



Sawtooth International Resources Inc.

Compulsory Pooling
Redwater Field

April 26, 2005

ALBERTA ENERGY AND UTILITIES BOARD
Decision 2005-033: Sawtooth International Resources Inc.
Application for Compulsory Pooling
Redwater Field

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ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**SAWTOOTH INTERNATIONAL RESOURCES INC.
COMPULSORY POOLING
REDWATER FIELD**

**Decision 2005-033
Application No. 1366191**

DECISION

The Alberta Energy and Utilities Board has considered the findings and recommendations set out in the following examiner report, adopts the recommendations, and directs that a pooling order be issued, subject to the approval of the Lieutenant Governor in Council.

DATED at Calgary, Alberta, on April 26, 2005.

ALBERTA ENERGY AND UTILITIES BOARD

(Original signed by)

Neil McCrank, Q.C., P.Eng.
Chairman

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

EXAMINER REPORT RESPECTING SAWTOOTH INTERNATIONAL RESOURCES INC. COMPULSORY POOLING REDWATER FIELD

**Decision 2005-033
Application No. 1366191**

1 RECOMMENDATIONS

The examiners appointed by the Alberta Energy and Utilities Board (EUB/Board) have considered the evidence and recommend the following:

- The Board, with the approval of the Lieutenant Governor in Council, issue an order under Section 80 of the *Oil and Gas Conservation Act* (the Act) designating that all tracts within Section 12 of Township 55, Range 21, West of the 4th Meridian (Section 12-55-21 W4M or Section 12), be operated as a unit for the production of gas from the Mannville Group, through the well with the unique identifier of 00/11-12-055-21W4 (the 11-12 well).
- The order allocate the costs and revenues associated with the 11-12 well on a reserves basis with 15 per cent (%) assigned to the southwest quarter of Section 12 and 85% assigned to the northwest quarter and east half of the section.
- The order provide that a penalty of 200% be applied to a tract owner's share of the actual costs of drilling and completing the well in the Mannville Group if the owner fails to pay such costs within 30 days of the later of the pooling order being issued, the owner being given notice in writing of its share of actual costs, or the well having commenced production.
- The order designate Sawtooth International Resources Inc. (Sawtooth) as the operator of the 11-12 well.

2 APPLICATION, INTERVENTION, AND HEARING

Sawtooth applied under Section 80 of the Act for an order prescribing that all tracts within the drilling spacing unit (DSU) constituting Section 12 be operated as a unit for the production of gas from the Mannville Group through the 11-12 well.

Caribou Resources Corp. (Caribou), on behalf of itself and Writers Oil & Gas Limited (Writers) (Caribou/Writers), filed a submission opposing the application.

The application was considered at a public hearing on February 2, 3, and 4, 2005, in Calgary, Alberta, before Board-appointed examiners R. J. Willard, P.Eng. (Presiding Member), B. C. Hubbard, P.Eng., and G. W. Dilay, P.Eng. The participants who attended the hearing are listed on the attached appendix.

3 BACKGROUND

Section 12 is a standard one section DSU where Sawtooth holds the Crown natural gas rights for the northwest quarter and east half for the Mannville Group, which is the interval of interest in

the subject application. Caribou/Writers hold the Crown natural gas rights for the southwest quarter of the section, as shown on the attached figure.

Section 5.005 of the *Oil and Gas Conservation Regulations* prohibits production from a DSU unless ownership is common throughout the DSU. In the case of Section 12 where common ownership does not exist, this condition can be met through a pooling arrangement to operate the DSU as a unit. Such arrangements are usually achieved through voluntary negotiations, but where a negotiated agreement cannot be reached, Section 80 of the Act provides the authority to the EUB to issue a pooling order.

Sawtooth drilled the 11-12 well in June 2004 and encountered gas in five intervals of the Mannville Group. Sawtooth and Caribou/Writers used the following terminology for the intervals:

Sawtooth	Caribou/Writers
Glaucinitic Sandstone	Glaucinitic Sandstone
Ellerslie A	Upper Ellerslie
Ellerslie B	
Ellerslie Channel	Basal Quartz Channel
Ellerslie D	Bruderheim or Detrital Sand

There are 3 wells in Section 12 in addition to the 11-12 well. The well with the unique identifier of 00/02-12-055-21W4/0 (the 2-12 well) was drilled in August 1994, the well with the unique identifier of 00/08-12-055-21W4/0 (the 8-12 well) was drilled in June 1991, and the well with the unique identifier of 00/15-12-055-21W4/0 (the 15-12 well) was drilled in July 2004. The current status of each well is shown on the attached figure.

Sawtooth and Caribou/Writers commenced negotiations for a pooling agreement in August 2004 but were unable to agree on the allocation of costs and revenues between the tracts. In October 2004, Sawtooth submitted its application requesting the EUB to issue a pooling order. Subsequent to the filing of Sawtooth's application, the parties continued to attempt to negotiate a voluntary arrangement and engaged in an Appropriate Dispute Resolution process. Ultimately the parties were unsuccessful in their negotiations, and Sawtooth's application was considered at a hearing in early February 2005.

4 ISSUES

The examiners consider the issues respecting the application to be

- the need for the pooling order, and
- the provisions of a pooling order if issued, and in particular, the basis for allocation of costs and revenues.

5 NEED FOR A POOLING ORDER

Sawtooth and Caribou/Writers each submitted that negotiations to complete a voluntary pooling arrangement failed, and that a compulsory pooling order was therefore required to allow production from the 11-12 well.

The examiners conclude that reasonable attempts were made to reach a pooling agreement, including use of the Appropriate Dispute Resolution process as expected by the Board. However, an impasse between Sawtooth and Caribou/Writers resulted over significant differences in the allocation of costs and revenues associated with drilling and producing the 11-12 well. The examiners agree that a compulsory pooling order provided for by Section 80 of the Act is an appropriate recourse to resolve the matter.

6 PROVISIONS OF A POOLING ORDER

6.1 Operatorship

Sawtooth requested that it be named the operator of the 11-12 well under the pooling order. Caribou/Writers did not object to Sawtooth being named the operator of the well.

The examiners note that Sawtooth drilled the 11-12 well and that both parties are in agreement regarding the operatorship of the well. The examiners conclude that the pooling order should name Sawtooth as the operator of the 11-12 well.

6.2 Penalties on Drilling and Completion Costs

Sawtooth requested that the maximum penalty allowed under the Act be applied to a tract's share of the costs of drilling the well to, and completing it in, the formations named in the order, if the tract owner does not pay its share of costs within 30 days of the later of the pooling order being issued, the tract owner being notified in writing of its share of actual costs, or the well commencing production. Caribou/Writers did not object to the penalty provisions requested by Sawtooth.

The examiners note that Sawtooth and Caribou/Writers are in agreement respecting the penalty provision to be included in a pooling order. The requested provision is commonly included in pooling orders resulting from industry disputes and the examiners conclude that the applied-for order should also include the requested penalty provision.

6.3 Allocation of Costs and Revenues

6.3.1 Views of Sawtooth

Sawtooth initially applied for the allocation of costs and revenues under the pooling order to be on a tract area basis, which would assign Sawtooth a 75% share and Caribou/Writers a 25% share. However, after reviewing geological, geophysical, and engineering data in detail, Sawtooth submitted that an area-based allocation would be inequitable and that the costs and revenues should be allocated based on the geology and reserves associated with the 11-12 well.

The applicant calculated allocations using three different methods. It used its pool interpretations (discussed below) to calculate allocations based on

- the rock volumes of the pools underlying its northwest quarter and east half of the section and Caribou/Writers' southwest quarter section,
- the gas volumes of the pools underlying the Sawtooth tract and Caribou/Writers tract, and

- a weighted land ownership method accounting for Legal Subdivision (LSD) 11 and the offsetting LSDs.

Sawtooth's weighted land ownership method did not use its detailed pool interpretation but was based on the premise that the pools are of small areal extent and that the allocation should account for the ownership of LSD 11 where the 11-12 well is located, and those LSDs immediately offsetting it. Sawtooth said that this allocation should recognize that the 11-12 well proved reserves under LSD 11 and it assigned a weighting factor of 1.0 to LSD 11. The 8 offsetting LSDs collectively were given the same weighting as LSD 11. Then on the basis of land ownership, Sawtooth allocated 100% of LSD 11 to itself and 0% to Caribou/Writers. The 8 offsetting LSDs were allocated 75% to Sawtooth and 25% to Caribou/Writers on the basis that 6 of these LSDs were owned by Sawtooth and 2 by Caribou/Writers. Sawtooth then calculated a total weighted allocation for its own and for Caribou/Writers' interests. The results of Sawtooth's three allocation calculation methods were as follows:

Method Used to Calculate Allocation	Sawtooth Northwest Quarter and East Half (%)	Caribou/Writers Southwest Quarter (%)
Rock Volume	88.97	11.03
Gas Volume	85.85	14.15
Weighted Land Ownership	87.50	12.50
Average	87.44	12.56

Sawtooth believed that a reasonable allocation for Mannville gas in Section 12 would be to average the results of its calculations using pool rock volume, gas volume, and land ownership methods. On this basis, it requested an allocation of 87.5% for its tract and 12.5% for the Caribou/Writers tract.

To support its requested allocation, Sawtooth submitted an interpretation of each of the 5 pools encountered by the 11-12 well, which are in the Glauconitic Sand and 4 different zones in the Ellerslie Member - the Ellerslie A, Ellerslie B, Ellerslie Channel and the Ellerslie D sands. It used geological, 3-D seismic, and engineering information to produce its interpretation of the pools.

Sawtooth's geological interpretation included consideration of regional stratigraphy and the structural and reservoir trends of the Glauconitic and Ellerslie zones in the area based on available data from a 30 section area around the subject well. The applicant observed a southeast to northwest trending paleozoic ridge in the immediate area around Section 12. It saw evidence of drape over the paleozoic high up to the Glauconitic level in the 11-12 well. Sawtooth concluded that this drape provided the main trapping mechanism for gas and that this trapping mechanism would result in very small pools.

Sawtooth stated that available geological data could not be used alone to accurately map the net pay and extent of the pools in question. The applicant submitted that its 3-D seismic information covering the entire section was of high quality and useful in mapping the various Mannville and paleozoic members. Sawtooth used well logs as control points and its seismic data to extrapolate from those fixed points using a series of seismic time structure and amplitude maps. It indicated that it looked for consistency between the interpreted data and the seismic images, and used the seismic to corroborate and refine its interpretation. Based on its integrated well log and 3-D seismic data for the section, the applicant produced detailed reservoir maps for each of the five Mannville gas pools.

As indicated on the attached figure, the applicant interpreted small pools primarily within the northwest quarter of Section 12 with only a small overlap onto the east half and southwest quarter of the section, except for the Ellerslie B sand pool which it mapped as a somewhat larger pool underlying portions of all four quarters of the section. Its mapping recognized that the abandoned 2-12 well and the 15-12 well did not encounter productive reservoir in the zones of interest. Sawtooth interpreted 0.8 metres (m) of Ellerslie B gas pay in the 8-12 well from well logs and observed that the gas/water contact in the Ellerslie B zone in both the 8-12 and 11-12 wells was nearly at the same elevation. Based on this, Sawtooth mapped its Ellerslie B pool to include both the 8-12 and 11-12 wells. However, the applicant acknowledged that the 8-12 well had no drill stem test (DST) over the Ellerslie B interval to confirm the presence of gas. During the hearing, Sawtooth also submitted that its offsetting well with the unique identifier of 02/12-07-055-20W4/0 (the 2/12-7 well) had also encountered Ellerslie B pay with a gas/water contact occurring at the same elevation as at the 8-12 and 11-12 wells. However, it did not amend its pool map to include the 2/12-7 well.

The applicant submitted that the DSTs performed on the 11-12 well also supported its interpretation that the pools encountered by the 11-12 well were of limited areal extent. It submitted that data from 6 of the 7 DSTs showed reductions in shut-in pressures ranging from 10 to 140 kilopascals during the tests. In the applicant's opinion, these reduced pressures could indicate that the pools are small enough to show depletion by gas production during testing.

Sawtooth also argued that its interpretation that the 11-12 well encountered pools of limited areal extent was consistent with the findings set out in the EUB publication *Alberta Single Gas Well Pool Drainage Study Area, December 2004*. The applicant noted that the report suggested that a drainage area of 32 hectares be used for setting initial reserves for single-well Ellerslie pools.

Sawtooth also presented an argument that if the gas pools encountered by the 11-12 well were created by a stratigraphic trap as interpreted by Caribou/Writers (which Sawtooth did not agree with) then regional dip would preclude the presence of any significant gas reserves under the southwest quarter of Section 12 down dip of the 11-12 well. On the basis of Caribou/Writers' mapping of the Ellerslie Basal Quartz Channel, Sawtooth's estimate of a regional geological dip of 12 m per mile to the southwest of the 11-12 well, and a 3 m pay in the well at the Ellerslie B sand in the up dip portion of the trap, the applicant contended that the pay would quickly thin towards the southwest from the 11-12 well and would place the sand underlying the Caribou/Writers southwest quarter of the section below the gas/water contact. Sawtooth submitted that the analysis would also apply to the Ellerslie A and Ellerslie Channel sands.

The applicant disagreed with the Caribou/Writers model that the main gas trapping mechanism was due to differential compaction over the Ellerslie channel sand. In Sawtooth's opinion, such compaction was a minor contributing factor to trapping in the stratigraphically higher gas reservoirs. Sawtooth also disagreed with the Caribou/Writers depiction of the Upper Ellerslie sand pool. It said that Caribou/Writers had taken the contours from the channel isopach to define the areal extent of the pool, but there was a discrepancy between the Caribou/Writers structure map and the channel trends. The applicant argued that using the Caribou/Writers model that gas trapping is due to differential compaction over the channels, where there is a thick channel, there would also be a structural high. However, the channel trend as shown on the Caribou/Writers map diverged markedly from the Caribou/Writers interpretation of the Upper Ellerslie structure. In Sawtooth's opinion, the discrepancy between Caribou/Writers' interpretation of the channel isopach and the Upper Ellerslie sand structure would not allow for gas underlying the sections offsetting Section 12 as depicted on the Caribou/Writers map of the Upper Ellerslie sand pool.

Sawtooth also contended that the 2-D seismic information recorded in 1984 in a line along the western boundary of Section 12 used by Caribou Writers in its interpretation was generally of poor quality and had poor resolution.

The applicant concluded that it would be inequitable for the examiners to accept the allocation sought by Caribou/Writers because the allocation was not supported by any well control in the southwest quarter of Section 12 or by seismic or regional data with respect to the size of the Ellerslie pools.

6.3.2 Views of Caribou/Writers

Caribou/Writers also sought a reserves-based allocation using geological evidence. It proposed an allocation of 50% each for Caribou/Writers and Sawtooth. It argued that the presence of three wells on the east half of Section 12 - the 2-12, 8-12, and 15-12 wells which in its view had no productive intervals equivalent to the productive intervals encountered by the 11-12 well - demonstrated that the east half of the section was not prospective for Mannville gas. Caribou/Writers was of the opinion that significant gas reserves underlie the west half of Section 12 and that the 50/50 allocation between the two quarters was equitable. In its written submission, Caribou/Writers had not provided a calculation to support this allocation, but in response to questioning at the hearing, it submitted a calculation based on its mapping that indicated a 60/40 split in favour of Caribou/Writers. However, it confirmed that it was requesting a 50/50 allocation.

To support its position, Caribou/Writers reviewed geological, petrophysical, and stratigraphic data to determine the location of the Lower Mannville pools in the area. It employed a “top down” (cast down) method using all geological information available from well logs for its pool delineation and mapping. Caribou/Writers argued that the Upper Ellerslie gas found in the 11-12 well was trapped by post-compactional drape due to differential compaction over the Ellerslie channel sands. In its interpretation, Caribou/Writers also used seismic information that it had obtained from a 2-D seismic line recorded in 1984 along the western edge of Section 12. However, it did not present the seismic information at the hearing due to a confidentiality agreement with the owner of the seismic data.

On the basis of its 2-D seismic data and its own analysis of a portion of Sawtooth’s 3-D seismic information, Caribou/Writers interpreted an Upper Ellerslie structural high on the southwest quarter of the section. It mapped an Upper Ellerslie pool (Sawtooth’s Ellerslie A and B sand pools) primarily underlying the west half of Section 12, with only minor portions of the pool extending into the east half of the section and into Sections 1, 2 and 11-55-21 W4M offsetting Section 12 as shown on the attached figure. It did not present separate pool maps showing the areal extent of the Glauconitic, Ellerslie Channel, or Ellerslie D reservoirs. However, it stated that net pay isopach maps for the Glauconitic and Ellerslie Channel pools would have a similar shape and orientation to the pool depicted for the Upper Ellerslie sands.

Caribou/Writers disagreed with several aspects of Sawtooth’s analysis. It challenged Sawtooth’s trap interpretation, arguing that the paleozoic high detected by Sawtooth’s 3-D seismic data was not pronounced enough to produce the structural drape trapping proposed by Sawtooth. With respect to the 8-12 well, it questioned Sawtooth’s ability to identify the presence of gas in the Ellerslie B sand given the thinness of the sand and the vertical resolution limits of logging tools. In the absence of a DST or production test to confirm the presence of gas in the 8-12 well, Caribou/Writers argued that the well is not productive. With no productive Mannville intervals in

the 2-12, 8-12, and 15-12 wells, the intervener submitted that there is no evidence of gas reserves on the east half of Section 12.

Caribou/Writers argued that the 3-D seismic interpretation presented by Sawtooth should not be given significant weight by the examiners in determining the areal extent of the productive reservoirs underlying Section 12. The intervener challenged Sawtooth's geophysical interpretation on the use of seismic time structure and amplitude maps, and its identification of seismic events. Caribou/Writers stated that using seismic time structure maps to determine the extent and detailed shape of pools can be erroneous due to the presence of a low velocity weathered/glacial layer which impedes seismic velocities. It pointed to examples in Sawtooth's interpretation where structural values based on the seismic analysis were not consistent with values obtained from well control. With respect to seismic amplitude maps, Caribou/Writers argued that gas can reduce seismic velocities creating an amplitude anomaly, and it highlighted cases in Sawtooth's submission where the presence of gas established from other data did not match the anomalies shown on the amplitude maps generated from seismic data. Caribou/Writers also submitted that the seismic event correlation used by Sawtooth in its seismic interpretation was invalid and that any maps derived from this correlation should be discounted.

Caribou/Writers also disagreed with Sawtooth's interpretation that the DSTs performed on the 11-12 well may indicate pools of limited areal extent. Its analysis of the DST results suggested that of the zones tested, only the Bruderheim sand showed possible depletion. Caribou/Writers also argued that an interpretation of depletion based on these pressures was questionable because of the very short flow and buildup periods during the tests and because of the effects of invasion of drilling mud into the formation. It considered that depletion could only be confirmed through a longer flow and buildup test.

Caribou/Writers did not agree that the EUB publication *Alberta Single Gas Well Pool Drainage Study Area, December 2004* supported the Sawtooth pool interpretations over that of Caribou/Writers. The intervener submitted that the areal extent of the reservoirs as interpreted by Caribou/Writers is within the range of pool sizes which the report finds as being typical. In addition, Caribou/Writers said that the report was statistical in nature and did not take individual pool geology, geophysics, or test results into consideration. It submitted that the 11-12 well has tested at rates that indicate pool sizes that are larger than the median 32 hectares found in the study.

Caribou/Writers rejected the regional dip analysis presented by Sawtooth on the basis that it failed to address the structural high and the increased thickness in sand at the Basal Quartz level (Sawtooth's Ellerslie Channel) in the southwest quarter of the section. The intervener also questioned the applicability of the regional dip analysis by pointing out that if Sawtooth had drilled the 15-12 well before the 11-12 well and used the regional dip analysis at that point, it would never have drilled the 11-12 well because the regional dip analysis would have erroneously suggested that the 11-12 well would be wet.

6.3.3 Views of the Examiners

The examiners note that Section 80(4)(c) of the Act requires the Board to allocate production under a pooling order on an area basis unless it can be shown that such an allocation is inequitable. In this case, both parties agreed that allocation should be on a reserves basis. There was no disagreement between Sawtooth and Caribou/Writers that the 2-12 and 15-12 wells failed to encounter producible gas reserves in the same horizons as the 11-12 well. With respect to the

8-12 well, the examiners agree with Caribou/Writers that without a DST or production test, the presence of producible gas in the 8-12 well as interpreted by Sawtooth is uncertain. On the basis of the foregoing, the examiners consider that at least some portion of the east half of Section 12 is not prospective for gas production from the zones encountered in the 11-12 well. The examiners therefore conclude that allocation on a simple tract area basis would be inequitable.

In determining what the allocation should be, the examiners reviewed the pool interpretations presented by each of the parties.

The examiners note that Sawtooth's interpretation was that the stacked pools encountered in the 11-12 well are relatively small in areal extent and for the most part underlay the northwest quarter of Section 12. The presence of a paleozoic high creating a structural trap for gas in the Mannville as interpreted by Sawtooth seems to be a more reasonable interpretation than a stratigraphic trap caused by drape over compacted thick channel sands, given the experience of gas accumulations found in the immediate area. In addition, the examiners considered that the Sawtooth geological interpretation and mapping of the pools was supported by analysis of its 3-D seismic data over Section 12. Although Caribou/Writers pointed to inconsistencies in Sawtooth's seismic analysis and challenged Sawtooth's interpretation, the examiners are satisfied that Sawtooth's general interpretation of the pools is a reasonable one sufficiently supported by its analysis.

The examiners note that Caribou/Writers' interpretation of the pools was based on a different geologic model which yielded a different pool outline, in terms of areal extent, orientation and location of the pool edge. In the examiners opinion however, Caribou/Writers' failed to support its geological interpretation with sufficient detail to convince the examiners that it was a more reasonable interpretation of the Mannville pools in Section 12 than Sawtooth's. The examiners did not put any weight on the 2-D seismic information referenced by Caribou/Writers because this seismic information was not submitted at the hearing. The examiners note that Caribou/Writers itself did not seem to rely on its own mapping to determine what it considered to be an equitable allocation of the pool, proposing a 50/50 allocation rather than the 60/40 allocation in favor of Caribou/Writers as indicated by its mapping. This inconsistency raises further doubt for the examiners about the reliability of the details of Caribou/Writers' mapping.

At the hearing, both parties referred to the recent EUB report *Alberta Single Gas Well Pool Drainage Study Area, December 2004*. The examiners note that this statistical study of single well gas pools in the province found the median size of Ellerslie pools studied to be 32 hectares. While the applicability of the results of a study of this nature to a specific case must be considered within the context of all available information, the examiners agree with Sawtooth's position that it directionally supports an interpretation of relatively small areal extent for the Ellerslie pools in Section 12.

The examiners have given no weight to Sawtooth's suggestion that an apparent pressure decline during drill stem testing of the 11-12 well was indicative of possible depletion occurring in a small pool. On this point, the examiners agree with Caribou/Writers that the DST results do not provide conclusive information about possible depletion or pool size.

The examiners considered Sawtooth's suggestion that regional dip would preclude any significant Mannville gas reserves being present on the Caribou/Writer's lands. The examiners believe that a regional dip analysis could be applicable to a more extensive area; however, in a

limited area of only Section 12, the localized structure determined from other data is a more relevant consideration to determining the pool boundary.

Between the two interpretations presented, the examiners favour the one advanced by Sawtooth. The examiners conclude that the pools encountered by the 11-12 well are likely very small in areal extent, and may not extend much beyond LSD 11 and portions of the adjacent LSDs.

Having accepted Sawtooth's interpretation of the pools except for the Ellerslie B sand pool as previously discussed, the examiners considered the applicant's three methods for calculating an allocation between the tracts. The examiners do not accept Sawtooth's weighted LSD method as an appropriate method to arrive at a reserves-based allocation. The examiners view this approach as primarily area-based and complicated by the assignment of somewhat arbitrary weighting factors. They consider the calculations using rock and gas volume to be similar, but are of the view that the gas volume calculation better represents the pool production to be allocated. The examiners therefore believe that it would be appropriate to use the gas volume calculation as the basis for allocation. They note that Sawtooth's calculated allocation of gas volume based on its pool maps yields an allocation of 85.85% to Sawtooth's land, and 14.15% to Caribou/Writers' land. However, considering that the examiners do not accept Sawtooth's position that producible gas exists in the Ellerslie B sand in the 8-12 well, this well should not be included in the pool as mapped by Sawtooth. In the examiners' view, this necessitates a minor adjustment to the allocation in favor of Caribou/Writers. Therefore, to reflect this minor adjustment, and considering that the nature of the evidence presented at the hearing does not lend itself to determining an allocation with accuracy to a fraction of a per cent, the examiners conclude that an allocation of 85% to Sawtooth's tract and 15% to Caribou/Writers' tract is reasonable and equitable to both parties.

Dated in Calgary, Alberta, on April 14, 2005.

(Original signed by)

R. J. Willard, P.Eng.
Presiding Member

(Original signed by)

B. C. Hubbard, P.Eng.

(Original signed by)

G. W. Dilay, P.Eng.

APPENDIX 1 HEARING PARTICIPANTS

Principals and Representatives
(Abbreviations used in report)**Witnesses**

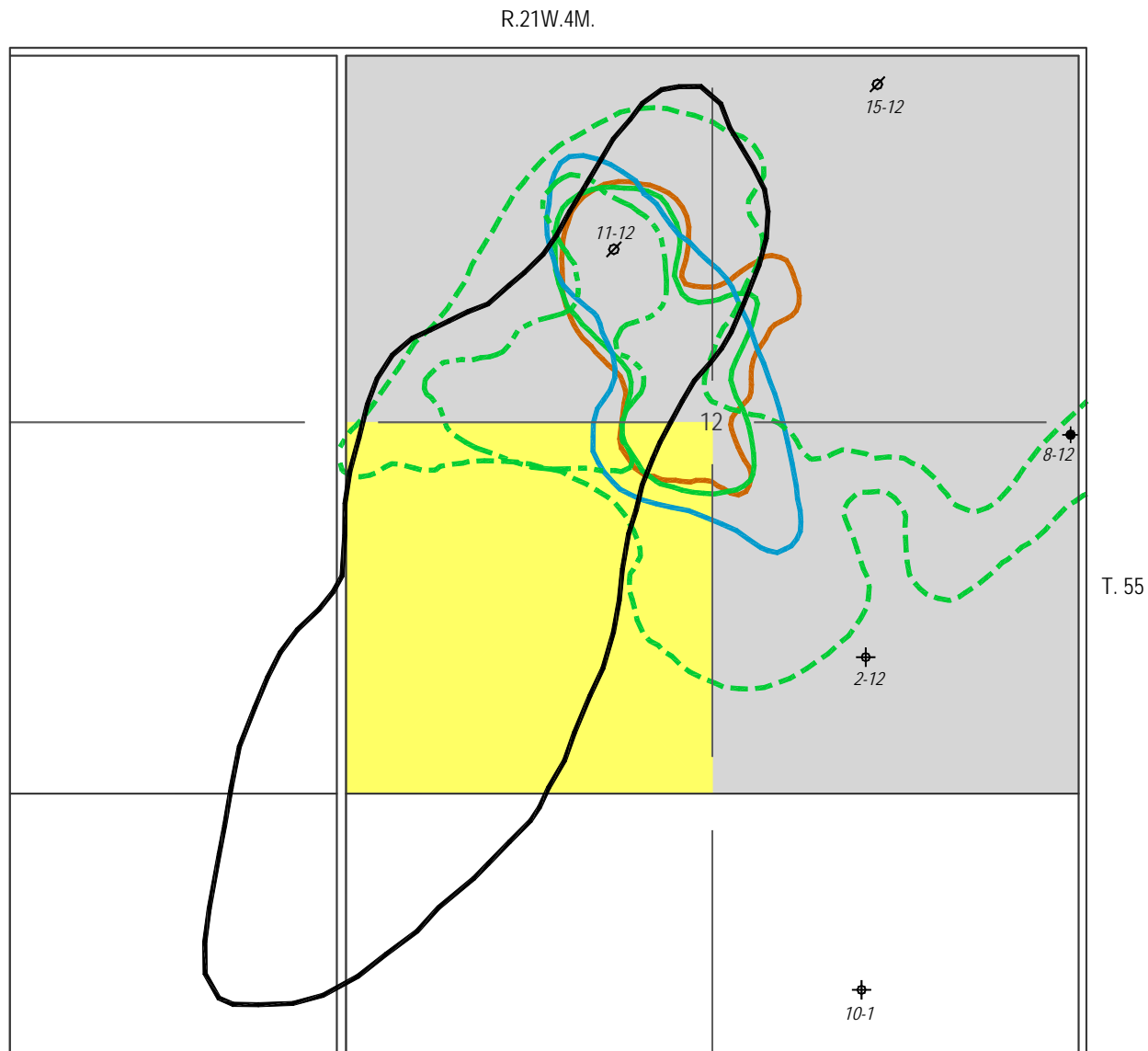
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Legend

- Caribou/Writers Upper Ellerslie pool
- Sawtooth Glauconitic pool
- Sawtooth Ellerslie A pool
- Sawtooth Ellerslie B pool
- Sawtooth Ellerslie Channel pool
- Sawtooth Ellerslie D pool

Well symbols

- Ø Suspended
- ⊕ Abandoned
- ⊕ Abandoned oil

Company tracts

- Caribou/Writers tract
- Sawtooth tract

Figure 1. Overview of application area in the Redwater Field