BRITISH COLUMBIA

MINISTRY OF FORESTS

Tree Farm Licence 46

Issued to TFL Forest Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective September 1, 2003

Ken Baker

Deputy Chief Forester

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Errata

Page 4: Under "Description of the TFL" the third sentence should read "The other 3000 hectares (4 percent) are composed…"

Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 46. This document also identifies where new or better information is needed for incorporation into future determinations.

Description of the TFL See errata on page 3

TFL 46 is held by TFL Forest Ltd. ('the licensee') and is administered from the British Columbia Forest Service (BCFS) South Island Forest District office in Port Alberni. The total area of the TFL is about 83 545 hectares, of which 80 545 hectares (96 percent) are considered to be productive forest. The other 10 325 hectares (4 percent) are composed largely of non-productive areas, rock, lakes, and swamp. The land base currently considered available for timber harvesting is 63 777 hectares or 79 percent of the total forested area.

The topography of the area is variable, ranging from flat, alluvial river valleys to steep, rugged and rocky slopes. Most of the rivers in the TFL flow westward toward the coast. Rivers associated with smaller blocks located in the Cowichan Valley drain eastward through more gentle terrain. A temperate, wet climate prevails over the TFL, with an average annual precipitation of about 380 centimetres.

Most of TFL 46 is situated within the Coastal Western Hemlock (CWH) biogeoclimatic zone. Commercial tree species include western hemlock, western redcedar, Douglas-fir, amabilis and grand fir (balsam) and yellow-cedar. Minor volumes of Sitka spruce, pine, and red alder also occur on the TFL. Because of the relatively long logging history in this area, much of the TFL is covered by younger second-growth stands that have regenerated following harvest.

History of the TFL and the AAC

TFLs 22 and 27 were amalgamated in July 1983 to form TFL 46, held initially by British Columbia Forest Products Ltd. The original AAC for TFL 46 was set at 1 178 000 cubic metres and remained at that level until December 1990. During this time the TFL changed ownership from British Columbia Forest Products Ltd. to Fletcher Challenge Canada Ltd.

In January 1991, the AAC was reduced to 840 000 cubic metres to account for new measures for management and protection of non-timber resource values, a court injunction prohibiting harvesting on Meares Island and other factors. One year later the AAC was further reduced to 609 000 cubic metres as a result of the subdivision of TFL 46 into TFL 46 on southern Vancouver Island and TFL 54 in Clayoquot Sound on western Vancouver Island. In December 1992, an area of land capable of sustaining the Small Business Forest Enterprise Program (SBFEP) portion of the AAC was removed from the TFL, causing the AAC to be reduced to 558 860 cubic metres.

In December 1993, the TFL changed ownership from Fletcher Challenge Canada Ltd. to TimberWest Forest Ltd. In December 1996, the AAC was determined at 535 000 cubic metres and accounted for new protected areas as well as provisions for stand-level biodiversity and riparian areas. In October 1998, ownership of the TFL changed again when it was transferred to TFL Forest Ltd., a subsidiary of TimberWest Forest Ltd. As a result, the licensee's portion of the AAC was reduced to 514 804 cubic metres, and the difference, 20 196 cubic metres per year, was allocated to the SBFEP. In January 1999, 8018 hectares of mostly private (schedule A) land were deleted from the TFL in exchange for the Province acquiring several parcels of the licensee's private land elsewhere. As a result, the AAC was reduced by 52 260 cubic metres to its current level of 482 740 cubic metres. This figure has not yet been formally adjusted to reflect the removal of the BC Timber Sales operations from the TFL, as described under '*BC Timber Sales area deletion*'.

New AAC determination

Effective September 1, 2003, and before taking into account a reduction that will remain in effect for as long as part of the TFL is a "designated area" under Part 13 of the *Forest Act*, the new AAC for TFL 46 is 510 000 cubic metres. This represents an increase of 27 260 cubic metres (or 5.6 percent) from the current AAC.

By way of a separate Order issued under authority of Section 173 of the *Forest Act*, I have stipulated that the new AAC is reduced by 11 000 cubic metres beginning on September 1, 2003 and lasting for as long as part of Hill 60 remains a "designated area" under Part 13 of the *Act*. If and when that designation ceases, the AAC will revert to 510 000 cubic metres.

This AAC will remain in effect until a new AAC is determined, which may take place within five years of this determination, unless that date is formally postponed according to the provisions of Section 8 of the *Act*.

Information sources used in the AAC determination

- Existing stand yield tables for TFL 46, accepted by the former BCFS Resources Inventory Branch, May 22, 2001;
- Managed stand yield tables and site index curves, accepted by BCFS Research Branch, September 9, 2001;
- *Timber Supply Analysis Information Package for TFL No. 46*, Management Plan No. 4, TFL Forest Ltd., accepted April 24, 2001;
- *Timber Supply Analysis for TFL 46*, Management Plan No. 4, TFL Forest Ltd., accepted December 19, 2001;
- TFL No. 46, Management Plan No. 4, Twenty-Year Plan, TFL Forest Ltd., accepted December 14, 2001;
- *Management Plan No. 4: TFL 46*, TFL Forest Ltd., approved March 1, 2002;
- Tree Farm License 46 2000 Annual Report;

- Summary of Public Input solicited by the licensee regarding the contents of Management Plan No. 4;
- Submissions received from, and discussions with, First Nations on numerous occasions through 2002 and 2003;
- Site index Adjustments for Old-growth Stands Based on Veteran Trees, Working Paper 36, BCFS Research Branch, 1998;
- Site index Adjustments for Old-growth Stands Based on Paired Plots, Working Paper 37, BCFS Research Branch, 1998;
- TFL 46 Rationale for AAC Determination, Chief Forester, November 27, 1996;
- *TFL 46 Inventory Audit*, BCFS Resources Inventory Branch (now the Ministry of Sustainable Resource Management), draft report dated September 2001.
- Letter from the Minister of Forests to the Chief Forester, dated July 28, 1994, stating the Crown's economic and social objectives;
- Memorandum from the Minister of Forests to the Chief Forester, dated February 26, 1996, stating the Crown's economic and social objectives with regard to visual resources;
- Letter from the Deputy Ministers of Forests, and Environment, Lands and Parks, dated August 25, 1997, conveying government's objectives regarding the achievement of acceptable impacts of biodiversity management on timber supply;
- Letter from the Director of the Timber Supply Branch of the Ministry of Forests, dated April 19, 2001, entitled *TFL46 MP4 Timber Supply Analysis – BEOs*;
- Memorandum from the Director of the Timber Supply Branch of the Ministry of Forests, dated December 1, 1997, entitled *Incorporating Biodiversity and Landscape Units in the Timber Supply Review*;
- Letter from the Chief Forester dated June 6, 2001 entitled Forest Ecosystem Networks (FENs) and Landscape Unit Planning in Tree Farm Licences 44 and 46;
- Forest Practices Code of British Columbia Act, consolidated to July 2003;
- Forest Practices Code of British Columbia Act Regulations and Amendments, current as of July 2003;
- Forest Practices Code of British Columbia Guidebooks, BCFS and MELP;
- Identified Wildlife Management Strategy, BCFS and MELP, February 1999;
- Higher Level Plans: Policy and Procedures, BCFS and MELP, December 1996;
- *Landscape Unit Planning Guide,* Province of British Columbia, March 1999*;*
- Vancouver Island Summary Land Use Plan (VISLUP), February 2000;
- Vancouver Island Land Use Plan Higher Level Plan Order, December, 2000;
- Technical review and evaluation of current operating conditions through comprehensive discussions with staff of the BCFS and Ministry of Water, Land and Air Protection, including the AAC determination meeting held in Victoria on October 18, 2001.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological, and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural, and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for TFL 46, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for TSAs and TFLs. Section 8 is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester, which include those required under Section 8 of the *Forest Act*.

The chief forester has expressed the importance of consistency of judgement in making AAC determinations. I also recognize the need for consistency of approach and I am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 46.

Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. When a large number of determinations are made for many forest management units over extended periods of time, administrative fairness requires a

reasonable degree of consistency of approach in incorporating these changes and uncertainty. To make his approach in these matters explicit, the chief forester has compiled a set of guiding principles for AAC determinations. I have reviewed these principles and find them to be reasonable, and thus I have adopted and applied them as deputy chief forester in AAC determinations for TFLs. These principles are set out below. If in some specific circumstance it may be necessary to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge, a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation of current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to reduce the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although the Forest Practices Code has been fully implemented since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 46, as deputy chief forester, I have followed the same approach.

More recently, on November 21, 2002, government passed the new *Forest and Range Practices Act*, which is expected to take effect in late 2003, ultimately replacing the *Forest Practices Code of British Columbia Act.* As the timber supply implications of this new Act and any pursuant regulations become clear and measurable, they will be

accounted for in future AAC determinations. Uncertainties will continue to be handled as they have been under the current legislative regime.

As British Columbia progresses toward completion of strategic land-use plans, the timber supply impacts associated with the land-use decisions resulting from the various planning processes are important to AAC determinations. Where specific protected areas have been designated by legislation or by order-in-council, these areas are no longer considered to be part of the timber harvesting land base or to contribute to the timber supply in AAC determinations.

Because the outcomes of planning processes are subject to significant uncertainty until formal approval by government, it has been and continues to be the position of the chief forester that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions that have not yet been taken by government. I consider this approach to be reasonable and appropriate. Like the chief forester, I will therefore not take into account the possible impacts of existing or anticipated recommendations made by such planning processes, nor attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impact in a current AAC determination. In many cases, government's land-use decisions must be followed by a number of detailed implementation decisions. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five-year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

TFL 46 lies within the area covered by the Vancouver Island Land Use Plan (VILUP). A summary plan combining the various decisions and reports for land use on Vancouver Island was announced by government in February 2000. Elements of the plan were made binding in the VILUP Higher Level Plan Order promulgated in December 2000. The provisions of the Order are being implemented, and are reflected in this determination.

The Forest Investment Account (FIA) and its predecessor Forest Renewal BC funded a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. As with all components of an AAC determination, like the chief forester, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete but this will always be true where

information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs in the province between 1992 and 1996. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I have made allowances for risks that arise because of uncertainty.

Overall, in making this AAC determination, as deputy chief forester, I am mindful of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act* and of the chief forester's responsibilities under the *Forest Practices Code of British Columbia Act* and the *Forest Act*.

Guiding principles with respect to First Nations

With respect to First Nations' issues, I am aware of the Crown's legal obligations, particularly as clarified in judgements by the Supreme Court of Canada and the British Columbia Court of Appeal. The AAC that I have determined should not in any way be construed as limiting those obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 46.

The British Columbia Court of Appeal decided in March 2002 that the Crown has an obligation to consult with First Nations with respect to asserted rights and title in a manner proportional to the apparent strength of the claimed interests. As a matter of course, I consider any information brought forward by all parties respecting First Nations' interests. In particular I consider information related to actions taken to protect interests, including operational plans that describe forest practices designed to address First Nations' interests. In this context, I stress that my AAC determination does not prescribe a particular plan of harvesting activity, nor does it involve allocation of the wood supply to any particular party.

In this document I will address the factors specified in the *Forest Act*, and then will address the concerns that First Nations have raised during consultations over the past year.

Subsequent to this or any other AAC determination, if I become aware of information respecting First Nations' interests that would substantially alter my understanding of relevant circumstances, I may revisit my determination sooner than as required by the *Forest Act*.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review program for TSAs and TFLs.

For each AAC determination for a TFL, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short- and long-term harvest levels.

From this range of forecasts, one is chosen which attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productive potential of forest lands is maintained. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it. In some cases, an AAC is determined that coincides with the base case starting point. In other cases, an AAC is determined which differs significantly from the modeled starting point.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which assumptions made in generating the base case forecast are realistic and current, and the degree to which I believe the predictions of timber supply must be adjusted to more properly reflect the current and foreseeable situation.

These adjustments are made on the basis of informed judgement, using current available information about forest management, which may have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory flux, such as the enactment of the Forest Practices Code, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgements that may be based in part on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional

precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The timber supply analysis for TFL 46 was prepared by D.R. Systems Inc. and Sterling Wood Group Inc., under the direction of licensee staff. D.R. Systems Inc. used its proprietary timber supply model OPTIONS V to prepare harvest forecasts for the timber supply analysis. This model can be used to project spatially-*implicit* or spatially-*explicit* timber supply forecasts. Spatially explicit means that the model accounts for the spatial relationship between mapped cutblocks, whereas spatially implicit means that the model does not track cutblocks (i.e., it does not track the spatial relationship between cutblocks); rather it uses forest cover constraints to approximate the timber supply impacts of implementing spatial restrictions.

For this analysis, the licensee used OPTIONS V in a spatially-implicit mode for timber supply analysis, and the spatially-explicit mode to develop the associated twenty-year plan. Based on a review of the model by BCFS staff, I am satisfied that the OPTIONS V model as used in the analysis is capable of providing a reasonable projection of timber supply.

The timber supply analysis included assumptions based on the licensee's assessment of the best available information on current forest management, land base and timber yields for the TFL. These assumptions are discussed in the information package and in the timber supply analysis documentation which form integral components of the licensee's Management Plan No. 4.

Where I have concluded that an assumption was appropriately modeled in the base case, I will not discuss my considerations of it in this document, other than to note my agreement with the approach that is already documented in the licensee's analysis report. Conversely I will explain my consideration of any assumption that concerns me for any reason, such as lack of clarity in the analysis report, apparent divergence from current management practice, a high level of public input, or because it was an issue in the previous AAC determination for TFL 46.

In the base case, the licensee projected an even-flow harvest level of 590 000 cubic metres per year for 200 years. This harvest level is 22 percent higher than the current AAC of 482 740 cubic metres. There was no accounting in the base case for non-recoverable losses, which the licensee estimated in its information package to be equivalent to one percent of the gross harvest level (i.e., 5900 cubic metres per year). For the purposes of this document, I will consider the 'base case' harvest level to be 590 000 cubic metres per year, and I will discuss my consideration of the accounting for non-recoverable losses under '*Non-Recoverable Losses*' and '*Reasons for Decision*'.

In its analysis, the licensee initially proposed an AAC of 582 674 cubic metres per year derived as follows:

- 21 000 cubic metres per year of harvest volume from alder-leading stands would be added to the base case harvest level of 590 000 cubic metres per year;

The resulting harvest level of 611 000 cubic metres per year would be reduced by:

- one percent (6110 cubic metres per year) to account for non-recoverable losses;
- 1030 cubic metres per year to account for Special Management Zones (as discussed later in this rationale under '*Vancouver Island Summary Land Use Plan*');
- 1000 cubic metres per year to account for the increasing use of variable retention silvicultural systems (as discussed later in this rationale under '*silvicultural systems*'); and
- 20 186 cubic metres to account for the then pending deletion of area to remove SBFEP operations from the TFL.

Because of a calculation error identified in the alder rotation assumptions of the timber supply analysis, the licensee later revised its proposed harvest level to 586 382 cubic metres per year.

In the timber supply analysis, the licensee conducted various sensitivity analyses to assess the potential implications for timber supply arising from uncertainty in data assumptions and estimates. These sensitivity analyses have assisted me in my determination, as explained throughout this document.

As discussed throughout this rationale, and in consideration of the items described above, I am satisfied that the information presented to me provides an adequate basis from which I can assess the timber supply for TFL 46 in this determination.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

Land base contributing to timber harvesting

- general comments

The total area of TFL 46, as estimated from the licensee's inventory file, is 83 545 hectares. This area reflects the deduction of 7325 hectares of protected areas deleted through provisions of the *Protected Areas Forest Compensation Act (2002).* As well, the TFL area accounts for the deletion of 8197 hectares under Instrument 20and a 63-hectare reduction resulting from map errors and reconciliation of TFL boundaries to current government base map standards.

As part of the process used to derive the timber harvesting land base (i.e., the land base estimated to be available for harvesting), a series of deductions was made from the productive forest land base. These deductions account for ecological, economic or social factors that effectively reduce the amount of productive forest area that is available and suitable for harvest. For TFL 46 these deductions result in an assumed timber harvesting land base of 63 777 hectares, or approximately 79 percent of the productive forest land.

I have considered all of the deductions applied in the derivation of the timber harvesting land base for TFL 46 assumed in the base case. I accept the deductions applied to account for the Carmanah Walbran and Hitchie Creek provincial parks, the San Juan River Estuary and San Juan Ridge ecological reserves, non-forested areas, non-productive areas, inoperable areas, environmentally sensitive areas, sites with low timber growing potential, and areas with non-commercial forest. All of these factors are described in the licensee's information package, and I will not discuss them further in this document.

- BC Timber Sales area deletion

As discussed above under *'History of the TFL and AAC'*, in 1998 the licensee's portion of the AAC was reduced by 20 196 cubic metres as a result of a transfer in licence ownership. This volume was allocated to the government's Small Business Forest Enterprise Program (SBFEP), which has since been re-named BC Timber Sales (BCTS). Pursuant to section 56(9)(b) of the *Forest Act,* 4370 hectares were deleted from the TFL in order to remove BCTS operations from the TFL. That deletion was effective June 25, 2003 and was based in part on my determination that the area in question was capable of producing no more than the 20 196 cubic metres per year allocated to BCTS.

For this determination I conclude that the deletion of this area has reduced timber supply by approximately 20 200 cubic metres per year, relative to the base case projection. I will discuss this further under *'Reasons for Decision'*.

- roads, trails, and landings

In deriving the timber harvesting land base, a proportion of the productive forest was excluded to account for the loss of productive area resulting from the construction of roads, trails, and landings. Separate estimates were made for existing and for future roads, trails and landings, to reflect both current access as well as anticipated road network requirements over time.

1) existing roads, trails and landings

Roads wide enough to be classified as distinct areas in the forest cover inventory were excluded as non-productive forest deductions. To estimate the area occupied by existing unclassified roads, trails, and landings, the licensee used the road line features in its Geographic Information System (GIS) database. The roads were assumed to be 14 metres wide on average, which, when applied to the total length of road, resulted in a total estimate of 2561 hectares covered by existing unclassified roads, trails, and landings. A total of 2530 hectares were excluded on this account following other deductions (i.e., because some road area is located in areas already deleted in the analysis).

District staff suggest that the assumed 14-metre average width may be excessive for some existing roads. I note that neither the licensee nor BCFS district staff provided measured sample information to substantiate existing road widths on TFL 46. However, I am aware that the average width estimate used for TFL 46 is the same as the sample-based estimate for an adjacent management unit. In the absence of better information, and noting that the conditions on TFL 46 and the adjacent unit are similar regarding road widths, I accept the assumptions used in the base case as adequate for this AAC determination.

However, I encourage the licensee to collect local field data to better substantiate the widths and associated area occupied by roads, trails and landings for use in the next timber supply analysis.

2) future roads, trails and landings

Based on the assumption that timber within 200 metres of an existing road can be harvested without building additional roads, the licensee estimated the "roaded" area of the TFL to be 40 593 hectares. The proportion of roads, trails and landings in the roaded area was calculated to be 6.23 percent.

In the base case the licensee assumed that the same proportion calculated for the existing "roaded" area (6.23 percent) would become unproductive in currently "unroaded" areas, when roads, trails and landings are eventually constructed in those areas. Application of this assumption resulted in the exclusion of a further 1445 hectares of productive forest from the timber harvesting land base.

I have reviewed and discussed the information regarding future roads, trails, and landings with BCFS staff, who believe that the estimates are reasonable. Given that the future road estimate is based on the estimate for existing roads, the uncertainty around road widths also applies to the estimates for future roads, trails and landings. However, based on the field data in the neighboring management unit, I am satisfied that the base case estimates are reasonable for this determination.

If the licensee collects field data to confirm the widths of existing roads, trails and landings, those data will substantially inform estimates of future roads trails and landings for the next determination.

- deciduous-leading stands

Deciduous species on TFL 46 include alder, maple and cottonwood. About three percent (2400 hectares) of the forested area of the TFL consists of alder-leading stands. In the analysis, the licensee excluded these areas from contributing to timber supply in the base case.

The licensee indicates that alder stands are currently included in its forest development plans (FDPs) and are harvested according to economic opportunity. The licensee therefore conducted a sensitivity analysis to assess how much these alder stands would contribute to timber supply. In this analysis, the licensee assumed that alder-leading stands would be converted to Douglas-fir/western redcedar stands following harvest. The

analysis indicated that the timber supply projected in the base case would increase by 29 000 cubic metres per year (4.9 percent).

However, the licensee indicated that the yields from this sensitivity are probably overstated. It suggests that these stands are likely to always have a deciduous component and that if these stands are harvested, full conversion to Douglas-fir/western redcedar stands is unlikely. Based on an assumed shorter rotation and lower total yields at rotation age of alder-leading stands compared to Douglas-fir/western redcedar stands, the licensee estimated that the increase in timber supply associated with including deciduous stands in the timber harvesting land base would actually be about 24 700 or 14.8 percent less than the increase suggested by the sensitivity analysis. The licensee included this reduced incremental volume in its recommended AAC for the TFL.

Staff from the Ministry of Water, Land and Air Protection (MWLAP) expressed concern with the concept of converting deciduous-leading stands to coniferous stands, indicating that the former are relatively rare on the TFL and meet the definition of rare ecosystems. MWLAP staff indicated that these stands would likely be targeted for placement of old growth management areas (OGMAs). They suggest it is unlikely that 100 percent of such stands would be available for stand conversion. I note that the licensee also indicated it does not expect to convert all the alder-leading stands to conifer-leading stands.

In its 2000 Annual Report, the licensee indicated that about 1000 cubic metres of deciduous volume was harvested annually, on average, over the term of Management Plan No. 3. However, BCFS staff indicate that this deciduous volume was incidental volume harvested from within conifer-leading stands. Furthermore, staff indicate that the licensee proposes in its current FDP to harvest some conifer-leading stands with an alder component, but does not propose to harvest any alder-leading stands.

I am aware that alder-leading stands could provide significant volume if they were utilized. However, there is no evidence that the licensee has, or will do so. Furthermore, it is likely that OGMAs will be preferentially located in these stands, so that their contribution to timber supply would be somewhat less than the licensee's estimated contribution of about 24 700 cubic metres per year.

Given the lack of harvesting performance in these stands, and no likelihood that they will be utilized in the near term, I conclude it is appropriate to assume that deciduous-leading stands will not contribute to timber supply in the near term. Therefore I have made no adjustments to the base case on account of this factor.

In preparation for the next timber supply analysis, I request that the licensee monitor and document harvesting performance in deciduous-leading stands. If deciduous utilization increases significantly, that should be reflected in the next timber supply analysis.

- *timber licence area additions*

Instrument No. 2, dated March 17, 1987, amended TFL 46 Schedule "B" lands to specify that Timber Licence (TL) 0057 and Timber Sale Licence (TSL) A07065 would be included in the TFL following their harvest and reforestation. These areas have been harvested, and will be included in TFL 46 once the areas have reached free-growing status. When these areas are added to the TFL, the timber harvesting land base will

increase by 1697 hectares, with TL 0057 contributing 1554 hectares and TSL A07065 contributing 143 hectares.

In the base case for TFL 46, both areas were assumed to be included in the timber harvesting land base from the beginning of the forecast period. According to BCFS district staff, the transfer of TL 0057 is currently underway. However, district staff inform me that areas within TSL A07065 have not yet attained free-growing status, and so it has not yet been included in the TFL.

I have reviewed and discussed with BCFS staff the information concerning the areas to be added to TFL 46. I am satisfied that TL 0057 has reached free growing, and that pursuant to Instrument No. 2 this area will become part of the TFL in the near future. I am also satisfied that pursuant to Instrument 2, TSL A07065 will be added to the TFL at some time in the future. Having been harvested during the last 10 to 20 years, this area is of little consequence to short-term timber supply, but will contribute to mid- and long-term timber supply. Therefore, I find the assumptions concerning the TLs and TSL applied in the base case acceptable and make no adjustments on this account.

Existing forest inventory

- *general comments*

The original forest cover inventory data for TFL 46 was collected between 1967 and 1970, with inventories of older immature stands updated in 1976 and 1977.

For the analysis, the forest cover inventory was updated to account for harvesting and silvicultural activities to December 31, 1999. Based on the inventory information, 77 percent of the stands that contribute to the timber harvesting land base on TFL 46 are less than 140 years of age.

An inventory audit was conducted on the old forest cover inventory for TFL 46 in 1997 and the results were summarized in draft form. The preliminary audit results suggest that the volumes for mature stands projected by the inventory are acceptable. The results also suggest that site indices for stands between free growing and 60 years of age are underestimated using the inventory data.

Staff from the BCFS Coast Forest Region indicate that inventory data for TFL 46 are outdated and do not meet current Ministry of Sustainable Resource Management (MSRM) corporate data standards with respect to vegetation inventories.. They recommend that the licensee should conduct a Vegetation Resources Inventory (VRI) over the term of Management Plan No. 4.

I have reviewed and discussed the inventory information used in the analysis with BCFS staff, and I am satisfied that it comprises the best available information. However, I note that the inventory data are now over thirty years old, bringing increasing uncertainty to the projected inventory attributes. Although the preliminary results of the audit suggest that the mature volume estimates are acceptable, I encourage the licensee to pursue completion of a VRI for the TFL, so that more up-to-date information can be used in the next determination for TFL 46.

- *volume estimates for existing stands*

I have reviewed the information concerning volume estimates for existing stands and I accept the assumptions applied in the base case. I will therefore not discuss this factor further in this rationale.

Expected rate of growth

I have reviewed the procedures used in the analysis for aggregating individual stands into analysis units and deriving the volume estimates for managed stands and am satisfied that the assumptions for these factors appropriately reflect conditions on TFL 46.

- *site productivity estimates*

Inventory data include estimates of site productivity for each forest stand, expressed in terms of a site index that is based on a stand's height at a given age. The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

The most accurate estimates of site productivity can be derived from measurements in stands aged between 30 and 150 years. In stands less than about 30 years of age (particularly stands less then 15 years old), the growth history of trees has not been long enough to allow for accurate measurement of site productivity using conventional site index tools (site curves) with inventory estimates of height and age.

Site productivity estimates derived from measurements of older stands are often underestimated because the trees are well past the age of maximum height growth and may have been affected by disease, insects and top damage. As a result, when site productivity estimates from older stands are used to predict the growth potential of young replacement stands, future stand yield may also be underestimated.

This has been verified in several areas of the province where studies—such as the Old-Growth Site Index (OGSI) 'paired plot' project and the 'veteran' study—as well as results from using the Site Index Biogeoclimatic Ecosystem Classification System (SIBEC) suggest that actual site indices are frequently and significantly higher than those indicated by existing data from old-growth forests. In recent years it has been concluded from such studies that site productivity has generally been underestimated in older inventories; managed stands tend to grow faster than projected by inventory-based site index estimates from old-growth stands.

A comprehensive Terrestrial Ecosystem Mapping (TEM) project for TFL 46 was completed during the term of Management Plan No. 3. This information was used by J.S. Thrower and Associates to complete a site index study for the TFL. The study indicated that the site indices for Douglas-fir should be 24 percent greater than indicated by the inventory; those for balsam should be 10 percent lower; those for hemlock should be 10 percent greater; and those for western redcedar should remain unchanged.

The licensee used the study results in the base case by revising the site indices of all existing stands less than 45 years of age, and all regenerating stands.

The licensee also conducted a sensitivity analysis in which the inventory site indices were applied, instead of those derived in the Thrower study. The results showed that a harvest level of 508 000 cubic metres per year could be maintained over the forecast period—14 percent lower than the level projected in the base case.

BCFS Research Branch staff reviewed and accepted the site indices used in the base case. However, they noted there was particular uncertainty associated with the site indices applied for Douglas-fir stands because they may be based on plots located within fertilized stands. Staff indicate that, as a result, the site indices used for Douglas-fir may overestimate the actual site productivity.

I have reviewed and discussed the information regarding site productivity estimates with BCFS specialists. I note that the site indices applied in the base case are likely the primary factor influencing the higher harvest level projected in the 2001 timber supply analysis compared to the previous analysis.

In considering the site indices applied in the base case, I am satisfied that overall, the study results provide a better reflection of true site productivity than do the inventory data. I am mindful that the site index adjustments for Douglas-fir sites would overestimate productivity of those sites, if indeed the relevant sample plots were located in fertilized stands. However, I have no evidence that that is necessarily the case. I conclude that this issue introduces uncertainty into the base case projections, with a possible downward influence on the modeled timber supply.

- *use of select seed*

The Forest Practices Code requires the use of the best genetic quality seed and vegetative material available for regeneration. Select seed produced from seed orchards is the product of British Columbia's forest gene resource management program, which uses traditional tree breeding techniques to select naturally occurring, well-adapted, healthy and vigorous trees.

Select seed produces trees that grow faster than trees that are germinated from natural stand seed for a specific time, which varies by species and site. As a result, a stand that originates from select seed has a greater volume at the same age than does a natural stand with the same species composition.

The licensee maintains a seed orchard that provides select seed for TFL 46. According to the licensee, it has used select seed for Douglas-fir, western redcedar, and hemlock species planted in the past several years.

In the base case, the licensee applied volume gains for Douglas-fir and western redcedar of eight and five percent respectively, for stands regenerated after 1999. The estimates were based on research data from the licensee's seed orchard. Research Branch staff reviewed and accepted the gains applied in the analysis.

BCFS district staff have reviewed the information regarding the use of select seed and confirm that the information provided by the licensee reflects current practice on TFL 46.

Having reviewed the information regarding the use of select seed on TFL 46, and the analysis assumptions, I am satisfied that the best available information was used and I have made no adjustments to the base case projection on this account.

- *minimum harvestable ages*

In timber supply analysis, estimates are made of the earliest age at which a forest stand has reached a harvestable condition or has met minimum merchantability criteria. These assumptions largely affect when second-growth stands will be available for harvest in the model. In practice, many forest stands will be harvested later than the age at which they reach minimum merchantability, due to economic considerations and constraints on harvesting that arise from managing for other forest values such as visual quality, wildlife, and water quality.

The licensee has a long history of harvesting second-growth stands on TFL 46, and brought this experience to bear when developing the modeling assumptions for first entry or minimum harvestable ages. The licensee indicates the ages assumed in the analysis represent an approximation of second-growth stand conditions that allow for economic operability in most markets, and reflect current as well as predictable future market conditions.

In the timber supply analysis, and except for higher productivity sites, minimum harvestable age estimates were based on the age at which a stand's annual volume increment to that date has reached a maximum, otherwise referred to as the age of culmination of mean annual increment (CMAI). For the higher productivity sites, the minimum harvest age was set at the age at which the stand reached an average diameter at breast height of 30 centimetres and a volume of 300 cubic metres per hectare. The base case projects that timber will ultimately average about 70 years of age when it is harvested, which I note is older than experienced on the company's private land in the same region.

During the public review of draft Management Plan No. 4, some respondents expressed concern that the objective of harvesting at the assumed minimum harvestable ages was to maximize fibre production. The licensee indicated that the assumed piece sizes at those ages would allow it to extract the greatest value from the trees, and that it would harvest trees of this size only if it could do so in compliance with the Forest Practices Code and attendant regulations.

Public concern was also expressed that harvesting at the assumed minimum harvestable ages would sacrifice biodiversity. The licensee responded that harvesting at the younger ages improves harvest scheduling flexibility, allowing maintenance of biodiversity on other sites. The licensee further indicated that the TFL is covered with large areas of younger second-growth that have reached merchantable size. Without harvesting at younger ages, the licensee maintains that requirements such as cutblock size, adjacency

and green-up would lead to many stands being harvested at ages that are much older than culmination age, this depressing timber supply and economic activity.

I have reviewed the licensee's assumptions and the public comments regarding the minimum harvestable ages assumed in the base case. I accept the licensee's responses to the public concerns and agree that harvesting second-growth stands reduces the pressure to harvest old growth, thereby enhancing the flexibility to conserve biodiversity. Concerning the criteria used to define the assumed ages, I recognize the licensee's considerable experience in harvesting second-growth stands. While it is difficult to predict what economic factors will be exist when regenerating stands are eventually harvested, I note that licensees on Vancouver Island are currently, and increasingly, harvesting stands at ages in the range of those assumed in the base case, particularly on their private lands. I therefore accept the minimum harvestable age assumptions used in the base case as suitable for this determination.

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

Expected time for the forest to be re-established following harvest

I have reviewed the assumptions applied in the base case regarding regeneration delays and not-satisfactorily-restocked (NSR) areas and I am satisfied that they appropriately represent current practice. I will therefore not discuss these factors further in this rationale.

(iii) silviculture treatments to be applied to the area,

Silvicultural treatments to be applied

- *silvicultural systems*

Clearcutting, including clearcutting with reserves, is the principal silvicultural system used on TFL 46. Alternative silvicultural systems are sometimes employed to address specific management for resource values such as riparian habitat, ungulate winter range and scenic areas. In the base case, the licensee modeled only clearcutting. According to the licensee, the implications of using alternative systems to address the above-noted values are accommodated in the analysis through forest cover constraints and land base reductions.

I note that the licensee said in the current Management Plan that "TFL 46 is shifting to a variable retention (VR) system …", wherein "the size and distribution of the retained areas depends on site-specific conditions". It said that it "… intends to phase in the VR system by the year 2004" and "… the application of this system will evolve over time as the Company gains experience".

When the timber supply analysis was submitted, the licensee said that it expected to employ dispersed variable retention on up to one-third of the TFL, and use aggregate variable retention on the other two-thirds of the licence area. Very recently, however, the licensee has advised me that "after extensive experience with variable retention and consultation with external experts, TimberWest determined that for safety, productivity

and environmental reasons it is not feasible to achieve 100 percent variable retention on the Company's private and public lands". I am not clear on the extent to which this change in direction is meant to apply to TFL 46, given the intentions stated in the Management Plan.

Under the dispersed retention system, the licensee said that it planned to harvest about 95 percent of the stems on first entry (or after a normal rotation), while retaining the remaining five percent of stems for about twice the normal rotation before harvest. The licensee developed estimates of the volume loss associated with dispersed variable retention and indicates that maintaining stems for twice the rotation results in a 15 percent loss in mean annual increment of those stems. In addition, the licensee suggests that the yield of stems regenerating under the retained stems is reduced by about five percent.

Using these estimates, the total weighted impact on future yields of stands managed under dispersed variable retention was calculated to be 5.6 percent (based on 15 percent growth loss on the 5 percent of the initial stand that is retained, plus 5 percent growth loss on 95 percent of the regenerated stand). The overall impact on future yields (as opposed to short-term timber supply) for the TFL was estimated to be approximately two percent (i.e., one-third of 5.6 percent).

Under the aggregate retention system, portions of the existing older stands would be retained permanently, up to a maximum of 10 percent of the cutblock area. The licensee assumed that the regenerating stems would not experience any volume losses, noting that no losses are assumed from the impact of retention of wildlife tree patches (WTPs) and riparian buffers. Moreover, the licensee believes that the retention requirements will be met through existing reserves for riparian areas and WTPs, and as a result, there will be no additional retention operationally.

The licensee conducted a sensitivity analysis to test the timber supply implications of using dispersed retention. Using the assumptions described above, the modeled flat-line timber supply was reduced by about 1000 cubic metres per year (0.2%) over the forecast period compared to the base case projection.

Research Branch staff reviewed the assumptions regarding both dispersed and aggregate retention, and noted that the assumed yield reductions appear to be low. They point to the larger yield impacts assumed in the analysis for adjacent TFL 39, which were based on detailed research studies conducted by the holder of that licence. Furthermore, the TFL 39 licensee assumed that regeneration yields would be reduced in both aggregate and dispersed retention systems, relative to clearcut harvesting.

Staff from the MWLAP expressed concern that the licensee did not explicitly attempt to approximate variable retention in the timber supply model. In considering this input, I acknowledge that models should reflect practices as closely as possible. However, modeling techniques to reflect variable retention systems are still relatively new and evolving. Moreover, I note that the aggregate retention anticipated for two-thirds of the land base is handled in the analysis through assumptions for WTPs and riparian habitat.

I have reviewed the information relevant to modeled and actual silvicultural systems, and discussed it with BCFS staff. I note that there are several uncertainties associated with

the silvicultural systems to be employed on TFL 46. Until recently, harvesting was virtually entirely clearcut in nature; variable retention is only now being introduced, and no data are available to document the impacts on this TFL. While the accounting for WTPs and other reserves in the analysis likely does approximate to a large extent the retention expected to be practiced through aggregate retention systems, it does not reflect possible impacts due to dispersed retention, including the impacts that retained stems may have on the growth of regenerating stems.

I am aware that there is still considerable uncertainty associated with the magnitude of potential volume losses in regenerating stands as a result of either form of variable retention. This uncertainty will only be resolved through ongoing monitoring as experience is gained with this silviculture system. I am also aware that there is no explicit accounting in the analysis for the use of dispersed retention, and it is still not known to what percentage of the land base this system will apply. Another source of uncertainty is associated with the economics of returning to harvest residual trees in the dispersed retention approach.

I have concluded that the silvicultural system assumptions used in the base case were the best available information when the base case was crafted, but that they are clearly out of date. I believe that timber supply will indeed be somewhat less because of the introduction of variable retention logging, even if that is not the sole silvicultural system employed on the TFL. The reduction in timber supply will probably be at least as great as, and possibly greater than, the 1000 cubic metres indicated in the licensee's sensitivity analysis. To lessen this significant uncertainty, I request that the licensee monitor the impacts on timber supply as the use of variable retention increases so that those impacts can be reflected in the next analysis.

- *incremental silviculture*

Incremental silviculture includes activities such as commercial thinning, juvenile spacing, pruning, and fertilization that are beyond the silviculture activities required to establish a free-growing forest stand.

No commercial thinning has been conducted on TFL 46. However, primarily in the 1970s and 1980s, about 22 300 hectares of stands were juvenile spaced, making up about 35 percent of the timber harvesting land base and about 45 percent of the existing managed stands on the TFL. About 11 600 hectares of those stands were fertilized after spacing.

In its management plan the licensee says it will consider juvenile spacing where appropriate for employment and community stability purposes, but does not expect to undertake much of that work. The licensee also states that it will consider aerial application of fertilizer in suitable Douglas-fir stands.

Neither activity was explicitly modeled in the base case, wherein the 'TIPSY' growth and yield model assumed stand densities of 1200 stems per hectare at time of planting, and projected the growth of managed stands on that basis. It is not clear what the actual

densities of the treated stands were after spacing, nor is it clear what impact fertilization had on their growth rates.

I am aware that not accounting for historical juvenile spacing likely presents some risk to timber supply because the ultimate yields of spaced stands may well be less than if they had not been spaced (although the piece size of the resulting timber will likely be greater).. I asked BCFS staff to review the available information and estimate the risk posed to timber supply by the difference between the assumptions in the analysis and the reality of historical spacing and fertilization.

BCFS staff indicate that for Douglas-fir- and hemlock-leading stands, which together constitute the majority of the timber harvesting land base, volumes in the juvenile-spaced stands at harvest age could be less than was assumed in the analysis—the difference depending on the species composition, site index, and residual density of each spaced stand. Allowing for a volume increase in the stands that were fertilized, staff estimate that eventual yields for spaced stands could be overestimated by 5 percent or more if they are harvested at about 70 years of age. The over-estimate would be greater if site indices have been over-estimated, or if the stands are actually harvested at younger ages.

That estimated difference applies to stands making up about one-third of the timber harvesting land base, and initially suggests that the impact should be proportionately reduced for application to the full TFL. However, at some point in the future, the stands in question will support the majority of the harvest over a period of about 30 years. Consequently, to the extent that their ultimate yield may be overestimated in the base case, a shortfall could have a significant bearing on the continuity of timber supply.

To help me in my consideration of this factor, the licensee provided me with information based on operational timber cruise data for seventeen cutblocks that included spaced stands and for which the total cruised volume was just over 200 000 cubic metres.. Most of the blocks contained approximately 500 cubic metres per hectare, implying that the sample covered roughly 400 hectares. The total cruise volume was about 18 percent higher than would be indicated by application of the TIPSY yield tables. Unfortunately, it is not clear if the blocks consisted entirely of spaced stands, if any or all of them were fertilized, or if the sample was representative of the 22 300 hectares that were spaced.

In its timber supply analysis, the licensee provided a sensitivity analysis in which managed stand yields were reduced by 10 percent. It indicated that the short-term harvest level would decrease by 7.5 percent. A 5-percent reduction in managed stand yields would therefore likely result in about a 3.7-percent reduction in the timber supply. If this applied to only one-third of the timber harvesting land base (i.e., the portion that has been spaced), the impact would be about 1.2 percent overall. The impact on continuity of supply would be greater if the spaced stands are the sole source of timber over an extended period of time.

Having considered the information about the incremental silviculture assumptions, I conclude that there is considerable uncertainty about the impact that juvenile spacing and fertilization may have had on timber supply. I note that no impact was factored into the

base case, and that this uncertainty applies to about one-third of the timber harvesting land base. I will discuss this further under '*Reasons for Decision*'.

I request that the licensee evaluate the implications to timber supply of this issue, and lessen the amount of uncertainty associated with this factor in the next timber supply analysis.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

Timber harvesting

I have reviewed the information regarding utilization standards and the decay, waste and breakage factors assumed in the analysis for TFL 46, and I am satisfied that these factors were appropriately modeled in the base case. As a result, I will not discuss these factors in this rationale.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production,

Integrated resource management objectives

The Ministry of Forests is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

I have reviewed the information and assumptions regarding cutblock adjacency and green-up, recreation resources and visually sensitive areas in the analysis for TFL 46, and I am satisfied that these factors were appropriately modeled in the base case.

- *cultural heritage resources*

Cultural heritage resources typically include archaeological and traditional use sites. Archaeological sites contain physical evidence of past human activity, whereas traditional use sites may not necessarily contain historical physical evidence but may indicate current use by a First Nation. To help manage for unrecorded archaeological sites, archaeological overview mapping may be conducted to assign high, moderate or low ratings for archaeological potential within an area. This has been completed for a portion of TFL 46 in cooperation with the Ditidaht First Nation.

The majority of known cultural heritage resources that have required specific management provisions on TFL 46 are culturally modified trees (CMTs), defined as a cultural heritage resource under the *Forest Act*. CMTs that predate 1846 are protected under the *Heritage Conservation Act*. The licensee indicates that when CMTs are encountered and protection is necessary, they are largely accommodated in the protection of other resources, such as riparian areas, Environmentally Sensitive Areas and wildlife

tree patches. As a result, no explicit reductions to account for management of CMTs were applied in the analysis.

District staff agree that most of CMTs are located outside of the timber harvesting land base, and that where this is not the case, their protection has been appropriately handled at the operational planning level with little incremental impact to date.

Public input received indicated that some of the proposed blocks outlined in the licensee's twenty-year plan were located in an area currently being studied and of significance to First Nations. However, I note that the twenty-year plan is a modeling tool only, and does not necessarily reflect the location of the licensee's operations. Rather, actual locations are proposed, publicly reviewed, and evaluated as part of the required operational planning process.

The licensee indicates in its management plan that its objective for cultural heritage resources is to identify and manage these resources. It commits to continue to meet with, and conduct field reviews with, First Nations to identify resources, and to retain qualified archaeological consultants to locate areas of significance.

In a letter regarding the AAC determinations for TFL 44 and TFL 46, the Ditidaht and Pacheedaht First Nations expressed concern over the continuing supply of old-growth cedar. They specifically asserted that the Ministry of Forests is obligated to ensure a supply of 15 000 cubic metres per year of old-growth cedar for access by each First Nation. They further noted the lack of explicit accounting in the analysis for cultural heritage resources, and requested a minimum of 3.4 percent reduction to account for old-growth forest types within their traditional territories. They proposed that in order to protect the old-growth resource, the AAC should be partitioned to second-growth forest in a manner that is consistent with its occurrence on the timber harvesting land base.

I have reviewed the available information concerning cultural heritage resources and discussed it with BCFS and MWLAP staff. I acknowledge the concerns expressed by the Ditidaht and Pacheedaht First Nations regarding continued access to the cedar resource, a concern raised as well by Cowichan Tribes. I recognize that this may impact the licensee's operations but in the absence of detailed information, the specific implications to timber supply are unquantified.

I note that the licensee has agreed in writing to work with First Nations that have asserted cultural rights regarding cedar on the TFL in order to develop a strategy whereby TFL lands can contribute to meeting those needs. I also note that management for cultural heritage resources has not impacted on operations in any significant manner to date.

In the absence of better information, I conclude that the assumptions regarding cultural heritage resources adequately reflect current practices on TFL 46 for the purposes of this determination. I expect that the licensee will actively engage relevant First Nations groups to develop a cedar management strategy for inclusion in the next TFL management plan, which will be reflected in the next timber supply analysis.

- *watershed assessments*

Within TFL 46, coastal watershed assessments have been completed for Hatton Creek and Gordon River. The recommendations from the assessments were to reduce the impact of forestry activities on peak flows and stream sedimentation. According to the licensee, these recommendations are largely addressed at the operational planning level.

Approximately 46 percent of the Hatton watershed lies within the boundaries of TFL 46. The Gordon watershed contains a series of sub-basins and operationally, practices are assessed and managed at a sub-basin level. An area-weighted equivalent clearcut area (ECA) of 33 percent was assumed for both watersheds in the analysis. However, in the base case, the ECA forest cover requirements were applied at the watershed level rather than at the more constraining sub-basin level.

The licensee provided a sensitivity analysis to assess the timber supply impact of applying the ECA constraint according to the recovery curve described in the *Watershed Assessment Procedure Guidebook*, indicating that there was no measurable impact on timber supply.

District staff indicate that harvesting is currently restricted in some of the sub-basins within both the Hatton and Gordon watersheds due to ECA concerns. Staff indicate that these concerns should be alleviated in about 10 years time.

Having reviewed the watershed considerations assumed in the analysis, I note that the methodology followed by the licensee did not entirely reflect operational practices. The licensee did not model ECA constraints on a sub-basin basis, although operationally, management is conducted at this level. I therefore conclude that timber supply may be overestimated in the base case by a small, but unquantified amount on this account, and I will discuss this further under '*Reasons for Decision*'.

- *riparian habitat*

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserve zones (RRZs) that exclude timber harvesting, and riparian management zones (RMZs) that restrict timber harvesting in order to protect riparian and aquatic habitats. For each stream, lake or wetland, the RRZ and RMZ make up the entire riparian management area. Stream riparian classes are described in the *Riparian Management Area Guidebook* and are determined based on presence of fish, occurrence in a community watershed, and average channel-width criteria. The stream class is used to estimate the area required to be retained in the RRZ and the area or volume to be managed as the RMZ.

The licensee completed stream classification for TFL 46 in 1996 using 1:20 000 maps and aerial photos. The classification was incorporated into a Geographic Information System (GIS) database and included assignment of the six stream classes (S1-S6) described in the *Riparian Management Area Guidebook*.

Using GIS-based techniques, and widths specified in the guidebook, the licensee assigned the appropriate riparian buffers according to the classification of each stream. Double

buffers were applied to S1, S2 and S3 streams to account for RRZs as well as the RMZs. Percentage retention levels within the RMZs were estimated based on current practices and an equivalent area was excluded from the timber harvesting land base. A total of 1046 hectares were deducted for RRZs, and a further 610 hectares for RMZs along streams in the derivation of the timber harvesting land base.

Lakes and wetlands were buffered according to their riparian classification, and in the analysis, area was excluded from the timber harvesting land base to account for management practices in both the reserve and management zones.

MWLAP staff suggest that the information used by the licensee was likely outdated and did not adequately reflect operational practices under the Code and as represented in silviculture prescriptions. MWLAP staff indicate that the licensee should have compared data from silviculture prescriptions to the older stream inventory data, to confirm the accuracy of the information and account for smaller streams that may have been missed because of the larger-scale maps used in the GIS exercise. MWLAP staff are further concerned that the base case did not account for recreational fishing corridors that have been identified on an ongoing basis since 1991 and which follow several of the streams and rivers on TFL 46. The licensee indicates that the riparian buffers capture a substantial proportion of the recreational fishing corridors.

BCFS district staff advise that these corridors are not currently recognized under the Forest Practices Code or in operational planning. District staff also note that while some of the S6 streams may indeed not be captured by the stream inventory used, the licensee is retaining less area operationally in riparian management zones than was assumed in the analysis.

I have reviewed the methodology and assumptions applied in the analysis to account for riparian areas. Regarding the assumptions used to account for riparian areas adjacent to lakes and wetlands, I am satisfied that current management was adequately reflected in the base case. I do, however, request that the licensee monitor and document retention levels within riparian areas adjacent to lakes and wetlands.

Regarding the assumptions for streams, I have concluded that the information used by the licensee reflects the best available information. While there is some uncertainty associated with the average retention levels in RMZs, I am satisfied that a reasonable methodology was used and find it likely that the deductions employed in the analysis approximate those required under the Forest Practices Code. For this determination, I therefore accept the reductions as adequate for this determination, and will make no adjustments to the base case. However, for the next analysis, I request that the licensee review the available operational data to confirm the retention levels within RMZs, and as well confirm the assumed lengths and classifications of streams. Any new information can be incorporated into the next timber supply analysis.

- wildlife habitat

1) identified wildlife

Identified wildlife refers to species at risk (red- and blue-listed) as well as regionally significant species that are potentially affected by forest management activities and that may not have been adequately accounted for through existing management strategies. While the biodiversity and riparian provisions of the Forest Practices Code are intended to provide for the needs of most wildlife species, some species that are considered to be "at risk" require special management practices. The Province's *Identified Wildlife Management Strategy* (IWMS)—released in February 1999—provides mechanisms for managing critical habitat for identified wildlife species including Wildlife Habitat Areas (WHAs), General Wildlife Measures (GWMs) and higher level plan recommendations.

For wildlife species considered at risk, the Conservation Data Centre of British Columbia maintains tracking lists for each forest district. Each list names the species and plant associations considered to be at risk (e.g., endangered, threatened, vulnerable or sensitive) and which are known to occur, are strongly expected to occur, or have occurred in the past within a given forest district.

On TFL 46, identified wildlife species that are known to be in possible conflict with forestry operations include Marbled Murrelet and Queen Charlotte Goshawk.

In November 1998, the licensee submitted a letter to the district manager indicating that BCFS, Ministry of Environment, Lands and Parks (MELP) and licensee staff had reached a non-binding agreement on the location of, and interim management for, Marbled Murrelet habitat management areas. MWLAP (formerly MELP) staff indicate that about 22 areas were originally identified on the TFL that had forest cover attributes potentially suitable for Marbled Murrelet habitat. Through subsequent assessment of habitat suitability and ground verification, eight areas totaling about 2000 hectares were described as Marbled Murrelet management areas. The licensee agreed in the November 1998 letter to defer harvest in these areas until such time as WHAs could be established or OGMAs delineated.

Approximately 1000 hectares of the proposed areas fall within the timber harvesting land base assumed in the base case. No harvesting has occurred in these areas since November 1998. However, because land-use decisions through a formal process have not yet been made for the areas, no explicit land base deductions were made in the base case to account for the management of Marbled Murrelet.

In the analysis, no specific land base deductions were applied to account for the establishment of WHAs or implementation of GWMs for other identified wildlife species. The licensee notes that it expects the majority of WHAs to be placed in the existing grandparented wildlife areas in TFL 46, or to be contained within OGMAs. A WHA has since been established on the TFL for a Queen Charlotte Goshawk nest. MWLAP staff indicate that this area, comprising 2135 hectares, is subject to specific management including a small no-harvest zone and requirements of meeting seral stage

objectives for a broader area. No specific sensitivity analysis was conducted to assess the impact of the WHA or the potential impact of excluding the eight Marbled Murrelet areas from contributing to timber supply.

I have considered the information about the identified wildlife species including the WHA established for Queen Charlotte Goshawk, the habitat considerations for Marbled Murrelet, as well as other species expected to be present on TFL 46. The eventual location and precise amount of WHAs that will be required on TFL 46 to fully implement the IWMS have not yet been established. I note that government has, in general, limited the impact of management for identified wildlife in the short term to a maximum of one percent of the harvest level for the province.

Given the Province's commitment to implementing the IWMS, and given the policy decisions and projected one-percent impact — and noting the occurrence of identified wildlife such as Marbled Murrelet and Queen Charlotte Goshawk within TFL 46 — I find it necessary and appropriate to account for an expected but not yet quantified impact on the timber supply of TFL 46. In the absence of specific information and analysis, I will assume a one-percent impact on timber supply, which I consider accommodates the established WHA as well as those likely to be established in the future. I will further discuss my considerations of this information under '*Reasons for Decision*'.

I encourage the licensee to continue to work with MWLAP and BCFS staff to assess the need for WHAs and appropriate GWMs on TFL 46. As the Province implements its strategy for the management of species at risk, I expect the specific implications to be reflected in future timber supply analyses and these will be taken into account in future AAC determinations.

2) ungulate winter range

For TFL 46, the ungulate winter range (UWR) areas assumed in the 2001 timber supply analysis are very similar to those used in the previous analysis. These areas total 2448 hectares, were grandparented under the Forest Practices Code *Operational Planning Regulation*. Of this area, 1631 hectares were excluded in deriving the timber harvesting landbase, the remainder having already been excluded for other reasons. Over the term of Management Plan No. 3, licensee and MWLAP staff worked together to assess UWR boundaries for TFL 46, and jointly issued a memo on April 26, 2001 in an attempt to clarify the boundaries. According to this memo, the area of timber harvesting land base considered to be UWR was 1869 hectares, or 238 more hectares than assumed in the base case of the analysis.

BCFS and MWLAP staff have reviewed the ungulate winter range assumptions used in the 2001 analysis, and note that three UWR polygons totaling 58 hectares, that were identified in the previous management plan, were not excluded from the timber harvesting land base in the latest analysis. MWLAP staff also note that two areas important for elk were not excluded in the analysis. BCFS staff advise me, however, that in both cases, these areas are very small and their exclusion would have a negligible impact on timber supply.

In this context, the Ditidaht First Nation requested a commitment from the licensee to jointly manage the elk herd at Tuck Lake. The licensee noted in its summary of response to public input that it was working with the First Nation on elk management. The Cowichan Tribes also expressed concern over habitat management for ungulates. To address these concerns, I request that the next TFL management plan include a habitat conservation strategy for ungulates, to be reflected in the next timber supply analysis.

I have reviewed and discussed the information regarding UWR with BCFS and MWLAP staff. Although I acknowledge that current practice was not entirely reflected in the analysis, I am satisfied that the minor adjustments to more accurately reflect current practices would have a negligible impact on timber supply. Therefore, I accept the assumptions for the purposes of this determination.

I am aware that government policy requires that UWR boundaries be finalized by October 2003, and therefore I expect that these areas will be more precisely reflected in the next timber supply analysis.

- *landscape-level biodiversity*

Biodiversity is defined as the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems and the evolutionary and functional processes that link them. Under the Forest Practices Code, biodiversity in a given management unit is assessed and managed at both the landscape and stand levels.

Achieving landscape-level biodiversity objectives involves maintaining forests with a variety of patch sizes, seral stages, and forest stand attributes and structures, across a variety of ecosystems and landscapes. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species that are dependent on or are strongly associated with old-growth forests. Although some general forest management practices can broadly accommodate the needs of most ecosystems, more often a variety of practices are needed to represent the different natural disturbance patterns under which ecosystems have evolved.

The delineation and formal designation of ‘landscape units’ is a key component of a sub-regional biodiversity management strategy. A landscape unit is an area established by the Designated Decision Maker (DDM) of the Ministry of Sustainable Resource Management, generally up to 100 000 hectares in size, based on topographic or geographic features such as a watershed, or series of watersheds, to manage biodiversity and other forest resource values.

The *Biodiversity Guidebook,* the *Landscape Unit Planning Guide* and *Higher Level Plans: Policy and Procedures* all provide policy and guidance on management for landscape-level biodiversity. The *Landscape Unit Planning Guide* provides guidance on which components of the full range of recommendations included in the *Biodiversity Guidebook* should be implemented to achieve a balance of forest management objectives. The *Landscape Unit Planning Guide* contains forest cover constraints for old seral forest

that are recommended for application at the biogeoclimatic variant level within each landscape unit. The recommendations are stated as a minimum percentage of the productive forest to be retained in stands above a specified age that varies by ecosystem type. The guide also allows the old seral requirement to be phased in over time in landscape units with a lower biodiversity emphasis.

The 1996 Higher Level Plans: Policy and Procedures guide provides further policy guidance. It outlines three biodiversity emphasis options (BEOs)—lower, intermediate and higher—that may be employed when establishing biodiversity management objectives for a landscape unit. To achieve a balance between biodiversity and timber supply objectives, this guide recommends the application of a mix of BEOs in each sub-regional planning area. The proportions of a planning area subject to lower and intermediate biodiversity emphasis should range from 30 to 55 percent, with the average at approximately 45 percent of the area subject to lower, 45 percent to intermediate, and 10 percent to a higher BEO (45-45-10).

Landscape unit boundaries have not yet been formally established for the area of TFL 46. However, draft landscape units, described as the Caycuse, Cowichan, Gordon, Nitinat, San Juan, and Walbran, have been delineated for the main body of the TFL, as well as smaller blocks of TFL 46, located on the east coast of Vancouver Island. Draft BEOs are available for these landscape units, and in the base case, old seral requirements were modeled in accordance with these draft BEOs and landscape unit boundaries.

One key assumption in the analysis for TFL 46 was that the old seral requirements were assumed to be met entirely from within the boundaries of the TFL, although both Schedule A (private land and timber licences) and Schedule B (Crown land) areas were assumed to contribute.

Another key assumption was that designated protected areas, although excluded from the timber harvesting land base, will contribute to forest cover objectives within their respective draft landscape units. Thirdly, as a modeling parameter, old-growth retention was phased in over three rotations in landscape units with a lower BEO. And lastly, only old seral stage retention constraints were employed; the retention of minimum amounts of "mature-plus-old" forest was not modeled in the base case.

BCFS staff have reviewed the assumptions used in the base case and indicate that the licensee used standard procedures for modeling landscape-level biodiversity.

A number of Forest Ecosystem Networks (FENs) are located within the boundaries of TFL 46. As discussed later under *Forest Ecosystem Networks*, the intent is that the FENs will eventually be superceded by old growth management areas (OGMAs) once landscape unit planning is complete. I understand that the licensee is currently working closely with MSRM staff to initiate this work.

The Vancouver Island Higher Level Plan (HLP) Order also outlines specific seral stage targets for resource management zones, and delineates special management zones, two of which occur within the TFL area. The specific implications of the HLP Order to

landscape-level biodiversity requirements on TFL 46 are discussed later in this rationale under *Vancouver Island Summary Land Use Plan*.

In summary, I have reviewed the information and assumptions regarding landscape-level biodiversity on TFL 46 and have discussed them with BCFS staff. I note that the assumptions incorporated in the base case are consistent with standard procedures and are therefore acceptable for this determination.

- *stand-level biodiversity*

Stand-level biodiversity is managed by retaining reserves of mature timber, or wildlife tree patches (WTPs), within cutblocks and in adjacent inoperable and other retained areas to provide structural diversity and wildlife habitat. The *Landscape Unit Planning Guide* (LUPG) outlines procedures and makes recommendations on the proportion of a cutblock that is required in wildlife tree retention.

As a condition of his approval of Management Plan No. 3, the chief forester indicated that it was unclear whether the areas and volumes in WTPs in planned cutblocks were intended to be temporarily or permanently set aside. In addition, it was not clear whether they were intended to specifically contribute to stand-level or landscape-level biodiversity, or some other objective.

As a result, the chief forester requested that the licensee develop a system for tracking the areas and volumes of trees and patches set aside for wildlife tree retention. During the term of Management Plan No. 3, the licensee commissioned a report to fulfill this request. Data collected by the licensee between December 1996 and May 2000 suggest that wildlife tree patches encompassed, on average, 8.1 percent of the gross cutblock area. Further evaluation of these areas indicated that 4.7 percent of the gross cutblock area—or 60 percent of total WTP area—was located within areas otherwise available for timber harvesting. However, in the timber supply analysis, the licensee assumed that on average, 25 percent of the stand-level biodiversity requirements would be met from areas within the timber harvesting land base. The licensee therefore applied a land base deduction of 2 percent (i.e., 25% x 8.1%) to account for WTPs.

Although 25 percent is consistent with the default value recommended in the LUPG, it is significantly lower than the proportion (i.e., 60 percent) suggested in the licensee's report. BCFS and MWLAP staff have reviewed the licensee's report and the LUPG. They indicate that the 4.7 percent reduction, rather than the 2 percent reduction assumed in the base case, would better reflect current practices on TFL 46. Based on the licensee's sensitivity analysis in which the timber harvesting land base was reduced by 5 percent, applying a 4.7 percent reduction for WTPs would likely reduce the base case harvest projection by about 2 percent.

Having considered the information regarding WTPs, and drawing on the results of the licensee's sensitivity analysis, I have concluded that the analysis assumptions likely underestimate the impact on the timber harvesting land base of managing for stand-level biodiversity on TFL 46. I will therefore take into account that timber supply has likely

been overestimated by up to 2 percent on this account, and will discuss my considerations further under '*Reasons for Decision*'.

I encourage the licensee to continue to monitor the proportion of area retained for stand-level biodiversity during the term of this AAC determination. Any new information can be incorporated into the next analysis.

- *forest ecosystem network*

During the early 1990's, a forest ecosystem network (FEN) was established over 15 000 hectares of forested area in TFL 46. The purpose was to provide for natural connectivity of mature and old-growth forests and to maintain biodiversity values until such time as landscape-unit planning was completed, at least to the point of creating old growth management areas (OGMAs). Those OGMAs would supercede the approach inherent in the FEN areas, and therefore the FEN areas were scheduled to expire on June 15, 2003 as stipulated in the Forest Practices Code *Operational and Site Planning Regulation*.

Landscape-unit planning has been slower than anticipated, and the *Regulation* was amended to remove the June 15, 2003 expiry date, and to instead specify that the FEN areas shall remain in effect in each landscape unit until OGMAs have been established in that landscape unit.

The FEN areas were assumed to contribute to timber supply in the base case. The licensee indicates that FEN areas consist of 47 percent old-growth stands, and that OGMAs will be established in some FEN areas, having a negative impact on timber supply relative to what is portrayed in the base case. The licensee therefore provided sensitivity analyses to show the potential impact on timber supply of maintaining the FEN areas. The results showed that, if old seral stage constraints are imposed and all of the FEN areas are unavailable to harvesting, timber supply would be reduced by six percent over the forecast horizon compared to the base case projection (I note that this outcome is much less than the proportion of the modeled timber harvesting land base covered by FEN areas because many of those areas are constrained for other reasons). Conversely, if old seral stage constraints are <u>not</u> imposed, and all of the FEN areas are unavailable to harvesting, timber supply would be reduced by 3 percent compared to the base case. What is not clear from the analysis is the extent to which retention of all the FEN areas would meet the old seral stage targets.

I have discussed the FEN situation with BCFS district staff and have studied the input from MSRM, MWLAP, and licensee staff. I also acknowledge the large number of public comments expressed concern about the inclusion of FEN areas within the timber harvesting land base. I note that no one knows what proportion of the FEN areas will become OGMAs, but it is unlikely that all will be. I have therefore concluded that timber supply projected in the base case may be overestimated by something less than six percent over the planning horizon. I will further discuss this in "*Reasons for Decision*".

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

Harvest profile and sequencing

I have considered the base case assumptions concerning the harvest profile and sequence of harvesting, and I am satisfied that they were appropriately modeled. As a result, I will not discuss my considerations in detail in this document.

First Nations considerations

Several First Nations groups have expressed an interest in areas within TFL 46. These are Chemainus First Nation, Cowichan Tribes, Ditidaht First Nation, Hul'qumi'num Treaty Group, Lake Cowichan First Nation, Pacheedaht First Nation, T'sou-ke First Nation, Malahat Indian Band, and the Te'Mexw Treaty Association.

All of the above-listed First Nations groups were sent a copy of the TFL Information Package and Timber Supply Analysis, along with an invitation to meet with BCFS staff. I am aware that the licensee indicates in Management Plan No. 4 that it actively participates in consultations with First Nations on resource-related issues. In addition, the standard Ministry of Forests consultation policies apply to operational planning, as outlined in the Ministry of Forests *Policy on Aboriginal Rights and Title*, and associated Consultation Guidelines. The licensee notes in its management plan that resource users and stakeholders may participate in the planning process for TFL 46 through the public review processes of each draft forest development plan and draft management plan.

I am aware that the Te'mexw Treaty Association, Hul'qumi'num Treaty Group, and the Ditidaht and Pacheedaht First Nations are all engaged in treaty negotiations under the British Columbia Treaty Process. I am also aware of the Hw'teshutsun Interim Measures Agreement with Cowichan Tribes; the Interim Measures Memorandum of Understanding with the Ditidaht and Pacheedaht First Nations; the Agreement Respecting Management of Forest Resources with the Te'mexw Treaty Association; and the Agreement Respecting Management of Forest Resources with the Hul'qumi'num Treaty Group.

I am aware that the Ditidaht First Nation have expressed concerns about:

- sustainability of old growth, especially cedar;
- maintenance of biodiversity and key heritage sites;
- the balance of harvest across species and between old growth and second growth;
- maintenance of visual quality in the Nitinat viewscape;
- continuing public access to the Tuck Lake area; and
- the unknown impacts of the variable retention silviculture system.

I am aware that the Ditidaht and the Pacheedaht are now at stage four of the six-stage treaty process, negotiating an Agreement in Principle. Canada and British Columbia presented an offer to the Ditidaht and Pacheedaht in October 1999, which included 1802 hectares of land and 17 million dollars. The Ditidaht and Pacheedaht are implementing interim measures agreement with British Columbia for the direct invitation of a 300 000 cubic metre timber sale licence over 10 years, and an economic measures

agreement for $258 000 over three years. Canada is also seeking to contribute matching funds to the economic measures agreement through their programs for the same three year period. This combined funding will be used for training and business development, resource planning, and governance skill development. I am aware that in January, 2003 the Minister of Forests invited the Ditidaht and Pacheedaht Bands to apply for a timber sale licence that would allow for the harvest of 300 000 cubic metres within TFL 46 over a ten-year period. The First Nations submitted an application on March 5, 2003 and the Minister has subsequently directed the regional manager to enter into a timber sale licence with the applicants, subject to agreement on the terms and conditions of the licence.

I note that the T'sou-ke First Nation and Malahat Indian Band — both part of the Te'mexw Treaty Association — have stated an interest in portions of TFL 46. The Te'mexw Treaty Association is now in stage four of the six-stage process, negotiating an Agreement in Principle, and I understand that it did not specifically comment on draft Management Plan No. 4 for TFL 46, or on the material underlying this AAC determination.

The Hul'qumi'num Treaty Group (on behalf of the Chemainus First Nation, Cowichan Tribes, Halalt First Nation, Lake Cowichan First Nation, Lyackson First Nation and Penelakut Tribe) is now in stage four of the treaty process, negotiating an Agreement in Principle. I am aware that the Hul'qumi'num Treaty Group has negotiated a memorandum of understanding with Canada and the Province that identifies certain treaty-related measures concerning the "Hill 60" (Hw'teshutsun) area, part of which is now a "designated area" under the Part 13 of the *Forest Act*. For the duration of the Part 13 designation, timber harvesting is prohibited within the designated area.

I am also aware that Cowichan Tribes have entered into an Interim Measures Agreement that speaks to:

- management of the Hill 60 area;
- acquisition of a community forest pilot agreement that would authorize a harvest of 10 000 cubic metres per year (which is now in the public review and comment stage);
- acquisition of a timber sale licence for 2000 cubic metres; and
- establishment of a forestry economic development fund of $1.7 million over four years, the funding to be provided by Canada and the Province.

I have met directly with the Cowichan Tribes on three occasions in order to discuss their interests and concerns regarding the AAC determination. During those discussions the Cowichan Tribes:

- asserted aboriginal title to a portion of the land and related resources within TFL 46;
- expressed concern that the AAC decision may allow resources to be depleted in this area at an unacceptable rate;
- asked me to either remove land from the timber harvesting land base to ensure that unharvested Crown land remains available for treaty settlement, or else "partition" the AAC to constrain harvesting in the Cowichan Valley portion of the TFL;

- argued that old-growth needs to be preferentially retained and recruited so that it makes up about 15 percent of the forest cover on the portion of TFL 46 that is in the Cowichan Valley;
- proposed a certain distribution of structural stages for the forest cover on the Cowichan Valley areas; and
- asserted that the government's socio-economic objectives, as expressed to date by the Minister, do not adequately protect First Nations' interests.

In response to the Cowichan Tribes requests, I believe it is important to note that a timber harvesting land base (THLB) is not a legal construct, but rather is only an area assumed to contribute to timber supply in a given management unit for the purposes of modeling that supply. In every case, a THLB is an area derived by excluding areas which are not expected to contribute to timber supply because harvesting is constrained for some reason, typically those described in this document. An assumed THLB is not binding on anyone; nor does the derivation of an assumed THLB constrain harvesting operations in areas outside that area. Constraints of that nature are only imposed by legislation and certain instruments that flow from that legislation. Although an AAC determination does have a significant bearing on the scale of harvesting in a given management unit, it is not such an instrument. Hence in this context it is not appropriate for me to remove area from the THLB assumed by the licensee in the timber supply analysis under discussion in this document.

I am aware that a major issue facing Cowichan Tribes in any treaty settlement is the preponderance of private land, and hence shortage of Crown land, in its area of interest. In recognizing this, the Province has "designated" the Hill 60 area within the Cowichan Tribes' asserted traditional territory and prohibited logging in that area. The *Forest Act* authorizes the chief forester (and by extension the deputy chief forester) to reduce the AAC of the relevant management unit to reflect such a logging prohibition, and through an instrument separate from this AAC determination, I have reduced the AAC for TFL 46 by 11 000 cubic metres for the duration of the designated area status of Hill 60.

I am especially attuned to the fact that First Nations on the Coast generally require access to suitable cedar for cultural and traditional uses. I expect that their acquisition of new harvesting tenures will help in that regard. However, that does not address the question of whether suitable cedar is being adequately conserved and/or recruited to ensure long-term supply. In that context, I note that the chief forester recently asked the Coast Forest Regional Manager to initiate a project that will determine the quantity and quality of cedar needed by First Nations for cultural and traditional uses, the apparent supply that presently exists, and what mechanisms are in place or are needed to facilitate access to that supply. The Regional Manager will engage First Nations, forest companies, and others in making these assessments.

With respect to TFL 46 in particular, the licensee provided me with information indicating that cedar species make up 24.7 percent of the volume in stands older than 120 years within the timber harvesting land base. The figure for stands older than 50 years in the timber harvesting land base is 17.9 percent. Based on the distribution of age classes shown in the timber supply analysis, I infer that the percentage of cedar

species in stands between 50 and 120 years in the timber harvesting land base is something less than 10 percent.

I understand that 23.5 percent of the harvest from 1992 through 2001 consisted of cedar, which accords closely with the percentage of cedar in stands older than 120 years (virtually all of which are in fact older than 250 years) but which is significantly higher than the inferred percentage in younger stands. This may or may not be a problem with respect to cedar conservation because what matters is how much cedar remains now and in the future, and what the quality of that cedar will be.

My conclusion is that most First Nations concerns relate more to operational planning, and to management strategies that should be enunciated in the TFL management plan, than they do to the AAC. That is because the AAC is primarily an outcome based on analysis of the physical circumstances of the TFL, and how the area is being managed. I believe that the proper way to address the First Nations' concerns is in development of the next version of the TFL management plan, and in reviews of operational plans. I will speak to this under '*Reasons for decision*'.

As I noted under '*Guiding Principles*', the AAC that I determine should not in any way be construed as limiting the Crown's obligations resulting from recent court decisions. As I make my AAC determination, I am mindful of the responsibility of other statutory decision-makers to administer the determined AAC consistently with other legislation, and with relevant court decisions respecting the First Nations' interests.

Vancouver Island Summary Land Use Plan

Strategic plans establish the broader context for operational plans by providing objectives for managing forest resources in a given area. Several types of strategic planning processes give direction to a licensee's operational planning, and to those who approve or reject operational plans. Distinction must be made between legally binding higher level plans under the Forest Practices Code, and non-binding regional or sub-regional land-use plans (most notably, Land and Resource Management Plans). Elements of the latter may be declared as binding higher level plans. A higher level plan defined under the Forest Practices Code establishes government's social, economic or environmental objectives, thereby setting the resource management context for developing subsequent operational plans.

The *Vancouver Island Summary Land Use Plan* (VISLUP) encompasses the whole of Vancouver Island, including the area of TFL 46. Some of the objectives of the VISLUP were made binding by government when it promulgated the *Vancouver Island Higher Level Plan Order* in December 2000. The Order defines certain protected areas and specifies provisions for managing visual quality, landscape biodiversity, wildlife habitat and riparian areas. Three general resource management zones and one enhanced forestry zone were designated under the higher level plan.

Two of the designated special management zones (SMZs 21 and 22) encompass about 3500 hectares in the San Juan Ridge and Walbran areas of TFL 46. At the time the analysis was initiated, the *Order* had not yet been legally established, and therefore its

constraints were not modeled in the base case. However, the licensee conducted a sensitivity analysis in which it assumed that management within the SMZs would result in a reduction in the volume available from these areas by 10 percent, which in turn would reduce overall timber supply by one percent relative to the base case. The lower green-up heights applicable to the enhanced forestry zone were not modeled in the sensitivity analysis.

Having reviewed the information, I am aware that the full implementation of the *Vancouver Island Higher Level Plan Order* was not reflected in the base case. I expect the licensee will do so in the next analysis for TFL 46. I have no evidence to indicate whether the licensee's assumption of a 10-percent impact within the SMZs is, or is not, reasonable. For this determination, I conclude that harvesting constraints inherent in the *Order* will reduce timber supply from TFL 46 by an unknown amount.

Hill 60

As mentioned above, Hill 60 is an area located in the Cowichan Valley, a portion of which has been claimed by the Cowichan Tribes as a spiritually significant area. Hill 60 contributes approximately 3660 hectares to the modeled timber harvesting land base. In response to First Nations concerns over the area, the licensee has voluntarily deferred harvesting in this area for the past several years.

A portion of Hill 60 was specified as a designated area under Part 13 of the *Forest Act* on April 2, 2001. I understand the "designated area" totals 1632 hectares, of which 1300 hectares is in the timber harvesting land base assumed in the base case. No specific AAC reduction under Part 13 of the *Forest Act* was made at the time, in large measure because this new AAC determination was on the horizon. The designated area status of Hill 60 was due to expire on March 31, 2003 but has since been extended to March 31, 2005.

In the base case analysis, the designated area was assumed to contribute to timber supply. However, the licensee did sensitivity analysis to assess the impact of excluding the entire 3845 hectares of Hill 60, of which 3661 hectares had been included in the assumed timber harvesting land base. The sensitivity analysis indicated that timber supply would be reduced by 32 000 cubic metres per year, or 5.5 percent relative to the base case on this account. Assuming the smaller area that was actually "designated" makes a proportional contribution to timber supply, the impact appears to be approximately 11 000 cubic metres per year.

Having considered the information about the Hill 60 area, I am satisfied that it was appropriately addressed in the analysis. Until such time as the status of this area becomes finalized, it is consistent with current policy to include the area in the assumed timber harvesting land base for modeling purposes. I have concluded, however, that it is also appropriate to specify a temporary AAC reduction of 11 000 cubic metres under the provisions of Part 13. I have done this under a separate instrument, specifying that the reduction will remain in place until Hill 60 is no longer a "designated area". In the meantime, I am aware that the licensee is also deferring its operations in the portion of Hill 60 that is outside the designated area.

Twenty-year plan

The main purpose of the twenty-year plan is to demonstrate that the harvest volume projected in the base case can be achieved from specific areas on the landscape over the next twenty years. Such a plan is, however, lacks the rigour of an operational plan and is not meant to be as precise or accurate as an operational plan. No harvesting authority is granted on the basis of a twenty-year plan.

The licensee submitted its twenty-year plan on November 16, 2001, and it was accepted by the district manager on December 14, 2001. The plan confirmed that the harvesting level projected in the base case could be achieved for at least twenty years, recognizing that operational plans are certain to vary somewhat from the spatial deployment illustrated in the twenty-year plan.

I have reviewed and discussed the information regarding the twenty-year plan with BCFS staff and I am satisfied that the first two decades of the base case harvest projection is operationally attainable. I note that the placement of operations projected in a twenty-year plan are not intended to reflect the actual location of harvesting. I have been mindful of this information in my consideration of an appropriate harvest level for TFL 46.

Difference between AAC and actual harvest

Until the *Forest Act* was amended this past year, each TFL holder was required to harvest no less than 50 percent, and no more than 150 percent of its AAC in a given year. In addition, it was held to harvesting between 90 percent and 110 percent over a five-year period. Changes to the *Act* have now eliminated the annual cut control requirements, as well as the minimum five-year limitation. Licensees are now held only to harvesting no more than 110 percent of their AAC over a five-year period.

At the completion of the 1993 to 1997 cut control period, the volume harvested by the licensee on TFL 46 was 545 779 cubic metres less than 100 percent of its accumulated five-year allowable cut. Section 67(3) of the *Forest Act* allows the Minister of Forests to dispose of any five-year undercut volume to a third party. On that basis, an Interim Measures Memorandum of Understanding (MOU) among the Government of B.C., Government of Canada and Ditidaht and Pacheedaht First Nations was entered into on February 28, 2001. The MOU committed the Province to working with the two First Nations to develop a proposal for a forest tenure within the traditional territories of the two First Nations, based on the TFL 46 undercut volume.

In November 2001 the Minister of Forests committed to offering a direct award of a Timber Sale Licence to the above two First Nations subject to approval of legislation to be tabled in the spring of 2002. Such enabling legislation was enacted in May 2002.

On January 28, 2003 the Minister invited the Ditidaht and Pacheedaht First Nations to apply jointly for a TSL for a volume of up to 300 000 cubic metres to be harvested over a ten-year period within the boundaries of TFL 46. The First Nations submitted an application on March 5, 2003 and the Minister has subsequently directed the regional

manager to enter into a timber sale licence with the applicants, subject to agreement on the terms and conditions of the licence.

I have reviewed the harvest over the past five years relative to the AAC and am familiar with the commitments made by the Province to the Ditidaht and Pacheedaht First Nations. I have considered this information in my determination.

(b) the short and long-term implications to British Columbia of alternative rates of timber harvesting from the area,

Alternative rates of harvest

- harvest flow/socio-economic implications

The nature of the transition from harvesting old-growth forests to harvesting second-growth forests is a major consideration in determining AACs in many parts of the province. In the short term, the presence of large timber volumes in older forests often permits harvesting above long-term levels without jeopardizing future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to ensure that current and mid-term harvest levels will be compatible with a smooth transition toward the usually (but not always) lower long-term harvest level. Thus, timber supply should remain sufficiently stable so that there will be no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

In the case at hand, the licensee did not model any harvest flows other than the flat-line base case and related sensitivity analyses, noting that the base case provided the highest possible projection of timber supply. Alternative projections, such as initiating harvest at the previous AAC or at some level higher than the initial rate of cut in the base case, would have helped me better understand the timber supply dynamics in this management unit. In order to bring greater rigour to the next timber supply analysis, I urge the licensee to do that when the time comes, in consultation with the relevant ministry staff.

Community dependence upon the forest industry

The licensee indicates in its management plan that in 1999, the total number of people employed by the company and associated with TFL 46 was 240. In addition, the licensee notes that numerous contractors are employed on the TFL for timber harvesting, timber salvage, road deactivation, stream cleaning, silvicultural surveys, planting, brushing and weeding, fertilization, planning, and inventories.

The licensee also notes that First Nations workers have been employed for stream cleaning, fisheries habitat enhancement and deer habitat forage enhancement projects.

I have reviewed and discussed the information with BCFS staff, and I am mindful of the employment and revenues provided to communities by the timber harvesting and other operations on TFL 46.

Ditidaht-Pacheedaht licence

In the 1993-97 cut control period, the licensee undercut the accumulated AAC by 545 779 cubic metres. If the forest regional manager decides to not allow the licensee to harvest the undercut volume in the subsequent cut control period, the Minister is entitled to dispose of some or all of that volume to a third party.

In the case at hand, the regional manager did not authorize the licensee to carry the undercut forward. The Province subsequently entered into an Interim Measures Memorandum of Understanding with the Ditidaht and Pacheedaht First Nations, one element of which is the awarding of a licence to harvest 300 000 cubic metres within the TFL 46 land base. If and when this harvesting occurs, it will have a relatively small impact on the inventory of merchantable timber in the TFL area, which will be captured in future timber supply analyses.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

Timber processing facilities

The majority of the timber harvested on TFL 46 is processed in mills on Vancouver Island and in the Lower Mainland. In 2000, less than one percent of the harvested volume was processed by the company's Elk Falls Lumbermill near Campbell River and 43 percent was processed in the company's Youbou sawmill, which has since been closed. About 8 percent was sold to Norske Pulp, and the remaining 49 percent was sold or traded to other firms.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia,

Economic and social objectives

- *Minister's letter and memorandum*

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). These economic and social objectives are an important consideration in my determination of the AAC for TFL 46.

The letter and memorandum include objectives for forest stewardship, a stable timber supply, and a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his 1994 letter, that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability." He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in

previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

The Minister's 1996 memorandum addressed the effects of visual resource management on timber supply. It asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure they do not unnecessarily restrict timber supply.

I have considered the contents of the letter and memorandum in my determination of the AAC for TFL 46.

- *local objectives*

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives.

According to the licensee, it provided opportunities for public review of the draft management plan and the timber supply analysis, including the following:

- advertising open houses in local and regional newspapers;
- distributing information by mail to municipal councils, First Nations, community organizations, and government agencies; and
- holding open houses on October 4 and 5, 2000 in Lake Cowichan and Duncan, respectively, and making the documents available for public viewing.

I am satisfied that the licensee has carried out its public involvement obligations satisfactorily, and I am aware that many concerns were raised. Having reviewed those concerns and the licensee's responses, I am satisfied that they have been adequately considered in this determination.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

<u>Non-recoverable losses</u>

Numerous parasites, fungi or plants can kill trees or degrade the quality and value of logs. Unsalvaged losses are timber volumes destroyed or damaged by agents such as fire and disease, that are not recovered through salvage operations.

Estimates for unsalvaged losses account for epidemic infestations that are not incorporated into yield estimates used in the analysis. Timber volume losses due to insects and diseases that normally affect stands (endemic losses) are accounted for in inventory sampling for existing timber yield estimation or through other methods. Losses associated with second-growth stands are addressed by application of operational adjustment factors.

No volume losses were applied in the base case to account for unsalvaged losses. The licensee indicates that an annual loss estimate equivalent to one percent of the total gross harvest level is adequate to account for unsalvaged losses from windthrow or possible

epidemic infestations. It indicates that it has an active salvage program, recovering most volume losses from windthrow.

Having considered the information about unsalvaged losses, I accept that the estimate of one percent of the total volume in the harvest forecast, or 6000 cubic metres, is based on the best available information and is an acceptable estimate of the annual unsalvaged losses on TFL 46. As a result, I conclude that the base case overestimates available timber supply by about one percent on account of this factor, and will discuss this in '*Reasons for Decision*'.

Reasons for decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

Based on my review of the licensee's base case described above, and notwithstanding adjustments that I believe are appropriate, I accept it as an adequate basis from which to assess timber supply for this AAC determination. The licensee projected in its base case that a harvest level of 590 000 cubic metres per year could be maintained on TFL 46 for 200 years.

In determining this AAC, I have identified factors which considered separately indicate that timber supply is either more or less than projected in the base case. Some of these factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision, but cannot be reliably quantified at this time. These latter factors are accounted for in AAC determinations in more general terms.

In this rationale I have identified a number of assumptions in the base case that I believe do not accord with current or readily foreseeable operational practices and conditions. None of those differences lead me to believe that the base case has <u>underestimated</u> timber supply.

A number of factors, however, lead me to conclude that the base case has <u>overestimated</u> timber supply. They are:

- *BC Timber Sales area deletion* — After the base case was crafted, an area of land was deleted from the TFL in order to remove BCTS operations from the TFL. I conclude that timber supply is therefore approximately 20 200 cubic metres per year less than indicated, across the full planning horizon.
- *Variable retention* — The base case assumed only clearcutting, which does not reflect current management. On the one hand, in its Management Plan the licensee commits to phasing out clearcutting and adopting variable retention logging by 2004. On the other hand, the licensee recently advised that "after extensive experience with variable retention and consultation with external experts, TimberWest determined that for safety, productivity and environmental reasons it is not feasible to achieve 100 percent variable retention on the Company's private and public lands". It is not clear to me whether this change in

direction is meant to apply to TFL 46, given the Management Plan statements about implementing variable retention harvesting. Hence the timber supply impacts of adopting variable retention are not clear.

The licencee's sensitivity analysis indicated that adoption of variable retention logging will of itself reduce long-term yields by about 0.2 percent. This has the effect of lowering the flat-line timber supply projection by about 1000 cubic metres per year over the planning horizon. Despite the uncertainty, I conclude that the majority of harvesting on the TFL is probably going to be by way of variable retention, and the impact on the base case projection will be at least as great as the sensitivity analysis indicated.

- *Managed Stand Yields for Spaced Stands and Fertilized Stands* —— Between 1955 and 1998, some 22 300 hectares were juvenile spaced. However, this treatment was not reflected in the base case.

  Ministry studies have shown that spaced stands typically yield less volume than if they had not been spaced, although the piece size of the harvested stems is generally greater. Off-setting the likely impact of the juvenile spacing is the fact that about 11 600 hectares have been fertilized. Again, this treatment was not modeled in the base case and the licensee did not provide any data to indicate how great the volume gains may be.

  The licensee recently provided me with information showing that at least some spaced stands produced more volume than indicated by the TIPSY yield tables applied in the base case. However, it is not clear whether those stands were representative of the large area that was spaced and fertilized. I conclude that there is considerable uncertainty about the base case projections for these stands, and this causes me to be cautious in respect of this factor. I encourage the licensee to assess the actual performance of these stands in order to reduce this uncertainty in the timber supply analysis.
- *Wildlife Habitat Areas* — Given the Province's commitment to implementing the Identified Wildlife Management Strategy, and given the known occurrence of certain 'identified wildlife' on TFL 46, I conclude that Wildlife Habitat Areas are certain to be created over the next few years. This will reduce timber supply by up to about 1 percent, or about 6000 cubic metres, relative to the base case.
- *Wildlife tree patches* — The base case assumed a 2 percent reduction in timber supply to account for establishment of wildlife tree patches. However, data collected by the licensee indicates that, on average, 8.1 percent of each gross cutblock area was being retained for this purpose, of which 4.7 percent would otherwise have been available for harvest. Based on a the licensee's examination of how sensitive timber supply is to a reduction in the timber harvesting land base, I conclude that timber supply has been overestimated by about 2 percent, or 12 000 cubic metres, on this count.
- *Forest Ecosystem Networks* — The base case assumed that all FEN areas would be available for harvesting, subject to any other harvesting constraints. However, the *Operational and Site Planning Regulation* has been amended to continue the FEN constraints until landscape-unit planning has been completed.

A sensitivity analysis indicated that, if old-growth retention targets are retained and all of the FEN areas are considered unavailable to harvesting, timber supply would be about 6 percent less than indicated in the base case. What is not clear, though, is the extent to which FEN areas will in fact be retained to satisfy old-growth retention, or any other forest cover, requirements. Hence it is not clear to what extent the conclusion of landscape-unit planning will make areas currently identified as FEN areas available for timber harvesting.

I believe that some of the FEN areas will be designated as old-growth management areas, but at this time I have no way of knowing to what extent that will be true, or to what extent such designation will allow harvesting of old-growth timber in other parts of the TFL that otherwise would have been set aside to satisfy old-growth retention targets.

I conclude that the temporary retention of FEN areas does have a downward influence on timber supply, and that some old-growth management areas will likely be established within current FEN areas. This may have a downward influence on timber supply compared to the aspatial old-growth constraints modeled in the base case. I believe these impacts will be less than 6 percent, which would be equivalent to 36 000 cubic metres per year.

- *Hill 60* — 1700 hectares of TFL 46 is included within a "designated area' under Part 13 of the *Forest Act*. For the duration of that designation, harvesting is prohibited within that area. I have concluded that timber supply is reduced by about 11 000 cubic metres per year because of this, and under a separate Order I am imposing an AAC reduction of this amount that will have effect for the duration of the "designated area" status.
- *Non-recoverable Losses* — The base case did not include any provision for non-recoverable losses, which the licensee estimates to be equivalent to about 1 percent of the harvest level shown in the base case. I conclude that this is a reasonable estimate, and that the base case therefore overestimates timber supply by about 6000 cubic metres per year.

I have concluded that other assumptions in the base case have introduced uncertainty that I have not been able to quantify:

- *Site Indices* — As explained under '*site productivity estimates*', I am mindful that site indices for Douglas-fir stands, comprising about 15 percent of the timber harvesting land base, may have been over-estimated because sample plots may have been located in fertilized stands. However, I have no evidence to confirm that, and I conclude that this factor introduces uncertainty into the base case, with a possible downward influence on the modeled timber supply.
- *Watershed constraints* — I conclude that watershed-related harvesting constraints should have been modeled at the sub-basin level, rather than the watershed level. This would have been more constraining, but I have no evidence to indicate by how much. I therefore conclude that this factor has a small, downward influence on timber supply in the short-term.

- *Special Management Zones* — Under *the Vancouver Island Higher Level Plan Order*, two Special Management Zones encompass about 3500 hectares of the TFL. Various stipulations in the *Order* will have the effect of lowering timber supply from those zones. If that impact is 10 percent, as assumed by the licensee in its analysis, the impact on timber supply for the TFL as a whole has been shown to be about 1 percent, or 6000 cubic metres per year. I have no evidence to indicate whether that estimate is sound, but I conclude that harvesting constraints in the *Order* are certain to lower timber supply compared to the base case projection.

Although the licensee has suggested that deciduous-leading stands should be assumed to contribute to timber supply, and their potential contribution should be added to the base case projections, I disagree. I have seen no evidence that such stands are being utilized, or are likely to be utilized in the foreseeable future. If in fact, that situation changes, I will certainly take that into account in the next AAC determination.

Finally, I am aware that the Ditidaht and Pacheedaht are implementing an interim measures agreement with British Columbia for the direct invitation of a 300 000 cubic metre timber sale licence over 10 years from within TFL 46. If this harvesting proceeds, the inventory of merchantable timber will be reduced accordingly, something that was not reflected in the base case. Such an impact will be taken into account in future timber supply analyses and AAC determinations.

First Nations Issues

Most First Nations issues have to do with how land is being, or will be, managed. During consultation on this determination, the concerns I heard related primarily to:

- sustainability of old-growth stands;
- conservation and recruitment of cedar to meet cultural needs;
- preservation of sufficient wildlife habitat, especially elk winter range;
- protection of key heritage sites and culturally significant areas including Hill 60;
- maintenance of visual quality in the Nitinat viewscape;
- continuing public access in the Tuck Lake area;
- increased participation in the forest sector economy; and
- preservation of forest resources in anticipation of settling land claims.

As I discussed under '*First Nations considerations'*, I believe that the primary instruments by which First Nations issues can be explicitly addressed are TFL management plans and operational plans. That is because each AAC determination is primarily an outcome that is based on analysis of the physical circumstances of a management unit and how it is being managed. In that light, I wrote to the licensee on January 2, 2002, acknowledging its commitment to develop a strategy whereby the TFL area will contribute to meeting the on-going interests that First Nations have in cedar for cultural uses. I stated that I anticipate the licensee, in developing a strategy for incorporation into the next management plan, will:

- work with relevant First Nations to identify the characteristics of cedar that are germane to their needs;
- estimate the volume of cedar that will meet relevant quality parameters, now and as projected over time;
- describe how the old-growth cedar resource will be conserved over time;
- quantify the extent to which suitable second-growth cedar will become available over time;
- explain the extent to which TimberWest, as part of its normal harvesting regime, may make suitable material available to First Nations; and
- outline how TimberWest will engage First Nations in implementing the strategy.

That work should take place over the coming two years. In addition, I note that the Coast Forest Regional Manager has been asked to lead a Coast-wide analysis of First Nations' requirements for cedar, the supply of suitable material now and in the future, and mechanisms that will facilitate access to that material. I believe the results of this analysis will have a significant bearing on the licensee's development of a cedar strategy for TFL 46.

My exercise of statutory authority to approve the next management plan will be the primary opportunity and means by which I will be able to discharge the Crown's obligations in respect of aboriginal rights on the TFL land base. In reflecting the input that the licensee and I have heard from First Nations over the past year, I expect the next management plan to enunciate how the licensee will conserve ungulate winter range, and identify and protect key heritage sites. I expect the next management plan and subsequent operational plans to also reflect the old growth management areas that will be established in the interim.

I am especially aware that relatively little old growth remains in the Chemainus and Cowichan landscape units, and that this is of particular concern to the Cowichan Tribes. This is especially so because Crown land makes up a relatively small percentage of the land base in the general area. I note that the portion of TFL 46 in these landscape units totals about 5200 hectares, and that harvesting operations have been prohibited on 1632 hectares of this, due to part of Hill 60 becoming a "designated area" under Part 13 of the *Forest Act*. In light of that, I conclude that the most appropriate way to reflect the Cowichan Tribes interests is to specify an AAC reduction for the TFL for as long as the designated area status is in effect. This will reduce the scale of harvesting that would otherwise take place in the Chemainus and Cowichan landscape units. I have effected this AAC reduction through an Order that is separate from this Rationale document.

I note that First Nations wish to participate more fully in the forest economy on southern Vancouver Island, and as noted under '*First Nations considerations*' are in the process of acquiring significant harvesting rights and funding. Those measures are beyond the scope of my authority as deputy chief forester, and this AAC determination in particular.

Determination

I have considered and reviewed all the factors documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that reflects current management practices as well as the socio-economic objectives of the Crown, and that reflects First Nations' issues, can best be achieved by establishing an AAC of 510 000 cubic metres, before taking into account the temporary reduction mentioned below. The new AAC represents an increase of 6 percent from the current AAC.

Under separate Order, I have coincidentally reduced the AAC by 11 000 cubic metres for as long as the Hill 60 area remains a "designated area" under Part 13 of the *Forest Act*. The AAC for the TFL area therefore will be 499 000 cubic metres for as long as the "designated area" remains in effect. If and when that status ends, the AAC will become 510 000 cubic metres.

This determination is effective September 1, 2003 and will remain in effect until a new AAC is determined, which must take place within five years of the date of this determination unless the re-determination date is formally postponed according to the provisions of Section 8 of the *Forest Act*.

As stated in *Guiding Principles*, I re-iterate that my AAC determination does not prescribe where harvesting should or should not occur, nor does it prescribe who should harvest the timber. If additional significant new information is made available to me in respect of the management assumptions upon which I have predicated this decision, or First Nations' interests, then I am prepared to revisit this determination sooner than the five years required by legislation.

Implementation

In the period following this determination and leading up to the subsequent determination, I request that the licensee conduct the following projects, working as appropriate with BCFS, MSRM, and MWLAP staff, and with First Nations:

- monitor and report on harvesting performance in deciduous-leading stands;
- monitor the impact that variable retention is having on timber availability, including the productivity of regenerating stands;
- continue to document actual levels of wildlife tree patch retention;
- complete landscape-unit planning, at least to the point of establishing old-growth management areas in each landscape unit;
- collect local field data on the width of roads constructed on the TFL;
- confirm retention levels and actual management practices within riparian management zones;
- develop a habitat conservation strategy for elk and deer; and

- develop an old-growth cedar conservation strategy to address First Nations concerns.

I also encourage the licensee to update the TFL forest inventory, and re-iterate the First Nations-related expectations listed in my January 2, 2002 letter mentioned above.

/Ken Baker

Ken Baker
Deputy Chief Forester

August 14, 2003

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, reads as follows:

Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 10 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

(3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she

(a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and

(b) must give written reasons for setting the earlier date.

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area,

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a rate of timber harvesting for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

1998-29-2; 1999-10-1; 2000-6-2; 2002-25-21.

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Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;
(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;
(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;
(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and
(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Documents attached:

Appendix 3: Minister of Forests' letter of July 28, 1994

Appendix 4: Minister of Forests' memo of February 26, 1996

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
OFFICE OF THE MINISTER

Ministry of Forests

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: The Crown's Economic And Social Objectives Regarding Visual Resources

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis.*

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests