	=	wellbore radius, m
s	=	skin factor
t	=	time, h
t_{eia}	=	time at the end of the infinite acting period, h
t_{pss}	=	time at the beginning of the pseudosteady-state flow, h
t_{DA}	=	dimensionless time, based on area
$(t_{DA})_{eia}$	=	dimensionless time, based on area, at the end of the infinite acting period
$(t_{DA})_{pss}$	=	dimensionless time, based on area, at the beginning of pseudosteady-state flow
u	=	viscosity, mPa.s
$\emptyset$	=	porosity

Shape	C_A	Exact for $t_{DA}>$	Less than 1% error for $t_{DA}>$	Use infinite system solution with less than 1% error for $t_{DA}<$
IN BOUNDED RESERVOIRS				
	31.62	0.1	0.06	0.10
	30.882 8	0.1	0.05	0.09
	31.6	0.1	0.06	0.10
	27.6	0.2	0.07	0.09
	27.1	0.2	0.07	0.09
	21.9	0.4	0.12	0.08
	21.836 9	0.3	0.15	0.025
	5.379 0	0.8	0.30	0.01
	2.360 6	1.0	0.40	0.025
	12.985 1	0.7	0.25	0.03
	4.513 2	0.6	0.30	0.025
	10.837 4	0.4	0.15	0.025

Shape	C_A	Exact for $t_{DA}>$	Less than 1% error for $t_{DA}>$	Use infinite system solution with less than 1% error for $t_{DA}<$
	4.514 1	1.5	0.50	0.06
	2.076 9	1.7	0.50	0.02
	2.689 6	0.8	0.30	0.01
	0.231 8	4.0	2.00	0.03
	0.115 5	4.0	2.00	0.01
	3.335 1	0.7	0.25	0.01
	3.157 3	0.4	0.15	0.005
	0.581 3	2.0	0.60	0.02
	0.110 9	3.0	0.60	0.005
	0.098	0.9	0.60	0.015
IN WATER-DRIVE RESERVOIRS				
	19.1	-	-	-
IN RESERVOIRS OF UNKNOWN PRODUCTION CHARACTER				
	25.0	-	-	-

PSEUDOSTEADY-STATE SHAPE FACTORS FOR VARIOUS RESERVOIRS

From Earlougher (1977)

NOTE : USE INFINITE SYSTEM SOLUTION AND EXACT FOR $t_{DA}>$ COLUMNS TO GET $(t_{DA})_{eia}$ AND $(t_{DA})_{pss}$ RESPECTIVELY.

ENERGY RESOURCES CONSERVATION BOARD
640 Fifth Avenue SW
Calgary, Alberta T2P 3G4

IL83-2

Informational Letter

To: All Oil and Gas Operators
Gas Purchasers

28 March 1983

PROCEDURE FOR SUBMISSIONS: ANNUAL RESERVOIR REVIEW FOR GAS POOLS

This informational letter supersedes ILs 80-9, 80-28, and 81-11, which outlined procedures and identified specific gas pools for industry submission of reservoir studies.

The Energy Resources Conservation Board has as one of its basic objectives the assessment of the reserves and deliverability of gas and associated co-products in Alberta. Such data are used by the Board in its role respecting conservation of resources, in its administrative duties respecting removal of gas from the province and for industrial use, and in providing advice to government for use in planning, policy development, and revenue forecasting. In addition, the Board's reserve estimates are used by other government organizations and industry for a variety of purposes. Consequently, it is very important that the Board keep abreast of provincial gas reserve developments. To accomplish this the Board has adopted a program that will result in a systematic, continuing review of all gas pools in the province.

General bulletins will be issued designating specific pools, submission dates, and requirements. Submission dates will be chosen having regard for the time required by industry to complete the studies and by the Board to review the submissions and incorporate any resultant reserve changes into its reserve updates. The Board will require that submissions, with detailed supporting information, be prepared respecting the established gas and co-product reserves, and the expected deliverability for each product produced from the pool. It is expected that follow-up regarding these submissions will be limited to telephone queries and possibly informal meetings with the Board staff, but probably not public hearings.

The Board welcomes submissions from gas producers and gas purchasers who have a direct interest in any of the pools. The Board would prefer a single submission from a major operator or co-ordinating operator in each pool, but where this is not practical, will accept separate submissions from different operators, each dealing with a significant portion of the pool.

The submissions will be available for public scrutiny in the Board's Records Centre by reference to the "Annual Reservoir Review for Gas Pools".

Any questions or discussions regarding this matter should be directed to Harold Keushnig of the Board's Gas Department, telephone 261-8511, telex 03-821717.

G. J. DeSorcy
Vice Chairman

ENERGY RESOURCES CONSERVATION BOARD
640 Fifth Avenue SW
Calgary, Alberta T2P 3G4

Informational Letter

To: All Oil and Gas Operators

23 March 1983

OILFIELD SOLUTION-GAS CONSERVATION: FLARING LIMIT REVIEW

In Informational Letter IL 81-24 the Energy Resources Conservation Board stated that it intended to review the level of flaring permitted in all existing oilfield solution-gas conservation (GC) orders. The purpose of the present informational letter is primarily to launch that review with particular attention to foreseeable economics of solution gas conservation and the resulting levels of flaring that would be acceptable.

The attachment lists all existing GC orders and the specified flaring allowances. Most were issued from 10 to 20 years ago when the price of gas was relatively very low and the orders specified a percentage flaring limit having regard for the then existing economics of conservation of solution gas. The price of gas has increased manifold since then and, accordingly, it would appear that the flaring limits should be much reduced in many cases. The economics of solution-gas conservation also undoubtedly bears some relationship to total produced volumes for individual wells and oilfield batteries, and this would suggest that a sliding-scale allowance related to total produced volume might be more suitable.

With the foregoing in mind, the Board requests operators, either individually or in aggregate for each field listed on the attachment, to prepare an oilfield gas conservation report for submission to the Board by 30 September 1983. The report, suitably documented, should address the following matters:

1. The perceived economics of solution-gas conservation for the next 10 years for the field, including consideration of gas and co-product production trends, price forecasts, and continuing costs (operating, maintenance, capital additions).

2. An analysis of the cost sensitivity of oilfield gas conservation in relation to:

   a. total gas volumes and variations in volumes available

   b. effects of fluid composition (gas, condensate, hydrates, etc.)

   c. distances between wells or satellites and compressor stations

   d. processing requirements

   e. compression requirements

   f. seasonal temperature variations and terrain.

3. The recommended appropriate flaring-allowance relationship for the field.

4. Description of and recommended flaring allowances for individual batteries, and the wells connected to each.

5. The appropriate procedure for establishing and allocating flared volumes as between plants, gas-gathering systems, batteries, and wells.

6. The production accounting period for which the flaring allowances should apply (ie. monthly or quarterly).

7. Any other factors considered relevant.

The Board sees an advantage in receiving a single comprehensive report for each field or major segment of a large field. Nevertheless, the Board invites presentations by all interested operators.

The Board intends to complete its review of all submissions during the last quarter of 1983 and make changes as warranted. For fields for which no submission is received, the Board would modify the flaring allowances on its own best judgement.

N. Strom
Board Member

ATTACHMENT TO IL 83-
GAS CONSERVATION ORDERS

Order No. GC	Field	% Flare Allowance	Order No. GC	Field	% Flare Allowance
23	Acheson	5	36	Kaybob	2
62	Acheson East	5	50	Kaybob South	2
51	Alix	10	37	Leduc-Woodbend	2
63	Ante Creek	8	66	Medicine River	7
56	Bantry	10	59	Mitsue	3
85	Bigoray	5	77	Nipisi	6
24	Bonnie Glen	2	57	Olds	5
82	Brazeau River	5	38	Pembina	5
72	Campbell-Namao	3	64	Provost	10
25	Carson Creek North	10	69	Rainbow	4
26	Cessford	5	73	Rainbow South	4
52	Clive	10	39	Redwater	2
68	Countess	4	76	Ricinus	4
83	Cyn-Pem	5	55	Simonette	5
80	Davey	5	40	Stettler	10
70	Duhamel	4	41	Stettler South	20
58	Erskine	5	81	Sturgeon Lake	4
27	Fenn-Big Valley	20	49	Sturgeon Lake South	10
60	Ferrier	5	54	Sundre	3
75	Garrington	5	42	Swan Hills	8
65	Gilby	7	43	Swan Hills South	6
28	Glen Park	2	44	Turner Valley	15
29	Golden Spike	2	74	Twining	5
30	Harmattan East	2	61	Twining North	3
31	Harmattan-Elkton	3	78	Utikuma Lake	7
79	Highvale	5	45	Virginia Hills	6
32	Homeglen-Rimbey	10	46	Westerose	3
33	Hussar	2	84	Westpem	5
34	Innisfail	2	53	Westward Ho	15
71	Joarcam	4	47	Willesden Green	10
67	Joffre	4	48	Wizard Lake	2
35	Judy Creek	5			

ENERGY RESOURCES CONSERVATION BOARD
640 Fifth Avenue SW
Calgary, Alberta T2P 3G4

IL 83-4

Informational Letter

To: To All Oil and Gas Operators

25 April 1983

SHIFTING POOLS FROM PRORATED TO GOOD PRODUCTION PRACTICE (GPP) STATUS

Although a significant number of light-medium crude oil pools in the province continue to be subject to prorated allowables*[1] and maximum rate limitations (MRLs)[2], which together represent base allowables[3], the need for such controls generally diminishes as pool depletion advances. Clearly where a pool does not have the production capability to share in fluctuations in oil market demand and, at the same time, where there are no other reasons for restricting well production rates, superfluous administrative obligations burdensome to both industry and the Energy Resources Conservation Board can be eliminated by assigning GPP[4] status. (The scope of oil production regulation is briefly discussed in reference 5.)

With those considerations in mind, the ERCB recently completed an extensive review of light-medium crude oil pools in the province to determine which of those still subject to base allowables could now be assigned GPP status. This review has indicated that only about one quarter of currently prorated pools have "swing" production capability[6] such as to respond to fluctuations in market demand conditions. By difference the remainder would appear to be eligible for GPP status provided there are no conservation or equitable production issues that have to be accommodated.

Pools identified as candidates for GPP status in the initial screening were taken to a second screening stage to ascertain if the currently assigned MRLs (set out in monthly MD orders) would be necessary for conservation or equitable production reasons for some wells within the pool. If the MRL restrictions were judged to be not necessary for present and future operations, the pool was assigned to the potential GPP status group.

By the above process of elimination, the ERCB has identified nearly 500 light-medium crude oil pools, shown on the attached list, which it now believes should be assigned GPP status. The ERCB proposes

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*Reference items are described briefly on page 3.

that these pools be assigned GPP status commencing with the July 1983 MD order provided that there are no unforeseen problems with such a change. In this regard, the ERCB asks operators with wells in each pool identified on the attached list to scrutinize the proposal as it may affect their operations and advise the ERCB in writing no later than 6 June 1983 of specific objections or concerns. If the ERCB is not advised of any problems by that date, it will proceed with the administrative conversion as proposed herein.

In the current review, the ERCB also noted certain pools that might be eligible for reclassification to GPP status except that there are some uncertainties regarding a change status might have on equitable production (eg. PSUs, Blocks, Control Wells, etc.), or there are situations where the conservation situation could be significantly affected (eg. plans for tertiary oil recovery or gas cap blowdown). Although in these instances the ERCB has not proposed a change to GPP status at this time, it is nonetheless receptive to duly supported applications for any such change.

N. Strom
Board Member

attachment

REFERENCES

1 Prorated allowables are set out in the monthly MD (market demand) orders pursuant to section 22 of the Oil and Gas Conservation Act.

2 "Maximum rate limitation" or "MRL" is the maximum rate of production prescribed for the avoidance of waste, after application of any applicable penalty factor.

3 Base allowable (section 1(1)(a.1) of the Oil and Gas Conservation Act) means the amount of production which, according to a Board order, could be taken if no penalty factor, whether its purpose be for proration, for avoidance of waste, or for the protection of the rights of others, were to be applied.

4 GPP (section 1.020(2)(9) of the Oil and Gas Conservation Regulations) means production of crude oil not governed by a base allowable but limited to what can be produced without adversely and significantly affecting conservation, the prevention of waste, or the opportunity of each owner to obtain his share of production.

5 Scope of oil production regulation: In accordance with section 22 of the Oil and Gas Conservation Act, the ERCB administers the proration plan (ERCB Decision Report 64-10) for crude oil, condensate and pentanes plus and issues a monthly market demand (MD) order and a companion documentation entitled "Oil Proration Data" reflecting expected production and allowable limits for all producing oil entities (PSUs, Blocks and Projects) in the province. The MD order is established by receiving market nominations, fixing the demand and establishing a market allocation among pools. Only light-medium oil pools are subject to market demand prorating. All others, including conventional heavy oil, synthetic crude oil, bitumen and condensate are assigned direct market demand allocation with buyer nominations. The provisions for regulation of oil production are more particularly set out in Part 10 of the Oil and Gas Conservation Regulations (Production Rates and Accounting).

To maintain conservation objectives for rate sensitive pools (particularly to avoid reservoir wastage through excessive well and reservoir pressure drawdown), and also to limit well production for purposes of ensuring equitable withdrawals within a given pool, the ERCB assigns maximum rate limits pursuant to section 24 of the Oil and Gas Conservation Act. Although a guideline formula is used for assigning MRLs, the formula and method for its administration (ERCB Decision Report 74-3) may be varied to meet the circumstances peculiar to each individual situation. Individual operators are at liberty to apply for such variances with due technical and other supporting information.

6 In this assessment, the Board excluded GPP status for any pool which retained "swing" capability at an allocation factor of 0.15 $m^3/d/10^3\ m^3$ of proratable reserves, but also excluded several fairly large pools which retained "swing" capability at an allocation factor of 0.10.

ATTACHMENT

Acheson D-2A
Acheson East Blairmore A
Acheson East Detrital A
Aerial Viking A
Amber Keg River F
Ante Creek Beaverhill Lake B
Bashaw Basal Mannville J
Bashaw D-3B
Bellshill Lake Blairmore C
Bellshill Lake Blairmore F
Black Keg River A
Black Keg River B
Brazeau River Cardium B
Brazeau River Cardium D
Brazeau River Viking B
Brazeau River Lower Mannville B
Bruce Lower Mannville I
Buffalo Lake D-3
Cambell-Namao Blairmore G
Carbon Pekisko B
Caroline Cardium B
Caroline Cardium D
Caroline Cardium G
Caroline Cardium H
Caroline Second White Specks A
Caroline Viking G
Caroline Viking H
Caroline Elkton F
Carrot Creek Cardium C
Cavalier Glauconitic A
Cherhill Viking D
Cherhill Banff G
Chigwell Mannville I
Chigwell Upper Mannville B
Chigwell D-2C
Chigwell D-3B
Claresholm Rundle A
Coutts Moulton B
Crossfield Second White Specks A
Crossfield East Cardium E
Crossfield East Ellerslie A
Cyn-Pem Cardium B
Drumheller Mannville AA
Drumheller Mannville DD
Drumheller Mannville FF
Drumheller Lower Mannville A
Drumheller D-2C
Duhamel D-2A
Eaglesham D-3A
Edson Cardium C
Edson Cardium D
Edson Cardium G
Edson Cardium H
Edson Cardium L
Entice Pekisko A
Erskine D-2B
Erskine D-2C
Erskine D-3
Ethel Beaverhill Lake A
Ewing Lake D-3A
Excelsior D-2
Fairydell-Bon Accord D-2B
Fenn-Big Valley Viking D
Fenn-Big Valley D-3A
Fenn West D-2B
Ferrier Belly River C

Ferrier Belly River D
Ferrier Belly River E
Ferrier Cardium K & L
Fire Keg River A
Fire Keg River C
Fox Creek Gething B
Gladys Lower Mannville A
Garrington Cardium D
Garrington Cardium E
Garrington Cardium G
Garrington Lower Mannville E
Ghost Pine Pekisko K
Gilby Belly River B
Gilby Belly River C
Gilby Viking B
Gilby Viking F
Gilby Viking H
Gilby Basal Mannville B
Gilby Rundle L
Gilby Rundle O
Giroux Lake Viking A
Halkirk Upper Mannville B
Halkirk Lower Mannville D
Harmattan East Viking B
Highvale Banff C
Highvale Banff F
Hatton Mississippian A
Hussar Glauconitic VV
Hussar Basal Mannville L
Hussar Basal Mannville SS
Hussar Pekisko B
Hythe Halfway A
Hythe Halfway B
Iron Springs Bow Island A
Joarcam Wabamun A

Joffre Blairmore B
Joffre Blairmore F
Joffre D-2
Jumbush Upper Mannville A
Jumbush Upper Mannville F
Jumbush Upper Mannville G
Josephine Kiskatinaw B
Kaybob Nisku C
Kaybob South Dunvegan A
Kaybob South Dunvegan B
Kakwa C Cardium B
Keho Colorado A
Keho Bow Island C
Keho Elkton A
Knappen Lower Mannville F
Lanaway Second White Specks A
Lanaway Mannville C
Larne Muskeg B
Larne Keg River K
Larne Keg River O
Larne Keg River P
Larne Keg River Q
Larne Keg River R
Leahurst Mannville C
Leduc Woodbend Blairmore J
Leduc Woodbend Blairmore CC
Leduc Woodbend D-3G
Leo Lower Mannville B
Lochend Cardium A
Majorville Lower Mannville A
Malmo D-3A
Medicine River Jurassic B
Medicine River Pekisko B
Medicine River Pekisko C
Medicine River Pekisko I

Meekwap D-2D
Mikwan Viking C
Mikwan D-3A
Markerville Glauconitic A
and Basal Quartz A
Minnehik-Buck Lake Cardium L
Nevis D-3C
Nevis D-3E
Nipisi Gilwood C
Nipisi Keg River Sandstone A
Nipisi Keg River Sandstone F
Niton Basal Quartz B
Ogston Keg River Sandstone A
Okotoks Wabamum A
Olds Cardium A
Peco Cadomin B
Pembina Belly River I
Pembina Belly River J
Pembina Keystone Belly River U
Pembina Belly River RR
Pembina Belly River HHH
Pembina Belly River JJJ
Pembina Belly River MMM
Pembina Belly River NNN
Pembina Cardium C
Pembina Cardium D
Pembina Cardium E
Pembina Cardium G
Pembina Lobstick Gluaconitic J
Pembina Ostracod H
Pembina Ostracod I
Pembina Jurassic A
Pembina Banff A
Pembina Blueridge B
Penhold Viking A
Penhold Lower Mannville A
Pine Creek Cardium J & K
Pine Creek Second White Specks C
Pine Creek North-West 2WS A
Prevo Upper Mannville A
Provost Viking Y
Provost Viking GG
Provost Mannville H
Provost Mannville I
Provost Mannville J
Provost Mannville S
Provost Lloydminster A
Provost Lower Mannville L
Rainbow Sulphur Point I
Rainbow Sulphur Point L
Rainbow Muskeg A
Rainbow Muskeg D
Rainbow Muskeg F
Rainbow Muskeg J
Rainbow Keg River M
Rainbow Keg River P
Rainbow Keg River S
Rainbow Keg River W
Rainbow Keg River MM
Rainbow Keg River NN
Rainbow Keg River WW
Rainbow Keg River HHH
Rainbow Keg River KKK
Rainbow Keg River QQQ
Rainbow Keg River WWW
Rainbow South Keg River A
Rainbow South Keg River E
Rainbow South Keg River G
Rainier Glauconitic B
Red Earth Slave Point A

Red Earth Slave Point C
Red Earth Slave Point F
Red Earth Slave Point G
Red Earth Slave Point I
Red Earth Slave Point J
Red Earth Slave Point K
Red Earth Granite Wash E
Red Earth Granite Wash P
Red Earth Granite Wash T
Redland Lower Mannville A
Redwater Upper Mannville E
Redwater Basal Mannville D
Redwater Basal Mannville E
Redwater Basal Mannville F
Redwater Basal Mannville H
Redwater Basal Mannville I
Redwater Basal Mannville J
*Redwater D-3
Retlaw Mannville II
Retlaw Mannville SS
Retlaw Mannville TT
Richdale Upper Mannville F
Ricinus Cardium B
Ricinus Cardium E
Ricinus Cardium F
Ricinus Cardium AA
Ricinus Cardium FF
Ricinus Cardium GG
Rowley Pekisko A
Rowley Pekisko B
St. Albert-Big Lake D-3A
Shekilie Muskeg A
Shekilie Keg River C
Shekilie Keg River I
Shekilie Keg River J
Shekilie Keg River K
Shekilie Keg River M
Shekilie Keg River O
Shekilie Keg River P
Shekilie Keg River Q
Shekilie Keg River T
Shekilie Keg River V
Shekilie Keg River X
Shekilie Keg River Z
Shekilie Keg River AA
Shekilie Keg River BB
Simonette Wabamum C
Spirit River Charlie Lake D
Sousa Keg River A
Sousa Keg River D
Sousa Keg River F
Sousa Keg River G
Sousa Keg River H
Stanmore Upper Mannville B
Stanmore Upper Mannville P
Stettler D-2B
Stettler D-3A
Stettler North Upper Mannville A
Stettler South D-2
Stettler South D-3
Strathmore Lower Mannville A
Sturgeon Lake South Triassic A
Sturgeon Lake South Triassic B
Sturgeon Lake South D-2A
Sunset Triassic A
Swalwell Pekisko H
Swalwell D-2A
Sylvan Lake Cardium A
Sylvan Lake Cardium B
Sylvan Lake Second White Specks A
Sylvan Lake Jurassic M
Sylvan Lake Elkton B

*The ERCB proposes concurrent cancellation of all PSUs and Blocks

Sylvan Lake Elkton C
Sylvan Lake Elkton E
Sylvan Lake Shunda C
Sylvan Lake Pekisko C
Tehze Muskeg A
Tehze Muskeg C
Thompson Lake Blairmore
Turin Upper Mannville I
Twining Glauconitic A
Twining Glauconitic B
Twining Lower Mannville B
Utikuma Lake Keg River Sandstone O
Vega Viking B
Vega Viking C
Virgo Muskeg C
Virgo Muskeg G
Virgo Muskeg L
Virgo Muskeg O
Virgo Muskeg D & Keg River L
Virgo Keg River A
Virgo Keg River B
Virgo Keg River H
Virgo Keg River Q
Virgo Keg River S
Virgo Keg River T
Virgo Keg River AA
Virgo Keg River EE
Virgo Keg River FF
Virgo Keg River JJ
Virgo Keg River RR
Virgo Keg River UU
Virgo Keg River YY
Virgo Keg River ZZ
Virgo Integrated Scheme No. 5
Virgo Integrated Scheme No. 7
Virgo Keg River GGG
Virgo Keg River LLL
Virgo Keg River MMM
Virgo Keg River QQQ
Virgo Keg River TTT
Virgo Keg River UUU
Virgo Keg River XXX
Virgo Keg River YYY
Virgo Keg River A2A
Virgo Keg River C2C
Virgo Keg River D2D
Virgo Keg River K2K
Virgo Keg River L2L
Virgo Keg River N2N
Virgo Keg River O2O
Virgo Keg River R2R
Virgo Keg River S2S
Virgo Keg River T2T
Virgo Keg River V2V
Virgo Keg River W2W
Virgo Keg River X2X
Virgo Keg River B3B
Virgo Keg River D3D
Virgo Keg River E3E
Virgo Keg River F3F
Virgo Keg River H3H
Virgo Keg River J3J
Wayne Rosedale Viking H
Wayne Rosedale Upper Mannville E
Wayne Rosedale Glauconitic F
Wayne Rosedale Glauconitic L
Wayne Rosedale Glauconitic M
Wayne Rosedale Glauconitic N
Wayne Rosedale Ostracod D
Wayne Rosedale Basal Quartz FF

Watelet Belly River B
Watelet Ellerslie A
West Drumheller Ireton A
Westerose South Banff A
Thorsby Lower Mannville A
Tony Creek North Cadomin A
Westward Ho Viking B
Westward Ho Rundle A
Willesden Green Belly River L
Willesden Green Belly River N
Willesden Green Belly River O
Willesden Green Cardium G
Willesden Green Second White Specks B
Willesden Green Second White Specks C
Willesden Green Viking B
Willesden Green Glauconitic A
Wintering Hills Lower Mannville A
Youngston Arcs
Zama Sulphur Point F
Zama Muskeg B
Zama Muskeg C
Zama Muskeg L
Zama Muskeg P
Zama Muskeg R
Zama Muskeg S
Zama Muskeg V
Zama Muskeg EE
Zama Muskeg GG
Zama Muskeg II
Zama Muskeg KK
Zama Muskeg LL
Zama Muskeg NN
Zama Keg River A
Zama Keg River D
Zama Keg River E
Zama Keg River F
Zama Keg River G
Zama Keg River H
Zama Keg River L
Zama Keg River N
Zama Keg River O
Zama Keg River P
Zama Keg River R
Zama Keg River T
Zama Keg River U
Zama Keg River V
Zama Keg River Y
Zama Keg River Z
Zama Keg River BB
Zama Keg River CC
Zama Keg River DD
Zama Keg River EE
Zama Keg River FF
Zama Keg River GG
Zama Keg River HH
Zama Keg River II
Zama Keg River LL
Zama Keg River NN
Zama Keg River PP
Zama Keg River RR
Zama Keg River SS
Zama Keg River UU
Zama Keg River WW
Zama Keg River XX
Zama Keg River BBB
Zama Keg River DDD
Zama Keg River EEE
Zama Keg River GGG
Zama Keg River HHH
Zama Keg River III

Zama Keg River KKK
Zama Keg River NNN
Zama Keg River OOO
Zama Keg River PPP
Zama Keg River RRR
Zama Keg River SSS
Zama Keg River TTT
Zama Keg River VVV
Zama Keg River XXX
Zama Keg River ZZZ
Zama Keg River B2B
Zama Keg River C2C
Zama Keg River E2E
Zama Keg River I2I
Zama Keg River J2J
Zama Keg River M2M
Zama Keg River N2N
Zama Keg River O2O
Zama Keg River S2S
Zama Keg River W2W
Zama Keg River A3A
Zama Keg River C3C
Zama Keg River D3D
Zama Keg River I3I
Zama Keg River F3F
Zama Keg River K3K
Zama Keg River L3L
Zama Keg River P3P
Zama Keg River Q3Q
Zama Keg River S3S
Zama Keg River W3W
Zama Keg River Z3Z
Zama Keg River C4C
Zama Keg River G4G
Zama Keg River I4I
Zama Keg River K4K
Zama Keg River N4N
Zama Keg River Q4Q
Zama Keg River S4S
Zama Keg River T4T
Zama Keg River V4V
Zama Keg River W4W
Zama Keg River A5A
Zama Keg River B5B
Zama Keg River F5F
Zama Keg River G5G
Zama Keg River H5H
Zama Keg River I5I
Zama Integrated Scheme No. 9

ERCB

Energy Resources Conservation Board
640 Fifth Avenue SW
Calgary, Alberta
Canada T2P 3G4

Informational Letter

IL 83-5

To: All Planners, Municipal Authorities, Developers, Consultants, and Oil, Gas, and Pipeline Operators

2 May 1983

PIPELINE RECORDS AVAILABLE

Urban encroachment upon existing pipelines is a problem that is receiving increasing attention from planners, municipal authorities, developers, and consultants engaged in urban planning matters. Oil, gas, and pipeline operators are also affected, since encroachment directly affects their operations.

Since the use of available records can help identify the presence and approximate location of pipelines, the Energy Resources Conservation Board believes that many of the problems of urban encroachment upon pipelines can be avoided at the early stages of land-use planning. Accordingly, the Board would like to make known the various types of pipeline records it has available for public use, and how such information can be obtained. Details are provided in the appendix.

Because of the constant and changing situation concerning urban and energy-resource development, it is essential that proper information concerning pipeline construction and operation be known. The Board therefore urges all responsible parties to take advantage of its pipeline records in order to avoid potential problems.

For further information, including that on any applicable fees, call the Board's Records Centre at 261-8190 in Calgary.

V. E. Bohme
Board Member

APPENDIX

The Board's records generally contain details of all oil, gas, or hydrocarbon pipelines constructed in Alberta. Certain kinds of lines however, are excluded from the Board's jurisdiction, hence are not shown in its records. In addition, there could be some pipelines constructed without the Board's prior knowledge or approval, but every effort is made to include all lines under Board jurisdiction.

Types of Pipelines in the Board's Records

Oil lines

Gas lines

Water lines (generally associated with oil and gas production)

Flow lines (oil, gas, and water in combination)

Liquid petroleum gas (LPG) lines (propane, butane, condensate, ethane, ethylene)

Rural gas distribution lines

Pipelines under National Energy Board jurisdiction (limited records)

Types of Pipelines Not in the Board's Records

Domestic water-supply pipelines

Water-supply and effluent pipelines for projects other than those approved under the Oil and Gas Conservation Act

Pipelines specifically excluded under the Pipeline Act

Pipeline Township Drawings (Microfiche or Paper)

These show, by township and range, the approximate location of all pipelines permitted or licensed by the Board. Users are urged to check with the permittee or licensee for the exact location. The identity of the permittee or licensee, along with a general description of the type of pipeline, can be obtained by reviewing the Pipeline Licence Register in the Board's Records Centre.

Pipeline township drawings are updated weekly, and may be purchased on paper or microfiche, or may be viewed at the Board's Records Centre in Calgary.

Pipeline Permits or Licences (Microfiche or Paper; Plans not Included)

Permit or licence documents identify legal descriptions and technical details associated with pipelines. These documents may be examined or purchased at the Board's Records Centre.

Oil and Gas Pipeline Maps

The Board makes available a selection of maps showing the main oil and gas pipelines in Alberta. The maps are reproduced as blueline prints, revised monthly, and available from the Board as single copies or by subscription.

These maps are titled as follows:

"Oil and Gas Fields and Main Pipelines in Alberta"

"Main Gas Pipelines in Alberta"

"Main Oil and Gas Pipelines in the Edmonton Area"

"Main Oil and Gas Pipelines in The Edmonton Area - Edmonton Roadway System"[1]

"Designated Oil and Gas Fields and Oil Sands Deposits, Main Pipelines, Refineries and Gas Processing Plants, Alberta"[2]

Computer Data Base (Tape Reels)

The Board maintains a complete data base of information on pipeline permits and licences. This data base contains information concerning pipeline status, location, substance transported, pipe specifications, and test data. Retrieval of information may be by permit or licence number, or pipeline operator.

There are varying charges for the use of this service, ranging from the outright purchase of tapes to retrieval or subscription. The Board retains all proprietary rights on all data sold. Copying files for resale is not permitted. Information concerning this data base is available from the Board's Data Processing Department at 261-2480 in Calgary.

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1 Also available from the City of Edmonton, Engineering Department, Supervisor Drafting, 12th Floor, Century Place, 9803 - 102A Avenue, Edmonton, Alberta, T5J 3A3.

2 Reproduced in colour.

Other Sources of Information

Additional information about pipelines under the Board's jurisdiction may be obtained from a number of other reference documents and reports. This information is more general in nature, but could provide useful background and direction in the planning process.

A catalogue of publications, maps, and services (Guide G-1), and copies of legislation, interim directives, informational letters, and special reports are available from the Board's Maps and Publications counter in Calgary.

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