Application Nos. 1394112, 1409180 and 1481725

ALBERTA ENERGY AND UTILITIES BOARD

IN THE MATTER OF the *Alberta Energy and Utilities Board Act*, R.S.A. 2000, c. A-17, the *Energy Resources Conservation Act*, R.S.A. 2000, c. E-10, the *Oil and Gas Conservation Act*, R.S.A. 2000, c. O-6 and regulations thereunder, the *Oil Sands Conservation Act*, R.S.A. 2000, c. O-7, and section 3 of the *Oil Sands Conservation Regulation*, AR/76/88, all as amended;

IN THE MATTER OF Alberta Energy and Utilities Board ("EUB" or "Board") Interim Directive ID99-1, as amended ("ID99-1");

IN THE MATTER OF Application No. 1394112 by Canadian Natural Resources Limited ("CNRL") requesting the Board shut in gas production in the Clearwater Formation in the Cold Lake Oil Sands Area;

IN THE MATTER OF Application No. 1409180 by EnCana Corporation ("EnCana") to the Board for approval to produce gas in the Clearwater Formation in the Fisher field of the Cold Lake Oil Sands Area;

IN THE MATTER OF Application No. 1481725 by Husky Oil Operations Limited ("Husky") requesting the Board shut in gas production in the Clearwater Formation in the Cold Lake Oil Sands Area; and

IN THE MATTER OF Board letter dated March 28, 2007 establishing an additional written process as described in the Board's letter.

SUPPLEMENTAL WRITTEN SUBMISSION OF HUSKY OIL OPERATIONS LIMITED

April 30, 2007

1. Introduction and Executive Summary

Husky submits that there is nothing contained in the input or output files or responses to information requests, filed by the parties subsequent to the close of the oral portions of the hearing, that either alters or qualifies the conclusions of Husky's submissions in this proceeding.

The reservoir simulations filed by Husky on April 5, 2007 employ reasonable operating parameters, including a representative geological model, with acceptable material balance errors of less than 1%. These reservoir simulations clearly demonstrate harm when the gas cap is depleted.

What the Board has received from EnCana are the results of numerous additional simulation cases that involve randomly altered data inputs and questionable assumptions. When EnCana was questioned in respect of the validity of inputs and assumptions used in a specific case, it is apparent that EnCana's approach was to vary other inputs or assumptions to drive the simulation results to EnCana's desired conclusion. In Husky's submission, EnCana's filings, subsequent to the close of the oral proceeding, have failed to add any reliable evidence relevant to the decision the Board must make in this proceeding.

Husky has four comments that provide an overview of its written submission.

First, it is obvious that reservoir simulation modeling is only one component of the totality of the evidence in this proceeding that supports Husky's Application. As submitted by Husky:

> ...EnCana relies solely on simulation. It, in essence, states that the simulation work of Husky and CNRL is worthless, yet seeks to elevate its own simulation to the status of being predictive....
>
> The Board has never said that simulation work trumps field data. Simulation is not a panacea that permits all other evidence to be shuttered out and excluded.
>
> Simulation is a function of inputs and where there is complex interaction between gas depletion and bitumen production, exceedingly complex. The inputs, in the colourful language of Mr. Scott of Imperial, permit a person running the simulator to play God. (Transcript, 265, line 13)[1]

[1] Transcript page 889, line 23 through 890, line 17.

Second, as detailed in Husky's oral submissions, there is substantial evidence on the record of this proceeding that supports Husky's Application in addition to the reservoir simulation data. That evidence includes geological data and analysis; field data, comprised of piezometer data from both Husky and CNRL and field data from Imperial and CNRL; and numerous scientific peer reviewed papers that state clearly the importance of solution gas drive to the recovery of bitumen using the cyclic steam stimulation process.

Third, none of the reservoir simulation data and analysis submitted in this proceeding was without challenges. Husky frankly conceded that the simulation data it submitted evolved over time. CSS is among the most difficult reservoir recovery processes to model because of the complex multiphase geomechanical high-pressure and temperature physics involved. The range of complexity of the process is defined by the input parameters that govern the physical phenomena that act in CSS. Husky has used a realistic geological model together with reasonable input data, supported by laboratory and other data, to address the recovery processes at Caribou. The focus of this data and analysis has been to assist in understanding whether solution gas depletion will impact the performance of CSS. In light of the complexity of the process and the experimental nature of the HSAGD, it is to be expected that as simulation efforts are refined the operating strategy will evolve. Given the overwhelming physical data from laboratory experiments as well as the dependence of oil viscosity and solution gas drive on solution gas content, it is obvious that the simulation model must reproduce these effects for it to be a meaningful representation of CSS. As Husky's April 5, 2007 filing clearly demonstrates, as Husky's modeling was more finely tuned to employ more realistic operating strategies and tighter tolerances to address material balance issues, the results continued to demonstrate a significant reduction in performance, moving from the no depletion to the depletion cases.

In contrast, when pressed through the information request process:

- EnCana was unable to credibly describe any location in the Clearwater, within the Husky and CNRL leases, where the reservoir geology, properties and geometry is as was shown in the modeling that it submitted;
- EnCana randomly and without justification used different permeability multipliers in its various flank models. In some models EnCana used 10 and in others it used 60. EnCana's models included vertical and horizontal transmissibility barriers that were not supported in the evidence;

- EnCana not only varied permeability multipliers randomly, it also changed the endpoints for its permeability curves in a seemingly random fashion;
- EnCana failed in its April 5, 2007 filing to demonstrate the dilation it claimed was shown in its modeling when it testified during the oral portion of the proceeding;
- EnCana's April 5, 2007 filing included gas flanking models that exhibited unrealistically narrow communication pathways between the top gas cap and the bottom bitumen zones;
- EnCana's revised FL 19 case, included an increased injection pressure. However, EnCana made numerous changes to the input file for that case that skewed the results by reducing any possible impact of dilation;
- EnCana conceded that it used an incorrect gas phase (methane) liquid equivalent value at 10 degrees C of 4391 cP in its simulations;
- EnCana's re-runs of Husky's input files [***April 5, 2007 and April 23, 2007 filings***] either used an old and less optimized Husky operating strategy, where solution gas drive did not act, or randomly changed well constraints to unrealistic values; and
- EnCana's re-runs of Husky's input files, provided in EnCana's April 23, 2007 filing, used an unrealistic 250 kPa bottom hole pressure constraint in a HWCSS simulation. In any event, certain of the cases filed by EnCana indicate that solution gas depletion harms process performance, consistent with Husky's conclusions.

Fourth, in its responses to the Board's information requests, EnCana again alludes to further runs and its willingness to submit additional inputs and outputs. Presumably, notwithstanding the extraordinary opportunity that EnCana has been afforded to supplement the record following the close of the oral hearing, EnCana is still not satisfied that the evidence it has submitted supports its position in this proceeding. The opportunity for all parties to provide evidence to the Board was in the extensive written process that preceded the hearing and during the oral hearing. Information submitted after the close of the oral part of the hearing was not rigorously tested through cross-examination of witnesses under oath. Fairness to all parties dictates that this proceeding be finally brought to a close and that the Board proceed expeditiously to rule on the applications before it, based on the evidence now on the record.

Husky respectfully submits that a fair reading of the totality of the evidence submitted to the close of the oral proceeding fully supports Husky's and CNRL's applications in this proceeding and nothing that EnCana has submitted since that date changes that conclusion.

2. Background

The oral hearing of the above described applications concluded on March 1, 2007, subject to the filing of responses to undertakings provided during the hearing. A dispute arose between Husky and EnCana as to whether Husky, in responding to its undertakings, and EnCana, in commenting on that response, filed new information related to certain reservoir simulation modeling.[2] In its March 28, 2007 letter responding to the dispute, the Board directed that the additional evidence filed by EnCana under cover of its letter of March 14, 2007 be allowed on the record. In its letter, the Board took the extraordinary step of directing EnCana to file input and output files related to certain flank cases and invited the parties to provide input and output files related to certain modeling work that had been referred to in the oral proceeding but had not been filed. Finally, the Board directed an additional written process, to enable parties and the Board to ask information requests in respect of the additional input and output files that were to be filed, and to submit written argument that was to be restricted to matters arising from the input and output files provided pursuant to the Board's March 14, 2007 letter. What follows are Husky's submissions in respect of the information that has been filed by the parties subsequent to the close of the oral hearing.

3. Husky's Subsequent Filings Fully Support its Application

EnCana claims that Husky's model, when run with acceptable material balance errors, has shown no impact of gas cap production on HWCSS and HSAGD oil recovery factors [***EnCana response to Board IRs filed on April 23, 2007, Question 1***].

EnCana is incorrect.

Husky's reservoir simulations filed on April 5, 2007 used reasonable operating parameters, reflected acceptable material balance errors of less than 1% and demonstrated the following in the gas cap is depleted case:

- HWCSS
    - ultimate recoveries are lower
    - oil production rates are lower
    - early cSORs are higher

[2] EnCana letter to the Board, dated March 14, 2007 and Husky's letter to the Board, dated March 22, 2007.

- economic viability is degraded

- HSAGD
  - early oil production rates are lower
  - early cSORs are higher
  - economic viability is degraded

As is evident from the simulation results filed, the similarities in ultimate recoveries for HSAGD for the depleted and non-depleted cases are due to late-life gravity drainage, which presumes that the gravity drainage process will be effective in late-life steam injection in the Clearwater formation. However, the only proven mature process in this reservoir is the CSS process. Within a reasonable time frame, simulations show a difference in ultimate recovery with the CSS process, which is the fall-back process should the experimental HSAGD process prove unsuccessful.

Only in the reservoir simulation cases for the HSAGD process were the ultimate recoveries the same for the depleted and non-depleted cases. However, the early performance was significantly better for the non-depleted case, in terms of the oil production rate and the SOR [***Husky's response to Board's IRs, filed on April 23, 2007, Question 3***]. To the extent that the simulations predict identical ultimate recoveries for an as yet unproven experimental process, HSAGD, the simulations embed the optimistic and unproven assumption that this experimental process will be successful.

Therefore, to allow gas production assuming no harm to a successful HSAGD process precludes the option of converting to HWCSS should the HSAGD process fail.

The Board has repeatedly refused to rely on experimental processes until they have been proven to be practical, based on field evidence. There is no such proven field evidence for HSAGD.

4. EnCana's Subsequent Filings are Flawed

EnCana has consistently used invalid inputs and assumptions and randomly altered inputs in the EnCana filings. It is on this basis that Husky maintains that EnCana's simulation work produces invalid results, is not representative of the geological, pressure and other field data and should be given no weight by the Board.

In Husky's view, EnCana's simulations are driven by the desired results, rather than the employing of realistic geological models, operating strategies, and rock/fluid properties which are required in order to make a valid prediction.

The CSS process in the Cold Lake region requires steam injection above the fracture pressure in order to fracture the oilsand formation [***refer to Exhibit C-7 and Transcript page 876, lines 16 through 20***]. This allows the injection of massive volumes of steam into the oilsand, and permits compaction drive during the production cycle. All parties have recognized compaction drive as a significant drive mechanism for CSS. The literature describes compaction as the dominant drive mechanism [***Denbina Paper, Exhibit C-7 and Imperial Oil Course Notes, Exhibit D-15***]. As with all earlier EnCana runs, the simulations filed by EnCana on April 5, 2007 failed to reflect any dilation effects. As with previous runs filed by EnCana in this proceeding, EnCana failed to inject at sufficiently high injection rates and pressures. This is notwithstanding the fact that EnCana claimed in its evidence to have run "high-pressure" CSS [***Transcript page 54***]. It was these runs, which EnCana claimed were in existence when EnCana's witnesses testified, that the Board asked EnCana to file in EnCana's April 5, 2007 filing. In examining the runs submitted by EnCana on April 5, 2007, Husky noted that nowhere in its simulation did EnCana ever induce dilation.

In Husky's April 13, 2007 information request of EnCana, Husky specifically asked EnCana to identify any occurrence of dilation. EnCana failed to answer the question. Instead, EnCana said that it had included the effects of dilation by arbitrarily increasing permeabilities within the reservoir by factors of 10 to 60 [***EnCana's response to Husky's IRs filed on April 23, 2007***]. This response is in stark contrast to EnCana's claims in respect of the dilation model within the STARS simulator, in which permeabilities are only increased once the dilation pressure is attained [***EnCana Submission dated September 5, 2006: Gas-Over-Bitumen Reservoir Simulation Study by KADE Technologies, Inc., Figure 2.2***]. Since EnCana has never achieved dilation in its models, EnCana has not modelled the actual CSS process. EnCana's failure to reflect dilation in its simulation of CSS precludes the compaction drive that is essential to CSS. As such, EnCana's CSS runs do not represent the physical process of CSS in the Clearwater formation, and are therefore invalid.

In its April 23, 2007 response to the Board's information requests, EnCana attempts to "shoe-horn" onto the record yet another simulation run (the revised FL 19 case) in which the injection

pressures were increased. However, it is evident that EnCana has made numerous additional changes to the input file for the FL 19 case. All the changes made skew the results by reducing any possible impact of dilation. Specifically EnCana has:

- reduced the rock compressibility in its dilation model, which reduces the effectiveness of dilation;
- reduced rock compressibility, which reduces compaction drive; and
- increased the irreducible water saturation from 0.3 to 0.4, which has nothing to do with dilation, but lessens pressure transmission resulting in reduced gas exolution in the bitumen zone and thereby reduced the extent of any possible dilated zone. [***EnCana response to the Board IRs, filed on April 23, 2007***]

Instead of simply increasing the injection pressure, EnCana once again alters the inputs in an apparent attempt to disprove the harmful effects of gas production. It is significant to note that EnCana has used the FL19 model, in which the communication path between the gas cap and the bitumen is unrealistically restricted to a mere 10-metre bottleneck between the gas cap and the bitumen zone.

EnCana claims that its model was unable to inject at steam rates sufficient to achieve fracture pressure. This is in stark contrast to Husky's runs, in which fracture pressures were attained. Both Imperial Oil and CNRL routinely inject above fracture pressure in the field. [***Imperial Oil Course Notes, Exhibit D-15 and CNRL Opening Statement, February 21, 2007***]. A fundamental requirement of any CSS model is that it is able to achieve dilation consistent with what occurs in the field.

Furthermore, EnCana specifically claims that an "important point that must be borne in mind is that due to solution gas liberation in the bitumen zone resulting from pressure reduction from gas production, formation of free gas from the bitumen zone should decrease the maximum achievable bottom-hole injection pressure at a given steam injection rate" [***EnCana response to Board IRs, April 23, 2007; Question 2, pg. 2***]. While Husky questions the validity of EnCana's simulations, it notes EnCana's recognition that gas cap production and consequent solution gas exsolution adversely affect the HWCSS process.

The relativity permeabilities used by EnCana in its modeling consistently reflect high irreducible water saturations, which reduces pressure transmission and the effects of gas production. [***EnCana's January 8, 2007 Submission: Gas-Over-Bitumen Reservoir Simulation Study by KADE Technologies, Inc.***].

As is shown in EnCana's April 5, 2007 filing, EnCana continues to employ a transmissibility factor that renders its simulation results meaningless. EnCana applied a zero transmissibility to the shale and to adjacent sandstone gridblocks leaving an extremely small 10-metre bottleneck of communication between the gas cap and bitumen zones. This severely impedes pressure transmission between the two zones, which results in dampening of the pressure decrease in the bitumen. The result is to impair gas exsolution, and ultimately the effect of gas cap production on the recovery processes.

5. Husky's April 5, 2007 Filing of Pre-existing Runs

Husky's runs submitted on April 5, 2007 were in existence at the time of the oral hearing. These runs were based on Husky's geological model for the Caribou, which was not contested. These runs exhibited material balance errors of less than 1%. The simulations demonstrated that in HWCSS, there is harm to ultimate bitumen recovery if the solution gas is depleted and in HSAGD, there is harm to early recovery. As explained in Husky's April 23, 2007 response to Board information request question 3, early recovery of bitumen is especially important because it establishes the economic viability of the resource. The key conclusion drawn from these runs is that harm occurs with solution gas depletion.

6. EnCana's April 5, 2007 Filing Included New Runs

EnCana's April 5, 2007 filing included EnCana's re-runs of Husky's January 30th simulations, flank model simulations, the new gas flanking simulations, high pressure CSS simulations using CNRL's model with Husky's January 30th operating strategy, and high pressure CSS simulations addressing dilation. In EnCana's re-run of Husky's model, EnCana uses an old operating strategy that does not allow the solution gas drive to act. Thus, the conclusions that EnCana draws from its re-runs are meaningless and obscure the effect of gas cap depletion.

7. EnCana Has Randomly Altered Inputs and Used Unrealistic Assumptions

Permeability Multipliers

EnCana uses different permeability multipliers in its different flank models, (in some models it is 10 and others it is 60). EnCana's models include vertical and horizontal transmissibility barriers, and the communication paths between the gas cap and the bitumen zone that are unrealistically miniscule. Given the number of models and all of their differences, it is unclear what these models are trying to prove. Husky uses a realistic model. Husky's operating strategy evolved over time to reflect more realistic assumptions. In contrast, it is apparent that EnCana randomly alters inputs and geological parameters in its models to achieve its desired outcome. EnCana's approach to modelling the reservoir and the processes adds confusion to the proceedings. Additionally, the values of permeability multiplier are small. In EnCana's models the permeability multipliers range from 10 to 60. No rationale is provided for the use of one value in one model and a different value in another model. In Husky's and CNRL's models higher values are used. As stated at Transcript page 877, "... Dr. Adegbasan, in his history match [of the HWP1 pilot in Cold Lake] states "Maximum permeability multipliers of 1,000 and 1.5 determined at a maximum vertical injector BHP of 10.4 MPa were applied in the fracture and matrix blocks respectively." This implies a value of 1,000 in the fractured dilated zone. ***At no point in the proceedings has Husky changed its original permeability multipliers, which were taken from the literature.***

Relative Permeability Curves

Not only does EnCana change permeability multipliers randomly, it makes seemingly random changes to the endpoints of the relative permeability curves. In some cases the irreducible water saturation is 0.3, in others it is 0.4, and in others it is 0.45. EnCana's April 23, 2007 response to the Board IRs, respecting EnCana's Gas Flanking Bitumen Cases, clearly makes this point. In response a) [pg. 2], of EnCana's response, EnCana states that it lowered the irreducible water saturation from 0.45 to 0.3 and lowered the critical gas saturation from 6% to 1%. In response a) [pg. 2], for the same base model, EnCana then raised the irreducible water saturation from 0.3 to 0.4 and lowered the critical gas saturation from 1% to 0.1%. EnCana also changed the steam injection rate, dilation and rock compressibilities. In response c) for the same base model, EnCana lowered the irreducible water saturation from 0.45 to 0.3 and lowered the critical gas saturation from 6% to 1%. These randomly changed parameters confuse the record and render

any conclusions drawn from EnCana's simulations meaningless. ***At no point in the proceedings has Husky changed its relative permeability curves from the original ones which were based on laboratory experiments.***

Dilation

In EnCana's April 5, 2007 filing, EnCana claimed that dilation occurred. However from an examination of the simulation results, it is obvious that dilation did not occur in the grid blocks around the well blocks. EnCana states that because of the dates that results were recorded it is not possible to see the dilated grid blocks. This is not the case given that the grid block pressures (for any grid block) can be plotted versus time in the CMG Results Graph program and no blocks show pressures that exceed the dilation pressure. EnCana has failed to show a set of grid blocks where dilation occurred. Failure to achieve dilation negates the impact of recompaction, a mechanism that EnCana states is a major drive mechanism in CSS. Notwithstanding EnCana's claims to the contrary, the fact that dilation and fracturing during steam injection are absent from EnCana's models demonstrates that EnCana has never truly modeled CSS. As discussed above, the conclusions EnCana draws from its April 23, 2007 filing are not reliable. EnCana increased steam injection pressure but then randomly changed a number of parameters that had the effect of masking the impact of the increased injection pressure on solution gas depletion. Thus, EnCana is not modelling CSS. In the conclusions of EnCana's April 23, 2007 filing, not only were the steam injection rates changed but other parameters (dilation and rock compressibilities, irreducible water saturation, critical gas saturation) were changed as well. This adds confusion to the interpretation of the results. EnCana provides no physical basis, for example based on lab data, to support these changes to the geological dataset. ***At no point in the proceedings has Husky changed its relative permeability curves and compressibilities from the original ones which were based on laboratory experiments and literature.***

In summary, these additional simulations add murkiness to murkiness as to what the simulation results mean.

Gas-Flanking Models

EnCana submitted the gas flanking models where there is an extremely narrow pathway between the top gas cap and bottom bitumen zones [**April 5, 2007 Submission**]. Having employed many parameter changes, EnCana purports to show that there is some pressure depletion in the thermal

zone [***Figure 5, April 23, 2007 filing***] but EnCana does not discuss the time scale nor the conductive path for free gas migration to the gas cap. From the field evidence, it is clear that gas is being supplied to the gas cap from the solution gas as it evolves with the consequent pressure reduction in the bitumen zone resulting from gas cap production [***Husky's Opening Statement, February 19, 2007, EnCana's Opening Remarks, February 22, 2007 and Transcript page 781, lines 3 through 11***]. This is clear evidence that the pathways from the bitumen zone to the gas cap zone for evolved solution gas are open. EnCana's gas flanking models have an extremely narrow pathway between the bitumen zone and the top gas zone. This means that even if the pressure is depleted, the more important variable to consider is the solution gas content and free gas saturation in the bitumen zone. If the free gas is not migrated from the bitumen zone during gas cap production, when CSS is used, the free gas phase will be pushed back into solution and the impact on process performance due to gas cap depletion will not be evident. Given the restrictive migration path for free gas in EnCana's gas flanking model, its geometry is not a representative model of the formation and again, like many other EnCana models, does not allow the true impact of solution gas depletion from the bitumen zone to show itself. This adds more confusion to the simulation record. ***At no point in the proceedings has Husky changed its geometry, as well as geological parameters, from the original ones which were based on the geological model, laboratory experiments and literature.***

EnCana's Methane Viscosity

EnCana used a gas phase (methane) liquid-equivalent viscosity value at 10 degrees C of 4391 cP in its simulations and justifies this erroneous value by referencing a previous submission [***EnCana response dated April 23, 2007 to Husky IR***]. Once again EnCana attempts to introduce additional simulation runs into evidence to support this inaccurate fluid description instead of correcting its mistake. The use of incorrect input data instead of solid laboratory or literature evidence invalidates EnCana's numerical simulation results.

EnCana's Re-Runs of Husky's Simulation Files

EnCana has submitted re-runs of Husky's input files [***April 5, 2007 and April 23, 2007 filings***] but has either used an old operating strategy, where solution gas drive does not act, or has had to change well constraints to unrealistic values. For example, EnCana has used a 250 kPa minimum bottom hole pressure constraint to achieve its desired conclusion. Even in its re-runs of Husky's model without changes, [***April 23, 2007 filing***], EnCana has confirmed Husky's

results that demonstrate that solution gas depletion harms the performance of the process. These results prove that there is potential for harm and that harm can be significant and thus it follows that first the bitumen should be preserved with possible gas production later on.

The Husky runs of April 5, 2007 include realistic input parameters, realistic geology, a more realistic operating strategy, and acceptable material balance errors. The results clearly show:

- HWCSS
    - higher recovery for non-depleted case for first 19 years [April 5, 2007 filing],
    - lower early cSOR for non-depleted case thus better economic viability,
- HSAGD
    - higher recovery for non-depleted case for about 14 years [April 5, 2007 filing],
    - lower early cSOR for non-depleted case thus better economic viability.

The fact that EnCana's modeling continues to show no impact on performance with or without gas cap production, notwithstanding all of the various model changes and different parameter values, suggests that the pressure and solution gas content near the thermal production wells is not being altered when the gas cap is depressured. Thus, the conclusion from EnCana's simulations will always be the same, no matter what changes it makes in the model, simply because pressure is not allowed to fully deplete and solution gas is not allowed to evolve and be transported away from the thermal well zones. This suggests that model geometry, barriers, and the combination of parameters that are chosen in a particular simulation are working to prevent this pressure communication and solution gas depletion in the thermal zone. Curiously, no matter what changes EnCana makes to its model, EnCana still obtains the same result. This is not the case in the Husky model where if the solution gas drive is not allowed to act in the model, then the results are different than in the cases where solution gas drive is active. Husky's model is consistent with lab and field data that shows clearly that solution gas depletion will harm performance.

8. Conclusion

Throughout this proceeding, Husky has maintained its geological model, lab-based fluid and rock-fluid properties, and other reservoir simulation input data. Husky has made no arbitrary changes to its geological description data nor reservoir geometry to achieve a conclusion. Husky

has acknowledged, like other participants, that both CSS and HSAGD are very complex processes to model and that its understanding of the processes has evolved throughout the hearing. Husky's models, submitted on April 5, 2007, have shown clearly that solution gas depletion harms the performance of HWCSS and HSAGD. For HWCSS this can be in the early and late parts of the process and for HSAGD, this is mainly in the early parts of the process where the economic viability of the process is established. Given the model inputs, there is a significant potential that the simulations are understating the field performance. This is the case because the latest simulations, with the newer operating strategies, are 2D and with additional pathways for pressure communication and gas migration as would exist in 3D have not been explored.

In EnCana's filings, EnCana has consistently used invalid and unrealistic inputs and assumptions and randomly altered data. It is on this basis that Husky maintains that EnCana's simulation work produces invalid results, is not representative of the geological, pressure and other field data and should be given no weight by the Board. The many simulations provided by EnCana have, through a combination of barriers, dilation, irreducible water saturation, relative permeability curves and geometry, shown no impact of solution gas depletion on process performance. This result is an artefact of the model designs and input parameters. The many different models, input parameter datasets, and geometries make the totality of EnCana's conclusions unclear and murky. The alterations EnCana has made to the Husky and CNRL models further cloud the underlying issue. EnCana's conclusions are inconsistent with field observations, the underlying physics, laboratory data from experiments, and simulations from other parties.

The result fully supports Husky's request that gas production should be stopped and its position that further propagation of this process will impose more harm to the bitumen resource at Caribou. The gas can be produced at a later time after the bitumen resource has been secured.

All of which is respectfully submitted this 30th day of April 2007.

Randall Block, Q.C.

Original signed by
Randall Block

Counsel for
Husky Oil Operations Ltd.